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# COMPETENT PERSONS REPORT

## REMAINING NICKEL RESOURCE ESTIMATE

## PT HENGJAYA MINERALINDO

**Bahodopi and South Bungku Subdistrict,**

**Morowali Regency, Central Sulawesi, Indonesia**



2026

**DATE CREATED** **DATE ISSUED**

27 January 2026

# EXECUTIVE SUMMARY

The PT Hengjaya Mineralindo nickel mine is 22km haul distance to RKEF and HPAL smelters at Indonesia Morowali Industrial Park, Central Sulawesi, Indonesia.

Since, November 2018 until July 2025, a systematic exploration program has been implemented and 14,704 holes with a total cumulative depth of 350,210m have been drilled with the objective to delineate a sufficient Resource of nickel laterite to support the mining operation into the future.

Since 2020, PT Hengjaya Mineralindo has sold 13,8 million Wmt of saprolite with a weighted average grade of 1.5% Ni and 10.9 million Wmt of limonite with a weighted average grade of 1.1% Ni, until the end of October 2025. Remaining inventory of limonite is approximately 31 million Wmt which has been stockpiled in-pit for future production.

Table I Estimated Nickel Resource Remaining 31 Dec 2025 (million dry tonnes)

| Laterite | Measured | Indicated | Inferred | Total | Ni | Co | Fe | SM Ratio | Ni Metal | Co Metal |
|---|---|---|---|---|---|---|---|---|---|---|
| CoG 0.7% | Dry Mt | Dry Mt | Dry Mt | Dry Mt | % | % | % | % | Dry Kt | Dry Kt |
| LIMONITE | 71.56 | 42.29 | 36.12 | 149.97 | 1.04 | 0.11 | 42.15 | 5.25 | 1,553 | 168 |
| SAPROLITE | 49.64 | 33.20 | 33.80 | 116.64 | 1.40 | 0.04 | 15.73 | 2.01 | 1,631 | 47 |
| **Total Insitu** | **121.50** | **75.47** | **69.64** | **266.61** | **1.18** | **0.08** | **31.15** | **2.43** | **3,157** | **224** |
| STOCKPILE | - | - | 18.76 | 18.76 | 1.00 | 0.09 | 38.98 | 2.17 | 187 | 17 |
| **Grand Total** | **121.50** | **75.47** | **88.40** | **285.37** | **1.17** | **0.09** | **31.66** | **2.41** | **3,344** | **241** |

An Exploration Target estimate, in the Central North area, is shown below and in accordance with the JORC Code, it must be stated that there is insufficient data to estimate a Resource at this time and it cannot be guaranteed that further exploration will result in the a Mineral Resource.

Table II Exploration Target

| Laterite | Target Area (Ha) | Laterite Thickness Assumption | | Million Wet Tonne | |
|---|---|---|---|---|---|
| | | Min (m) | Ave (m) | Min (Mt) | Max (Mt) |
| **Limonite** | 280 | 3 | 12 | 15 | 60 |
| **Saprolite** | 280 | 2 | 8 | 9 | 38 |
| **Total** | **280** | **5** | **20** | **24** | **98** |

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| Al2O3 | Aluminium Oxide |
| APL | Areal penggunaan lain (Forestry status for land with no forestry restriction) |
| AusIMM | Australasian Institute of Mining and Metallurgy |
| Ave | Average |
| BB | Bete-bete block |
| BBFW | Bete-bete far west block |
| BBS | Bete-bete south block |
| BBW | Bete-bete west block |
| CAD | Computer-aided design |
| CaO | Calcium oxide |
| CE | Central east block |
| cm | Centimeter |
| $cm^3$ | Centimeter cubic |
| CN | Central north block |
| Co | Cobalt |
| CoG | Cut-off Grade |
| Cr2O3 | Chromium oxide |
| CRM | Certified Reference Materials |
| CSR | Corporate social responsibility |
| CV | Coefficient of variation |
| CW | Central west block |
| DA | Pulverize duplicate |
| DEX | PT Danmar Explorindo |
| dmt | Dry metric tonnes |
| DR | Double roll crush duplicate |
| EDXRF | Energy Dispersive X-Ray Fluorescence |
| EOH | End of hole |
| ESG | Environmental, Social, and Governance |
| Fe | Iron |
| g | grams |
| gm | Gram |
| GPR | Ground penetrating radar |
| GPS | Global positioning system |
| Ha | Hectare |
| HM | PT Hengjaya Mineralindo |
| HQ | Drill rod sizes |
| HPAL | High-Pressure Acid Leach |
| ID | Identity |
| IMIP | Indonesia Morowali Industrial Park |
| IQR | Inter quantile range |
| IUP | Indonesian mining business permit |
| JORC | Joint ore reserve committee |
| Kg | Kilogram |
| km | Kilometer |
| Kt | Kilotonne |
| KNA | Kriging neighborhood analysis |
| LiDAR | Light Detection and Ranging |

| | |
|---|---|
| m | Meter |
| Max | Maximum |
| MC | Moisture content |
| MgO | Magnesium oxide |
| Min | Minimum |
| Mn | Manganese |
| MnO | Manganese oxide |
| Mt | Million tonnes |
| Ni | Nickel |
| NiO | Nickel oxide |
| OP | Operation production |
| OREAS | Ore Research & Exploration Assay Standard |
| ph | Potential of Hydrogen |
| PPKH | Forest Area Borrow to Use Permit |
| PROPER | Public disclosure program for environmental compliance |
| PT | Limited Liability Company |
| QA/QC | Quality assurance, quality control |
| $R^2$ | Correlation coefficient |
| RBF | Radial basis function |
| REP | Replicate |
| RKEF | Rotary Kiln Electric Furnace |
| RTK | Real time kinematic |
| SCM | PT Sulawesi Cahaya Mineral |
| Si | Silica |
| SiO2 | Silica oxide |
| SMI | Smelter at Morowali |
| SOP | Standard Operating Procedure |
| STD | Standard |
| t | Tonne |
| UTM | Universal Transverse Mercator |
| VO | Variable orientation |
| WGS | World Geodetic System |
| Wmt | Wet Metric Ton |
| XRF | S-ray fluorescence |
| µm | Micrometer |

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# COMPETENT PERSON'S STATEMENT

| Position | Name | Qualifications | Signature | Date |
|---|---|---|---|---|
| Competent Person / Author | Daniel Madre | MSc MAusIMM |  | 10 Feb 2026 |
| Competent Peson / Contributing Author | Charles Watson | BSc FellowAusIMM |  | 10 Feb 2026 |
| Contributing Author / Peer Review | Tobias Maya | BSc MAusIMM |  | 10 Feb 2026 |

## REPORT OBJECTIVES

This report was prepared for PT Hengjaya Mineralindo for the purpose of updating the Nickel Resource based on exploration and mining until 1st November, 2025.

## REPORTING STANDARD

This report is intended to comply with the 2012 Code, of the Joint Ore Reserve Committee (JORC) of Australia for the reporting of Mineral Resources and Reserves (https://www.jorc.org/docs/jorc_code2012.pdf). All the information used in this report was assessed for compliance with the JORC Code and only information that was considered compliant was included in the estimate of a Nickel Resource as specified in the JORC Code of 2012. The competent persons contributing to this report have memberships to the Australasian Institute of Mining and Metallurgy (AusIMM) that are current and in good standing.

## AUTHORS QUALIFICATION STATEMENTS

The information in this report that relates to Exploration Results and Mineral Resources based on information compiled by Daniel Madre, AusIMM member no: 100878, Charles Watson, AusIMM Fellow no: 312716 and Tobias Maya, Aus IMM member no: 304661.

Daniel Madre has a Master of Science degree majoring in geology and more than 44 years of experience as an exploration geologist of which more than 38 years has been working in Indonesia. Since 2002, Daniel Madre has been involved in numerous nickel laterite exploration and mining projects in Indonesia in Kalimantan, Sulawesi, Halmahera and Papua. Daniel

Madre is currently a director of PT Danmar Explorindo and a consultant to PT Hengjaya Mineralindo for the purpose of this study. PT Danmar Explorindo has also been the exploration contractor to PT Hengjaya Mineralindo since 2019, providing exploration management including geology, drilling, well site monitoring, core sample preparation and database management.

Charles Watson is a geologist with more than 46 years' experience in Indonesia, Africa, Australia and New Zealand and has provided a detailed review of laboratory procedures, quality control procedures and assay result reliability at the Hengjaya Project for the purpose of this report. Charles is a consultant to Nickel Industries Limited that owns 80% of the Hengjaya Nickel Project.

Tobias Maya has a Bachelor of Science degree majoring in Spatial Science from Charles Sturt University, Australia. Tobias Maya is a Mineral Resource modelling specialist with more than 24 years of experience in exploration and modelling lateritic nickel resources in Indonesia. Tobias Maya is currently a director of PT Geo Search and a consultant to PT Danmar Explorindo for the purpose of this study. PT Geo Search has also provided Ultra-GPR (Ground Penetrating Radar) survey services PT Hengjaya Mineralindo.

Daniel Madre, Charles Watson and Tobias Maya have sufficient experience which is relevant to the style of mineralization and type of deposit under consideration and to the activity that they are undertaking; reporting of Exploration Results and Mineral Resources. Resumes for Daniel Madre, Charles Watson and Tobias Maya are attached in Appendix 7.

Daniel Madre, Charles Watson and Tobias Maya and PT Danmar Explorindo's partners, directors, substantial shareholders and their associates are independent of PT Hengjaya Mineralindo, its directors, substantial shareholders, its advisers and their associates.

Neither Daniel Madre, Tobias Maya and or PT Danmar Explorindo nor any of its partners, directors, substantial shareholders, advisor's and their associates have any interest, direct or indirect in PT Hengjaya Mineralindo, its subsidiaries, associated companies, or any related entities in Indonesia or elsewhere in the world. Charles Watson is a private shareholder in Nickel Industries which has in no way influenced his objectivity and transparency in contributing to this report.

Daniel Madre, Chrles Watson, Tobias Maya and PT Danmar Explorindo have no conflicts of interest issues that affect their objectivity in writing this report. PT Danmar Explorindo's fee

for completing this report is based on normal commercial terms and the payment is not contingent upon the outcome and findings of this report.

Yorris Wibriana and Harman Adhittyo are senior resource geologists specializing in, geological modelling and the use of Leapfrog Edge Ver.2025.3 software which has been used in this study to model the remaining Resources at Hengjaya Nickel Mine.

## DISCLAIMER

PT Danmar Explorindo has used the results of exploration programs provided by PT Hengjaya Mineralindo as well as the results of exploration drilling done on their behalf for the purpose of writing this report. In making this Mineral Resource estimation PT Danmar Explorindo has assumed all the relevant data available was provided without prejudice and key assumptions are accepted as described in this report. In view of the above assumptions PT Danmar Explorindo has made reasonable enquiries and exercised their judgment on the reasonable use and validity of the data and found no reason to doubt its accuracy and reliability. For this reason, we believe that this report is an objective, accurate and reliable representation of the nickel laterite at the PT Hengjaya Mineralindo project, based on the exploration results until 1 November, 2025. PT Danmar Explorindo makes no warranty to PT Hengjaya Mineralindo or any third parties with regard to any commercial investment on the basis of this report. The use of this report by PT Hengjaya Mineralindo or any other parties shall be at their own risk. The report must always be read in its entirety so that all the data and assumptions are fully considered and properly understood.

# 1 INTRODUCTION

## 1.1 Background

PT Danmar Explorindo (DEX) was asked to provide an update of the Nickel Resources remaining at the PT Hengjaya Mineralindo (HM) laterite nickel mine, using the Joint Ore Reserve Committee of Australia (JORC) Code, 2012. The last Nickel Resource report was dated 30 June 2022.

Since, November 2018 until July 2025, a systematic exploration program has been implemented and 14,704 holes with a total cumulative depth of 350,210m have been drilled. The objective was to delineate a sufficient Resource of nickel laterite to support the mining operation into the future.

During the last 7 years until 2026, the competent persons and contributing authors for this report worked at the HM site on numerous occasions. During the site work the exploration program was set up, monitored and the sample handling and laboratory operation of the project was reviewed, upgraded and continually improved. Mine production has also been reconciled against predicted Resource models and this work is continuing.

HM has been mining laterite nickel ore since 2013. Initially, direct ore shipments were made to export markets in China and Japan. A total of 328,000t of nickel ore was produced with a weighted average nickel grade of 1.97% and 38% Total Moisture in 2013. Direct shipping of nickel ore, to export markets, was banned by the Indonesian Government in 2014. Production resumed in 2015 and nickel ore was barged to the local smelter at Morowali (SMI). Since 2020, the Indonesia Morowali Industrial Park (IMIP), has purchased 13.8 million Wmt of saprolite with a weighted average grade of 1.5% Ni and 10.9 milllion Wmt of limonite with a weighted average grade of 1.1% Ni, until the end of October 2025.

Nickel Industries Limited, the 80% shareholder of HM, has downstream industrial projects at IMIP including; an 80% interest in three Rotary Kiln Electric Furnace (RKEF) smelter operations known as Hengjaya Nickel, Ranger Nickel and Oracle Nickel and is also has a 10% interest in the Huayue Nickel Cobalt High Pressure Acid Leach (HPAL) project and is in the process of acquiring 55% of Excelsior Nickel Cobalt, HPAL project which is still under construction. This ensures the HM mine project, a reliable market for its saprolite and limonite products into the foreseeable future. These RKEF and HPAL smelter plants are located 22 kms from the mine site at the IMIP.

## 1.2 Mining Lease Details

Mining rights for the area are held under an Operation and Production Mining Business Permit (IUP OP), with Area Code 540.3/SK.001/DESDM/VI/2011. The area covers 5,983Ha and gives HM the right to mine nickel and its associated minerals. The IUP OP was originally granted by the Regent of Morowali in 2011 and is valid until 26th May 2031. Table 1 shows the tenement license details of the HM lease. The IUP OP may be renewed twice, each for a period of 10 years. The mining lease document is attached in Appendix 2.

The IUP is located in the East Indonesian Ophiolite Belt and for this reason is surrounded by numerous other nickel mining tenements as well as one of Indonesia's largest nickel smelting and industrial hubs known as IMIP. The concession map for the area is shown in Figure 1.

Table 1 License details

| License holder | Province | Permit Type | Area (Ha) | Date of Issue | IUP Area Code | Commodity | Duration |
|---|---|---|---|---|---|---|---|
| PT Hengjaya Mineralindo | Central Sulawesi | IUP Operation Production | 5,893 | 10-Jul-2020 | 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 | Nickel and associated minerals | 26-May-31 |

HM is owned by the following shareholders: 80% Nickel Industries Limited, 20% by Indonesian partners. The IUP OP mining license documents are shown in Appendix 2. Legal due diligence was not part of the scope of work for this report and for this reason no legal due diligence of the lease documents or ownership was made at this time.

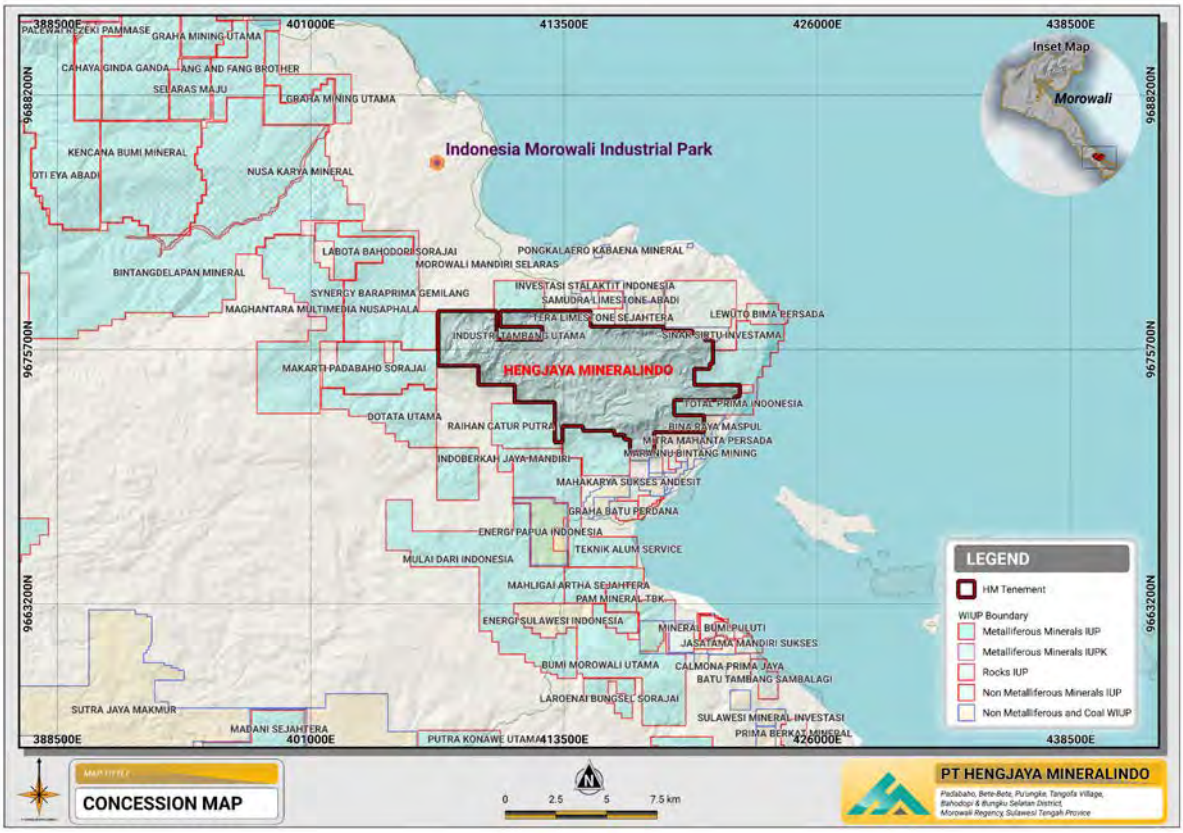



Figure 1 Concession map

## 1.3 Location and Access

The HM lease is within the villages of Padaboho, Bete Bete, Puunkeu and Tangofa in the shires of Bahodopi and Bungku Selatan, Regency of Morowali, Central Sulawesi Province. The location of the area is shown in Figure 2.

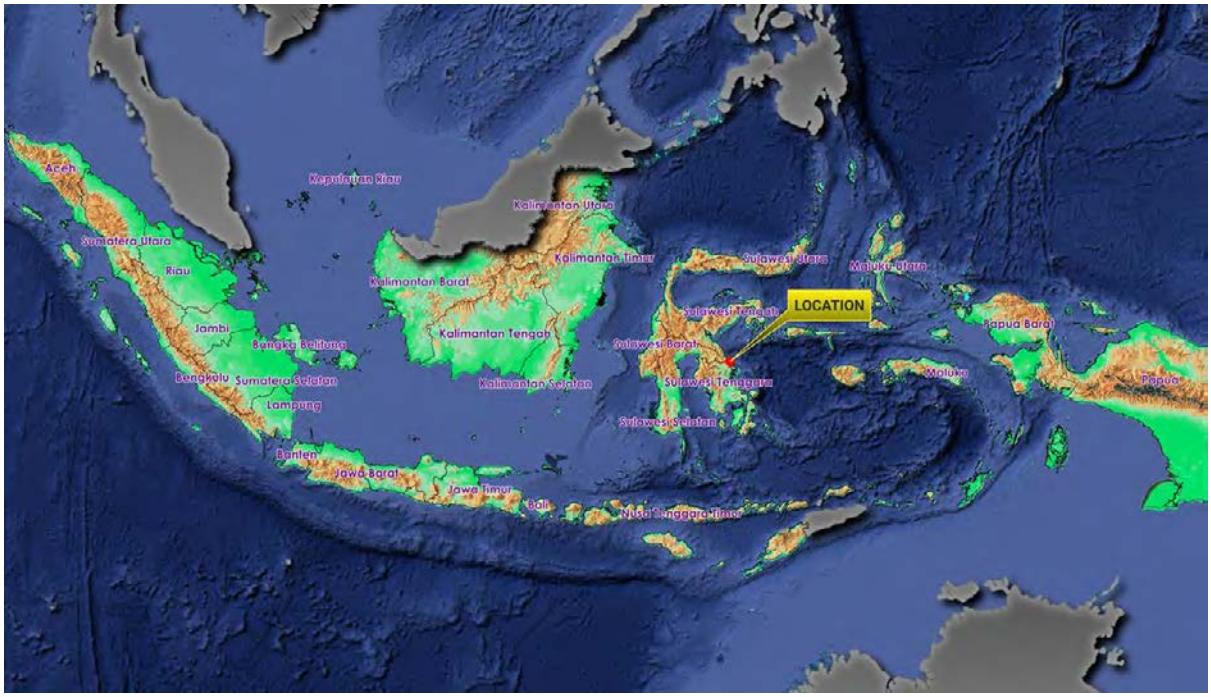



Figure 2 Project location map

Access to the HM concession from Jakarta is by commercial flight (2.0 hours) to Makassar, then from Makassar commercial flight (1.0 hour) to Morowali. Then drive to the site 4 hours by car via the provincial highway. Figure 3 shows the access from Morowali airport to the HM project.




Figure 3 Project access map

## 1.4 Forestry and Land Use

There are no Protected Forests in the HM project area and there are no other Forestry boundaries that prohibit surface mining. Approximately, 86% of the concession area is a Production Forest and the remaining 14% of the area is free from any Forestry overlaps. Figure 4 shows the HM lease area on the published Forestry Map of Indonesia.

Two Forestry permits (PPKH 1 & 2) to allow open cut mining within a 1,869.77Ha area have been granted by the Minister of Forestry (see Table 2) which covers approximately 34% of the Production Forest (see Figure 4) and also includes the haul road (PPKH 4) area. Exploration of the 984.61ha PPKH 3 area has been completed, with 465ha currently in the submission stage for Production Operation. Meanwhile, an additional area for further exploration, PPKH 5 covering 279.94 ha is planned for exploration in the future.

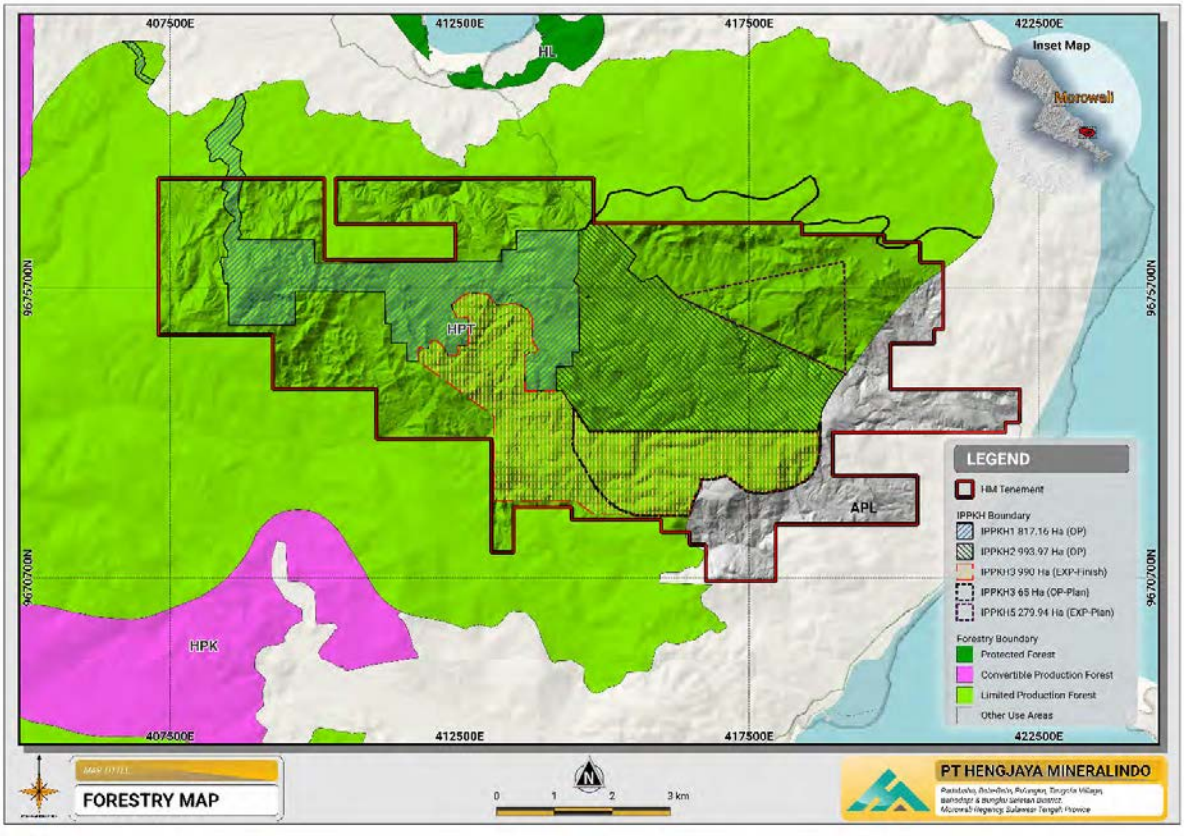



Figure 4 Forestry map

Table 2 Forestry (PPKH) land borrow permits details

| Forestry Permit | Permit Number | Permit | Status | Area (Ha) | Released Date | Expiry Date |
|---|---|---|---|---|---|---|
| PPKH1 | SK.644/MENLHK/SETJEN/PLA.0/6/2023 | Construction-Operation | Ongoing | 875.45 | 19-Jun-23 | 26-May-31 |
| PPKH2 | 1132 TAHUN 2024 | Construction-Operation | Ongoing | 994.32 | 30-Aug-24 | 26-May-31 |

## 1.5 Environment, Social and Governance

Below is the Company's vision for the HM Nickel Project taken from the Nickel Industries Sustainability Report, 2024. A full copy of this report is contained in Appendix 3 as well as a summary of HM's recent community development, environmental and safety achievements.

Nickel Industries instills a culture of acting professionally, ethically, sustainably and responsibly. It seeks to operate in line with the values set out below to ensure all employees within the Company and its subsidiaries work to reinforce these values.

The company prioritizes safety, health, community and environment. Working safely with regards to the environment and communities in which it operates enhances the sustainability and performance of the business.

The Company is results and performance-driven, striving to generate returns for shareholders by meeting strategy and targets developed to drive continuous improvement for all stakeholders.

The company encourages its people to work together as a high performing team and values rewarding team success. The company encourages and values strong, open inclusive communication and treats all people, within and outside the company, ethically and with dignity and mutual respect.

The company manages business risk through sound business processes and high quality decision making. The Company is committed to following all applicable rules, regulations and standards.

Figure 5 summarizes awards the HM Project has received in 2024, demonstrating the recent ESG achievements.




Figure 5 HM project ESG achievements in 2024

## 1.6 Infrastructure

As well as a jetty for loading barges with nickel laterite ore for shipment to IMIP, a haul road linking the HM mine to the IMIP nickel smelter facility was completed in 2023. A slurry pipeline for limonite transportation is also under construction (currently 56% complete) and is planned to have a transport capacity up to 14million wet metric tonnes of limonite per annum when completed in 2026. This will facilitate limonite and saprolite production and sales to increase beyond 2026.



Photo 1 HM mine offices, laboratory, workshop and accomodations



Photo 2 Haul road and slurry pipeline at HM mine

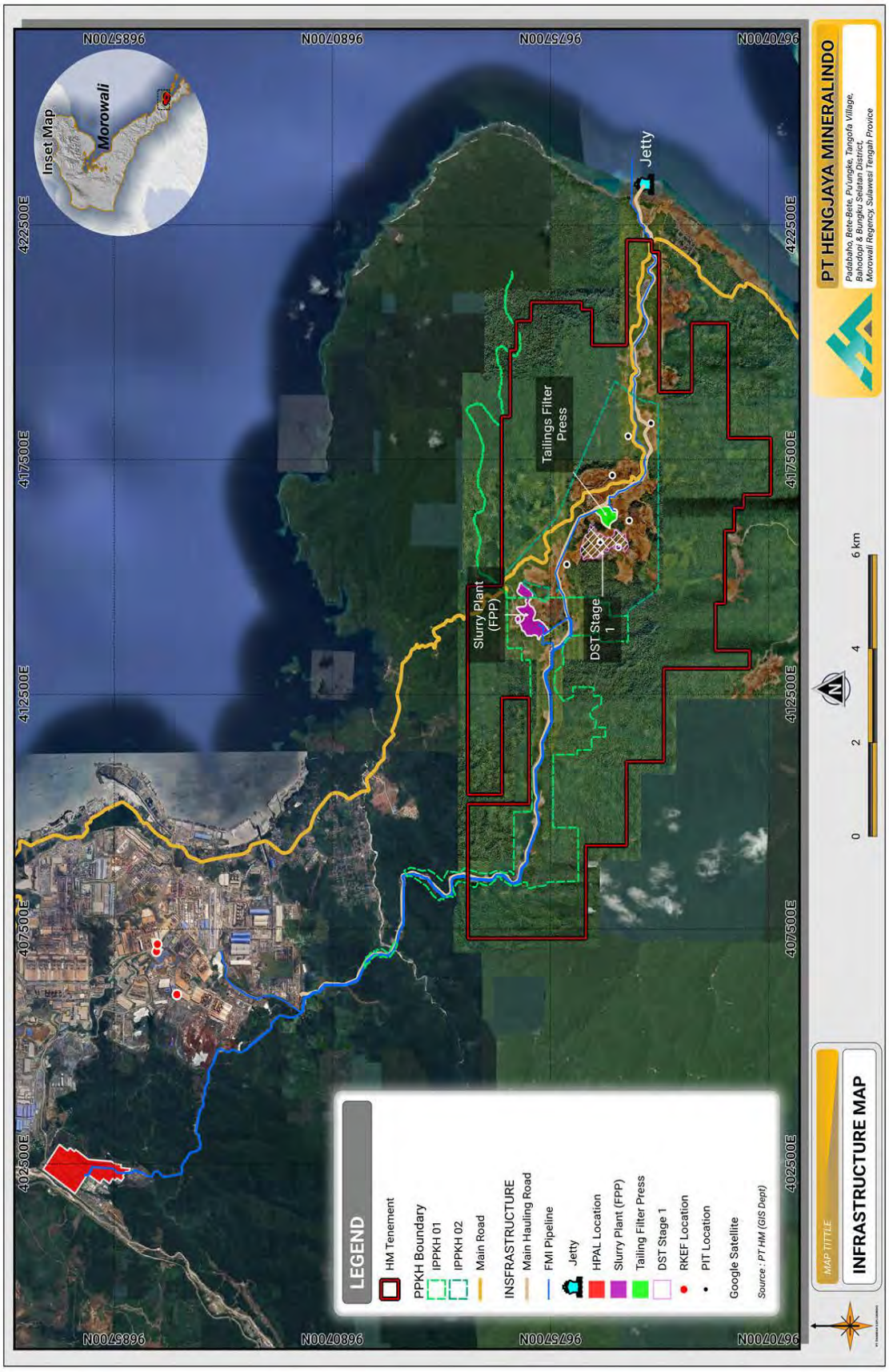



Figure 6 Infrastructure and smelter location map

# 2 GEOLOGY

## 2.1 Regional Geology

The regional tectonic setting for Central Sulawesi is the result of a complex collision between 3 of the earth's major crustal plates namely, the Australian plate, the Pacific plate and the Eurasian plate. As a result, three smaller plates have formed in this collision zone known as the Sunda Plate, Philippine Plate and Caroline Plate. The collision between all these tectonic plates is the cause of sections of the seafloor to be uplifted and deposited onshore in Sulawesi, North Maluku and Papua. This is the origin of the East Indonesian Ophiolite Belt which is one of the largest ophiolite regions in the world and the source of nickel laterite deposits in East Indonesia. Ophiolites are the result of the process of overthrust of oceanic crust and mantle to a position on top of continental rocks. This intense structural geological setting is also the reason major geological structures such as the Palu, Matano and Lawanopo faults dissect the Central Sulawesi region and control the distribution of rocks in the area.

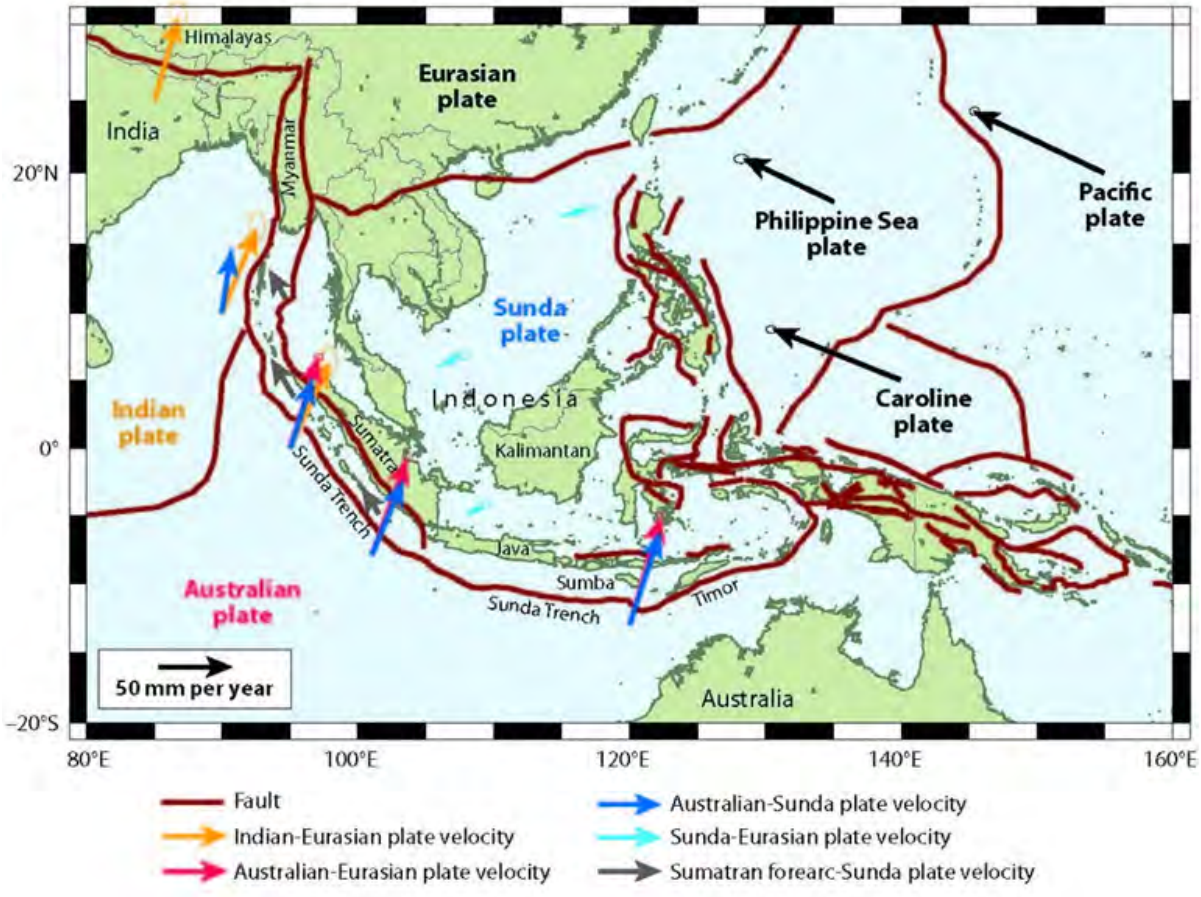



Figure 7 Regional tectonic geology map of Indonesia (R McCaffery 2009)

According to the 1:250,000 scale Bungku Geology Map Sheet, most of the HM concession area is covered by the Tokala Formation which is marine in origin and dominated by limestone, sandstone and shales (see Figure 8). The Tokala Formation underlies and is much older than the Ultramafic Complex of the East Sulawesi Ophiolite Belt. Figure 9 shows the naming and correlation of rock units on the published Regional Geology Map of the HM project area.

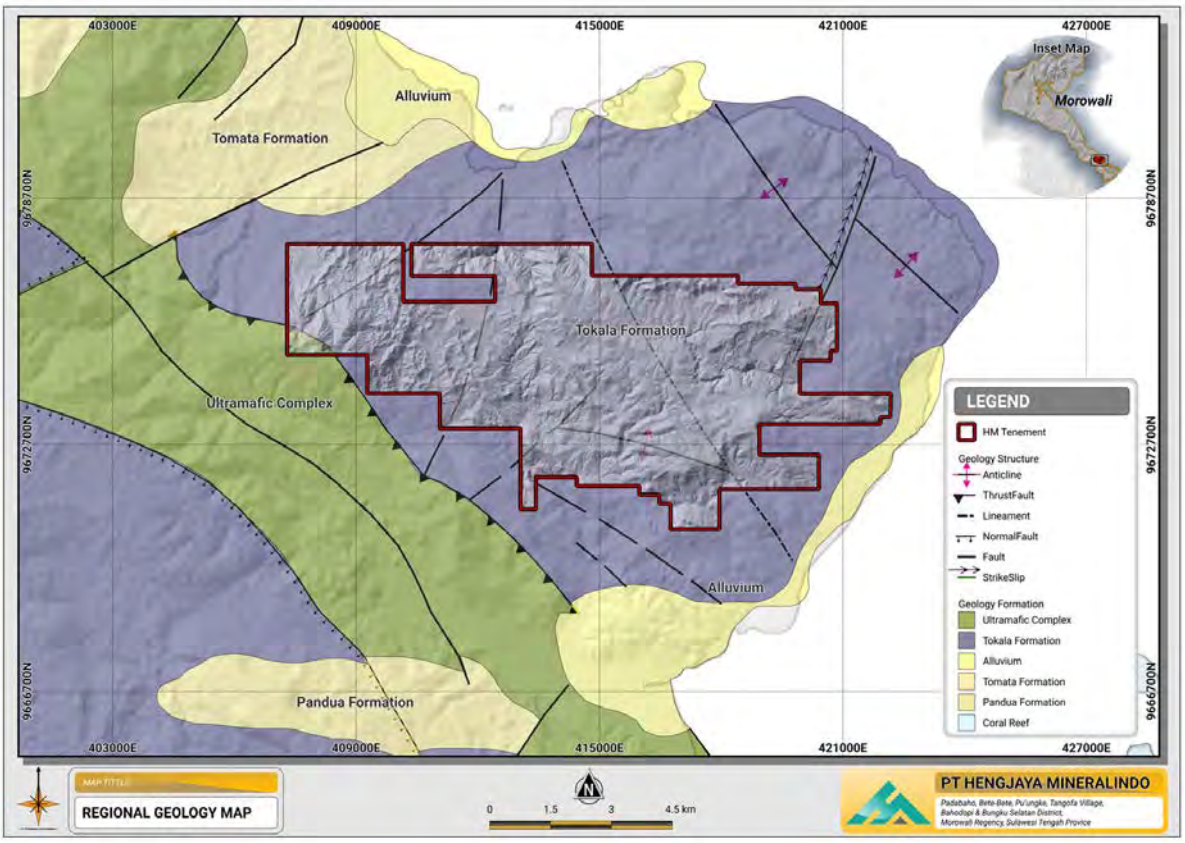



Figure 8 Regional geology map

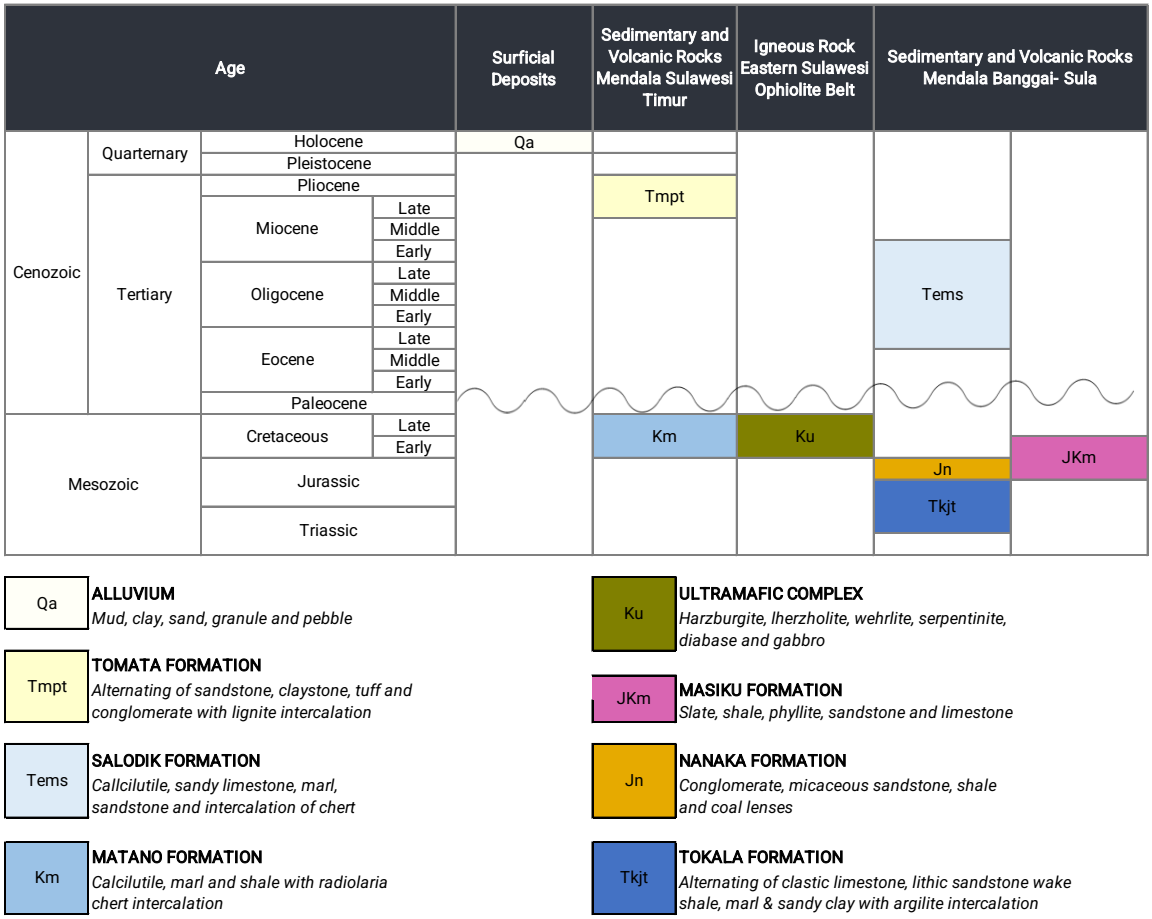



Figure 9 Regional stratigraphy in the Bungku Geology Map Sheet

## 2.2 Local Geology

A geology map, produced by HM, has been used as a guide to the surface geology at HM during the most recent exploration program. The basic geology map is shown in Figure 10. The map is in sharp contrast with the published Regional Geology Map of the area (Figure 8) which shows the HM concession area to be covered entirely by the Tokala Formation. In reality ophiolite is the dominant rock type at the surface in the HM IUP area and extends over more than 60% of the IUP concession. The Tokala Formation is older and lies underneath the ophiolites.

The local geology is represented by an analyzed suite of 15 samples (Table 3) categorized into ultramafic and sedimentary lithologies. The ultramafic group is dominated by harzburgite and low serpentinized peridotite, with localized occurrences of highly serpentinized intervals. The sedimentary sequence consists of calcareous sandstone alongside carbonate facies ranging from mudstone to wackestone.

Table 3 Thin section sample and results (source HM)

| No | Sample Code | Rock Name |
|---|---|---|
| 1 | HM-PT 1 | Harzburgite (Streckeisen, 1974) |
| 2 | HM-PT 2 | Low serpentinized peridotite (Streckeinsen (1974), Babineau (2022)) |
| 3 | HM-PT 3 | Harzburgite (Streckeisen, 1974) |
| 4 | HM-PT 5 | Harzburgite (Streckeisen, 1974) |
| 5 | HM-PT 6 | Low serpentinized peridotite (Streckeinsen (1974), Babineau (2022)) |
| 6 | HM-PT 7 | Serpentinized (Santos, 2020) |
| 7 | HM-PT 8 | Serpentinized (Santos, 2020) |
| 8 | HM-PT 9 | Harzburgite (Streckeisen, 1974) |
| 9 | HM-PT 10 | Wackestone (Embry & Klovan, 1971) |
| 10 | HM-PT 11 | Low serpentinized peridotite (Streckeinsen (1974), Babineau (2022)) |
| 11 | HM-PT 12 | Calcareous Sandstone (Gilbert, 1975) |
| 12 | HM-PT 13 | Calcareous Sandstone (Gilbert, 1975) |
| 13 | ANG_STA 19 | Wackestone (Embry & Klovan, 1971) |
| 14 | ANG_STA 20-1 | Mudstone (Embry & Klovan, 1971) |
| 15 | ANG_STA 20-2 | Mudstone (Embry & Klovan, 1971) |

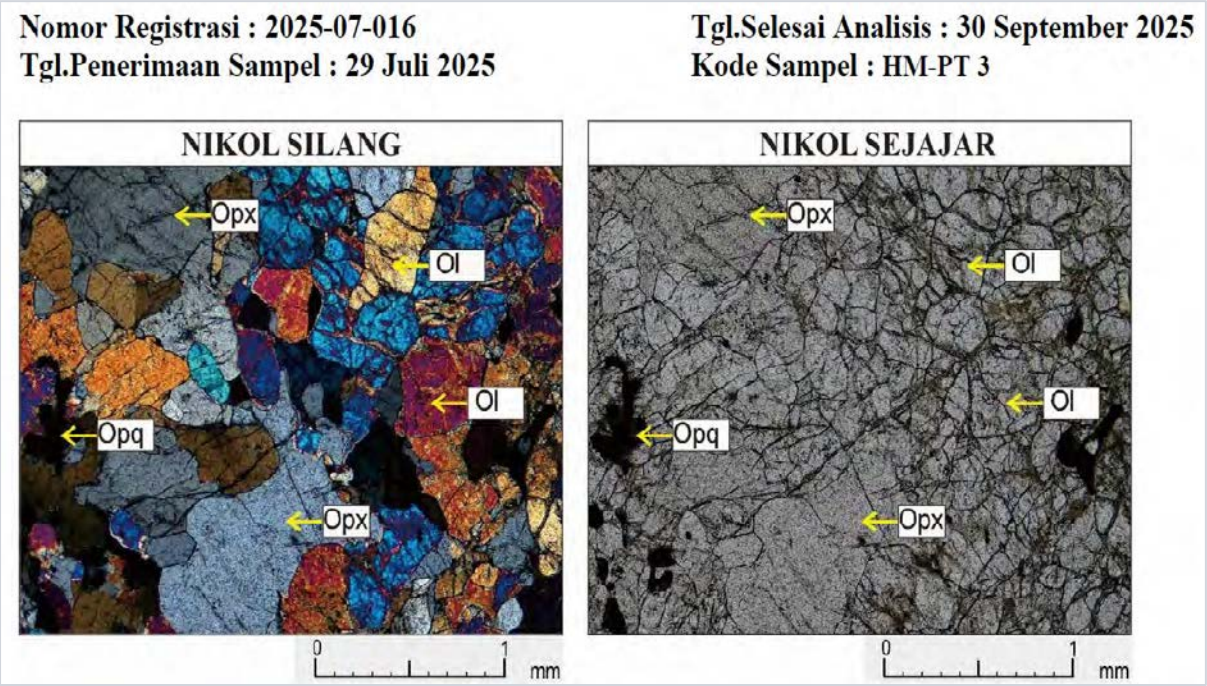



Photo 3 Parallel and Cross Nikol of Harzburgite from thin section



Photo 4 Laterite profile at HM nickel mine

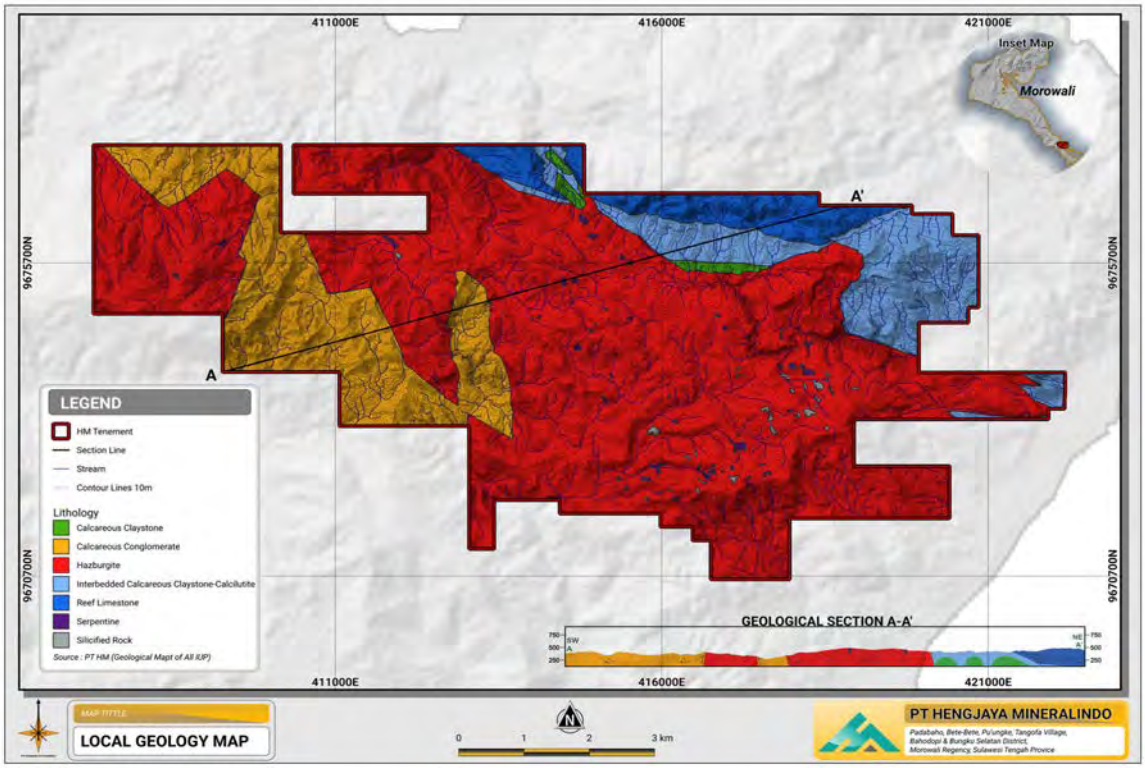



Figure 10 Local geology mapped by HM

## 2.3 Mineralisation

When ophiolite rocks are exposed to humid, tropical climates over a long period of time laterization can occur as the rocks are weathered. In this process of weathering by rain, soluble minerals are leached away and less soluble minerals such as iron, nickel and cobalt are left behind in the weathering profile. This laterization process is influenced by climate, geological structure, rock type, permeability and topography over long periods of time, to form a soil profile in which minerals containing nickel and other elements can be depleted in some places and concentrated in other areas. Within the ground, the leaching process is enabled by the permeability of the bedrock often as a result of tectonic movement causing fracturing and shearing, creating conduits for the flow of mineral rich solutions leached from above.

## 2.4 Previous Exploration, Resource Studies and Reports

PT Aneka Tambang (Indonesian Government mineral company) explored the nickel potential of a broad area which included the location of where the HM concession is currently located around 2007. The work included mapping and wide spaced drilling. The data is poorly documented with many holes having ambiguous hole identification, location coordinate and or no sample analysis information.

HM started drilling in 2010. At least 3 separate phases of drilling were carried out. Initially, wide spaced drilling on a 400m X 400m grid was conducted followed by 100 X 100m spacing and eventually 25 X 25m grids. From 2013 onwards, drilling operations had standard operating procedures implemented (GMT Hengjaya Mineralindo Resource Report dated 2018) that meet the requirements of the JORC Code for points of observation. In 2015 sample splits were transported to PT Geoservices in Kendari for preparation of pulps and sent on to Jakarta for fused bead XRF analysis. Table 4 summarizes the documented exploration history at HM until 2025.

Table 4 Previous Exploration Reports

| Reporting Company | Report Issue Date | Title of Report | Report Authors |
|---|---|---|---|
| PT GMT INDONESIA | May-12 | TECHNICAL REVIEW AND RESOURCE ESTIMATION FOR HENJAYA MINERALINDO CONCESSION AREA | BRET GUNTER & KRISJNA ALIMOEDDIN |
| PT GMT INDONESIA | Aug-15 | TECHNICAL REVIEW AND RESOURCE ESTIMATION FOR HENJAYA MINERALINDO CONCESSION AREA | BRET GUNTER & KRISJNA ALIMOEDDIN |
| PT GMT INDONESIA | Apr-18 | TECHNICAL ASSESSMENT REPORT FOR NICKEL MINES LIMITED | BRET GUNTER & KRISJNA ALIMOEDDIN |
| PT GMT INDONESIA | Dec-18 | RESOURCE ESTIMATE REPORT FOR NICKEL MINES LIMITED | BRET GUNTER & KRISJNA ALIMOEDDIN |
| PT DANMAR EXPLORINDO | Jun-20 | PT HENGJAYA MINERALINDO, NICKEL RESOURCE ESTIMATE, QUALIFIED PERSONS'S REPORT USING THE JORC CODE | DANIEL MADRE, CHARLES WATSON, TOBIAS MAYA |
| GEOMINE MINING AND GEOTECHNICAL CONSULTANT | Dec-21 | KAJIAN GEOTEKNIK DAN HIDROLOGI/HIDROGEOLOGI DEPOSIT NIKEL TAMBANG HENGJAYA MINERALINDO | GEOMINE MINING AND GEOTECHNICAL CONSULTANT |
| PT DANMAR EXPLORINDO | Jul-22 | PT HENGJAYA MINERALINDO, NICKEL RESOURCE ESTIMATE, QUALIFIED PERSONS'S REPORT USING THE JORC CODE | DANIEL MADRE, CHARLES WATSON, TOBIAS MAYA |
| ALAN MATANO | Jan-24 | LAPORAN AKHIR HASIL EKSPLORASI DAN ESTIMASI SUMBERDAYA NIKEL LATERIT PT HENGJAYA MINERALINDO | ALAN MATANO |
| PT LAPI ITB | Oct-24 | STUDI HIDROLOGI, HIDROGEOLOGI DAN GEOTEKNIK | PT LAPI ITB |
| PT ABHIPRAYA NUSA ENGINEERING | Sept-25 | GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PRPERTIES MATERIAL | ANDI SETIA RAHARDIAN |
| YANRI BUDI KARSENO | Sept-25 | LAPORAN TEKNIS ESTIMASI SUMBER DAYA DAN CADANGAN MINERAL | YANRI BUDI KARSENO, CITRA KUSUMA |

# 3 CURRENT EXPLORATION PROGRAM METHOD

Since 2019 systematic exploration of the HM mine area has been carried out using the following equipment and techniques.

## 3.1 Ultra Ground Penetrating Radar Survey

Groundradar's Ultra GPR technology is a geophysical survey technique that can be used to detect subsurface geological layering and structure in nickel laterite. Relatively quick and easy to apply in the field, Ultra GPR enhances the exploration process for laterites by detecting laterite thickness and bedrock morphology. The use of the Ultra GPR survey is designed to increase the confidence of geological interpretation, provide a guide to thickness and depth of the target layers and help to optimize drill programs to focus on the thickest areas. As with all geophysical methods, Ultra GPR provides supportive data for points of observation provided by drilling for Mineral Resource estimation.



Photo 5 Ultra GPR tool

At HM, Ultra GPR has been a useful exploration tool to indicate the lithological contact between limonite (massive clays) and the saprolite (weathered rocks) as well as the bedrock profile. Results provide indicative volumes of potential limonite and saprolite located within the survey area. Results combined with drilling data can give greater confidence of nickel laterite ore body structure, dimensions and distribution.

## 3.2 Topography and Collar Survey

The topography of the HM has been surveyed using LiDAR to produce a digital terrain model of the ground surface in the area. The accuracy of the LiDAR is within 20cm vertical and 40cm in the horizontal plain which is appropriate to support Mineral Resource estimation. Ground survey utilizing E-Survey, RTK GPS equipment is used to survey the drill hole collar locations.



Photo 6 RTK survey tool

## 3.3 Drilling

### 3.3.1 Rig Type and Rods

Since 2019 Dexdrill 200 drill units have been used to systematically drill the HM nickel laterite project. The drills are ideally suited to laterite core drilling as they are quick, lightweight and man portable. They have the added advantages of providing local people employment and also have low environmental impact with no need for road access or dozer support. The drills use HQ diameter equipment including drill pipe and triple tube wireline core barrels.



Photo 7 Dexdrill 200 drill rig using a HQ core barrel to sample the laterite



Photo 8 HQ diameter core barrel, drill pipes & bits

### 3.3.2 Geological Logging of Cores

The description starts at the surface and follows each one meter core run until the total depth, in fresh bedrock, is reached. The core description is recorded in a standard format which has been provided by HM so that the data is easily usable and recognizable by the mine technical team. Core that contains more than 20cm of solid rock is recorded as a geological boundary. The core length is checked against the actual depth recorded in the core box. The detailed description is completed as required in the logging form (see figure 11). The well site geologists follow a standard operating procedure for the core logging process so that all geological logs are standardized.

Each core box is photographed, in a level place, with good light conditions after the geological description is completed. Checks are carried out to make sure that the depth labels are clearly visible and in position at the bottom of each core run. Cores with swelling or core loss are clearly marked. Labels showing where density samples have been removed or will be taken are also labelled. The well site geologist checks to make sure the core box label shows the correct Hole Identification, sequential arrangement, depth interval, date of start and finish drilling, EOH (end of hole), initials of the wellsite geologist and the rig identification number. When this is ready photos are taken making sure to minimize shadows and reflections.

| Hole_id | Depth | Prospect | x | y | z | Geos | Start Date | End date | Rig Number | Driller |
|---|---|---|---|---|---|---|---|---|---|---|
| DEX-BB5800 | 33 | BB | 414475 | 9674445 | 419 | Rais | 2024-07-09 | 2024-07-10 | RB 07-14-2 | HABIBI |

| | | | | | Lithology | | | | | | | | | | | | | | Sample | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| from | to | length | genlith | sample_id | rock | % | colour | brightness | weathering | grain | serpenz | majmin | smin1 | smin2 | texture | structure | fracture | comments | rec | weight |
| 0.00 | 1.00 | 1.00 | OB | BB342734 | | | BRN | MED | 5 | FG | 0 | hm | mn | | | | | Root material | 1 | 4.80 |
| 1.00 | 2.00 | 1.00 | LIM | BB342735 | | | BRN | MED | 4 | MG | 0 | hm | mn | | | | | Red limonite | 1 | 6.25 |
| 2.00 | 3.00 | 1.00 | LIM | BB342736 | | | BRN | MED | 4 | MG | 0 | hm | mn | | | | | Red limonite | 1 | 6.20 |
| 3.00 | 4.00 | 1.00 | LIM | BB342737 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.70 |
| 4.00 | 5.00 | 1.00 | LIM | BB342738 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 6.00 |
| 5.00 | 6.00 | 1.00 | LIM | BB342739 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.50 |
| 6.00 | 7.00 | 1.00 | LIM | BB342740 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.00 |
| 7.00 | 8.00 | 1.00 | LIM | BB342741 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.50 |
| 8.00 | 9.00 | 1.00 | LIM | BB342742 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.50 |
| 9.00 | 10.00 | 1.00 | LIM | BB342743 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.50 |
| 10.00 | 11.00 | 1.00 | LIM | BB342744 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 6.00 |
| 11.00 | 12.00 | 1.00 | LIM | BB342745 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite | 1 | 5.50 |
| 12.00 | 13.00 | 1.00 | LIM | BB342746 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 5.50 |
| 13.00 | 14.00 | 1.00 | LIM | BB342747 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 5.10 |
| 14.00 | 15.00 | 1.00 | LIM | BB342748 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.90 |
| 15.00 | 16.00 | 1.00 | LIM | BB342749 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.50 |
| 16.00 | 17.00 | 1.00 | LIM | BB342750 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.80 |
| 17.00 | 18.00 | 1.00 | LIM | BB342751 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.90 |
| 18.00 | 19.00 | 1.00 | LIM | BB342752 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.90 |
| 19.00 | 20.00 | 1.00 | LIM | BB342753 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.90 |
| 20.00 | 21.00 | 1.00 | LIM | BB342754 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.60 |
| 21.00 | 22.00 | 1.00 | LIM | BB342755 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 5.80 |
| 22.00 | 23.00 | 1.00 | LIM | BB342756 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.60 |
| 23.00 | 24.00 | 1.00 | LIM | BB342757 | | | BRN | MED | 4 | MG | 0 | hm | mn | si | | | | Red limonite | 1 | 4.80 |
| 24.00 | 25.00 | 1.00 | LIM | BB342758 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite, contain clay | 1 | 4.75 |
| 25.00 | 26.00 | 1.00 | LIM | BB342759 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite, contain clay | 1 | 4.40 |
| 26.00 | 27.00 | 1.27 | LIM | BB342760 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite, contain clay | 1 | 5.50 |
| 27.00 | 28.00 | 1.00 | LIM | BB342761 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite, contain clay | 1 | 4.80 |
| 28.00 | 29.00 | 1.15 | LIM | BB342762 | | | BRN | MED | 4 | MG | 0 | hm | mn | go | | | | Red limonite, contain clay | 1 | 5.00 |
| 29.00 | 30.00 | 1.00 | SAP | BB342763 | | | GRN | MED | 4 | MG | 2 | se | mn | go | | | | Soft saprolite | 1 | 4.50 |
| 30.00 | 31.00 | 1.00 | SAP | BB342764 | | | GRN | MED | 3 | MG | 2 | se | mn | go | | | | Soft and rocky saprolite | 1 | 3.80 |
| 31.00 | 32.00 | 1.00 | BRK | BB342765 | IPD | 100 | GRY | MED | 0 | VCG | 0 | ol | px | si | MAS | VN | 4 | Solid core | 1 | 5.20 |
| 32.00 | 33.00 | 1.00 | BRK | BB342766 | IPD | 100 | GRY | MED | 0 | VCG | 0 | ol | px | si | MAS | VN | 2 | Solid core | 1 | 5.40 |
| | | | | TS: 33 BAGS | | | | | | | | | | | | | | | | |

Figure 11 Wellsite logging sheet

### 3.3.3 Sample Handling and Chain of Custody

1. Primary Bagging and Labeling
    - Double Layering: All samples must be double-bagged in plastic to prevent contamination, damage, or loss
    - Interval Strategy: Samples are collected at 1 m intervals based on the geological layer, if no geological break present, maintain strict 1 m increments
    - Internal ID: Place a plastic identity label inside the outer bag
    - Securing: Once the core box is emptied, tie the outer bag with a bow-style string knot to allow for easy reopening during checks
2. Field Documentation and Verification
    - Real-time Logging: Fill out the sample form continuously during the bagging process to ensure every sample is recorded immediately and correctly
    - Quality Checks: Verify that sample intervals and labels match the core box. Perform a reconciliation check to ensure there are no gaps in the depth intervals
    - Field Storage: Pack bags into sacks and tie with flagging tape labeled with the Hole ID. If stored on-site, sacks must be covered to protect them from weather
3. Lab ID Assignment and Data Sync
    - Daily Transport: Transport all samples to the field camp daily
    - ID Allocation: Assign a unique sample ID provided by the HM laboratory
    - Integrity Check: During labeling, inspect all bags; replace any that are damaged
    - Data Transmission: Record the Sample IDs and depth intervals on the sampling forms. Photograph all forms and transmit them to the DEX head office for entry into the HM Project database
4. QA/QC Protocols
    - Standard Insertion: For every 92 exploration core samples, include the following; 4 Certified Reference Materials (OREAS standards); 4 Blank samples
    - Reconciliation: Perform a final count of physical samples against the field log to ensure 100% alignment
5. Final Packaging and Delivery
    - Repacking: Pack the fully labeled samples (including QA/QC) into sacks tagged by Hole ID

- Storage & Receipt: Deliver samples to the HM core store and lay them out in rows organized by hole. Complete a Formal Sample Receipt, which must be signed by both DEX and HM representatives to formalize the handover



Photo 9 Field sample preparation



Photo 10 Sample recheck at field camp

### 3.3.4 Geotechnical Drilling and Hydrogeology

When HM was planning to significantly increase production at the mine site PT Geomine Mining and Geotechnical Consultant ("GEOMINE") was engaged in 2021 to conduct geotechnical and hydrology/hydrogeology studies. In 2024, PT LAPI ITB further hydrogeological and geotechnical studies. In September 2025 PT Abhipraya Nusa Engineering carried out a geotechnical study of the HM haul road as well. The geotechnical and hydrogeology reports are attached in Appendix 4.

## 3.4 Laboratory Sample and Analysis Procedures

HM has established its own laboratory facility to prepare and assay samples from exploration programs, mining grade control, stockpile sampling, hauling and barging. Below is a summary description of the sample preparation and assay process. The full QA/QC at the HM sample preparation and assay laboratory report, dated January 2026, is attached in Appendix 6.

### 3.4.1 Laboratory Sample Preparation

Drill samples are collected by drilling teams and submitted from the drilling operations in plastic sample bags weighing between 6-8 Kgs per bag, with each bag representing a one meter drill advance in the drill hole. Sample sacks are submitted to the HM Sample Preparation and Sample Assay Lab in batches of 92 original samples, with 4 x blank samples and 4 x OREAS Standards (CRM's) for a total of 100 samples per consignment.



Photo 11 Sample sack consignment delivery to HM sample preparation and lab facility

Bags of 6 - 8kg bags of wet drillhole sample are first  weighed, dried, weighed, crushed, split, crushed, split and pulverized to produce - 200# (-75 micron) pulp samples, with a portion of between 50gm and 80gms are carefully taken and packed into brown paper geochemical envelopes and then taken through to the HM Assay Laboratory for analysis, as the individual Jobsheets (consignments) are completed, on a regular schedule varying between 100 to 400 samples per day.




Photo 12 HM onsite sample preparation laboratory drying ovens



Photo 13 HM onsite sample laboratory pulverizers

On arrival at the HM Assay Laboratory, the exploration pulp samples are unpacked and a 10gm portion of each pulp sample is processed into a pressed pellet using a 15tonne manual hydraulic press, and this pressed pellet is assayed using Malvern Panalytical Epsilon 4 EDXRF's, to provide the elemental composition of the drill samples, the weight percent of nickel, iron, silicon dioxide and magnesium oxide, to be used in calculating the grade of the valuable elements, nickel, iron and cobalt.



Photo 14 HM assay laboratory 10g reduced samples made into pressed pellets for assay

The purpose of sampling and sample preparation is described in the AusIMM Field Geologist's Manual, Fifth Edition, 2011, as being *".the reduction in particle size, through crushing and pulverizing, and its sample size, through splitting, while retaining the representativeness of the medium being sampled. Samples of 10 – 30kgs are presented for preparation and the final analysis is of a portion as little as 50gms, and the expectation is that the result obtained from this 50gm sample is, within acceptable limits, representative of the original drill sample*."

### 3.4.2 Laboratory Sample Preparation and Analysis Procedures

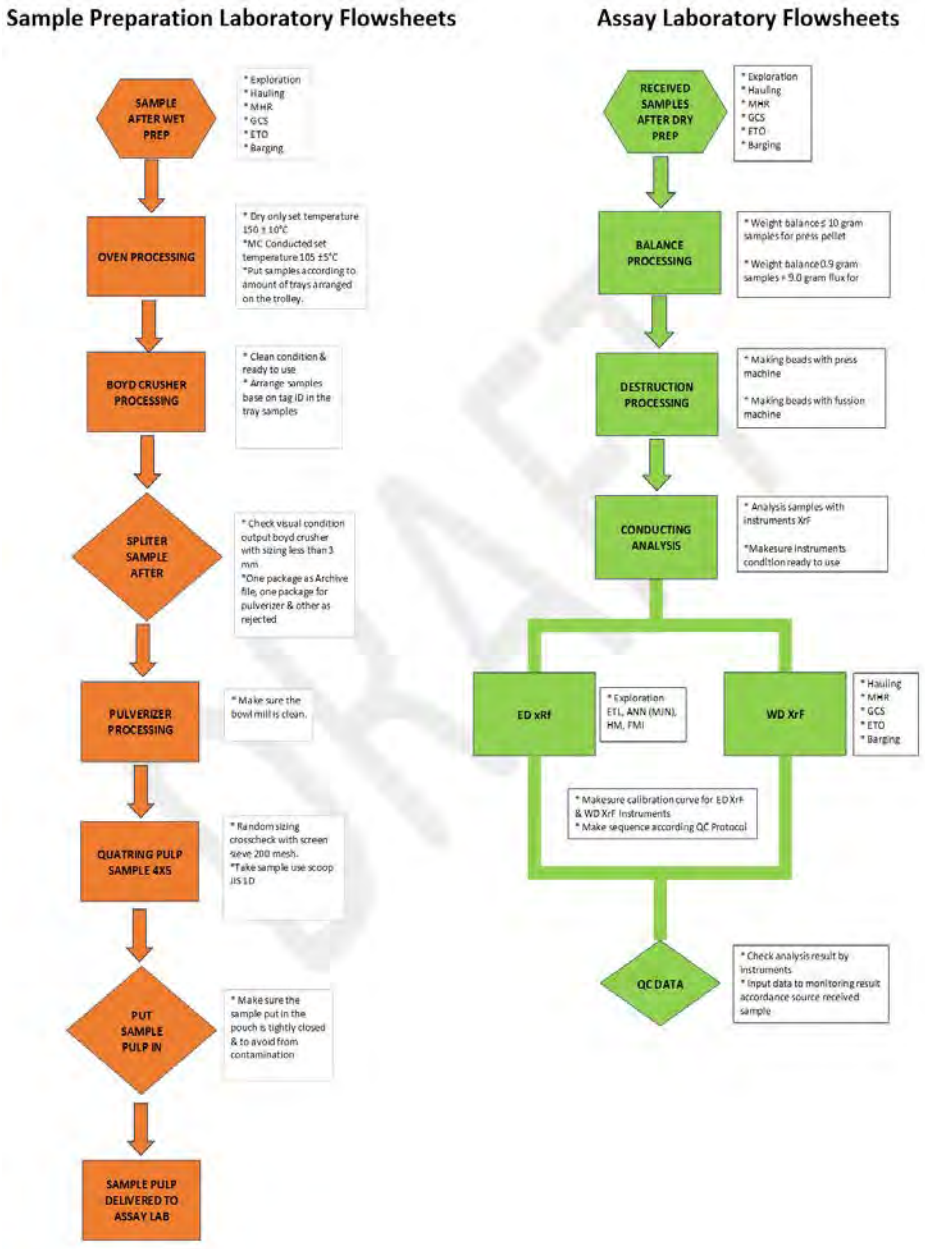



Figure 12 Sample prep/analysis flowcharts (HM, 2026)

### 3.4.3 Sample Security, Audits and Review

A sample core store at the mine office can be locked when unattended and is located in front of the security post which operates 24 hours per day. A Sample Dispatch Form SOP and construction of a special purpose sample storage facility, adjacent to the Sample Prep Lab, ensures samples are properly recorded and duplicates stored for future reference if required.

The Quality Control program at HM ensures that checks and balances are implemented during the sample preparation and sample assaying stages and are constantly reviewed and assessed, in order to identify whether the sampling /measuring systems and the laboratory are providing reliable assay results. In the minerals industry, the checks and balances commonly used to monitor the sample preparation and assaying processes includes standards, blanks and duplicates.

At the HM Sample Preparation Laboratory, the monitoring of sample quality and measurement of precision is quantified by the insertion of blanks and duplicates into the sample stream, and the screen size testing of pulverized samples. The laboratory uses Coarse Blanks to measure contamination, Coarse Duplicates/Duplicate Rejects/ Coarse Rejects measure sub-sampling precision at the crushing and incremental splitting stages in the reduction of the sample size from +10 mm to – 3 mm in crushing stages, and the effectiveness of the pulverizing process in producing a suitable sized homogenous sample for assay through the – 200 # Screen Particle Sizing Test.

# 4 EXPLORATION RESULTS

## 4.1 UltraGPR Survey



Photo 15 UltraGPR field acquisition

The Ultra GPR survey lines are shown in Figure 13 below. The Ultra GPR survey data from all areas were of good quality and was easily interpretable. Maps were created showing the interpreted thickness of limonite, saprolite and depth to bedrock. The total area surveyed was approximately 2,409ha. The nominal spacing between radar lines was approximately 100m with some 50m spacing in the Bete Bete mining area. The Ultra GPR survey grid, where possible, is in the same location as the drill lines.

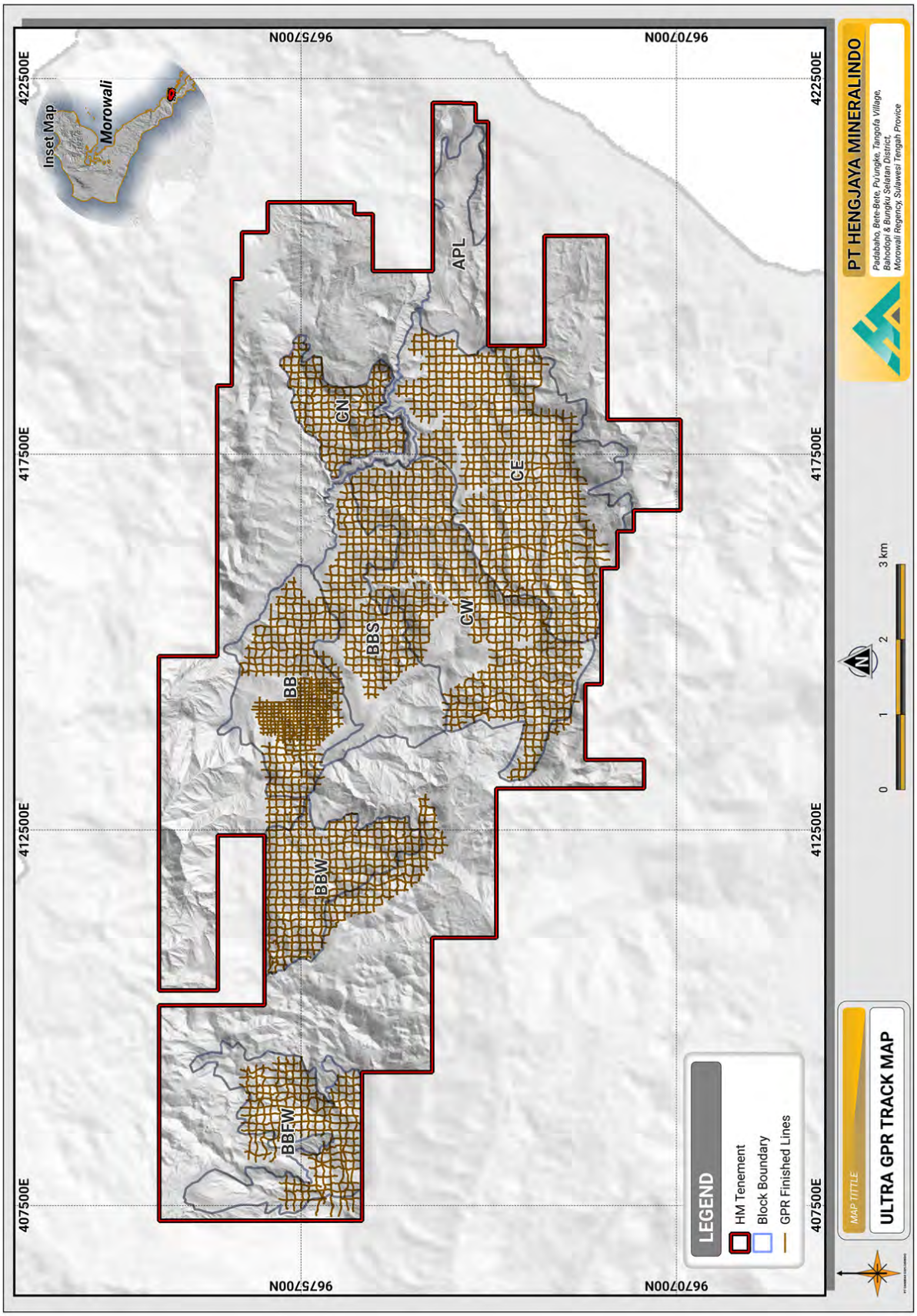



Figure 13 UltraGPR track map

Table 5 UltraGPR survey summary

| Prospect Area | GPR Coverage (ha) | Total Lines | Total Length (km) |
|---|---|---|---|
| BETE BETE | 254 | 98 | 60 |
| BETE WEST (MIA) | 136 | 36 | 26 |
| BETE SOUTH | 195 | 72 | 35 |
| CENTRAL WEST | 262 | 85 | 48 |
| CENTRAL EAST | 214 | 57 | 34 |
| BETE FAR WEST | 227 | 45 | 45 |
| PPKH 3 | 747 | 109 | 144 |
| PPKH 5 BLOCK A | 151 | 49 | 32 |
| MIA WEST | 224 | 55 | 47 |
| **Total** | **2410** | **606** | **471** |

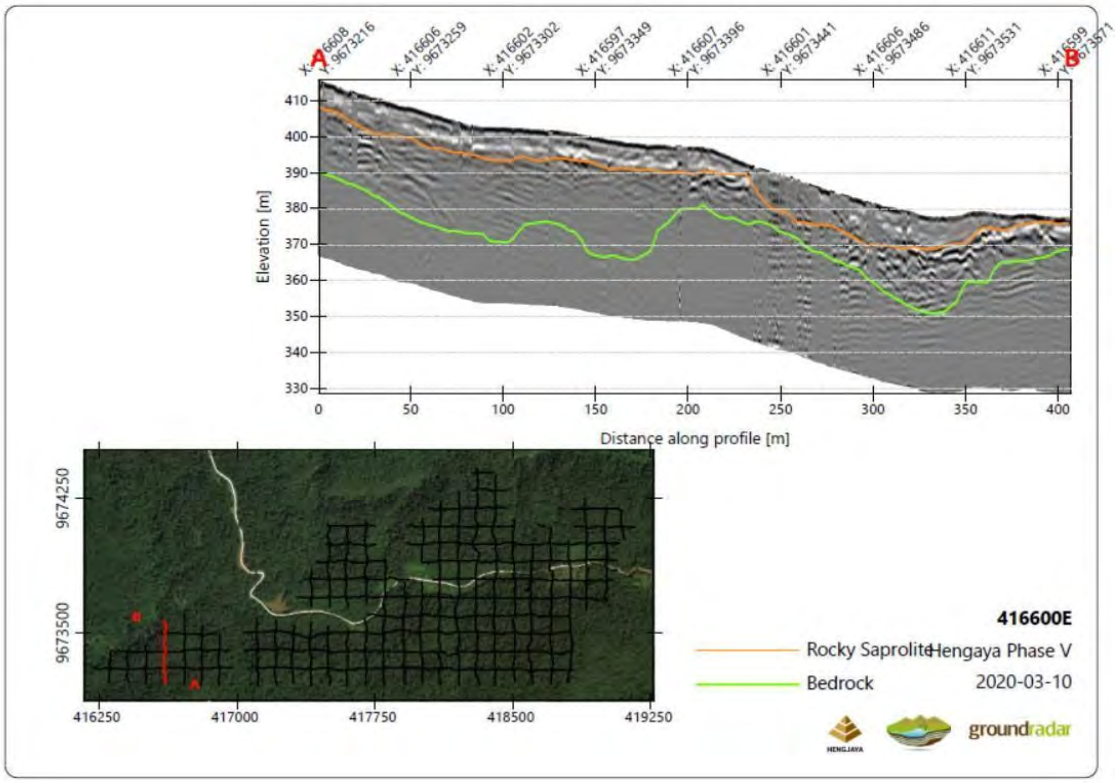



Figure 14 Ultra GPR section line interpretation example from Central East

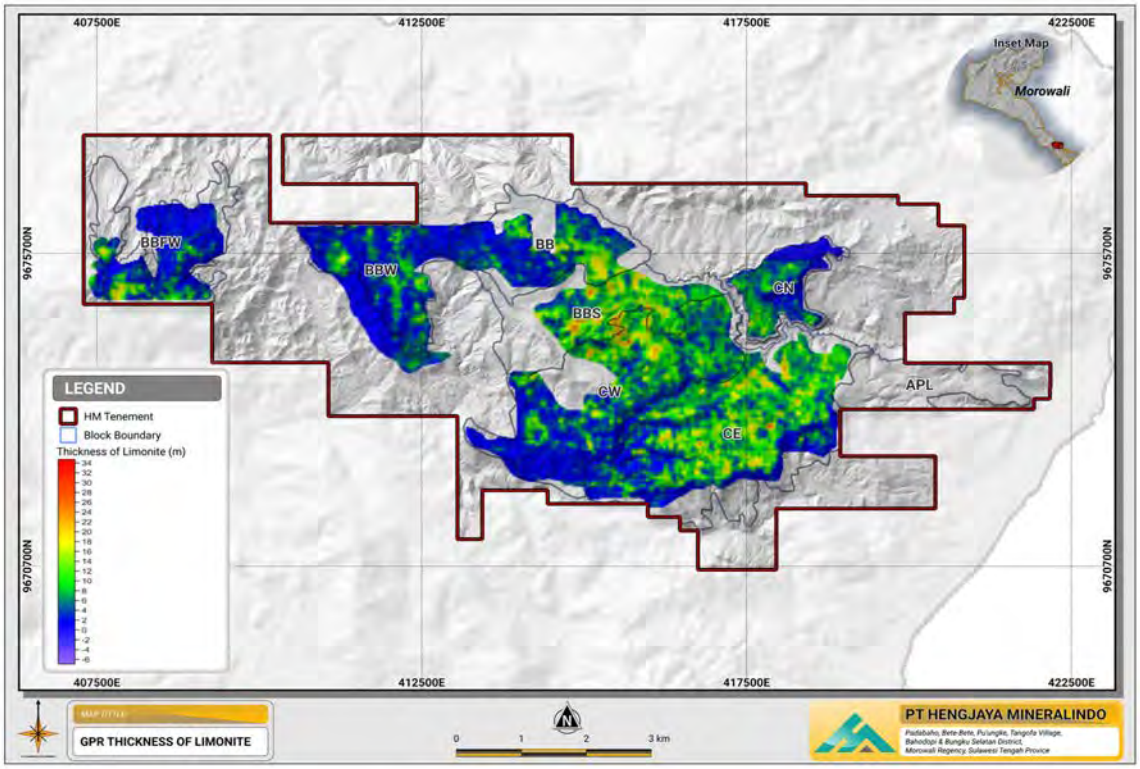



Figure 15 Limonite thickness interpreted from the Ultra GPR survey

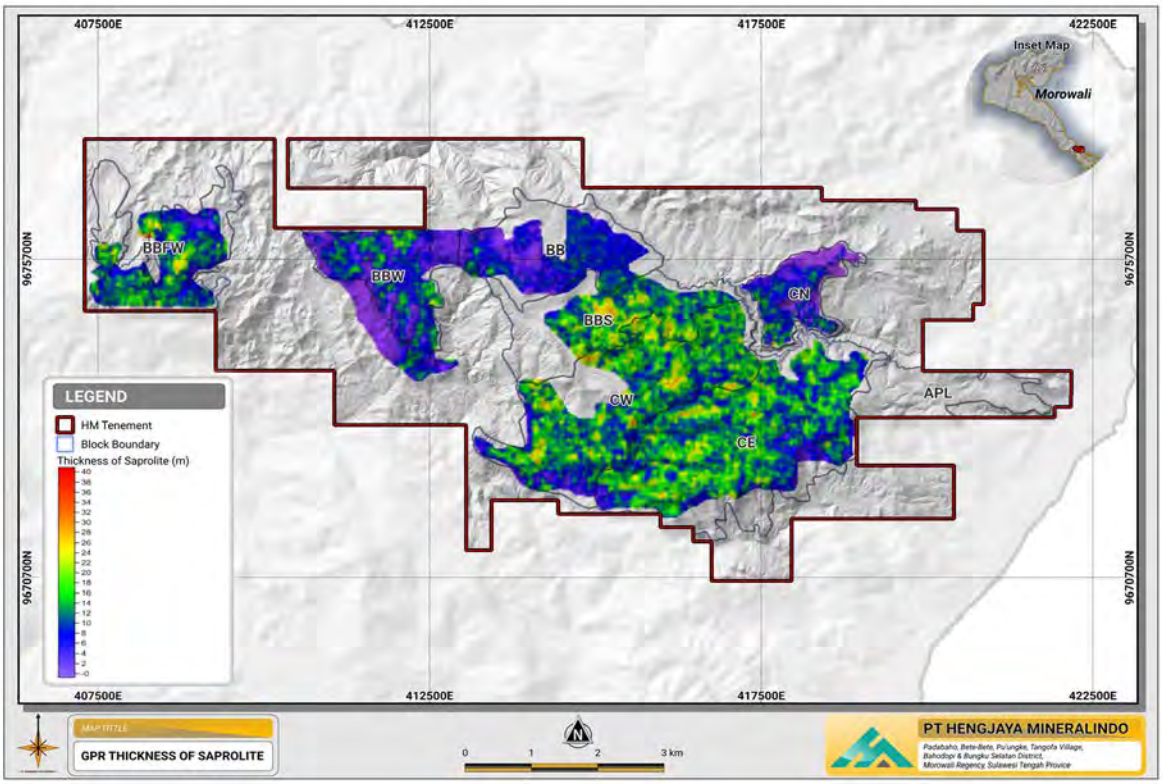



Figure 16 Saprolite thickness interpreted from the Ultra GPR survey

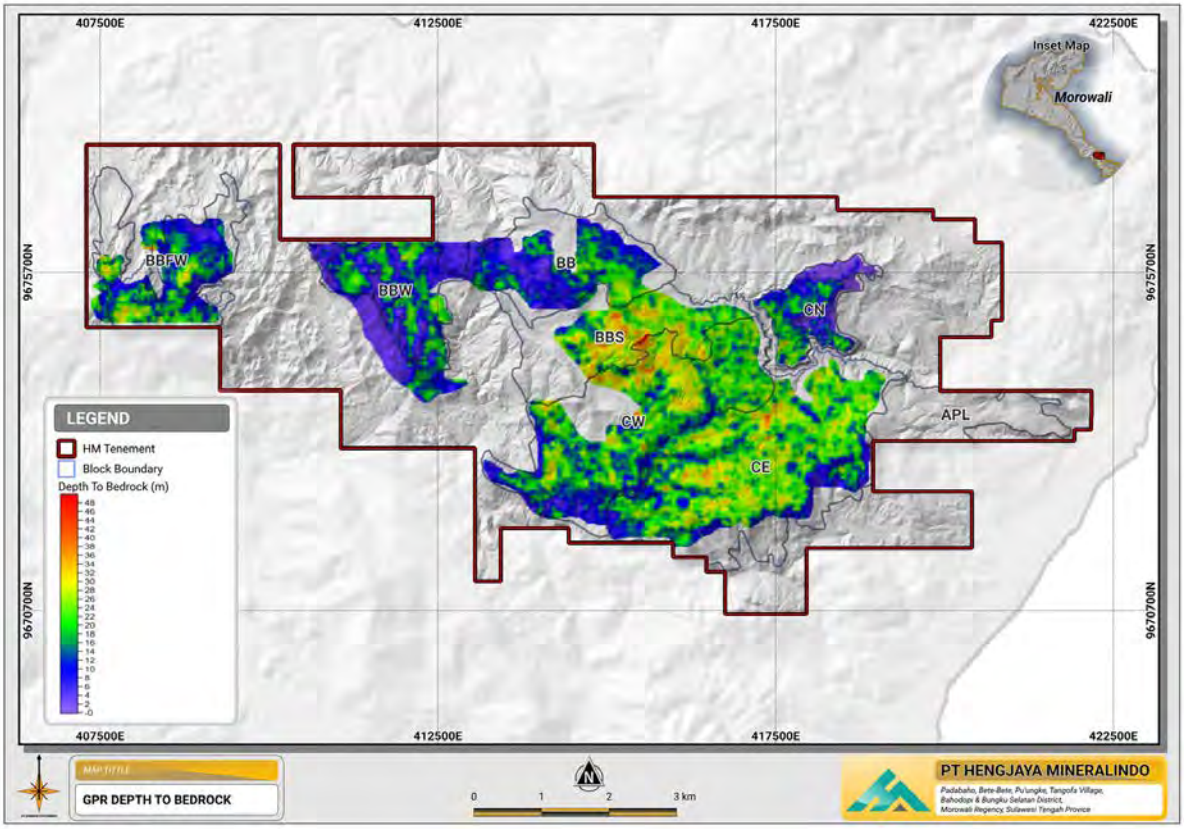



Figure 17 Depth to bedrock interpreted from the Ultra GPR survey

## 4.2 Drill Results

Systematic drilling on Ultra GPR targets started at 100m spacing and as assay results supported positive results, infill drilling began, initially at 50m grid spacing and eventually 25m spacing as viable grades of nickel laterite were confirmed.

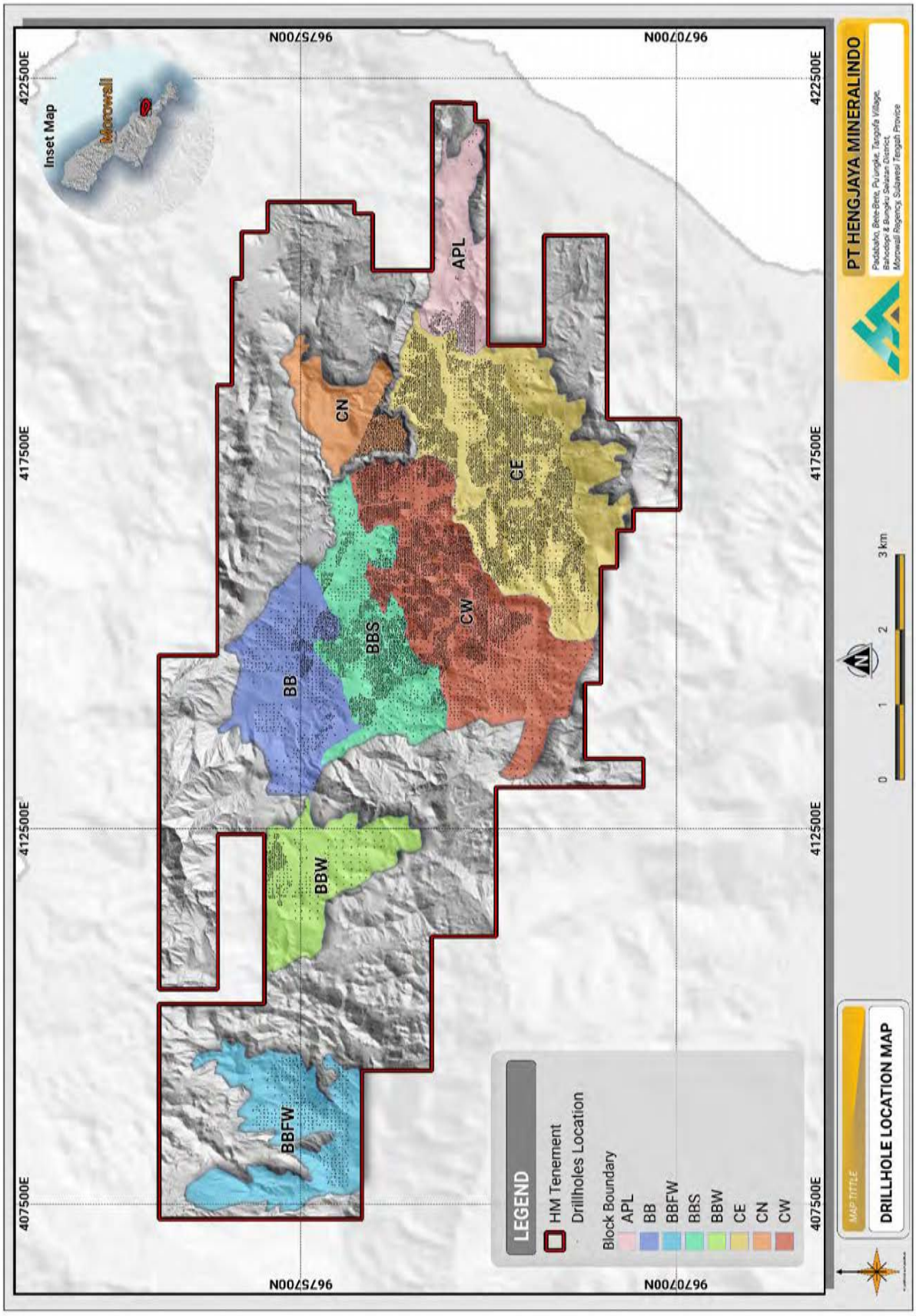



Figure 18 Drillhole location map

### 4.2.1 Drill Meterage and Samples

For the purpose of this Resource estimate, a database of drilling data including 14,704 drill holes with a cumulative total depth of 350,210m and 358,268 analyses results has been constructed. All of the drilling is on a systematic grid, providing a regular spread of drill data over most of the laterite areas. The drilling locations used in this study are displayed in Figure 18. Other drill data excluded from the Resource database has only been used for Exploration Target identification.

Most (75%) of the drilling has been done at less than 100m spacing on Ultra-GPR targets with the objective of Resource definition in these areas. The distribution of drilling in each Resource block area is summarized in Table 6.

Table 6 Drill meterage and samples

| Block-ID | Area (Ha) | Drilled | Cumulative (m) | Samples |
|---|---|---|---|---|
| APL | 179 | 505 | 12,789 | 13,284 |
| BB | 324 | 919 | 17,186 | 17,919 |
| BBFW | 305 | 348 | 4,982 | 5,210 |
| BBS | 325 | 2,169 | 52,833 | 53,808 |
| BBW | 247 | 392 | 7,091 | 7,116 |
| CE | 751 | 5,568 | 138,178 | 140,775 |
| CN | 151 | 463 | 11,492 | 11,606 |
| CW | 594 | 4,340 | 105,660 | 108,550 |
| **Total** | **2,874** | **14,704** | **350,210** | **358,268** |

### 4.2.2 Core Photography

With the core box in position, in a level place, with no cover, core photos can take place. Checks are carried out to make sure that the depth labels are clearly visible and in position at the bottom of each core run. Cores with swelling or core loss are clearly marked as well as labels showing where density samples have been removed or will be taken. The well site geologist checks to make sure the core box label shows the correct Hole Identification, sequential arrangement, depth interval, date of start and finish drilling, when this is ready photos are taken in good light conditions making sure to minimize shadows and reflections.

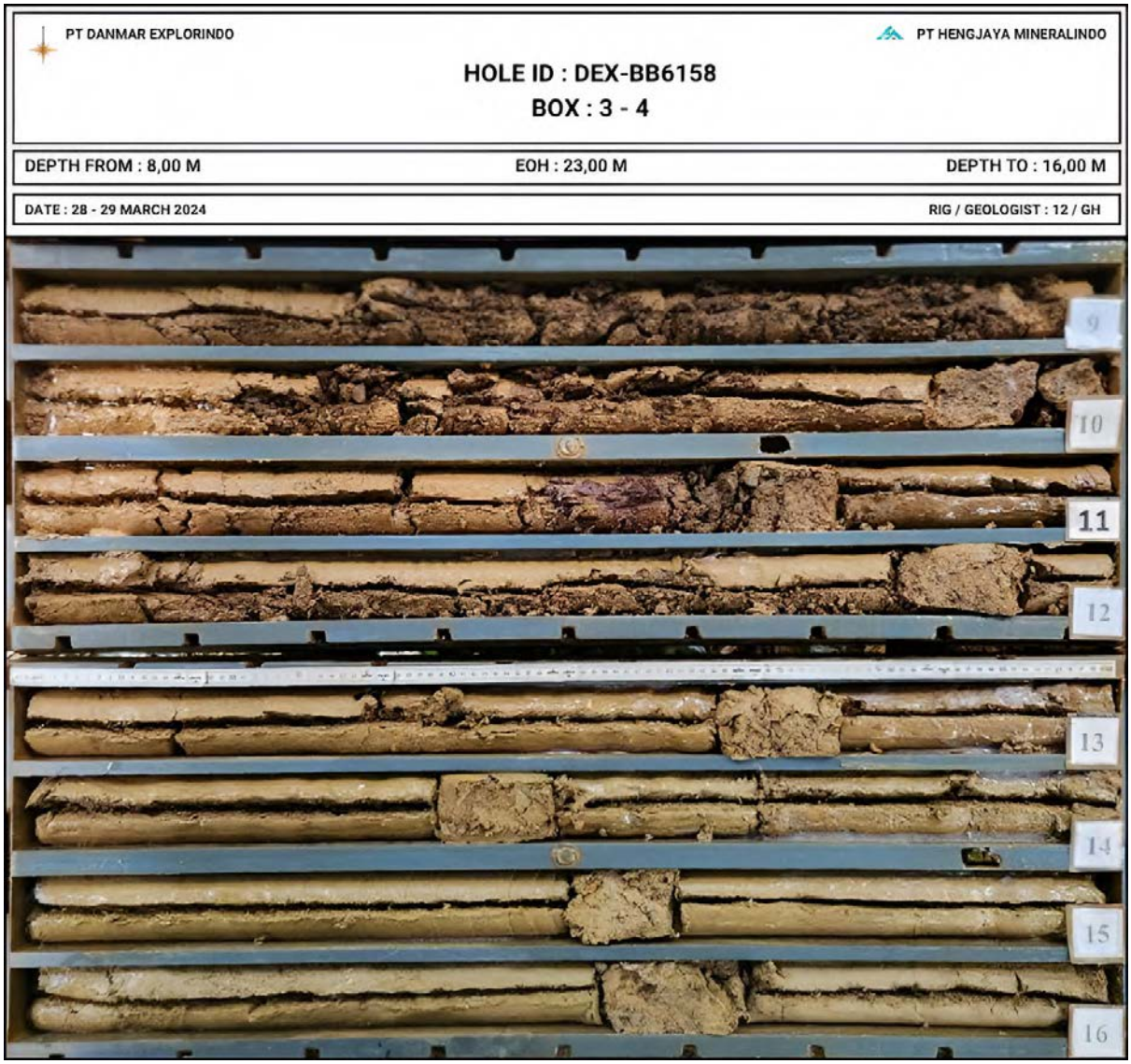



Photo 16 Core photo from drill hole DEX-BB6158 depth 8 – 16m

### 4.2.3 Core Recovery

Core recovery data is summarized below. Data from the latest drilling programs was systematically recorded and includes core recovery measurements supported by core photography. Core recovery obtained from drilling is 98.84%.

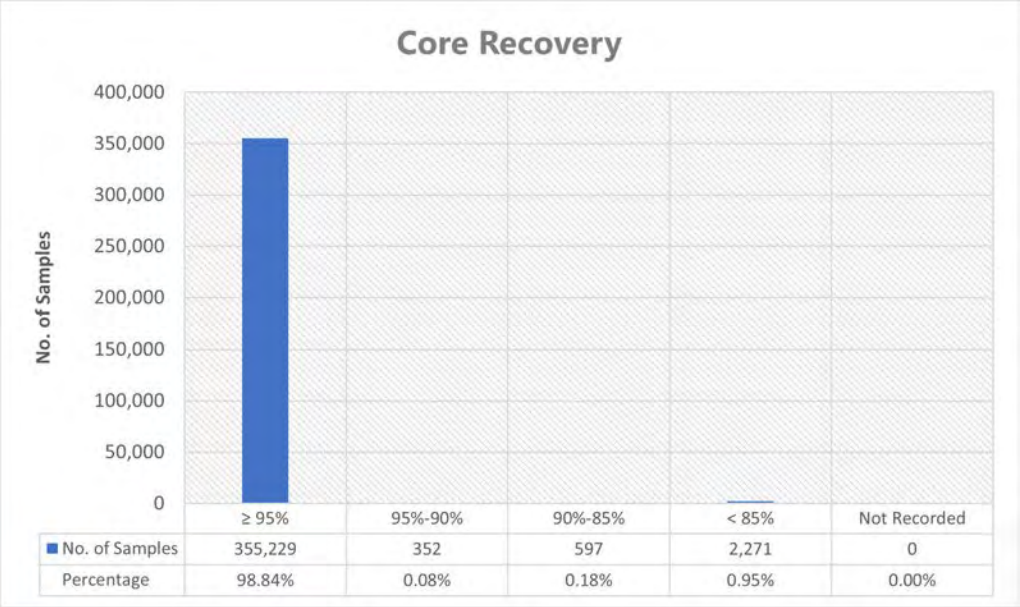



Figure 19 Histogram of the core recovery

## 4.3 Topography and Collar Survey Results

Aerial LiDAR topographic survey of the HM concession was carried out to map the topography and 7 local survey benchmarks used for the LiDAR and subsequent collar survey. The survey datum and coordinate system used at HM is WGS 84/UTM Zone 51 South. The resultant topography map and list of benchmarks are shown below. Drill hole collars that were not surveyed using RTK equipment were not used in this Resource estimate.

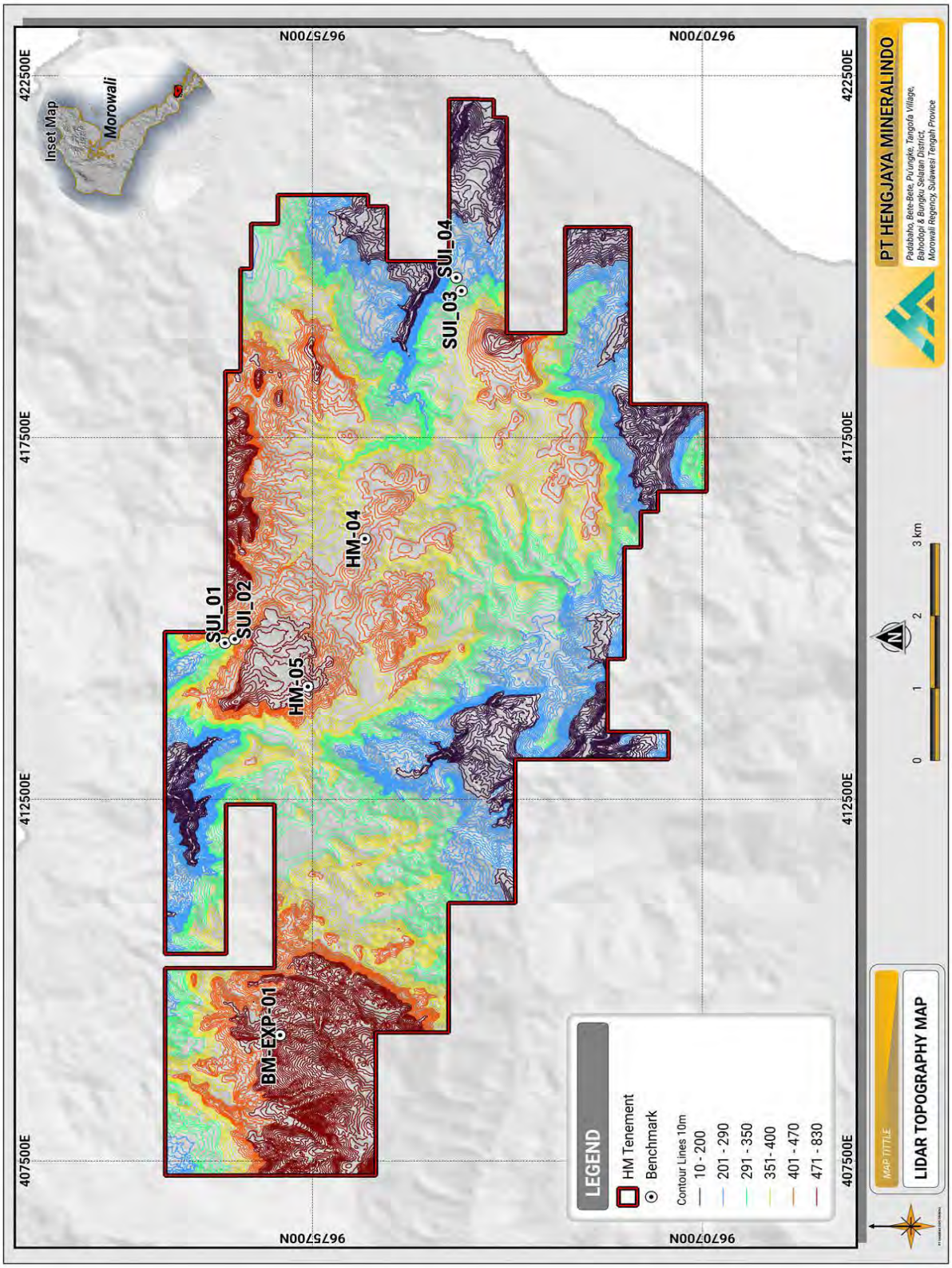



Figure 20 Topography map

Table 7 Benchmark points

| Point | X | Y | Z |
|---|---|---|---|
| SUI_01 | 414657.665 | 9676822.194 | 374.976 |
| SUI_02 | 414712.487 | 9676697.737 | 399.842 |
| SUI_03 | 419525.593 | 9673789.651 | 317.651 |
| SUI_04 | 419708.012 | 9673855.022 | 303.398 |
| HM-04 | 416098.875 | 9675028.600 | 441.410 |
| HM-05 | 414056.271 | 9675759.910 | 526.177 |
| BM-EXP-01 | 409239.052 | 9676114.607 | 572.261 |

Table 8 Collar survey results

| Block | Drilled | RTK Surveyed | GPS |
|---|---|---|---|
| APL | 505 | 344 | 161 |
| BB | 919 | 836 | 83 |
| BBFW | 348 | 348 | 0 |
| BBS | 2,169 | 2,147 | 22 |
| BBW | 392 | 384 | 8 |
| CE | 5,568 | 5,517 | 51 |
| CN | 463 | 458 | 5 |
| CW | 4,340 | 4,268 | 72 |
| **Total** | **14,704** | **14,302** | **402** |

## 4.4 Assay Analysis Results

Table 9 Assay analysis results

| Block | Sample | Assay results | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ni | Co | Fe | MgO | $SiO_2$ | CaO | $Al_2O_3$ | $Cr_2O_3$ | MnO | Moisture |
| APL | 13,284 | 9,135 | 9,135 | 9,135 | 9,107 | 9,107 | 9,107 | 9,055 | 9,055 | 9,055 | 0 |
| BB | 17,919 | 15,265 | 15,265 | 15,265 | 15,265 | 15,265 | 15,265 | 15,265 | 15,265 | 15,265 | 15,265 |
| BBFW | 5,210 | 5,097 | 5,097 | 5,097 | 5,097 | 5,097 | 5,097 | 5,097 | 5,097 | 5,096 | 5,097 |
| BBS | 53,808 | 53,069 | 53,069 | 53,069 | 53,069 | 53,069 | 53,069 | 53,069 | 53,069 | 53,069 | 53,069 |
| BBW | 7,116 | 6,938 | 6,938 | 6,938 | 6,938 | 6,938 | 6,938 | 6,938 | 6,938 | 6,938 | 6,950 |
| CE | 140,775 | 133,934 | 133,934 | 133,934 | 133,934 | 133,934 | 133,934 | 133,933 | 133,934 | 133,934 | 133,934 |
| CN | 11,606 | 11,503 | 11,503 | 11,503 | 11,503 | 11,503 | 11,503 | 11,503 | 11,503 | 11,503 | 11,503 |
| CW | 108,550 | 105,721 | 105,721 | 105,721 | 105,721 | 105,721 | 105,721 | 105,721 | 105,721 | 105,721 | 105,719 |
| **Total** | **358,268** | **340,662** | **340,662** | **340,662** | **340,634** | **340,634** | **340,634** | **340,581** | **340,582** | **340,581** | **331,537** |

### 4.4.1 Sample Preparation Quality Assurance and Quality Control

During the sample collection and preparation for laboratory analysis, QA/QC procedures including Blank Samples, Replicate Samples, Certified Reference Materials, Jaw Crusher duplicates and Pulverizer duplicates were introduced into the sample stream at regular intervals to ensure acceptable and reliable sample assay results would be produced.

### 4.4.2 Coarse Blanks and Standard

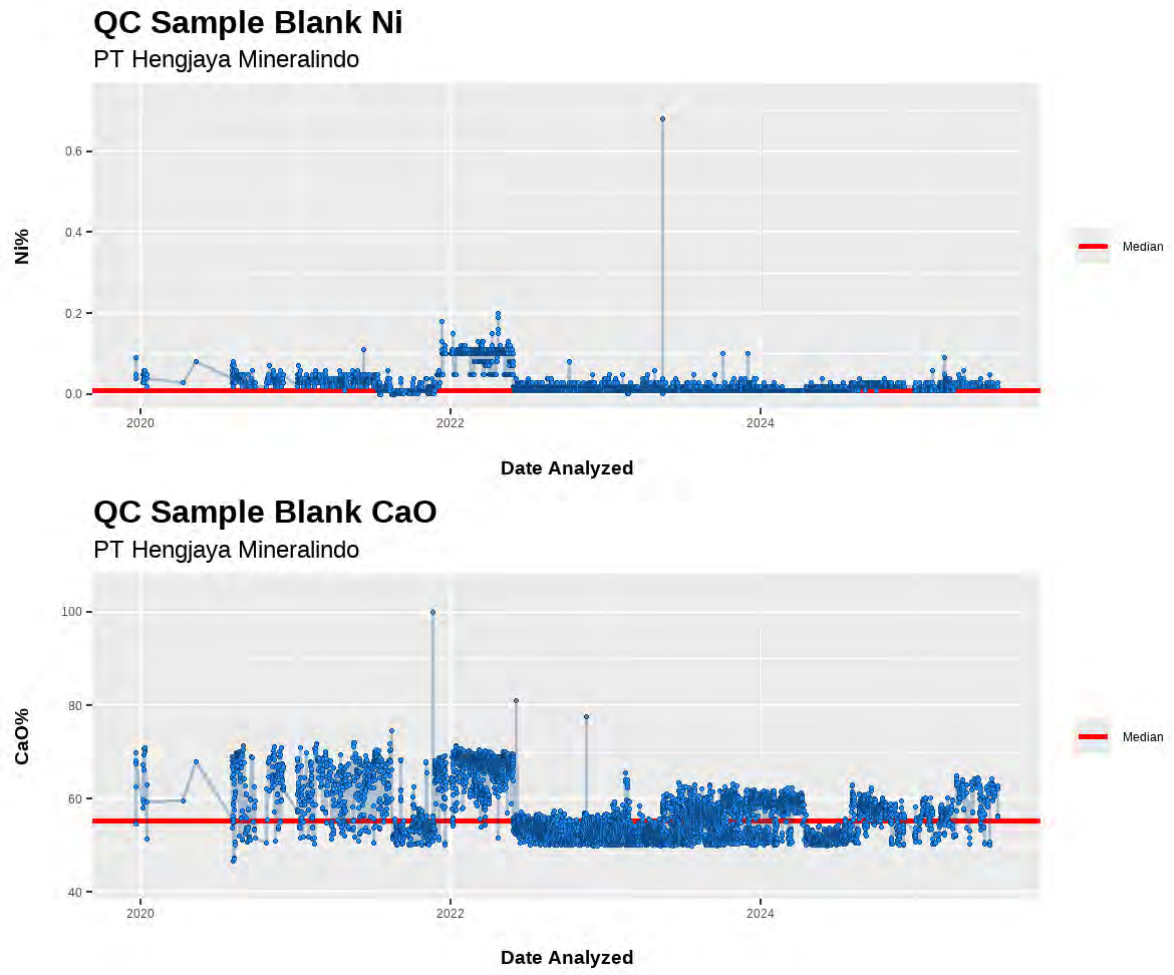



Figure 21 Blank samples – 9,235 sample analysis

Blank and OREAS samples are inserted within exploration batch streams at rate of 4 OREAS and 4 course blanks for every 92 exploration core samples to test for cross contamination. Sample blanks total 9,235 results for Ni, over the last 5 years, show a relatively consistent low result as expected. Occasional variation and anomalous results were most probably due to blank source material used having occasional, inconsistent quality. Calcium carbonate

samples show some variation also likely to be a consequence of the source material used as well. Overall, samples assays show a consistent result close to the median composition.

### 4.4.3 Coarse Duplicates

Course duplicate assays from the jaw crusher show a relative tight range of sample variability, consistently within a 5% range for Ni and Fe, which is acceptable for sample reliability and use for assay quality determination. Magnesium and silica show a slightly lower accuracy but still within the 10% tolerance range for assay reliability.

The coarse duplicate samples were inserted into the sampling stream at a rate 1 per every 50 samples.

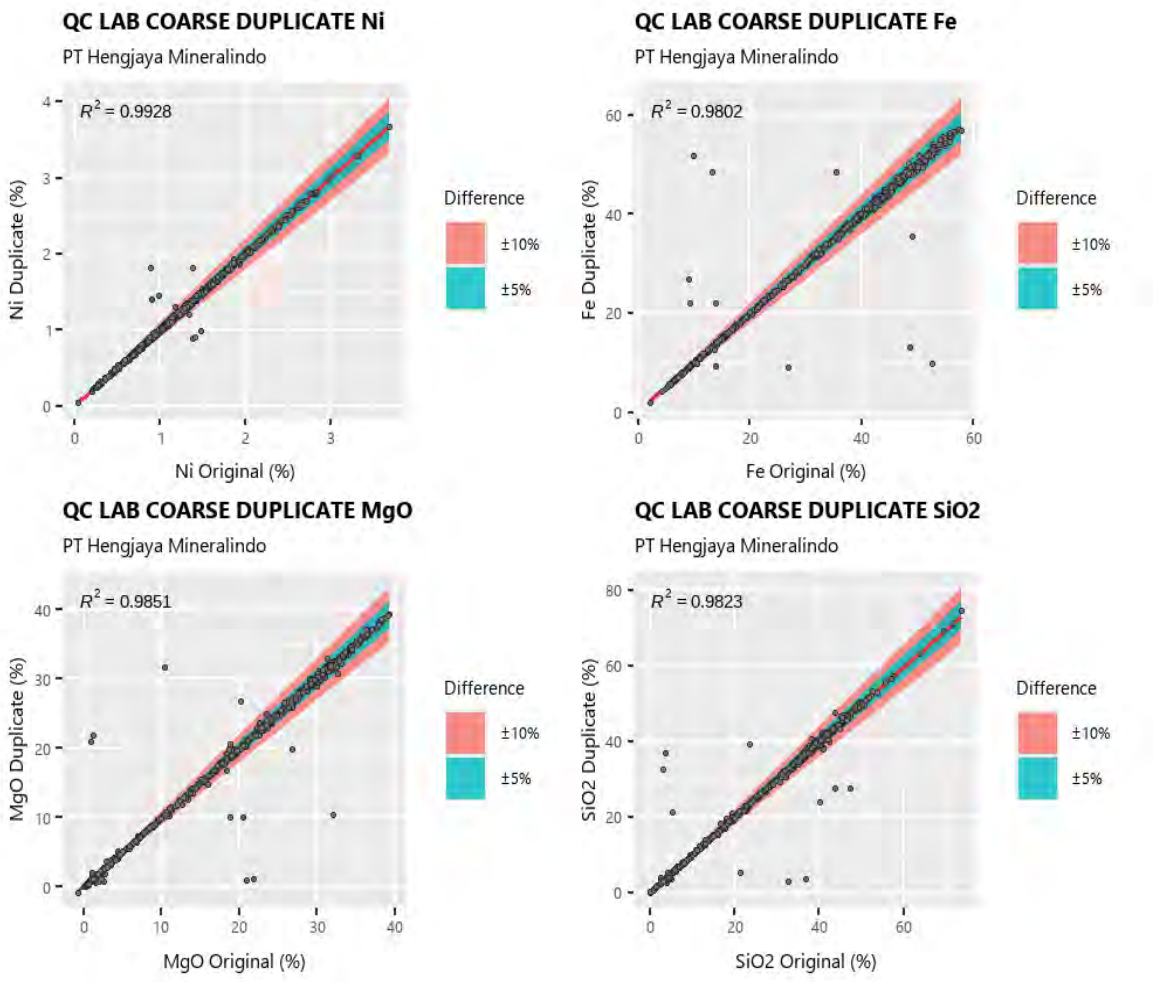



Figure 22 Coarse duplicate vs original assay– 6,337 sample analysis

### 4.4.4 Pulverizer Duplicates

The pulverizer duplicate assay results show a relative tight range of sample variability, overwhelmingly within a 5% range, which is acceptable for sample reliability and use for assay quality determination.

The pulp duplicate samples were inserted to be analysed 1 every 50 samples.

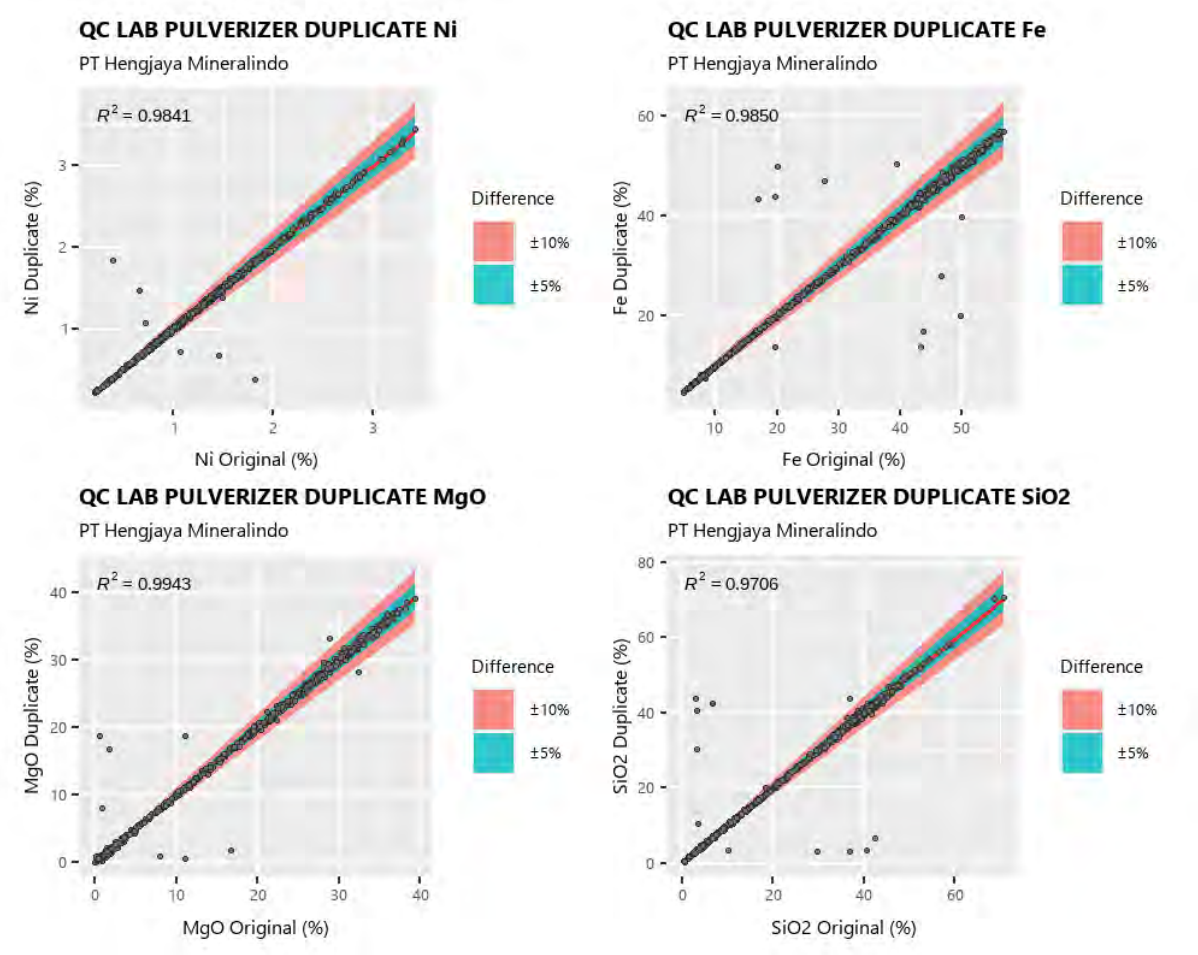



Figure 23 Pulverizer duplicate vs original assay – 6,360 sample analysis

### 4.4.5 Duplicate

The duplicate assay results show a high correlation between the original and the duplicate assay value. This further confirmed with the correlation coefficient ($R^2$) values more than 0.99 for the elements being assayed.

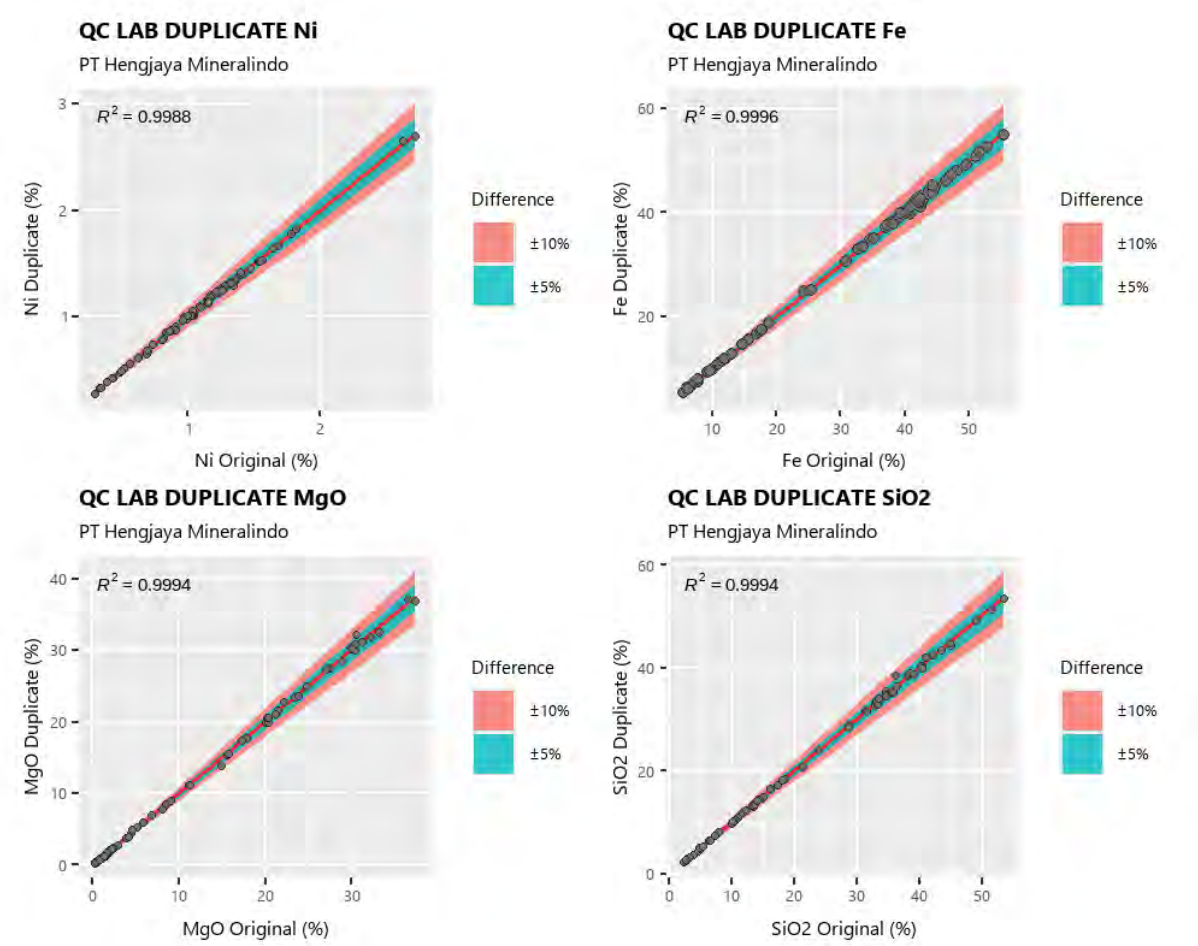



Figure 24 Duplicate vs original assay – 500 sample analysis

### 4.4.6 Certified Reference Materials

Certified Reference Materials are samples with a known nickel and other element values that are used to make sure that assay equipment and sample results are at a level accuracy and precision sufficient to justify use for Resource estimation. From the data recorded over the last 5 years, for which the charts represent 39,567 CRM assays performed and during that time only 305 anomalous sample results showed more than 10% variance for Ni which is 0.7% of the total samples. From investigations as to what may have caused these anomalies it was found that there had been some error in recording the OREAS identification numbers which led to some of the anomalous results.

Table 10 Certified nickel values of OREAS CRMs

| CRMs | Certified Nickel Values | Total Samples |
|---|---|---|
| OREAS 182 | 0.71 | 8088 |
| OREAS 184 | 1.02 | 4366 |
| OREAS 187 | 1.37 | 8325 |
| OREAS 192 | 1.77 | 7360 |
| OREAS 193 | 1.93 | 5726 |
| OREAS 194 | 2.13 | 5682 |
| OREAS 195 | 2.94 | 14 |

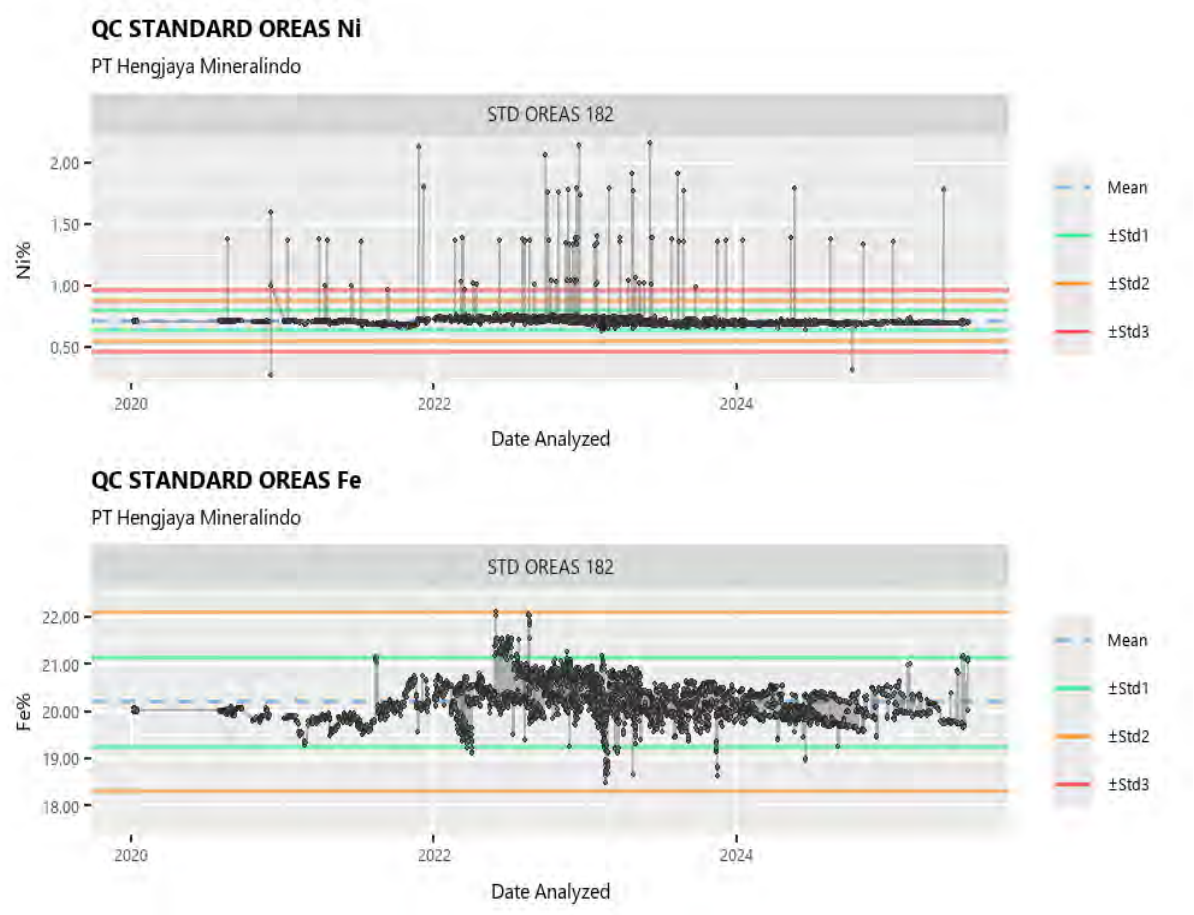



Figure 25 CRM OREAS 182 - 8,088 sample analysis

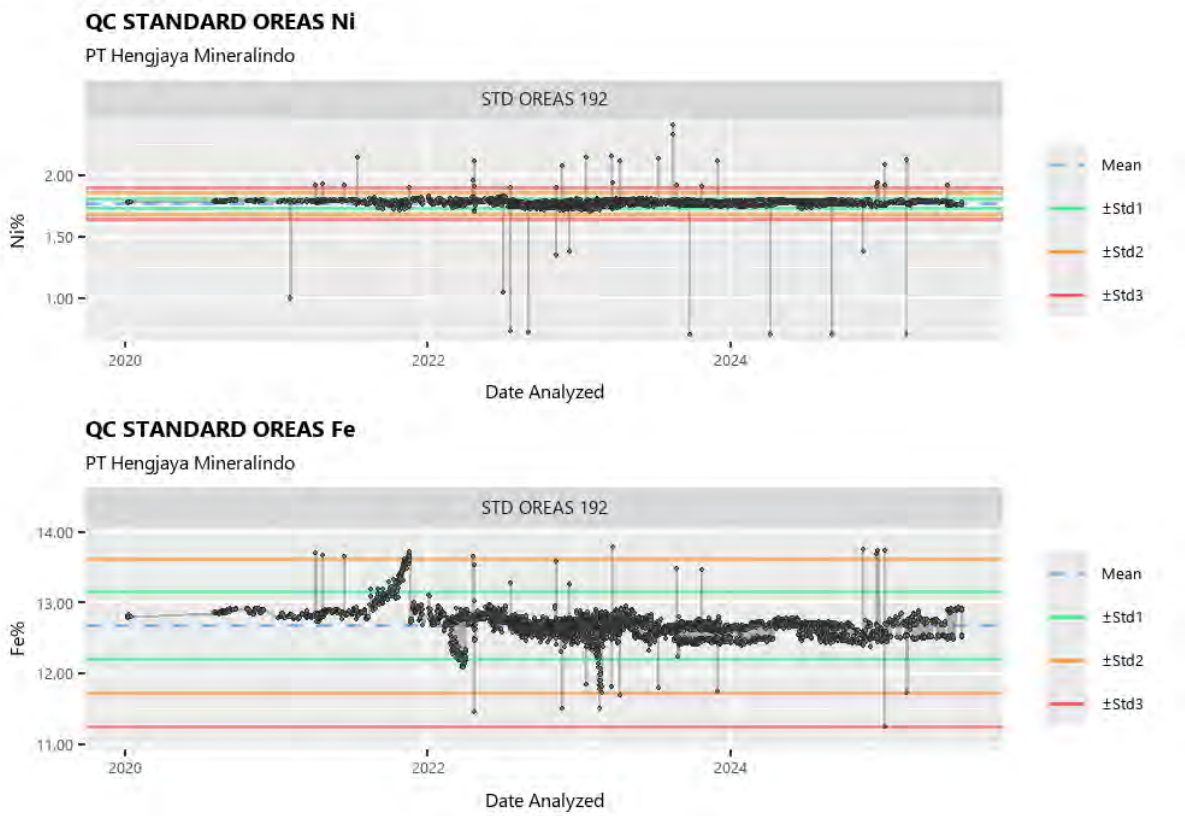



Figure 26 CRM OREAS 192- 7,360 sample analysis

### 4.4.7 Replicate Samples

These are two portions of the same pulp samples that are used to produce two separate pressed pellets, that are given different sample numbers before being inserted into the same batch or Job Sheet. At HM they are taken as part of the standard package of check samples. Out of 13,255 samples anomalous results were an acceptable rate of 0.16% over the 5 year period of testing.

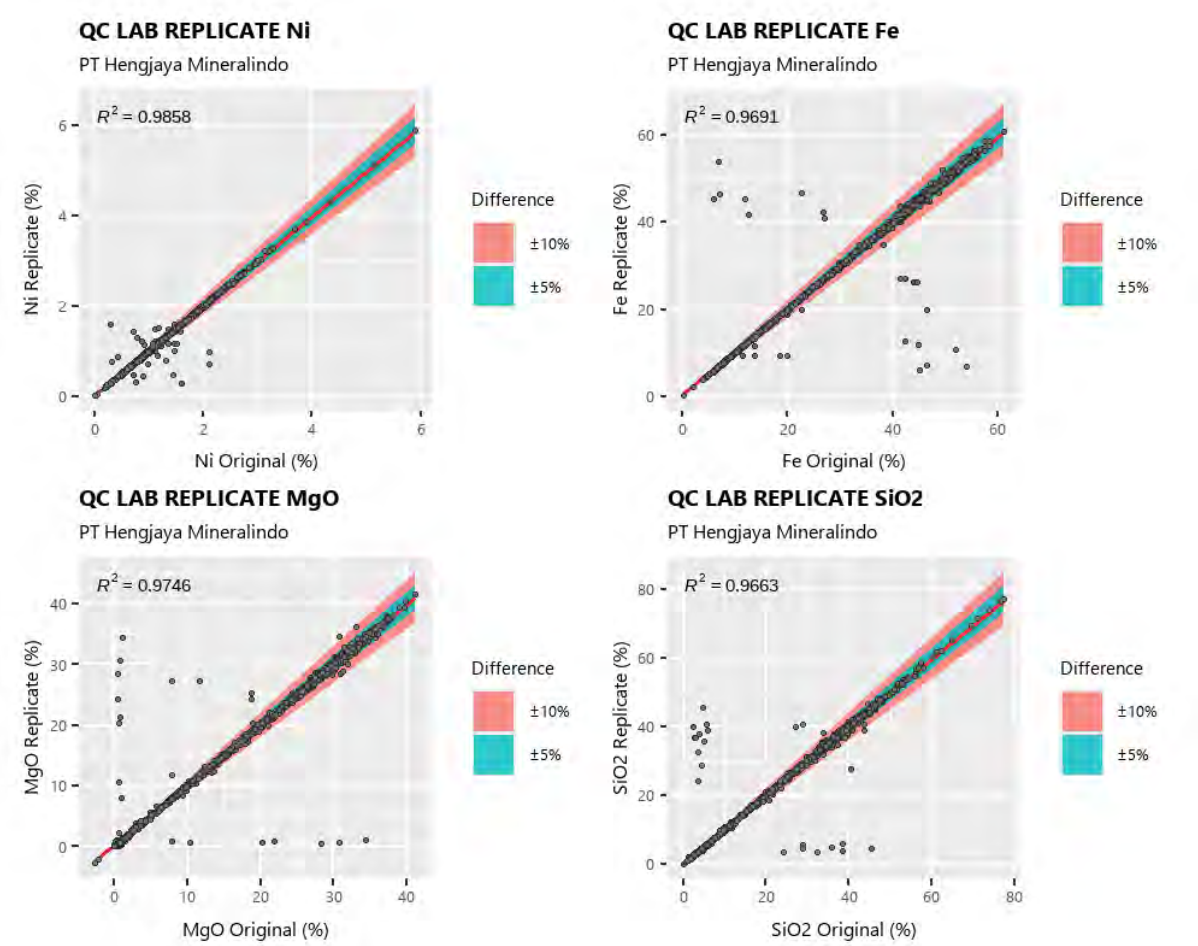



Figure 27 Replicate vs original assays – 13,255 sample analysis

### 4.4.8 Control Sample Insertion Rates

Control samples used to check and ensure the accuracy and precision of the sample handling, preparation and assay tests made up more than 20% of the assays carried out. This is a reliable level of check sampling. Table 11 below documents the number of check samples.

Table 11 Sample insertion rate

| Pediod | Exploration Samples | Blank | | Jaw Crush Duplicate | | Pulverized Duplicate | | Replicate | | Duplicate | | CRM's | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample | % | Samples | % | Samples | % | Samples | % | Samples | % | Samples | % |
| August 2020 - July 2025 | 358,268 | 9,235 | 2.58 | 6,337 | 1.77 | 6,360 | 1.78 | 13,255 | 3.70 | 500 | 0.14 | 39,567 | 11.04 |

# 5 MINERAL RESOURCE ESTIMATE

The author visited the site numerous times during the exploration drilling program. The objective of the site visit was to review the protocols and processes in place to verify the data acquisition is suitable for use in this Resource study.

## 5.1 Database Validation

Field data have been reviewed, checked and verified by comparing the original field data and core tray photos against the official Certificate of Analysis by HM, From this dataset, a joint validation was conducted between HM and Danmar to align perceptions of the geological layers based on the actual mining progress. A flowsheet for the data verification procedure is shown below.

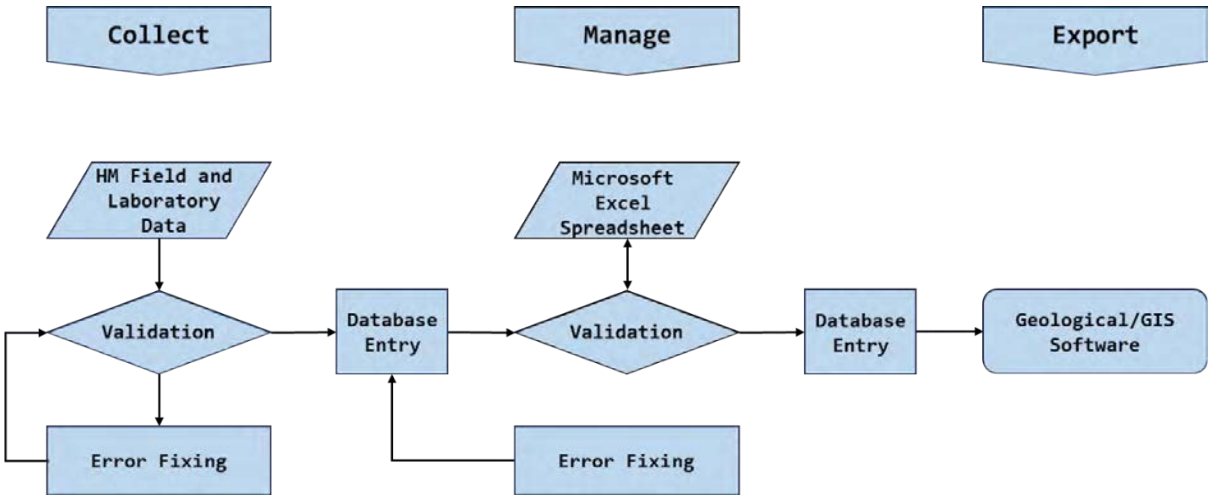



Figure 28 Simplified data verification workflow

### 5.1.1 Topography and Collar Survey Validation

HM has supplied a digital copy of LiDAR topographic data in CAD format.

A total of 402 drill holes with GPS coordinates were excluded from the dataset. 81 drill holes (1.24% of total surveyed collar) have a difference in elevation of more than 2m compared to the LiDAR topographic surface. This probably is due to the influence of satellite signals and dense vegetation, so the drill hole elevation using the RTK sometimes does not produce an accurate measurement.

Drill collar survey and LiDAR topography match well with more than 98% of drill collars survey less than 1m difference with the LiDAR.

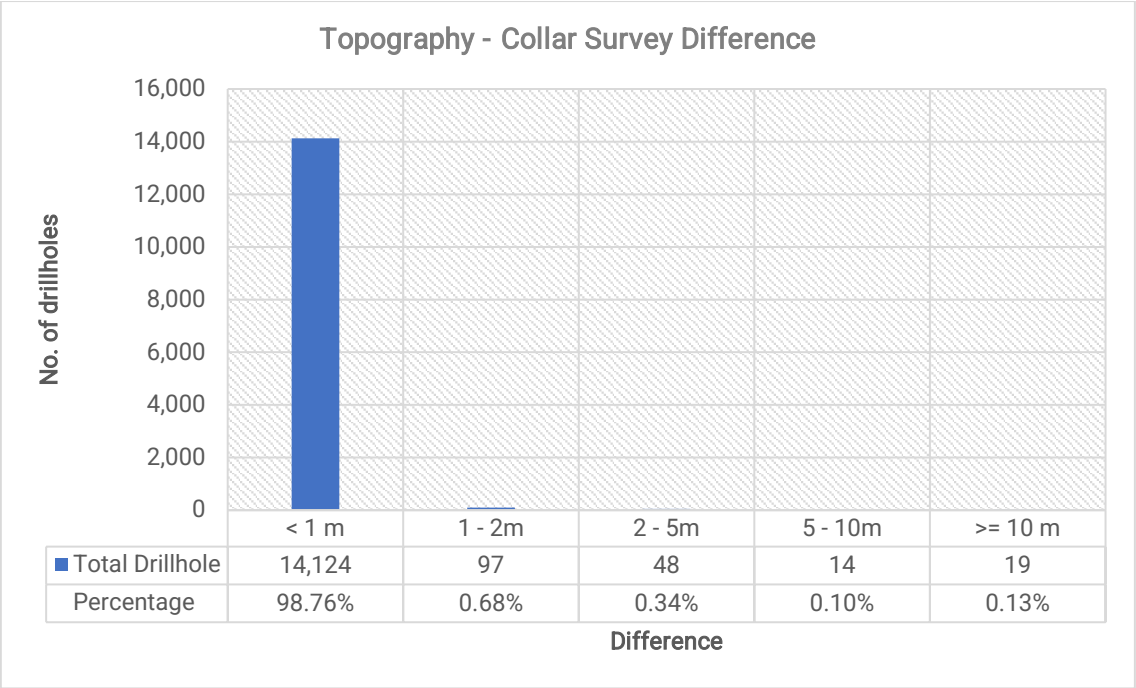



Figure 29 Histogram of topography and collar survey differences

For results less than 2m difference the collar survey was used. Where the drill collar survey was more than 2m difference to the LiDAR the data was not used.

### 5.1.2 Assay Data

#### 5.1.2.1 Data Validation

Data supplied by HM has been checked and validated manually using Microsoft Excel for this project. The assay database validation has been done for common errors and mistakes but not limited to;

1. Total of collar ID, survey, assay and lithology should be the same
2. Duplicate data
3. Overlapped interval
4. Zero, negative and alphanumeric check
5. Absent data or below detection limit value
6. Error or negative value
7. Missing sample interval

8. Sample end of holes depth
9. Unit assay check
10. Metal elements or oxide compound (Ni or NiO/ Si or SiO2, etc)

#### 5.1.2.2 Extrapolatory Data Analysis

Based on the correlation matrix between elements, as shown in Figure 30 below, it is evident that Fe and SiO2 exhibit a strong correlation across all lithologies (0.85 of coefficient of correlation). Therefore, Fe and SiO2 are used as the initial starting point for validating and grouping lithologies from the field data.

Once the initial group was formed, then MgO, Cr2O3, Al2O3, Co, and Ni were also taken into consideration for validation based on this statistical analysis.

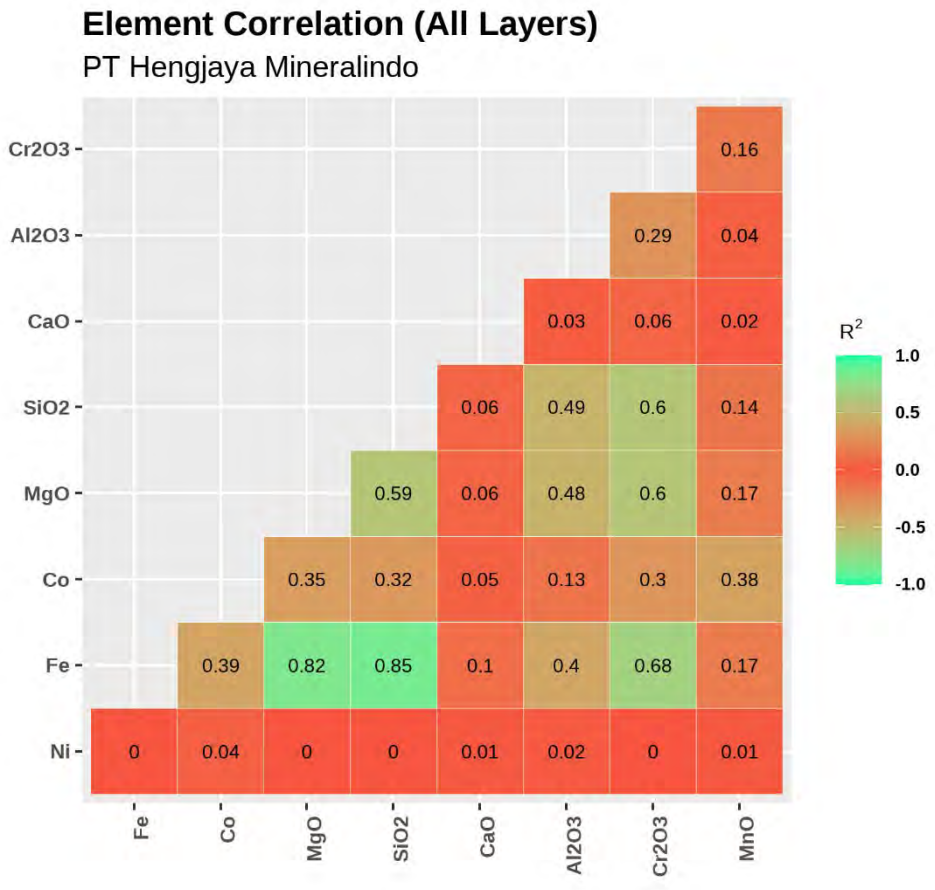



Figure 30 Coefficient correlation matrix

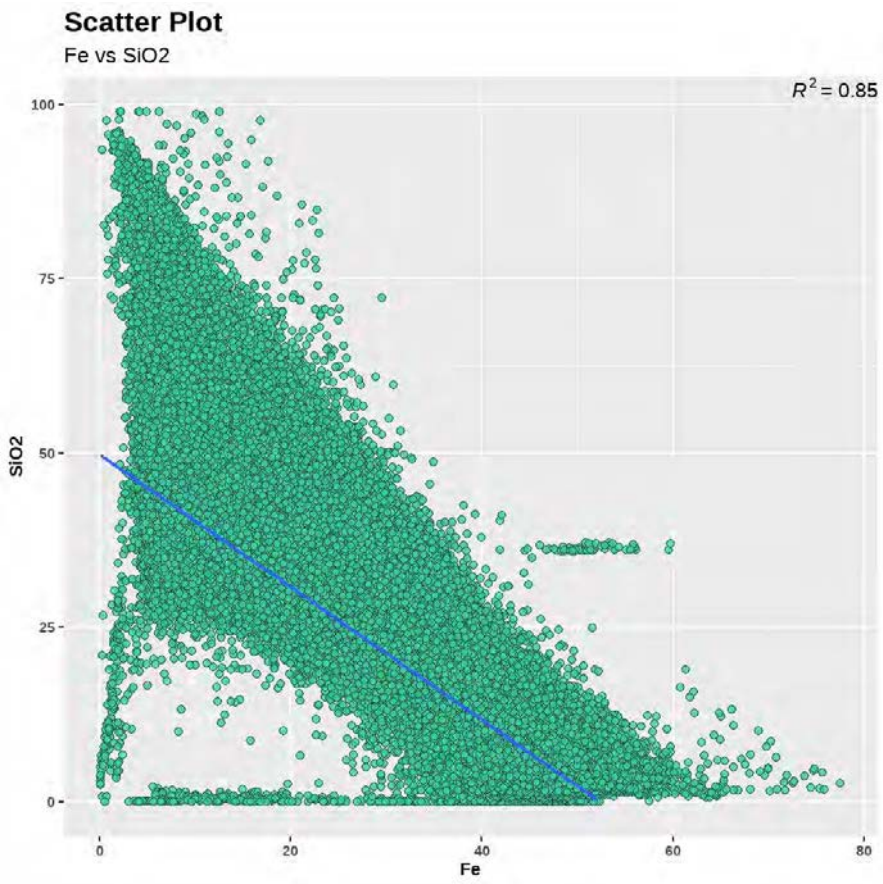
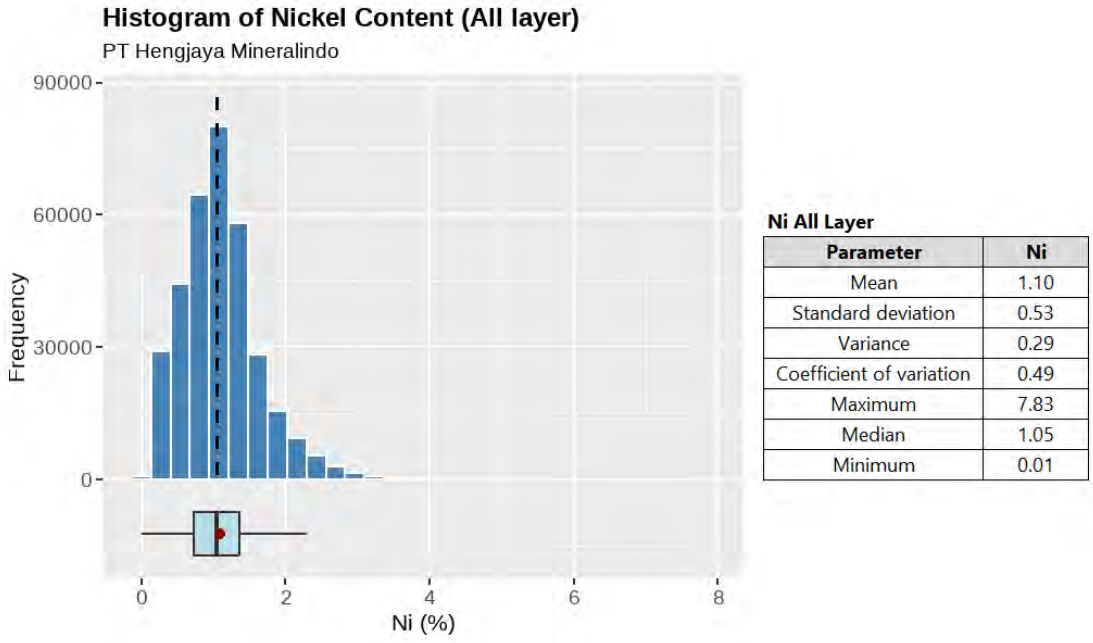



Figure 31 Scatter plot of Fe and SiO2 (all lithologies)




**Ni All Layer**

| Parameter | Ni |
|---|---|
| Mean | 1.10 |
| Standard deviation | 0.53 |
| Variance | 0.29 |
| Coefficient of variation | 0.49 |
| Maximum | 7.83 |
| Median | 1.05 |
| Minimum | 0.01 |

Figure 32 Histogram of Ni (all lithologies)

### 5.1.3 Valid Data

Based on the drill data validation, 359 drill holes from 14,124 surveyed drillholes have been excluded due to; close to a new resurveyed hole coordinate (25 drillholes), >2m difference elevation to LiDAR (81 drillholes), no assay (1 drillhole) and 252 old drillholes under the assumption that the old drillholes are adequately represented by the new drillholes (see Table 12).

Table 12 Valid data used in Resource estimation

| Block | Drilling Used in Resource | | Drilling Excluded from Resource | |
|---|---|---|---|---|
| | Drill holes | Assays | Drill holes | Assays |
| APL | 344 | 9,135 | 0 | 0 |
| BB | 797 | 15,265 | 39 | 808 |
| BBFW | 342 | 5,097 | 6 | 113 |
| BBS | 2,139 | 53,069 | 8 | 196 |
| BBW | 376 | 6,938 | 8 | 31 |
| CE | 5,266 | 133,934 | 251 | 5,469 |
| CN | 458 | 11,503 | 0 | 0 |
| CW | 4,221 | 105,721 | 47 | 1,048 |
| **Total** | **13,943** | **340,662** | **359** | **7,665** |

## 5.2 Lithological Domains

### 5.2.1 Domain Coding

At this stage, the dilution between lithologies may occur to facilitate easier geological modelling, for example, a boulder with thickness of less than 3m may be classified as either limonite or saprolite.

There are at least seven lithologies that can be identified in the current exploration activity namely:

1. CLAY
2. CARBONATE (CALCIUM)
3. LIMONITE
4. SAPROLITE
5. BOULDER
6. BOXWORK
7. BEDROCK

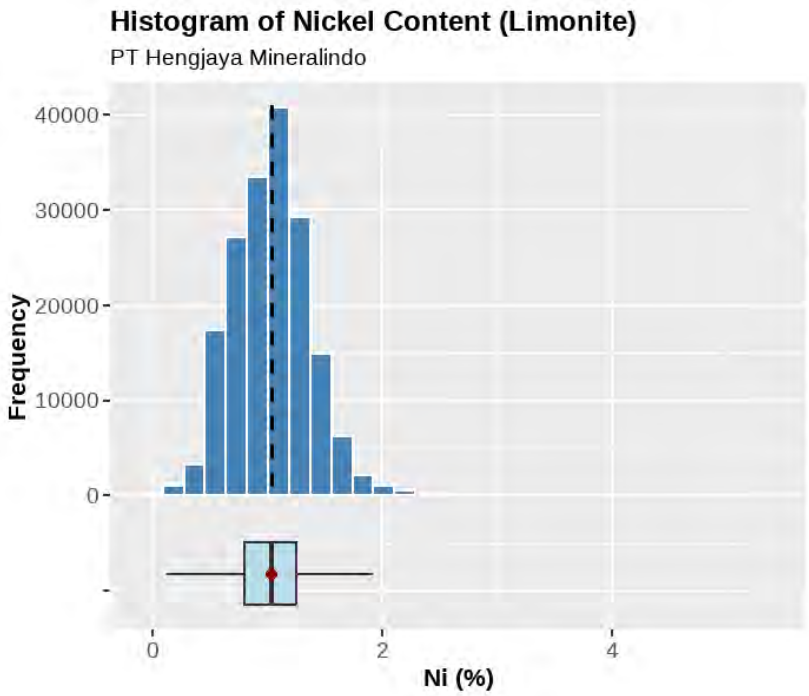
It should be noted that 'BOXWORK' refers to all types of lithology that have an $SiO_2$ content greater than or equal to 50% with a thickness of more than 3 meters, which may consist of clay or the silica boxwork itself.

Table 13 Lithological domain coding

| Domain | Fe (%) | Ni (%) | $SiO_2$ (%) | $Al_2O_3$ (%) | CaO (%) | Thickness (m) |
|---|---|---|---|---|---|---|
| LIM | X ≥ 30 | | | | | |
| SAP | 10 > X ≤ 30 | X > 0.8 | | | | |
| BRK | X ≤ 10 | X ≤ 0.8 | | | | |
| BOXWORK | | | X ≥ 50 | | | X ≥ 3 |
| BOULDER | | X ≤ 0.8 | | | | X ≥ 3 |
| CLAY | | | | X ≥ 40 | | |
| CARBONATE | | | | | X ≥ 40 | |

Table 14 Descriptive statistics of limonite

| Parameter | Ni | Co | Fe | MgO | $SiO_2$ |
|---|---|---|---|---|---|
| Mean | 1.04 | 0.12 | 42.70 | 1.67 | 8.85 |
| Standard deviation | 0.34 | 0.07 | 0.16 | 2.17 | 8.94 |
| Variance | 0.12 | 0.00 | 46.67 | 4.72 | 79.95 |
| Coefficient of variation | 0.33 | 0.60 | 6.83 | 1.30 | 1.01 |
| Maximum | 5.33 | 1.89 | 77.54 | 42.06 | 99.00 |
| Median | 1.03 | 0.10 | 43.61 | 1.02 | 5.32 |
| Minimum | 0.01 | 0.00 | 0.17 | 0.00 | 0.00 |

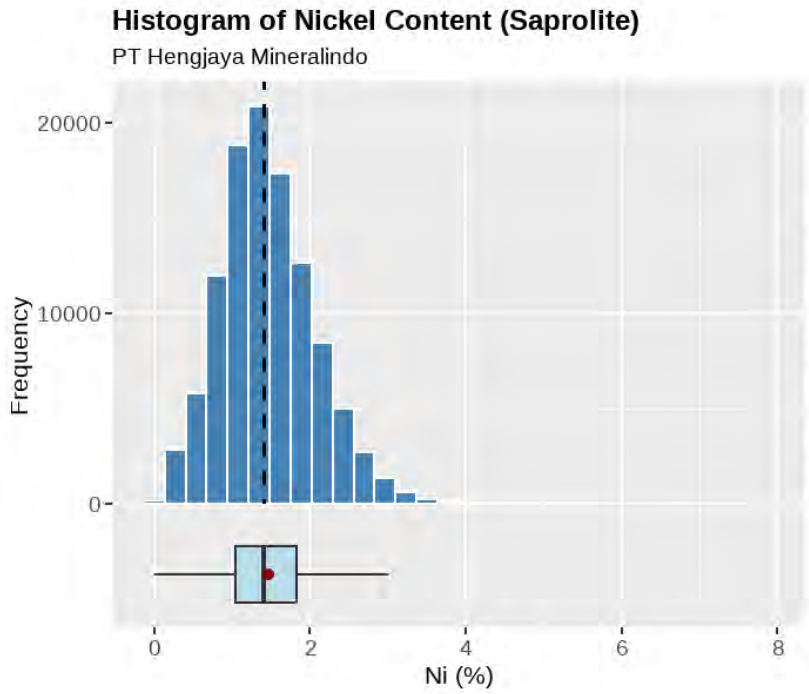



| Parameter | Ni |
|---|---|
| Mean | 1.04 |
| Standard deviation | 0.34 |
| Variance | 0.11 |
| Coefficient of variation | 0.33 |
| Maximum | 5.33 |
| Median | 1.04 |
| Minimum | 0.01 |

Figure 33 Histogram and descriptive statistics of Ni limonite after validation

Table 15 Descriptive statistics of saprolite

| Parameter | Ni | Co | Fe | MgO | $SiO_2$ |
|---|---|---|---|---|---|
| Mean | 1.46 | 0.04 | 15.22 | 18.81 | 36.71 |
| Standard deviation | 0.61 | 0.04 | 7.17 | 73.51 | 8.02 |
| Variance | 0.37 | 0.00 | 51.45 | 73.51 | 64.30 |
| Coefficient of variation | 0.41 | 0.87 | 0.47 | 0.46 | 0.22 |
| Maximum | 7.83 | 1.48 | 69.00 | 58.43 | 99.00 |
| Median | 1.40 | 0.03 | 13.32 | 19.28 | 37.46 |
| Minimum | 0.01 | 0.00 | 0.14 | 0.00 | 0.01 |




| Parameter | Ni |
|---|---|
| Mean | 1.46 |
| Standard deviation | 0.60 |
| Variance | 0.37 |
| Coefficient of variation | 0.41 |
| Maximum | 7.83 |
| Median | 1.40 |
| Minimum | 0.01 |

Figure 34 Histogram and descriptive statistics of Ni saprolite after validation

Complete descriptive statistics for each lithological domain are summarized in Appendix 5.

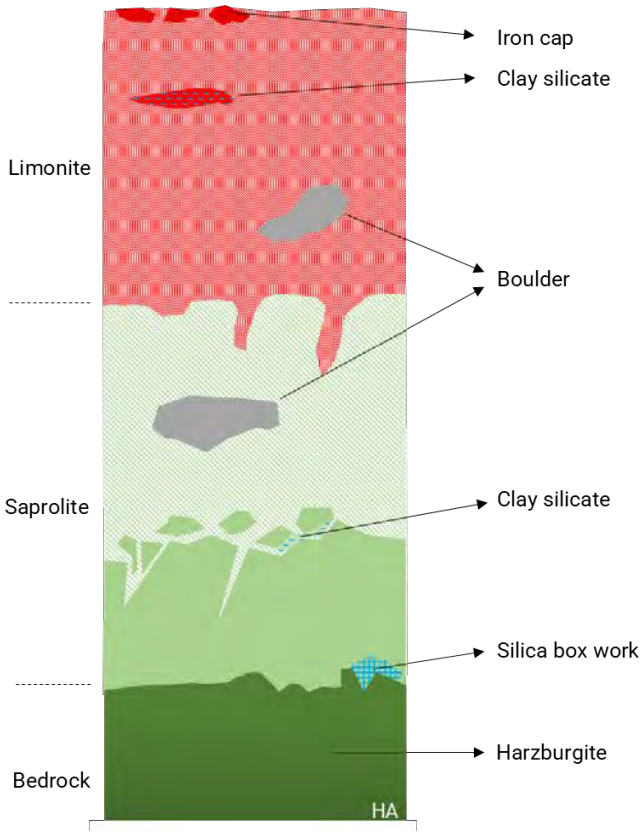



Figure 35 Typical nickel laterite profile at HM

### 5.2.2 Drill Hole Lithology Interval Validation

The drill hole lithology database validation has been done for common errors and mistakes but not limited to;

1. Total of collar ID, survey, assay and lithology should be the same
2. Duplicate data
3. Spatial validation
4. Overlapped interval
5. Collar elevation error
6. Collar status (GPS, RTK or Total Station)

## 5.3 Data Security and Audit

All the original hard copy and original data is already stored in a secure and safe place after checking, comparing and agreeing results by HM and DEX technical teams.

All data has been entered into the PostgreSQL database. This database is then secured by applying:

1. Strong authentication during log in
2. Access controls, only authorized users can access the database
3. Regular backups to recover from potential data loss

## 5.4 Software

Geological modelling, geostatistical study and Mineral Resource Estimation were completed using Seequent Leapfrog Geo 2025.3 software.

## 5.5 Geological Modeling

Each lithology in the drillhole data has been coded into a distinct geological layer (domain), based on their physical and chemical composition determined by the core descriptions and assay results.

Each contact of the layer has been modelled in the 10x10m grid surface. This size was chosen based on less than half of the minimum drillhole spacing in the project, which is 25m.

The geological model was visually checked by easting and northing cross sections to ensure the surface fit the drillhole data. The topographic surface was used to limit the vertical extrapolation of each layer. The cumulative thickness of each layer has been verified by comparing the layer thickness observed in the drillhole with the layer thickness in the geological model as shown in Table 16.

Table 16 Drillhole and geological model cumulative thickness comparison

| BLOCK | Drilling Lithology | Drilling Length (m) | Model Length (m) | Matching Percent (%) |
|---|---|---|---|---|
| APL, BB, BBS, CE, CN, CW | CLAY | 21 | 21 | 100 |
| | LIM | 171,939 | 171,881 | 99.97 |
| | SAP | 101,121 | 100,994 | 99.87 |
| | BOULDER | 3 | 3 | 100 |
| | BOXWORK | 2,391 | 2,383 | 99.64 |
| | BRK | 46,289 | 46,198 | 99.8 |
| BBFW | CLAY | - | - | - |
| | LIM | 1,892 | 1,891 | 99.95 |
| | SAP | 1,145 | 1,142 | 99.7 |
| | BOULDER | - | - | - |
| | BOXWORK | 12 | 12 | 99.78 |
| | BRK | 1,827 | 1,825 | 99.86 |
| BBW | CLAY | - | - | - |
| | LIM | 3,434 | 3,433 | 99.98 |
| | SAP | 1,798 | 1,794 | 99.73 |
| | BOULDER | - | - | - |
| | BOXWORK | 43 | 42 | 99.19 |
| | BRK | 1,587 | 1,585 | 99.85 |

All layers appear to have high model thickness accuracy which is higher than 99% match.

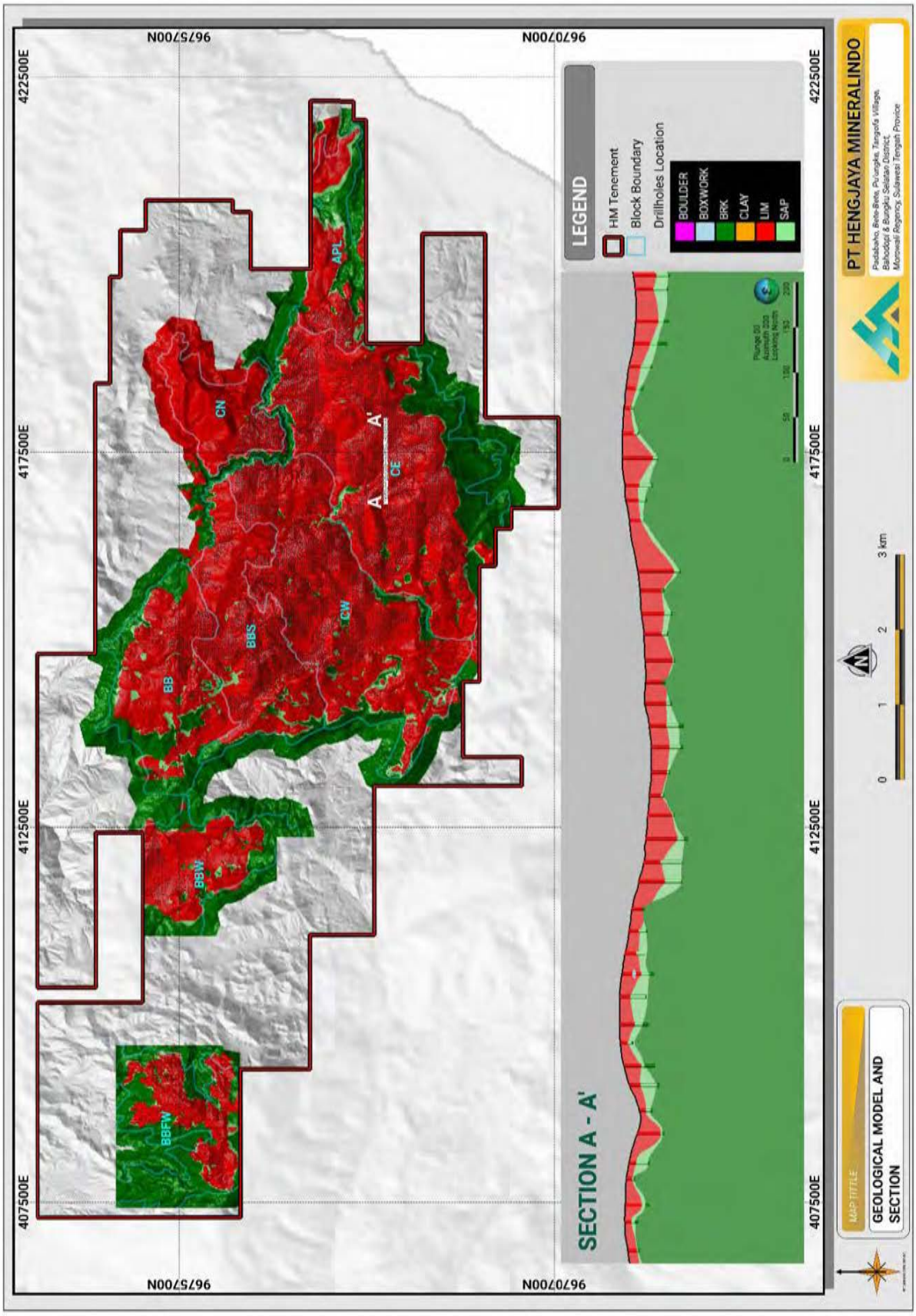



Figure 36 Geological model and section

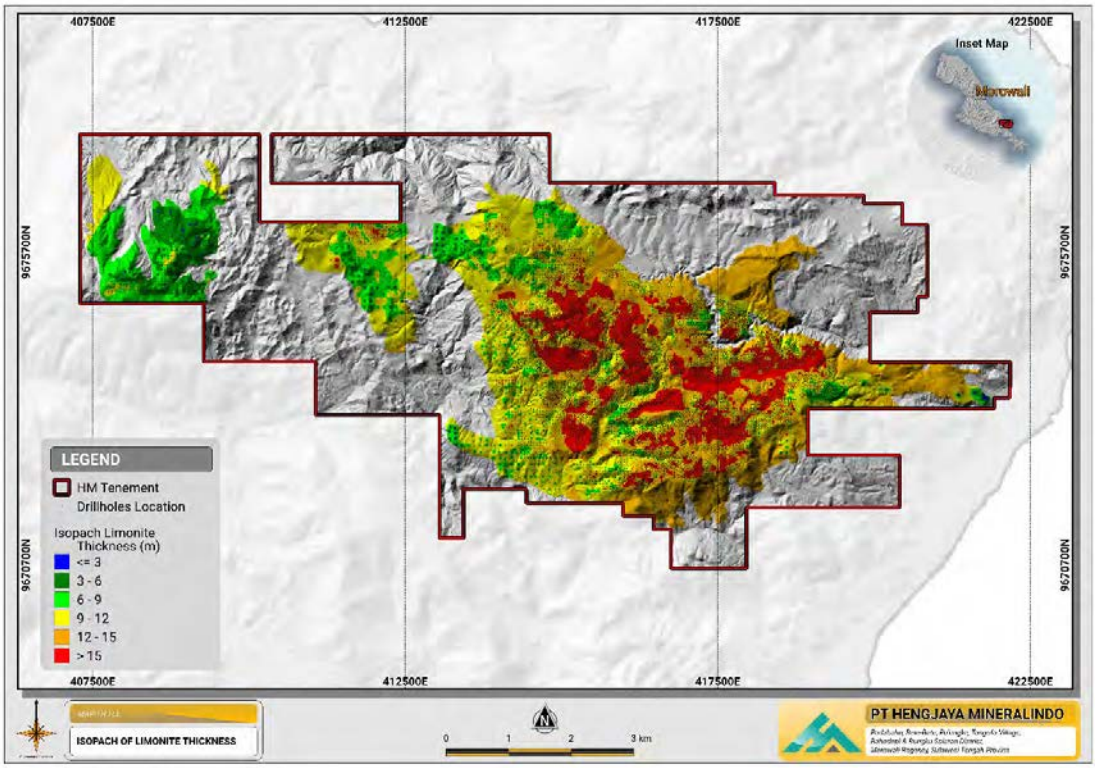



Figure 37 Isopach of limonite

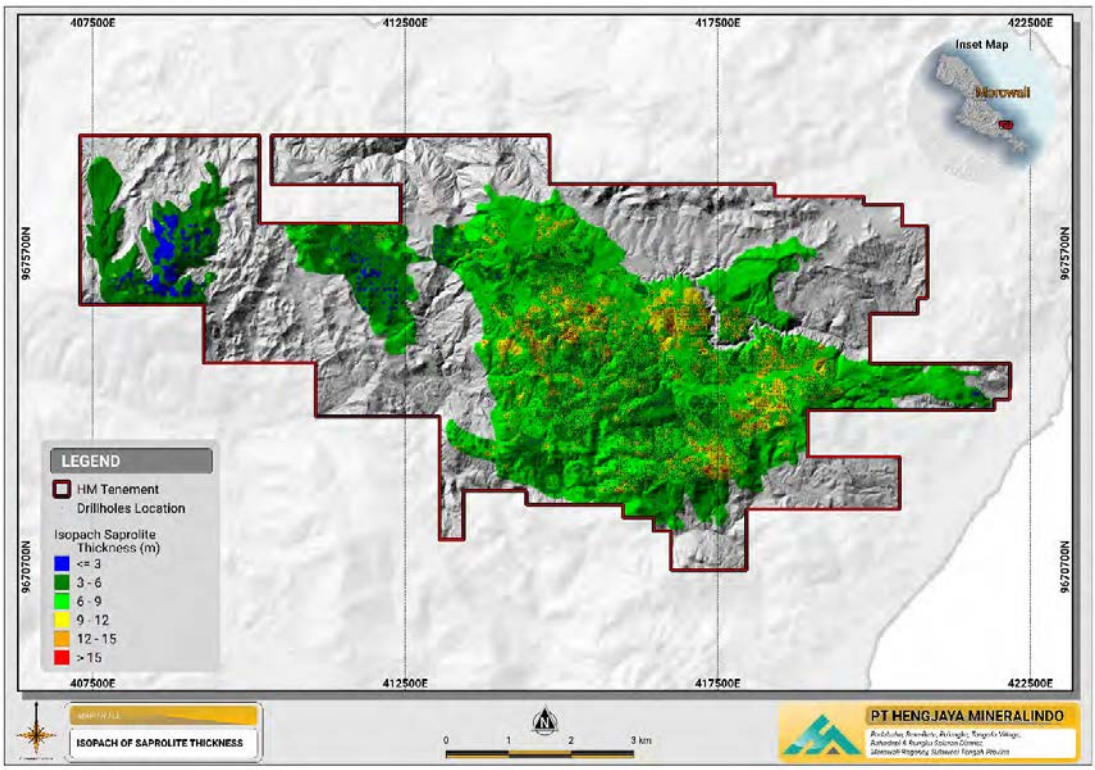



Figure 38 Isopach of saprolite

## 5.6 Sample Composites

A composite sample is created by combining multiple individual samples into a single representative sample. This technique is used to reduce the number of analyses needed while still providing a reliable representation of the overall area of material being studied.

A 1m compositing length was selected because it represents the modal length of the samples taken during exploration and will preserve the information details obtained in the samples.

Several compositing strategies for sample length with less than 1m have been tested in the geological model by adding it to the previous interval or distributing it equally between previous and subsequent samples or ignoring it completely. The three compositing methods show very little change in the coefficient of variation (CV), so that in the current geological model, samples length less than 0.5m are added to the previous interval composite to include all analyses in the geological model.

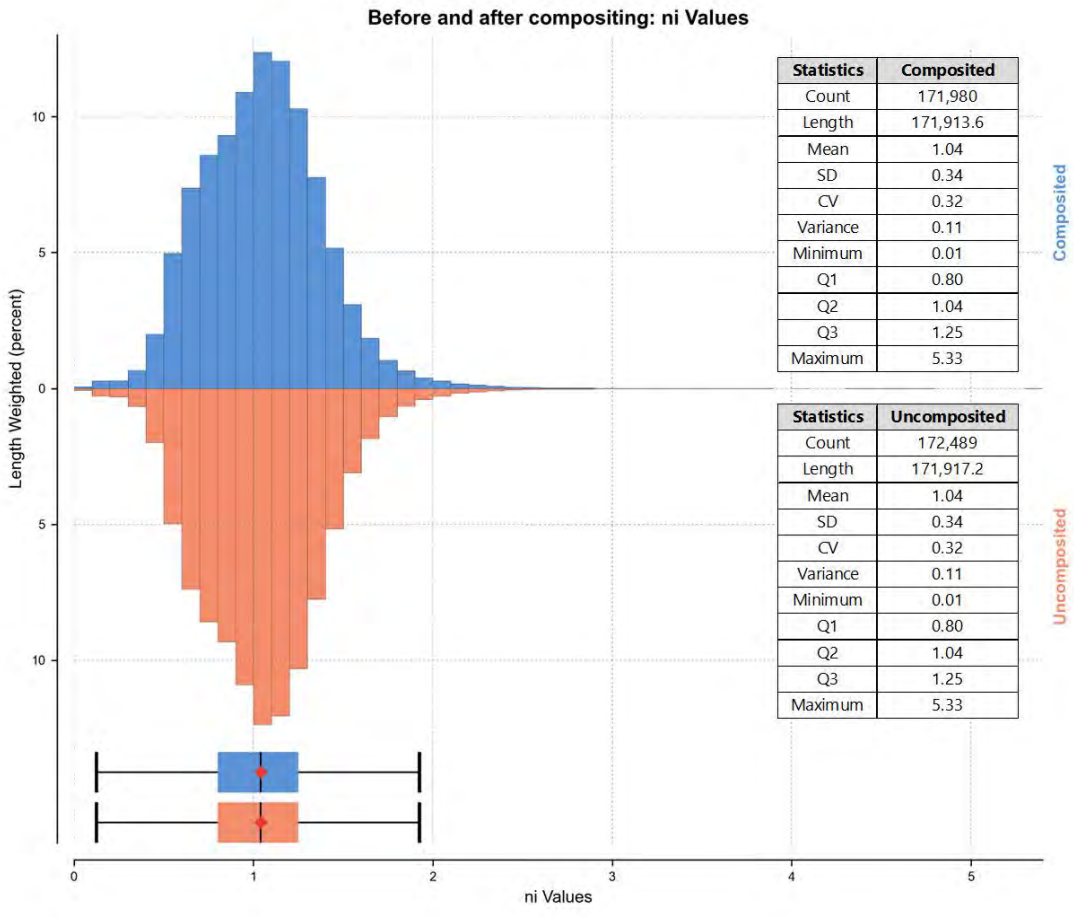



Figure 39 Composite and original data comparison limonite

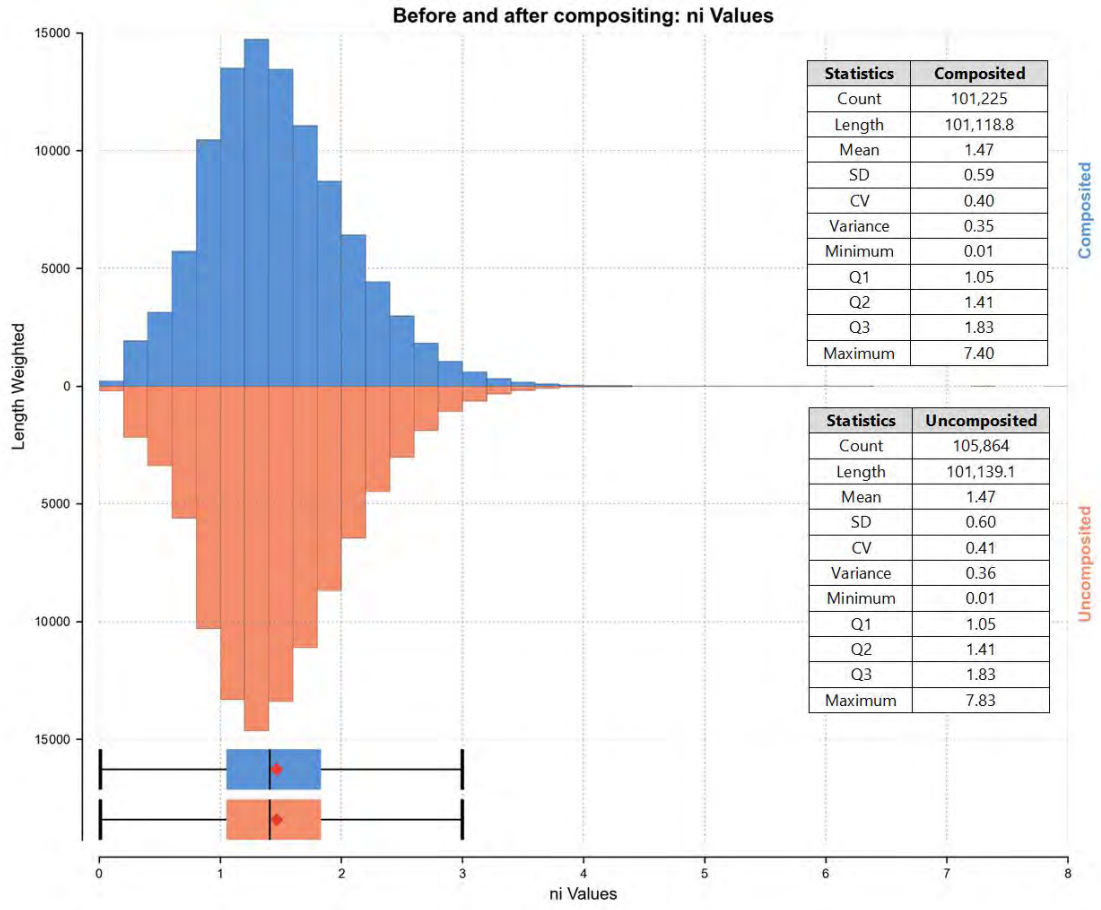



Figure 40 Composite and original data comparison saprolite

## 5.7 Variography

Variography is a technique used in spatial analysis to study how sample values relate to each other in space and quantify their spatial variability. It involves analysing the differences between sample values at various separation distances and directions to understand the spatial correlation within a dataset.

### 5.7.1 Variogram

A variogram is a function that describes the spatial continuity or variability of data; it helps understand how much the value of a variable (grade) changes as we move further away from a given point.

In this project, two types of variograms are used depending on the degree of data skewness. For data with high skewness, the values are transformed into Normal Score Data to facilitate the creation of variogram models without applying capping or top cuts to the data.

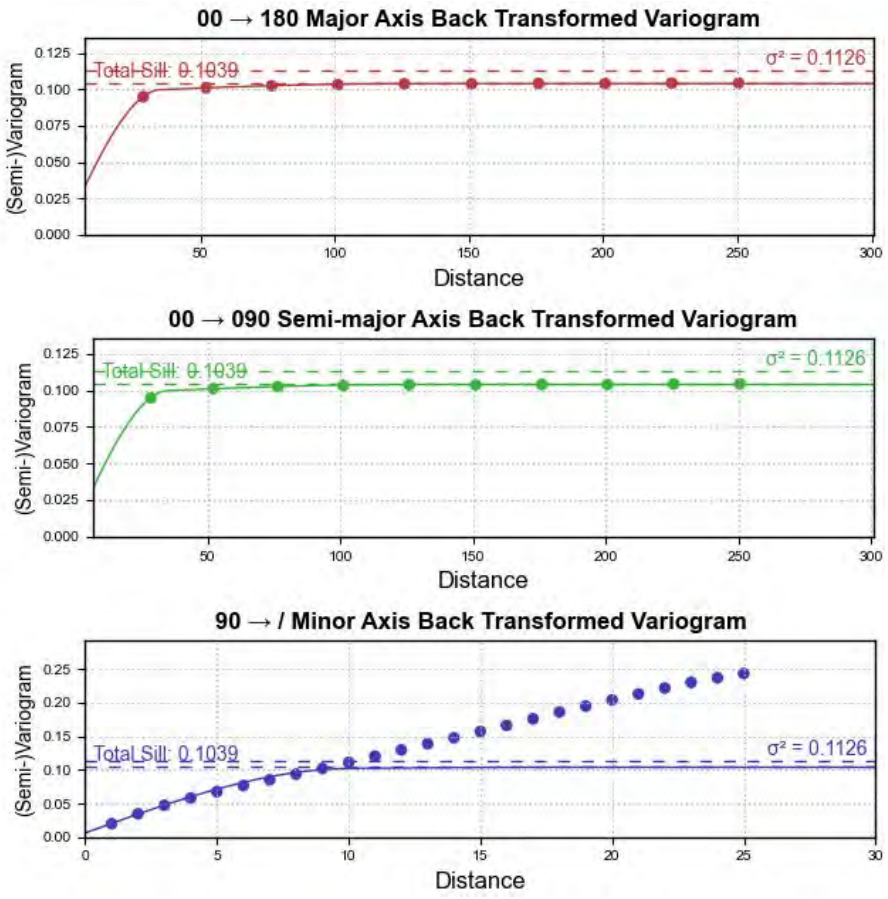



Figure 41 Variogram of Ni limonite (APL, BB, BBS, CE, CN, CW)

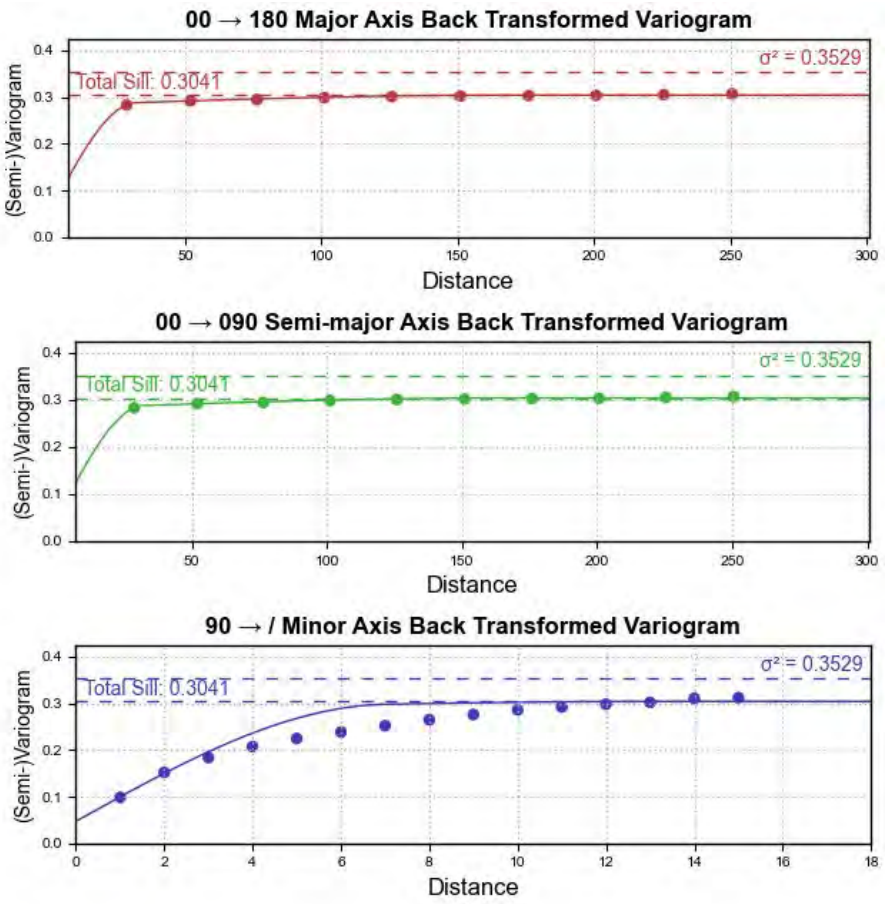



Figure 42 Variogram of Ni saprolite (APL, BB, BBS, CE, CN, CW)

Table 17 Summary of variogram analysis Ni Limonite

| Variogram Name | | APL, BB, BBS, CE, CN, CW | | BBFW | | BBW | |
|---|---|---|---|---|---|---|---|
| Direction | Dip | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.1126 | | 0.0857 | | 0.1394 | |
| | Nugget | 0.0063 | | 0 | | 0.0021 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.0905 | 0.0071 | 0.0828 | - | 0.1144 | 0.0229 |
| | Major | 35 | 35 | 55 | - | 33 | 33 |
| | Semi-major | 125 | 125 | 55 | - | 110 | 110 |
| | Minor | 10 | 18 | 6 | - | 10 | 16 |

Table 18 Summary of variogram analysis Ni saprolite

| Variogram Name | | APL, BB, BBS, CE, CN, CW | | BBFW | | BBW | |
|---|---|---|---|---|---|---|---|
| Direction | Dip | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.3529 | | 0.0857 | | 0.3092 | |
| | Nugget | 0.0472 | | 0 | | 0.0211 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.2343 | 0.0226 | 0.0828 | - | 0.1558 | 0.0584 |
| | Major | 32 | 32 | 55 | - | 33 | 33 |
| | Semi-major | 165 | 165 | 55 | - | 135 | 135 |
| | Minor | 7 | 13 | 6 | - | 7 | 8 |

Complete variogram modelling for each element and domain in each block are summarized in Appendix 5.

### 5.7.2 Kriging Neighbourhood Analysis (KNA)

To minimize the conditional bias, quantitative Kriging Neighbourhood Analysis (KNA) was performed to determine the optimum block size for block model, discretization block, minimum and maximum number of samples and search ellipsoid ranges on the selected variogram model.

In this project area the saprolite layer was chosen to perform the KNA study.

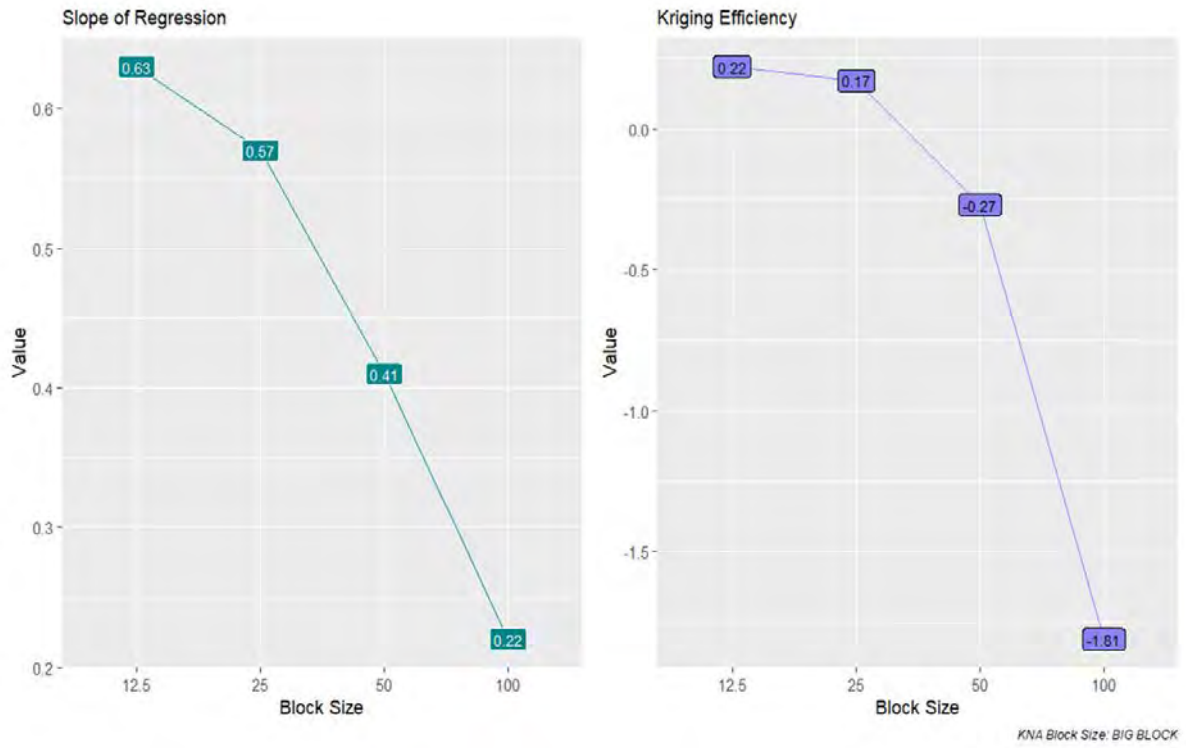



Figure 43 KNA optimum block size

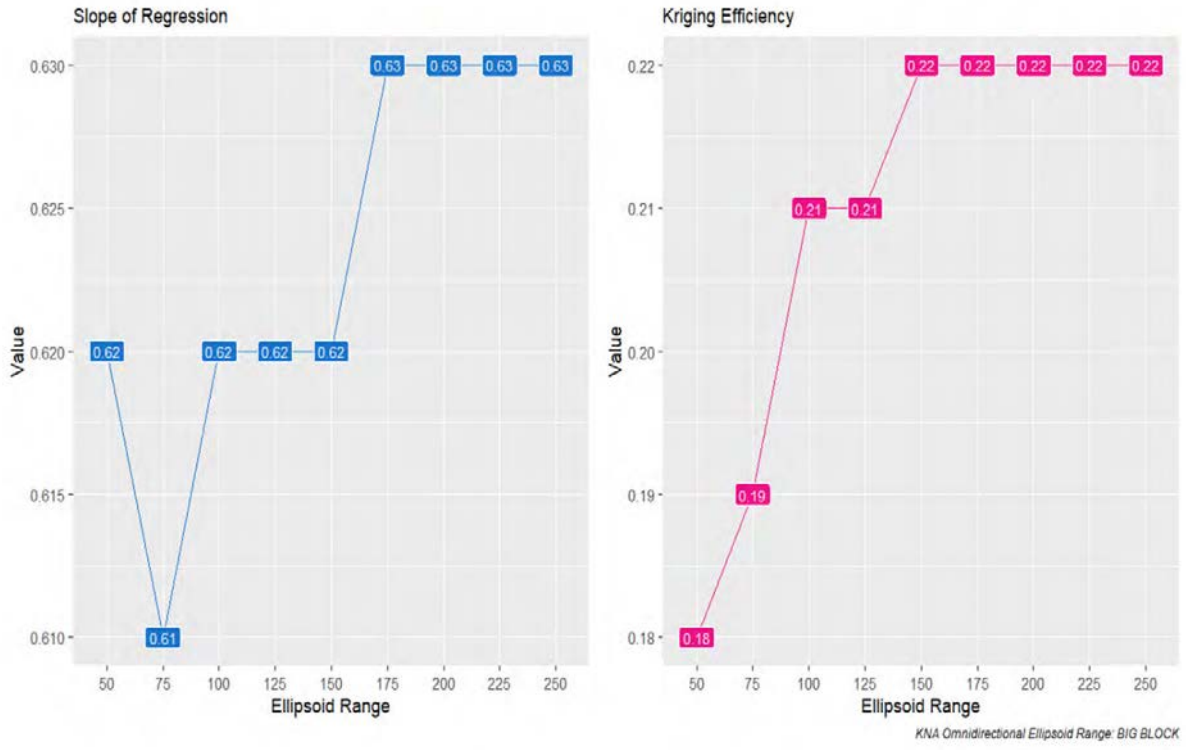



Figure 44 KNA optimum ellipsoid search distance

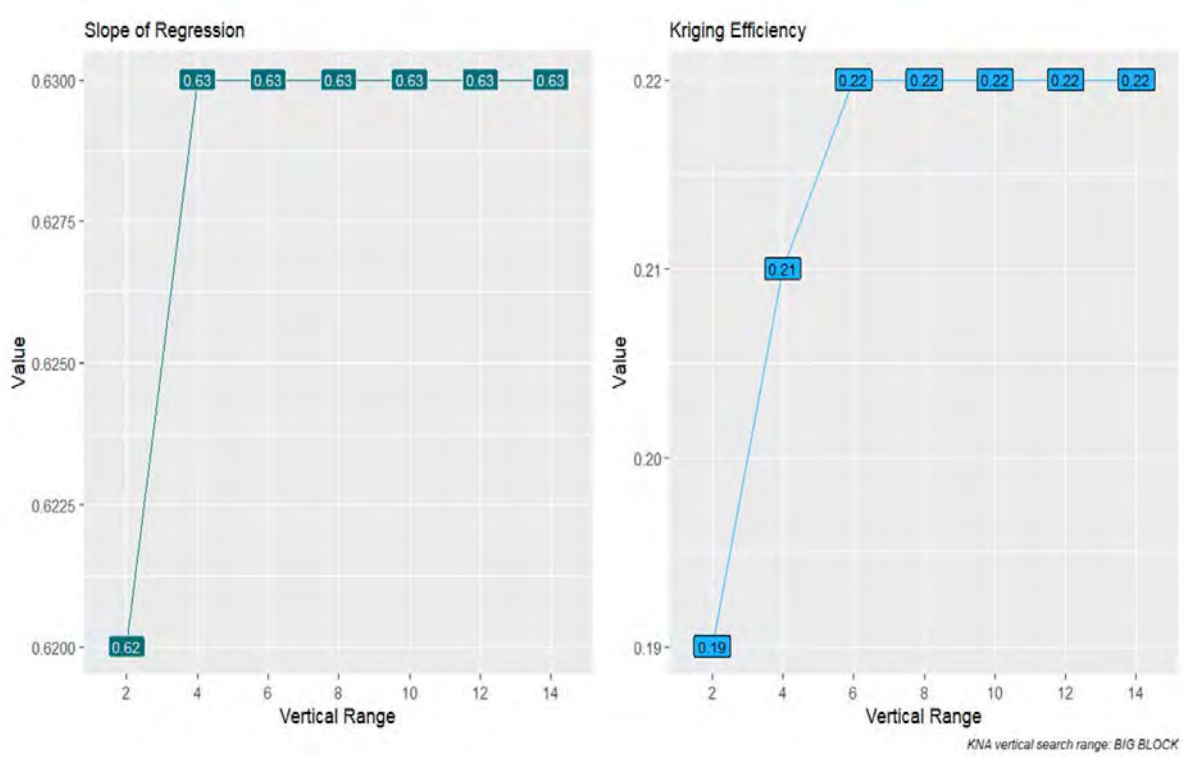



Figure 45 KNA optimum vertical search distance

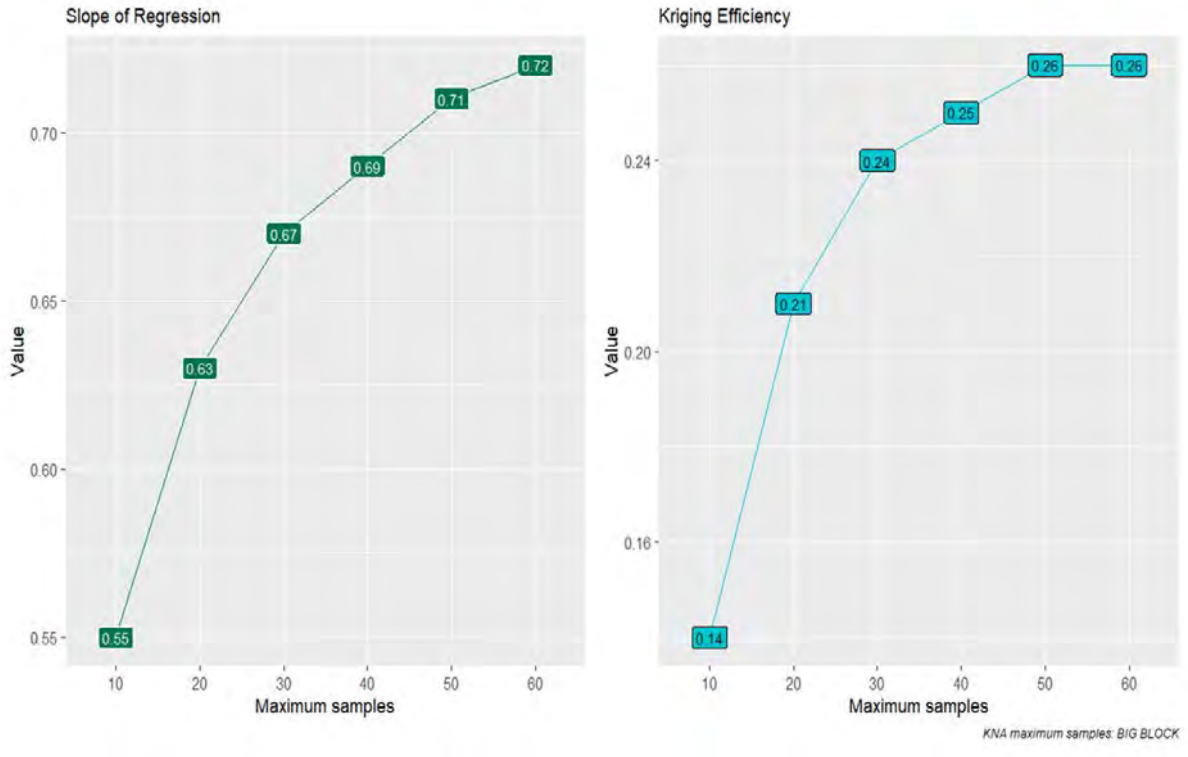



Figure 46 KNA maximum number of samples

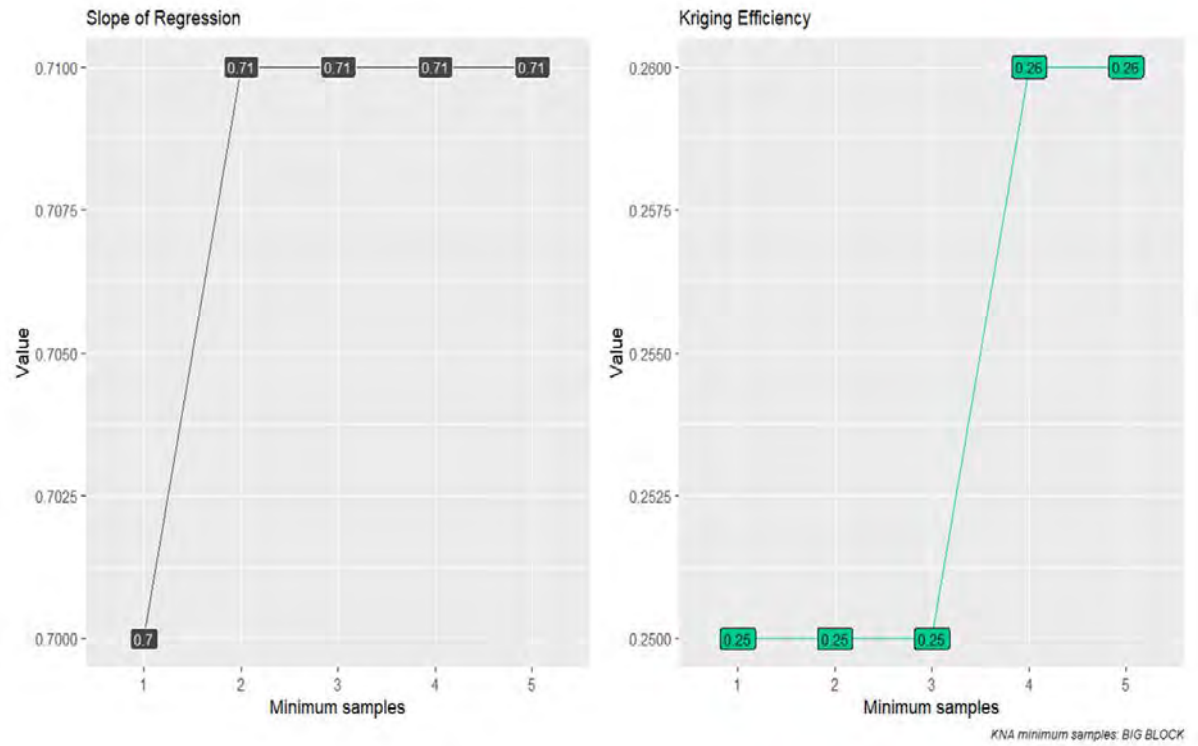



Figure 47 KNA minimum number of samples

The complete KNA results are summarized in Table 19.

Table 19 KNA summary

| Parameter | APL, BB, BBS, CE, CN, CW | | BBFW | | BBW | |
|---|---|---|---|---|---|---|
| | Limonite | Saprolite | Limonite | Saprolite | Limonite | Saprolite |
| Block Size | 12.5 x 12.5 x 1 | | 12.5 x 12.5 x 1 | | 12.5 x 12.5 x 1 | |
| Discretization Block | 5 x 5 x 2 | | 5 x 5 x 2 | | 5 x 5 x 2 | |
| Max. Horizontal Search | 175 | 175 | 125 | 125 | 225 | 225 |
| Max. Vertical Search | 6 | 6 | 10 | 10 | 12 | 12 |
| Min. Samples | 4 | 4 | 1 | 1 | 5 | 5 |
| Max. Samples | 50 | 50 | 30 | 30 | 50 | 50 |

## 5.8 Block Model

As suggested by KNA, an Octree sub-block model size of 12.5 x 12.5 x 1m with no rotation has been selected.

Octree block model was chosen because, instead of dividing a block entirely into small sub-blocks when sub-blocking is triggered, the block is first divided in half in a particular direction,

and then only the partitioned blocks that still trigger a further division are divided into smaller units so the processing time can be more efficient.

The block model dimension and attributes, coded into the block models, including interpreted generic lithology, estimated grades and Kriging estimation attributes are as shown in Table 20 and Table 21 respectively.

Table 20 Block model dimensions

| Type | APL, BB, BBS, CE, CN, CW | | | BBFW | | | BBW | | |
|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | X | Y | Z | X | Y | Z |
| Block Type | Octree Sub-blocked Model Type | | | Octree Sub-blocked Model Type | | | Octree Sub-blocked Model Type | | |
| Parent Block Size | 12.5 | 12.5 | 1 | 12.5 | 12.5 | 1 | 12.5 | 12.5 | 1 |
| Sub-block count | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Minimum Block Size | 3.125 | 3.125 | 0.25 | 3.125 | 3.125 | 0.25 | 3.125 | 3.125 | 0.25 |
| Base Point | 411,000 | 9,670,100 | 640 | 407,411 | 9,674,897 | 869 | 411,025 | 9,674,376 | 470 |
| Boundary Size | 12,000 | 8,100 | 712 | 2,200 | 1,663 | 531 | 2,150 | 1,988 | 338 |
| Azimuth | 0 | | | 0 | | | 0 | | |
| Dip | 0 | | | 0 | | | 0 | | |
| Pitch | 0 | | | 0 | | | 0 | | |
| Size In Blocks | 960 x 648 x 712 = 442,920,960 | | | 176 x 133 x 531 = 12,429,648 | | | 172 x 159 x 338 = 9,243,624 | | |

Table 21 Block model attributes

| Attribute | Type | Description |
|---|---|---|
| AvgD | Numeric | Average distance to samples of Ni |
| Blocks | Character | APL, BB, BBS, CE, CN, CW |
| BMLayer | Character | CLAY, BOULDER, BOXWORK, LIM, SAP, BRK, Unknown |
| Co | Numeric | OK interpolated grades for Cobalt (Co%) |
| Fe | Numeric | OK interpolated grades for Iron (Fe%) |
| KE | Numeric | Kriging Efficiency of Ni |
| KV | Numeric | Kriging Variance of Ni |
| MC | Numeric | Insitu lab moisture measurement (%) |
| MgO | Numeric | OK interpolated grades for Magnesium Oxide (MgO%) |
| Ni | Numeric | OK interpolated grades for Nickel (Ni%) |
| ResClass | Character | MEASURED, INDICATED, INFERRED, BLANK |
| SG | Numeric | Insitu lab density measurement (wet g/cm$^3$) |
| SiO2 | Numeric | OK interpolated grades for Silica Oxide (SiO2%) |
| SoR | Numeric | Slope of Regression of Ni |
| SumN | Numeric | Sum of negative weights of Ni |

The complete block model attributes are summarized in Appendix 5.

## 5.9 Grade Estimation

### 5.9.1 Top Cut

Top cut is a method to limit the influence of extreme values that deviate significantly from overall data distribution which can lead to over estimation and unrealistic results. A 1.5 times multiplication of Inter Quantile Range (IQR) has been applied to determine the top cuts.

Table 22 Assay Top Cut

| BLOCK | Laterite Layers | Ni Top Cut (%) | % of Top Cut Data |
|---|---|---|---|
| APL, BB, BBS, CE, CN, CW | Limonite | 2 | 0.85 |
| | Saprolite | 3 | 1.31 |
| BBFW | Limonite | 1.6 | 1.53 |
| | Saprolite | 2.3 | 2.63 |
| BBFW | Limonite | 1.7 | 2.32 |
| | Saprolite | 3 | 0.28 |

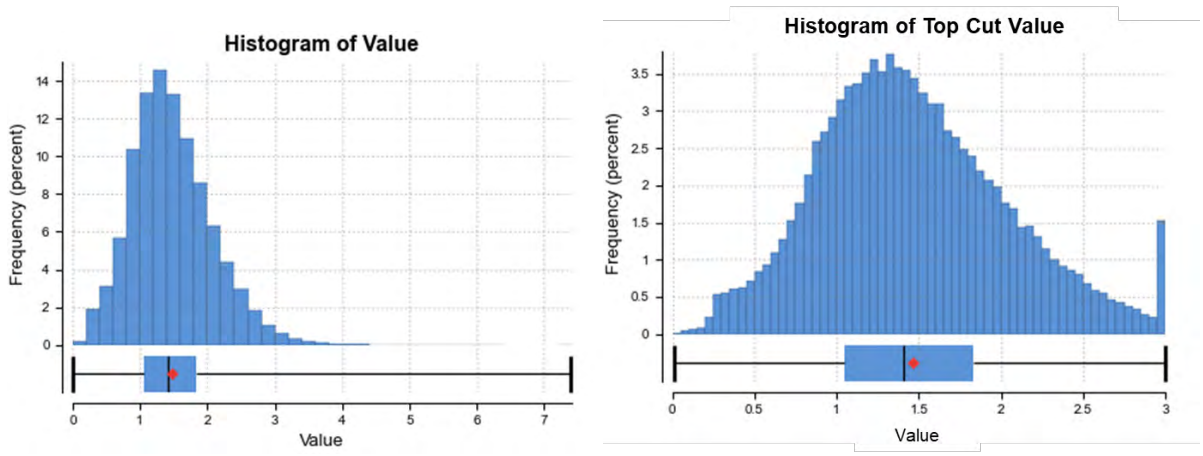



Figure 48 Histogram comparison before and after top cut of Nickel saprolite

### 5.9.2 Search Neighbourhood

Ordinary Kriging grade estimate has been applied for Ni, Co, Fe, MgO and SiO2. The minimum and maximum number of samples, search radius and vertical search distance for each block were taken from KNA results.

Several tests (multi passes) have been applied to the grade estimate to cover all the laterite domains in the block model. The first search radius (pass 1) was obtained from KNA, then multiplied by 2 for the subsequent passes, except for the BBFW block, pass 3 multiplied by 4.

Table 23 Search neighbourhood parameters

| Parameter | | APL, BB, BBS, CE, CN, CW | | | | | | BBFW | | | | | | BBW | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Limonite (Ni) | | | Saprolite (Ni) | | | Limonite (Ni) | | | Saprolite (Ni) | | | Limonite (Ni) | | | Saprolite (Ni) | | |
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | - | | | - | | | 1.6 | | | 2.3 | | | 1.7 | | | 3 | | |
| Interpolant | Kriging Type | Ordinary Kriging | | | Ordinary Kriging | | | Ordinary Kriging | | | Ordinary Kriging | | | Ordinary Kriging | | | Ordinary Kriging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 4 | 4 | 1 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 5 | 1 | 5 | 5 | 1 |
| | Maximum Sample | 50 | 50 | 50 | 50 | 50 | 50 | 30 | 30 | 30 | 30 | 30 | 30 | 50 | 50 | 50 | 50 | 50 | 50 |
| Ellipsoid Ranges | Maximum | 175 | 350 | 700 | 175 | 350 | 700 | 125 | 250 | 1,000 | 125 | 250 | 1,000 | 225 | 450 | 900 | 225 | 450 | 900 |
| | Intermediate | 175 | 350 | 700 | 175 | 350 | 700 | 125 | 250 | 1,000 | 125 | 250 | 1,000 | 225 | 450 | 900 | 225 | 450 | 900 |
| | Minimum | 6 | 12 | 24 | 6 | 12 | 24 | 10 | 20 | 80 | 10 | 20 | 80 | 12 | 24 | 48 | 12 | 24 | 48 |

### 5.9.3 Variable Orientation

In simple and plainar geology, a single constant orientation for search and variogram is applied across each geological domain. This type of estimation is not appropriate to be applied in the HM project as the nickel laterite is undulating without a constant orientation. To overcome the problem, Leapfrog Edge's Variable Orientation (VO) was used to allow re-orientation of the search and variogram to better match the local structural geometry (see the illustration below).

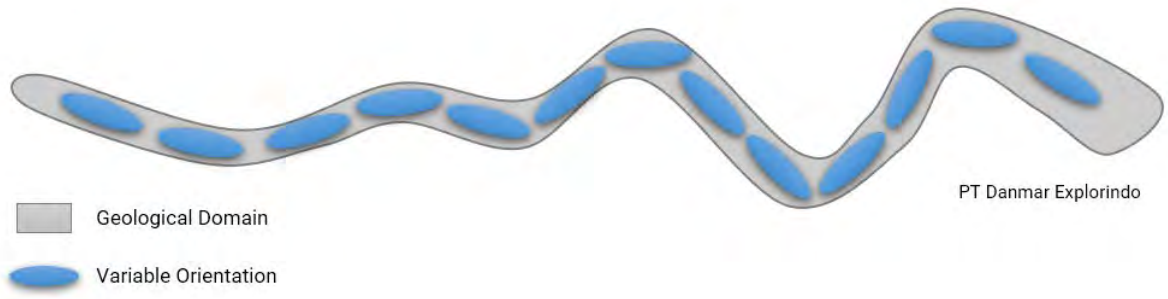



Figure 49 Variable orientation illustration

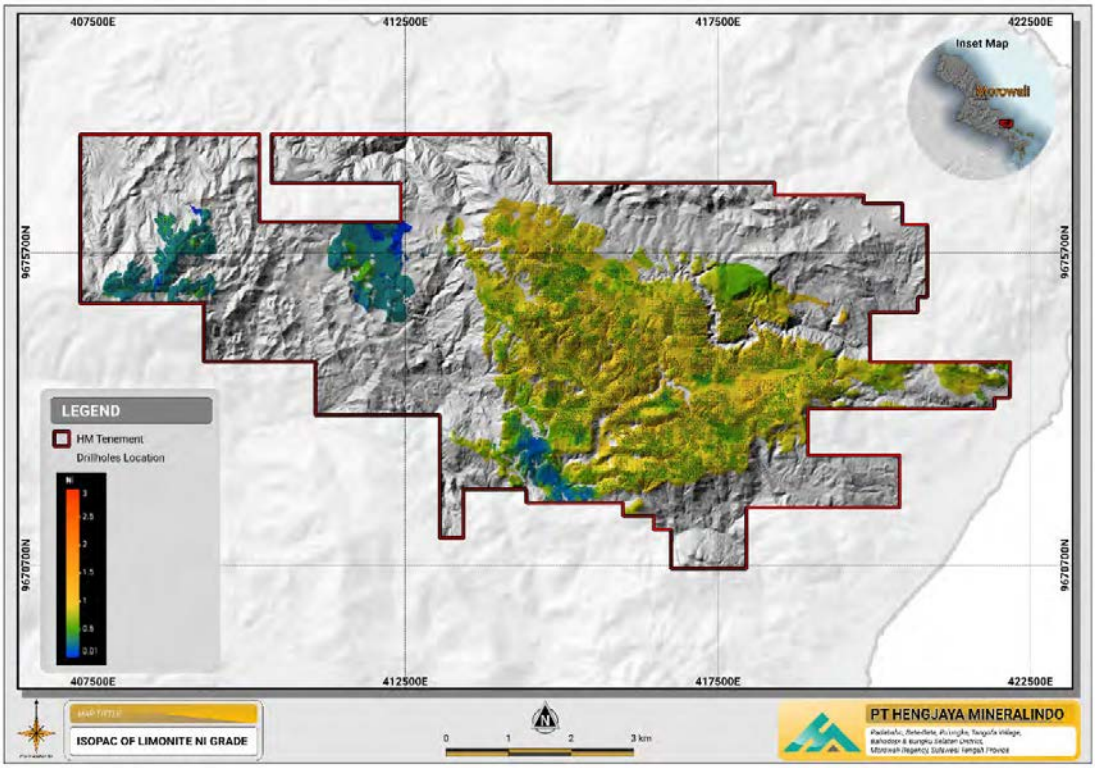



Figure 50 Isograde of Ni limonite in blockmodel

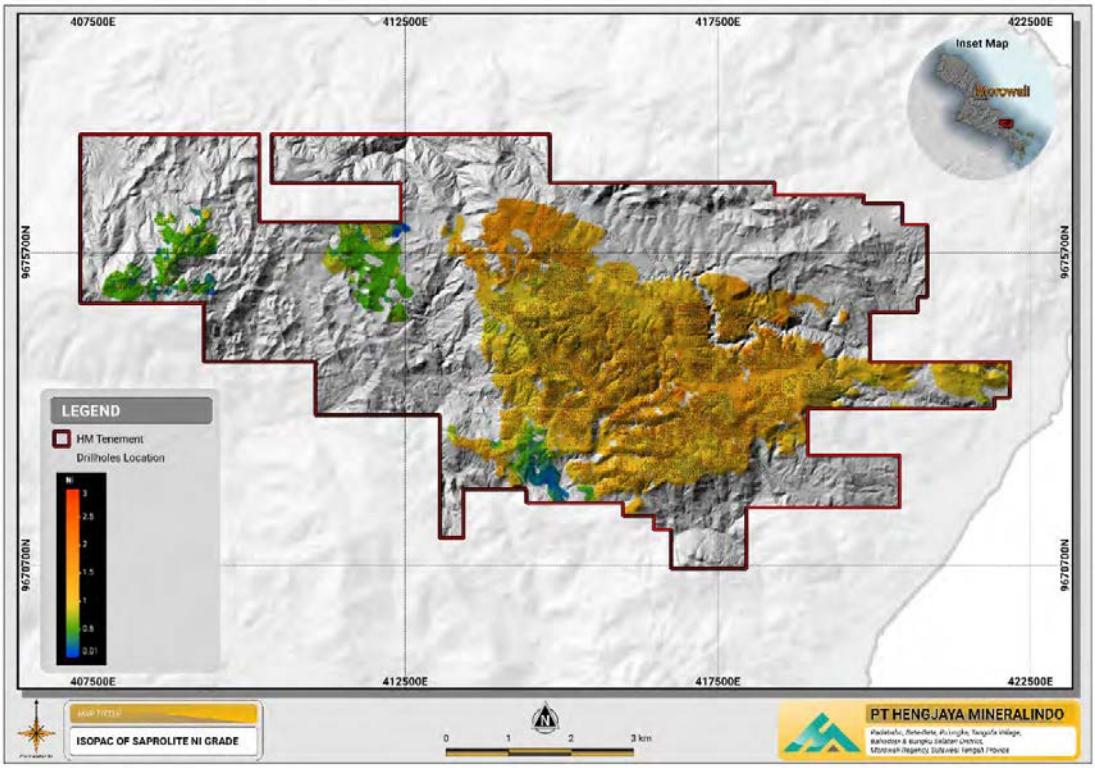



Figure 51 Isograde of Ni saprolite in blockmodel

## 5.10 Block Model Validation

The estimated block model was validated visually on screen as well as by the statistical means.

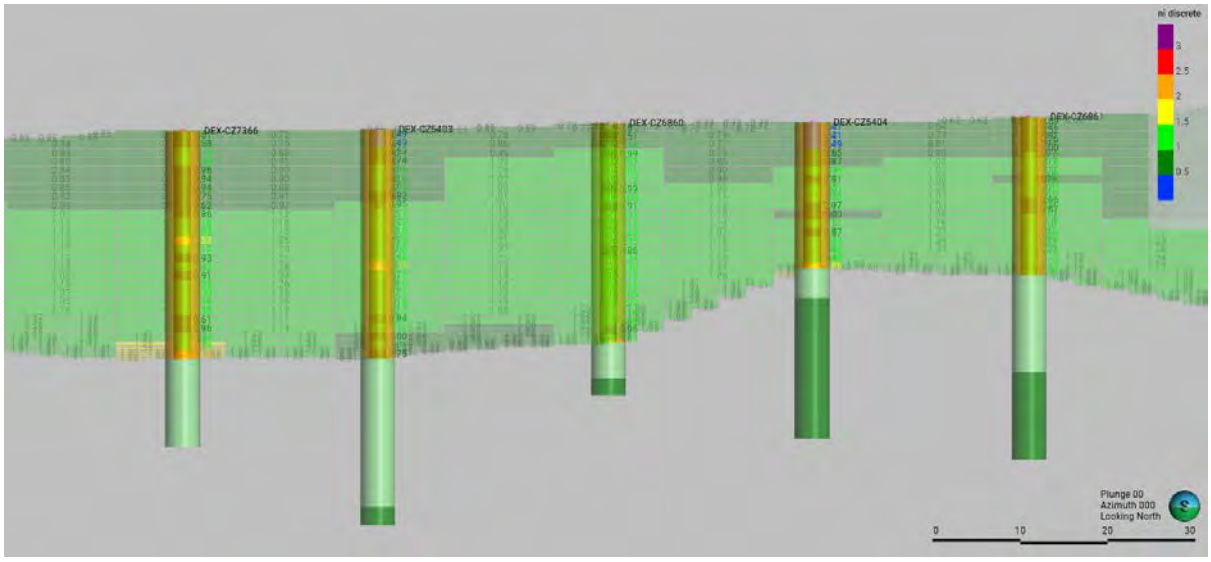



Figure 52 Example of block model validation using visual method for limonite

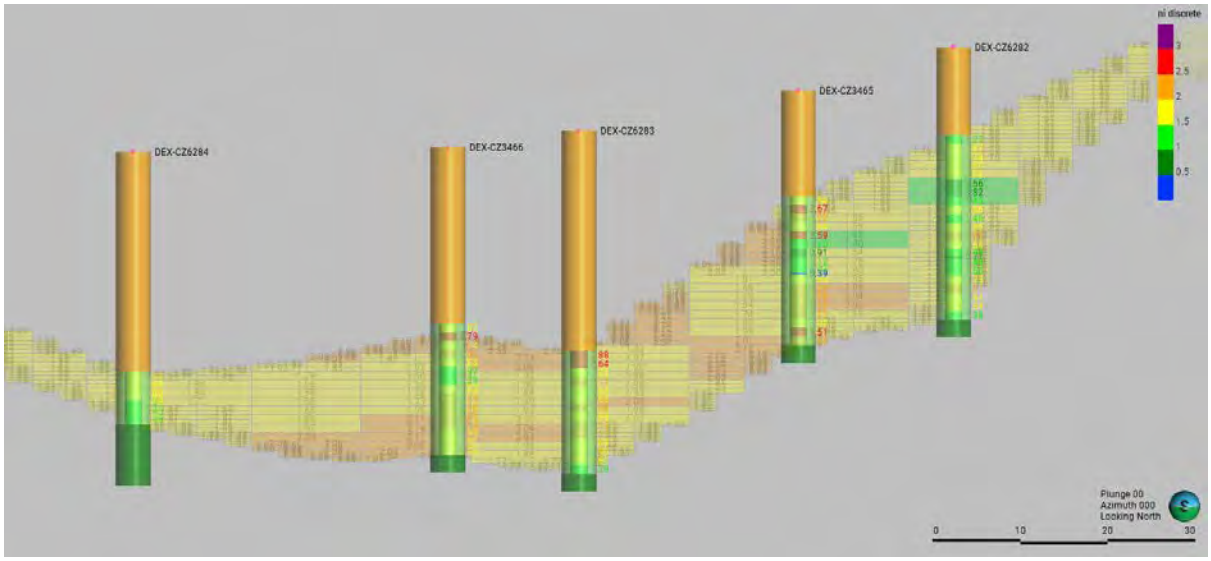



Figure 53 Example of block model validation using visual method for saprolite

The block model was compared with drillhole sample data on cross sections to verify the geological interpretation and estimated grades.

Table 24 Solid model vs block model volume

| Domain | Solid Volume ($M^3$) | Block Volume ($M^3$) | Volume Difference (%) |
|---|---|---|---|
| Limonite | 197,790,300 | 197,785,029 | 0.0 |
| Saprolite | 123,951,600 | 123,958,142 | 0.0 |
| **Total** | **321,741,900** | **321,743,171** | **0.0** |

Swath plots were used to visualize the statistical mean and magnitude of error between composite samples and the average estimated grades in the northing and easting directions (see figures 54 and 55).

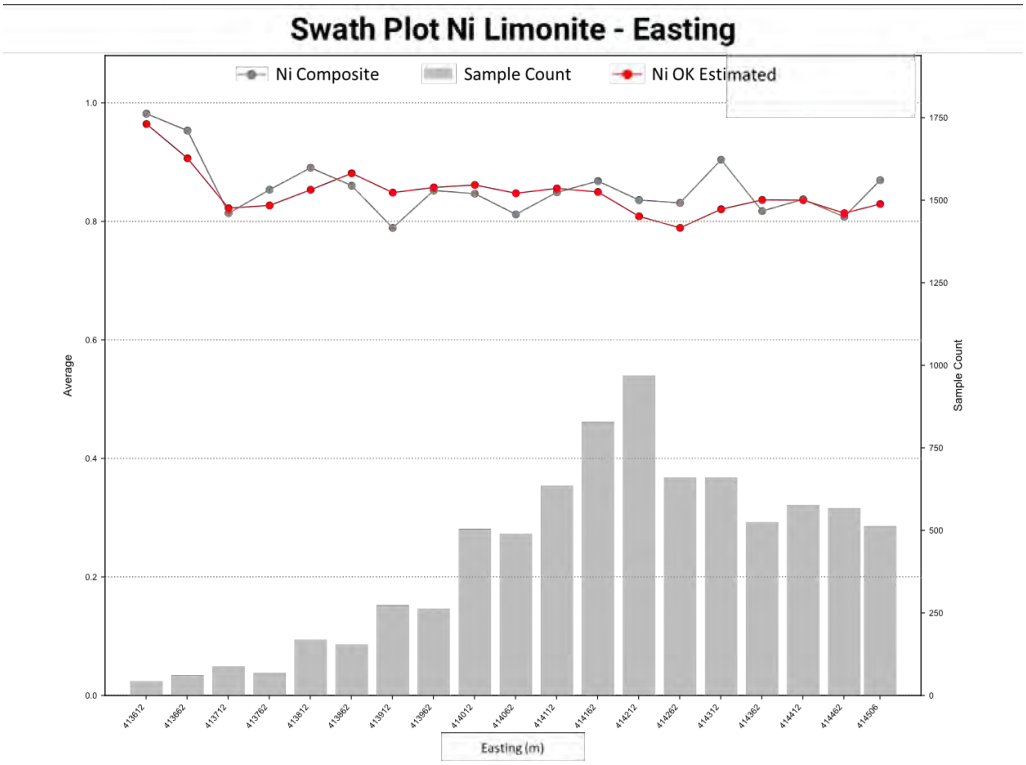



Figure 54 Block model validation using swath plot for Ni limonite

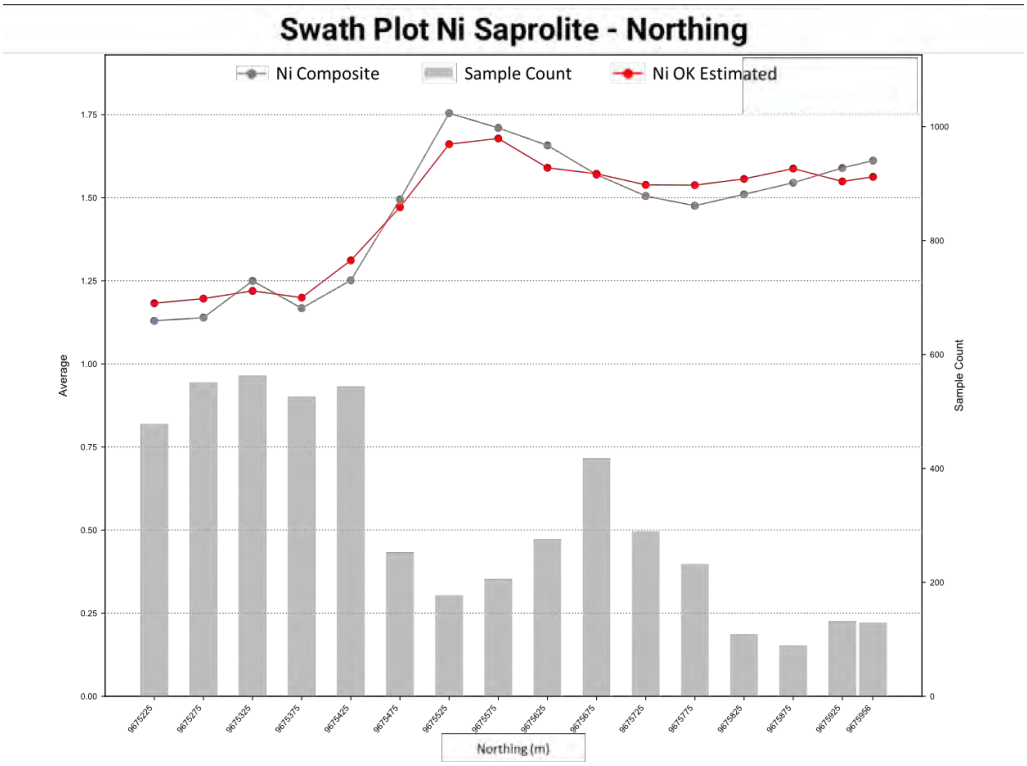



Figure 55 Block model validation using swath plot for Ni saprolite

## 5.11 Resource Estimate Assumption & Parameters

### 5.11.1 Insitu Density and Moisture Content

The results of 2,744 Insitu Density and 329,716 Moisture Content measurements are considered to be representative of the Density and Moisture insitu at HM, as they were taken from almost all drill holes. For this reason, these measurements have been used for this Resource estimate, as follows;

Table 25 Insitu Density and Moisture Contents applied in the Resource estimate

| Block | Density | | | | | | Moisture Content | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LIM | | SAP | | BRK | | LIM | | SAP | | BRK | |
| | Total Samples | g/cm3 | Total Samples | g/cm3 | Total Samples | g/cm3 | Total Samples | % | Total Samples | % | Total Samples | % |
| APL | 0 | 1.78 | 0 | 1.63 | 0 | 2.67 | 0 | 40.21 | 0 | 34.76 | 0 | 12.76 |
| BB | 193 | 1.83 | 185 | 1.53 | 191 | 2.87 | 6,705 | 39.01 | 5,008 | 36.73 | 3,552 | 14.12 |
| BBFW | 66 | 1.78 | 66 | 1.75 | 68 | 2.89 | 1,905 | 39.95 | 1,249 | 33.25 | 1,931 | 12.53 |
| BBS | 16 | 1.70 | 13 | 1.63 | 16 | 2.71 | 28,746 | 40.94 | 19,747 | 34.12 | 4,521 | 5.37 |
| BBW | 0 | 1.77 | 0 | 1.50 | 0 | 2.25 | 3,440 | 40.65 | 1,846 | 41.16 | 1,621 | 16.69 |
| CE | 26 | 1.75 | 27 | 1.69 | 27 | 2.60 | 72,767 | 40.30 | 40,643 | 35.17 | 18,998 | 14.17 |
| CN | 0 | 1.81 | 0 | 1.60 | 0 | 2.58 | 5,458 | 41.53 | 3,829 | 36.72 | 2,179 | 15.26 |
| CW | 631 | 1.83 | 593 | 1.73 | 626 | 2.78 | 55,795 | 39.79 | 33,912 | 33.86 | 15,864 | 12.13 |
| | **932** | **1.78** | **884** | **1.63** | **928** | **2.67** | **174,816** | **40.21** | **106,234** | **34.76** | **48,666** | **12.76** |

The average Insitu Density and Moisture Content were used for the APL Block as no data was found for these analyses.

### 5.11.2 Prospect for Economic Extraction

The HM project is currently targeting the sale of nickel ore to the PT Indonesia Morowali Industrial Park (IMIP) nickel smelter located 22km north of the project area. At this time the requirement for HPAL smelters is assumed to be 1% of Ni from limonite whereas the requirement for RKEF smelters is 1.6% of Ni from saprolite. A cut-off grade (CoG) of 0.7% Ni for limonite as it ensures a suitable product for HPAL. For saprolite a cutoff grade of 0.7% Ni content for saprolite has also been applied in the Resource estimate as RKEF grade requirements have been falling over the last few years and it is expected that grade requirements will continue to fall over the coming years as higher grade resources are diminished.

Table 26 Grade tonnage limonite (dry tonnes)

| GRADE CUT-OFF RANGE | MINERAL RESOURCE | | | | XRF (DRY ANALYSIS) | | | | | | Relative Density (sg Wet) | Moisture Content | Material Content (Dry) of Ni (Kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Measured Dry Mt | Indicated Dry Mt | Inferred Dry Mt | Total Dry Mt | Ni % | Co % | Fe % | MgO % | SiO2 % | SM Ratio | | | |
| ≥0.2 | 79.09 | 47.29 | 42.20 | **168.58** | 0.98 | 0.11 | 41.52 | 1.90 | 10.52 | 5.54 | 1.77 | 40.26 | 1,658.07 |
| ≥0.3 | 79.02 | 46.70 | 41.16 | **166.88** | 0.99 | 0.11 | 41.76 | 1.89 | 10.21 | 5.42 | 1.77 | 40.26 | 1,650.26 |
| ≥0.4 | 78.83 | 46.29 | 40.55 | **165.67** | 0.99 | 0.11 | 41.89 | 1.88 | 10.07 | 5.36 | 1.77 | 40.26 | 1,647.70 |
| ≥0.5 | 78.18 | 45.82 | 39.83 | **163.83** | 1.00 | 0.11 | 41.99 | 1.88 | 9.98 | 5.32 | 1.77 | 40.26 | 1,636.33 |
| ≥0.6 | 76.04 | 44.79 | 38.58 | **159.41** | 1.01 | 0.11 | 42.08 | 1.88 | 9.93 | 5.27 | 1.77 | 40.26 | 1,613.43 |
| ≥0.7 | 71.56 | 42.29 | 36.12 | **149.97** | 1.04 | 0.11 | 42.15 | 1.89 | 9.94 | 5.25 | 1.77 | 40.27 | 1,552.66 |
| ≥0.8 | 64.44 | 37.44 | 30.97 | **132.85** | 1.07 | 0.12 | 42.20 | 1.92 | 10.01 | 5.22 | 1.77 | 40.26 | 1,423.95 |
| ≥0.9 | 55.21 | 30.15 | 22.70 | **108.06** | 1.12 | 0.12 | 42.23 | 1.92 | 10.09 | 5.25 | 1.77 | 40.27 | 1,211.86 |
| ≥1.0 | 44.17 | 21.52 | 14.49 | **80.18** | 1.18 | 0.13 | 42.24 | 1.93 | 10.14 | 5.25 | 1.77 | 40.27 | 946.81 |
| ≥1.1 | 31.65 | 13.04 | 8.29 | **52.98** | 1.25 | 0.13 | 42.19 | 1.99 | 10.22 | 5.13 | 1.77 | 40.26 | 662.27 |
| ≥1.2 | 19.76 | 6.18 | 3.96 | **29.90** | 1.33 | 0.14 | 42.06 | 2.10 | 10.40 | 4.94 | 1.77 | 40.26 | 396.69 |
| ≥1.3 | 10.62 | 2.27 | 1.63 | **14.51** | 1.41 | 0.15 | 41.69 | 2.30 | 10.85 | 4.72 | 1.77 | 40.27 | 204.59 |
| ≥1.4 | 4.91 | 0.70 | 0.58 | **6.19** | 1.50 | 0.16 | 41.12 | 2.57 | 11.56 | 4.50 | 1.77 | 40.27 | 92.81 |
| ≥1.5 | 2.02 | 0.19 | 0.21 | **2.42** | 1.59 | 0.17 | 40.47 | 2.90 | 12.33 | 4.26 | 1.77 | 40.27 | 38.53 |
| ≥1.6 | 0.72 | 0.04 | 0.08 | **0.83** | 1.68 | 0.17 | 39.78 | 3.24 | 13.15 | 4.06 | 1.77 | 40.26 | 13.99 |
| ≥1.7 | 0.23 | 0.01 | 0.03 | **0.26** | 1.77 | 0.17 | 39.31 | 3.50 | 13.62 | 3.89 | 1.77 | 40.28 | 4.67 |
| ≥1.8 | 0.05 | 0.00 | 0.01 | **0.06** | 1.84 | 0.19 | 38.78 | 3.77 | 13.88 | 3.68 | 1.77 | 40.26 | 1.07 |
| ≥1.9 | 0.00 | 0.00 | 0.00 | **0.01** | 1.93 | 0.21 | 39.16 | 3.28 | 12.77 | 3.90 | 1.76 | 40.21 | 0.10 |

Table 27 Grade tonnage saprolite (dry tonnes)

| GRADE CUT-OFF RANGE | MINERAL RESOURCE | | | | XRF (DRY ANALYSIS) | | | | | | Relative Density (sg Wet) | Moisture Content | Material Content (Dry) of Ni (Kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Measured Dry Mt | Indicated Dry Mt | Inferred Dry Mt | Total Dry Mt | Ni % | Co % | Fe % | MgO % | SiO2 % | SM Ratio | | | |
| ≥0.2 | 50.06 | 34.20 | 35.63 | **119.89** | 1.37 | 0.04 | 15.60 | 18.04 | 36.76 | 2.04 | 1.67 | 34.87 | 1,641.56 |
| ≥0.3 | 50.05 | 34.14 | 35.02 | **119.22** | 1.38 | 0.04 | 15.64 | 18.08 | 36.69 | 2.03 | 1.67 | 34.87 | 1,641.98 |
| ≥0.4 | 50.04 | 33.94 | 34.75 | **118.72** | 1.38 | 0.04 | 15.66 | 18.12 | 36.65 | 2.02 | 1.67 | 34.87 | 1,638.72 |
| ≥0.5 | 50.00 | 33.67 | 34.53 | **118.20** | 1.38 | 0.04 | 15.68 | 18.14 | 36.61 | 2.02 | 1.67 | 34.88 | 1,634.62 |
| ≥0.6 | 49.90 | 33.45 | 34.19 | **117.55** | 1.39 | 0.04 | 15.70 | 18.16 | 36.59 | 2.02 | 1.67 | 34.88 | 1,632.65 |
| ≥0.7 | 49.64 | 33.20 | 33.80 | **116.64** | 1.40 | 0.04 | 15.73 | 18.16 | 36.56 | 2.01 | 1.67 | 34.88 | 1,630.67 |
| ≥0.8 | 49.08 | 32.73 | 33.09 | **114.91** | 1.41 | 0.04 | 15.76 | 18.16 | 36.53 | 2.01 | 1.67 | 34.89 | 1,615.54 |
| ≥0.9 | 47.89 | 31.62 | 31.84 | **111.35** | 1.42 | 0.04 | 15.79 | 18.17 | 36.50 | 2.01 | 1.67 | 34.91 | 1,583.59 |
| ≥1.0 | 45.59 | 29.79 | 29.63 | **105.01** | 1.45 | 0.04 | 15.81 | 18.20 | 36.48 | 2.00 | 1.67 | 34.94 | 1,521.79 |
| ≥1.1 | 42.09 | 26.92 | 25.98 | **94.99** | 1.49 | 0.04 | 15.76 | 18.32 | 36.55 | 1.99 | 1.67 | 34.99 | 1,415.57 |
| ≥1.2 | 37.60 | 23.02 | 21.86 | **82.48** | 1.55 | 0.04 | 15.66 | 18.53 | 36.64 | 1.98 | 1.67 | 35.04 | 1,274.46 |
| ≥1.3 | 32.46 | 18.25 | 17.52 | **68.23** | 1.60 | 0.04 | 15.55 | 18.78 | 36.69 | 1.95 | 1.67 | 35.09 | 1,095.06 |
| ≥1.4 | 27.01 | 13.25 | 13.20 | **53.46** | 1.67 | 0.04 | 15.44 | 19.09 | 36.67 | 1.92 | 1.67 | 35.13 | 895.20 |
| ≥1.5 | 21.52 | 8.92 | 9.64 | **40.07** | 1.75 | 0.04 | 15.34 | 19.44 | 36.64 | 1.88 | 1.67 | 35.18 | 701.27 |
| ≥1.6 | 16.37 | 5.60 | 6.82 | **28.80** | 1.83 | 0.04 | 15.25 | 19.83 | 36.58 | 1.85 | 1.67 | 35.23 | 527.44 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ≥1.7 | 11.93 | 3.24 | 4.68 | **19.86** | 1.91 | 0.05 | 15.17 | 20.17 | 36.53 | 1.81 | 1.67 | 35.29 | 379.69 |
| ≥1.8 | 8.28 | 1.77 | 2.98 | **13.04** | 2.00 | 0.05 | 15.11 | 20.45 | 36.48 | 1.78 | 1.67 | 35.32 | 260.64 |
| ≥1.9 | 5.51 | 0.88 | 1.72 | **8.11** | 2.09 | 0.05 | 15.04 | 20.67 | 36.42 | 1.76 | 1.67 | 35.30 | 169.41 |

### 5.11.3 Resource Classification

The Mineral Resource has been classified on the basis of drillhole spacing and Kriging properties with a digitized polygon boundary. The boundaries of resource polygons are also influenced by disposal areas, whether waste dumps or in-pit dumps. Resources were classified as follows;

- Measured - Area of 25m drilling spacing on the spatial continuity, with 12.5m extrapolation from the last drillhole. Geostatistical thresholds include a Kriging variance < 0.05 and a slope of regression > 0.80.
- Indicated - Area 50m drilling spacing on the spatial continuity, with 25m extrapolation from the last drillhole. Geostatistical thresholds include a Kriging variance between 0.05 and 0.13 and a slope of regression between 0.35 and 0.80.
- Inferred - Area 100m drilling spacing on the spatial continuity, with 50m extrapolation from the last drillhole. Geostatistical thresholds include a Kriging variance > 0.13 and a slope of regression < 0.35.

The Measured and Indicated Resource category were downgraded into Inferred below in-pit dump areas.

Table 28 Kriging properties to asses the Resource classification at HM

| Kriging Variance | Slope of Regression | Category |
|---|---|---|
| KV ≤ 0.05 | SoR ≥ 0.8 | Measured |
| 0.05 < KV ≤ 0.13 | 0.35 ≤ SoR < 0.8 | Indicated |
| KV > 0.13 | SoR < 0.35 | Inferred |

## 5.12 Statement of Mineral Resources

The Mineral Resource estimate for HM project has been completed with data until 31 October 2025. The numbers have been rounded to reflect the relative accuracy of the estimate.

Table 29 Statement of Mineral Resources Insitu, 31 October 2025

| Blocks | Laterite Layer | MINERAL RESOURCE | | | | XRF (DRY ANALYSIS) | | | | | Relative Density (sg Wet) | Moisture Content | Material Content (Dry) of Ni (Kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Measured Dry Mt | Indicated Dry Mt | Inferred Dry Mt | Total Dry Mt | Ni % | Co % | Fe % | MgO % | SiO2 % | | | |
| APL | Limonite | 1.58 | 0.56 | 0.54 | **2.68** | 0.99 | 0.12 | 38.79 | 1.62 | 14.84 | 1.78 | 40.21 | 26.55 |
| | Saprolite | 1.95 | 0.79 | 0.93 | **3.67** | 1.30 | 0.05 | 16.79 | 15.42 | 42.41 | 1.63 | 34.76 | 47.77 |
| | **Total** | **3.54** | **1.35** | **1.47** | **6.36** | **1.16** | **0.08** | **26.54** | **9.31** | **30.19** | **1.70** | **37.18** | **73.72** |
| BB | Limonite | 0.58 | 2.95 | 3.08 | **6.61** | 1.00 | 0.12 | 44.76 | 2.21 | 7.91 | 1.83 | 39.01 | 66.13 |
| | Saprolite | 0.54 | 2.82 | 4.09 | **7.45** | 1.51 | 0.04 | 15.51 | 20.14 | 36.65 | 1.53 | 36.73 | 112.55 |
| | **Total** | **1.12** | **5.78** | **7.17** | **14.07** | **1.27** | **0.08** | **29.53** | **11.55** | **22.88** | **1.67** | **37.82** | **178.66** |
| BBFW | Limonite | 0.00 | 4.34 | 1.50 | **5.84** | 0.92 | 0.11 | 42.97 | 3.13 | 11.26 | 1.78 | 39.95 | 53.73 |
| | Saprolite | 0.00 | 2.89 | 1.22 | **4.11** | 1.30 | 0.04 | 15.19 | 19.90 | 35.64 | 1.75 | 33.25 | 53.49 |
| | **Total** | **0.00** | **7.24** | **2.71** | **9.95** | **1.07** | **0.08** | **32.19** | **9.64** | **20.72** | **1.77** | **37.35** | **106.52** |
| BBS | Limonite | 12.47 | 6.07 | 6.64 | **25.18** | 1.02 | 0.11 | 41.37 | 1.88 | 8.30 | 1.70 | 40.94 | 256.81 |
| | Saprolite | 9.88 | 6.21 | 7.30 | **23.40** | 1.14 | 0.04 | 16.32 | 18.45 | 33.60 | 1.63 | 34.12 | 266.71 |
| | **Total** | **22.45** | **12.25** | **13.88** | **48.57** | **1.07** | **0.08** | **29.98** | **9.41** | **19.80** | **1.67** | **37.84** | **519.74** |
| BBW | Limonite | 1.03 | 1.65 | 4.78 | **7.46** | 0.92 | 0.09 | 39.59 | 3.05 | 15.17 | 1.77 | 40.65 | 68.64 |
| | Saprolite | 0.70 | 0.64 | 2.10 | **3.44** | 1.45 | 0.04 | 16.33 | 18.16 | 37.82 | 1.50 | 41.16 | 49.84 |
| | **Total** | **1.73** | **2.29** | **6.88** | **10.90** | **1.09** | **0.08** | **32.21** | **7.84** | **22.35** | **1.68** | **40.81** | **118.80** |
| CE | Limonite | 37.65 | 15.60 | 10.20 | **63.45** | 1.06 | 0.11 | 42.01 | 1.69 | 10.42 | 1.75 | 40.30 | 672.53 |
| | Saprolite | 24.22 | 10.54 | 7.11 | **41.88** | 1.51 | 0.04 | 15.84 | 17.05 | 37.58 | 1.69 | 35.17 | 632.36 |
| | **Total** | **61.90** | **26.13** | **17.29** | **105.33** | **1.23** | **0.09** | **32.12** | **7.50** | **20.69** | **1.73** | **38.36** | **1,295.51** |
| CN | Limonite | 3.00 | 0.22 | 0.22 | **3.45** | 1.09 | 0.12 | 45.15 | 1.43 | 7.23 | 1.81 | 41.53 | 37.61 |
| | Saprolite | 2.17 | 0.19 | 0.17 | **2.53** | 1.63 | 0.05 | 16.09 | 18.05 | 34.49 | 1.60 | 36.72 | 41.25 |
| | **Total** | **5.18** | **0.42** | **0.39** | **5.98** | **1.31** | **0.09** | **33.41** | **8.14** | **18.24** | **1.73** | **39.59** | **78.35** |
| CW | Limonite | 15.15 | 10.98 | 9.17 | **35.30** | 1.05 | 0.12 | 42.86 | 1.83 | 9.18 | 1.83 | 39.79 | 370.67 |
| | Saprolite | 10.19 | 9.19 | 10.78 | **30.15** | 1.41 | 0.04 | 15.00 | 19.11 | 36.83 | 1.73 | 33.86 | 425.14 |
| | **Total** | **25.47** | **20.18** | **19.80** | **65.45** | **1.20** | **0.08** | **30.67** | **9.39** | **21.28** | **1.79** | **37.20** | **785.39** |
| **TOTAL** | **Limonite** | **71.56** | **42.29** | **36.12** | **149.97** | **1.04** | **0.11** | **42.15** | **1.89** | **9.94** | **1.77** | **40.27** | **1,552.66** |
| | **Saprolite** | **49.64** | **33.20** | **33.80** | **116.64** | **1.40** | **0.04** | **15.73** | **18.16** | **36.56** | **1.67** | **34.88** | **1,630.67** |
| | **Total** | **121.50** | **75.47** | **69.64** | **266.61** | **1.18** | **0.08** | **31.15** | **8.67** | **21.03** | **1.73** | **38.02** | **3,156.79** |

Remaining inventory of limonite is approximately 19 million dry tonnes (31 million wet tonnes) which has been stockpiled in-pit for future production. For the location, tonnage and grade see Figure 57.

Table 30 Total Remaining Resources including Limonite Inventory

| Laterite | Measured | Indicated | Inferred | Total | Ni | Co | Fe | SM Ratio | Ni Metal | Co Metal |
|---|---|---|---|---|---|---|---|---|---|---|
| CoG 0.7% | Dry Mt | Dry Mt | Dry Mt | Dry Mt | % | % | % | % | Dry Kt | Dry Kt |
| LIMONITE | 71.56 | 42.29 | 36.12 | 149.97 | 1.04 | 0.11 | 42.15 | 5.25 | 1,553 | 168 |
| SAPROLITE | 49.64 | 33.20 | 33.80 | 116.64 | 1.40 | 0.04 | 15.73 | 2.01 | 1,631 | 47 |
| **Total Insitu** | **121.50** | **75.47** | **69.64** | **266.61** | **1.18** | **0.08** | **31.15** | **2.43** | **3,157** | **224** |
| STOCKPILE | - | - | 18.76 | 18.76 | 1.00 | 0.09 | 38.98 | 2.17 | 187 | 17 |
| **Grand Total** | **121.50** | **75.47** | **88.40** | **285.37** | **1.17** | **0.09** | **31.66** | **2.41** | **3,344** | **241** |

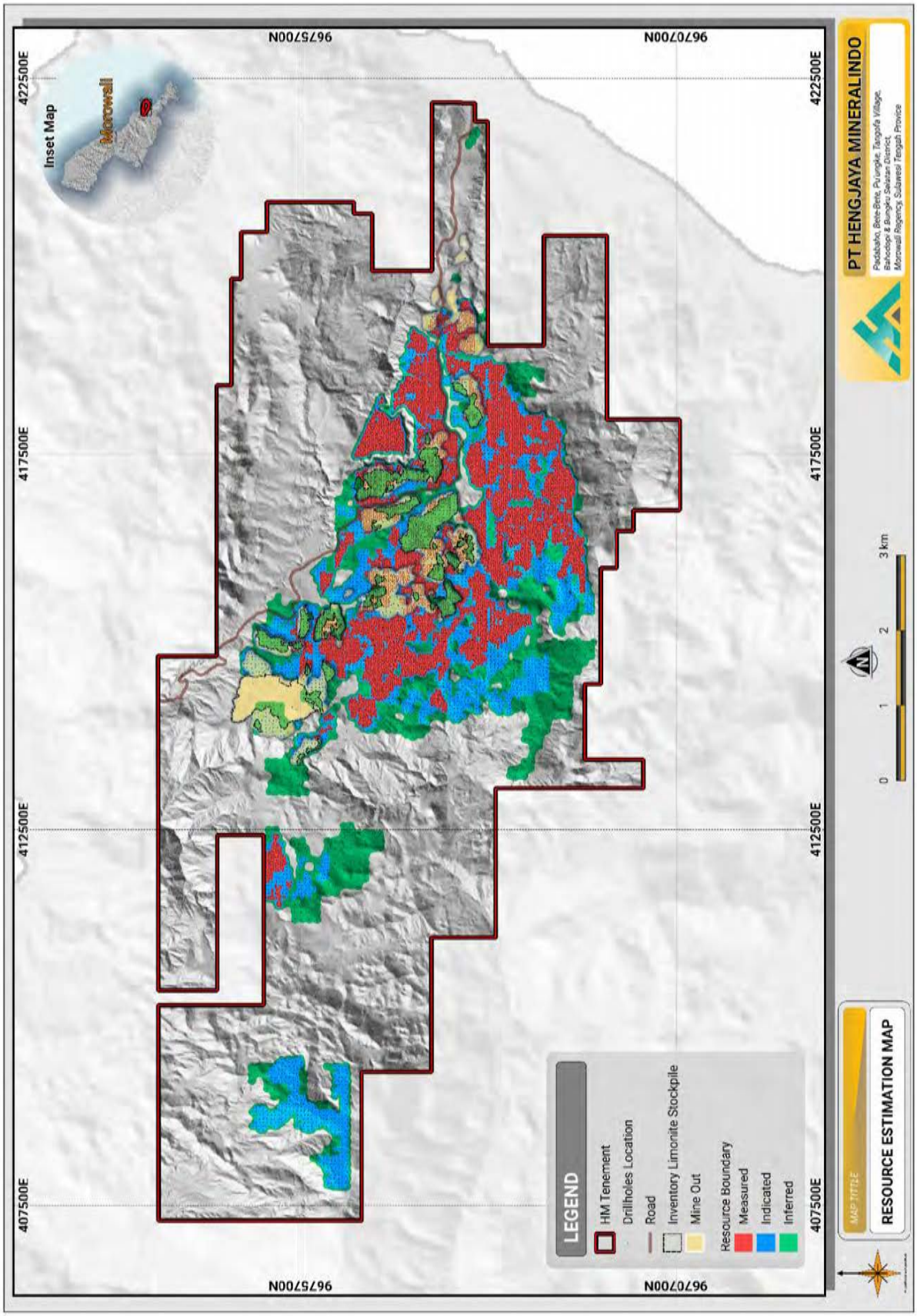



Figure 56 Remaining Resource Insitu classification map

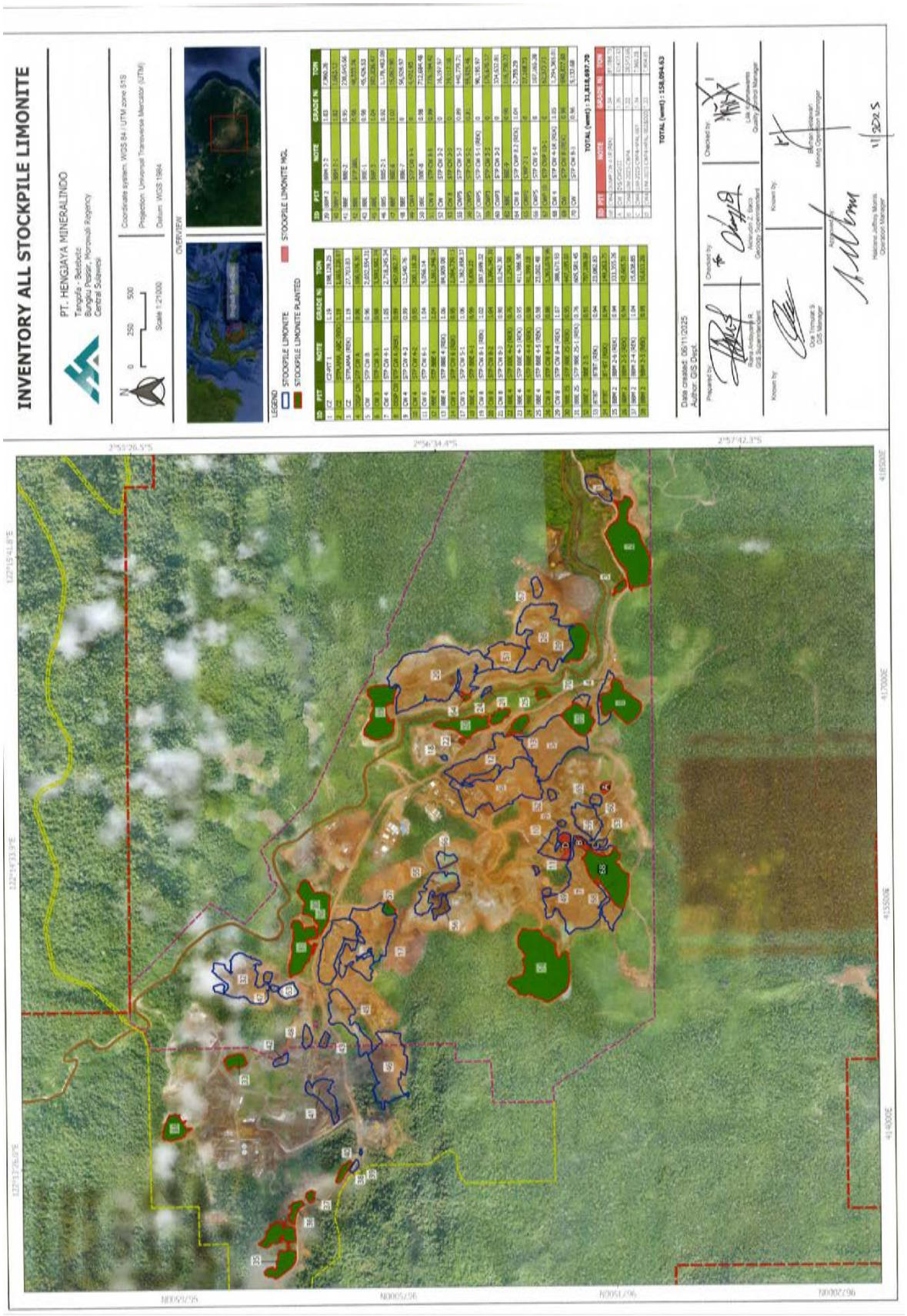



Figure 57 Limonite inventory stockpiles 31 October 2025

## 5.13 Risk and Opportunities

Systematic 25m grid drilling, UltraGPR surveys, and detailed core analyses have enhanced the confidence in the geological interpretation and model at HM.

Some areas currently have 100m drill spacing; therefore, changes in tonnage and grade may occur if infill drilling at 50m and 25m intervals is conducted in the future.

The database has been validated and audited for errors. All drillhole collar coordinates used in the geological model were surveyed with high accuracy, providing confidence in the current Nickel Resource estimate. However, discrepancies between the LiDAR data and surveyed collar elevations have been identified; these will require correction in future Resource estimations.

Discrete geological models for limonite (LIM), saprolite (SAP), boxwork (BOXWORK), clay (CLAY), boulder (BOULDER), and bedrock (BRK) were interpreted using lithological logs and assay data. This approach ensures that all blocks within the model are correctly coded relative to their position in the laterite profile; consequently, the risk of lithological misallocation having a material impact on the Nickel Resource is considered low.

Relative confidence in the laboratory analysis results is supported by proper quality assurance and quality control protocols including, sample blanks, sample standards, duplicate samples and replicate samples. A potential negative bias identified during recent data verification (see Appendix 6), makes it more likely nickel grades have been underestimated rather than over estimated if any error exists.

The haul road and planned slurry pipeline to IMIP provide a direct transportation route from HM to the processing facility, greatly enhancing the economic potential of the HM nickel project area.

The limonite inventory, of approximately 19 million dry tonnes (31 million wet tonnes), which is in addition to the remaining Resource, remains untested for nickel content post-extraction and for this reason there is a risk of dilution or contamination incurred during mining and stockpiling process.

# 6 EXPLORATION TARGET

The remaining Exploration Target at Hengjaya Mineralindo is in Block Central North in the northeast of the HM mining lease area. The location is shown below in Figure 58 The area is 280ha within a Production Forest area, with relatively gentle slope topography, suitable for the accumulation of nickel laterite. For the laterite thickness assumptions the minimum thickness intersected in drilling to date (458 observations) in Central North, outside the Forestry area was used and for the maximum thickness the average limonite thickness was used from the same data set. The in-situ density used was 1.8 for limonite and 1.6 for saprolite. The estimated range of tonnes are shown below. However, it must be stated that this table is an Exploration Target, as there is insufficient data to estimate a Resource, at this time and it cannot be guaranteed that further exploration will result in the Mineral Resource.

Table 31 Exploration Target

| Lithology | Target Area (Ha) | Laterite Thickness Assumption | | Estimate Wet Ton (Million) | |
|---|---|---|---|---|---|
| | | Min (m) | Ave (m) | Min (Mt) | Max (Mt) |
| Limonite | 280 | 3 | 12 | 15 | 60 |
| Saprolite | 280 | 2 | 8 | 9 | 38 |
| **Total** | **280** | **5** | **20** | **24** | **98** |

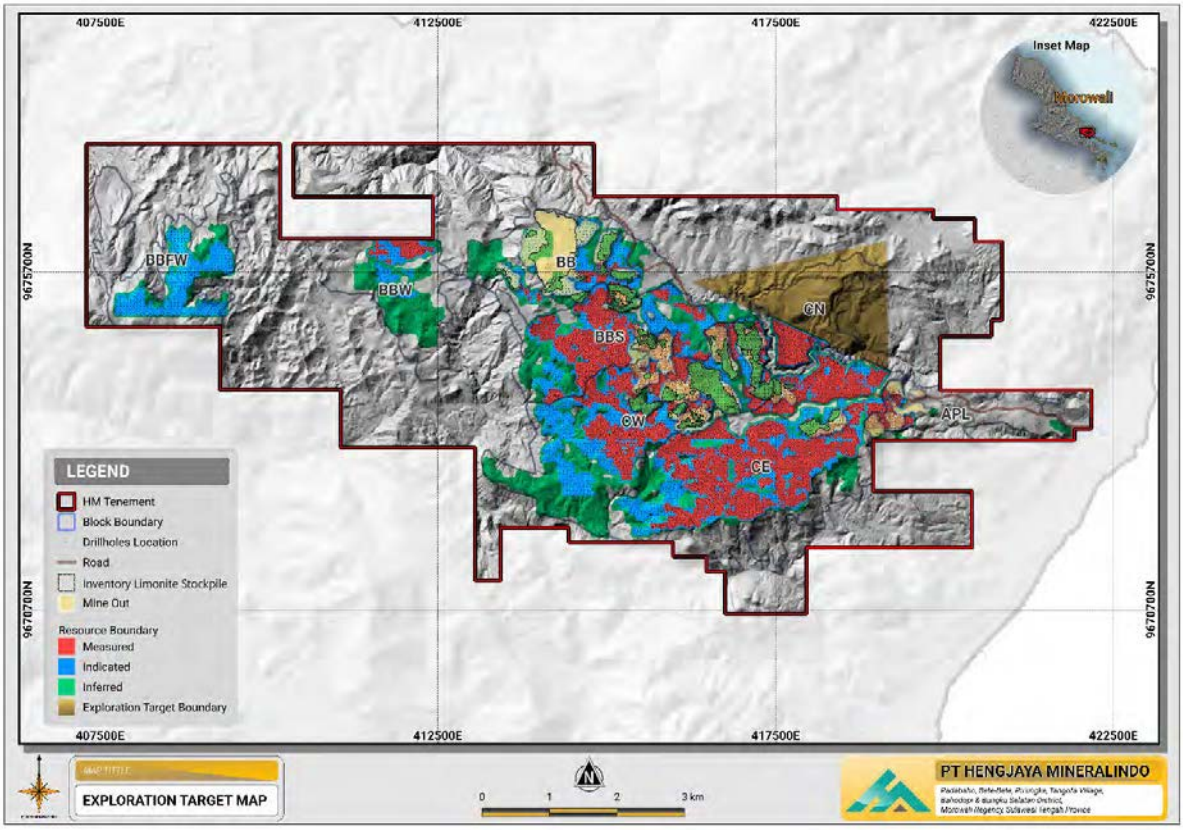



Figure 58 Exploration Target map

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# APPENDIX 1

# TABLE 1 JORC

# JORC Code, 2012 Edition – Table 1 report template

## Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Sampling techniques* | • *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.*<br>• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*<br>• *Aspects of the determination of mineralisation that are Material to the Public Report.*<br>• *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.* | • HQ diameter core samples taken in 1m intervals and all new core since April, 2019 photographed<br>• Drill on systematic 100 X 100m grid over GPR targets for Inferred Resources and 50X50m for Indicated Resources and 25X25m grid for Measured Resources<br>• Since April 2019, all core photographed and described by well site geologists as well as laboratory sample preparation, reduction and moisture determination follow the Japanese Industrial Standard, Method for Sampling and the Determination of Moisture Content of Garnieritic Nickel Ore, 1996<br>• High confidence in the laboratory analyses results are supported by rigorous quality assurance and quality control protocols including; sample blanks, sample standards, duplicate samples and interlaboratory checking. A complete report on this is provided in the Appendix 6 |
| *Drilling techniques* | • *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).* | • HQ wireline triple tube coring in 1m runs to ensure accurate measurement of core expansion (swelling) and recovery<br>• Vertical drilling used to measure true thickness because laterite is horizontal and core orientation is not required for this reason as well |
| *Drill sample recovery* | • *Method of recording and assessing core and chip sample recoveries and results assessed.*<br>• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*<br>• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.* | • Full coring used and core recovery data collected for all runs since 2019 (14,704 holes), core recoveries documented by photography<br>• Core recoveries maximized by restricting core runs to 1m intervals<br>• Minimum 95% recovery maintained for all holes<br>• If 3 consecutive runs are less than 95% the hole was re-drilled<br>• Some lower core recoveries were tolerated in silica boxwork zones (which are not mined due to high silica content) but overall drilling conditions are relatively good and core recoveries remain consistently high |
| *Logging* | • *Whether core and chip samples have been geologically and* | • 100% of laterite layers drilled have been logged and photographed in |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | *geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*<br>• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*<br>• *The total length and percentage of the relevant intersections logged.* | drilling since 2019<br>• Logging includes core recoveries and core swelling measurements<br>• From 2019-2023 all holes have 1 density sample (700-800g of solid core) taken from each stratigraphic layer to give representative insitu density data throughout the deposit<br>• Every meter of the core is logged and sampled separately<br>• Total assays in this report 358,268 |
| *Sub-sampling techniques and sample preparation* | • *If core, whether cut or sawn and whether quarter, half or all core taken.*<br>• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*<br>• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*<br>• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*<br>• *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.*<br>• *Whether sample sizes are appropriate to the grain size of the material being sampled.* | • With the exception of a small density sample weighing 700-800g taken from each of the 4 main geological horizons observed in each drill hole, full drill core was submitted to the lab for analysis<br>• industry standard laboratory sample preparation methods suitable for nickel laterite mineralization style and involve drying, crushing and splitting using Boyd Mid crusher and RSD, then pulverizing to -75um pulps for assay.<br>• Representivity at sub-sampling stages at sample prep lab maintained by following JIS M-8109-1996 SOP to maintain accuracy and precision at all sub-sampling stages eg coarse blanks, coarse replicates and 200# pulp sieve tests, whilst reducing sample particle size and volume.<br>• Sample sizes are according to JIS M-8109-1996 Industry Standard and have shown to be effective regarding accuracy and precision during life of project to date. |
| *Quality of assay data and laboratory tests* | • *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*<br>• *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.*<br>• *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.* | Industry standard laboratory sample preparation methods, suitable for nickel laterite mineralization style, involve drying, crushing and splitting using Boyd Mid Crusher and Rotary Splitting Device and then pulverizing and incremental splitting to produce -75um pulps for assay<br><br>Representivity at sub-sampling stages at the sample prep lab is maintained by following JIS M-8109-1996 SOP to maintain accuracy and precision at all sub-sampling stages eg coarse blanks, coarse replicates and 200# pulp sieve tests, whilst reducing sample particle size and volume.<br>Representivity at sub-sampling stages at sample assay lab to maintain accuracy and precision controlled by Pulp Duplicates, CRM's, Replicates and Inter Laboratory Lab checks at ISO 17025 certified commercial laboratories. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | Scatterplots for the Duplicate rejects, Pulp duplicates, Replicates and Inter Laboratory Check samples confirm high precision and repeatability. The OREAS 182, 187 and 192 CRM's show generally good results with majority of plots within the yellow 2 sigma limits, but negative bias in some samples means the accuracy is not to the same high standard as the precision and this is currently under review to improve accuracy |
| *Verification of sampling and assaying* | • *The verification of significant intersections by either independent or alternative company personnel.*<br>• *The use of twinned holes.*<br>• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*<br>• *Discuss any adjustment to assay data.* | • Geological logs of the drill core are reconciled against assay results to verify lithology for any misallocation.<br>• Database checked and rechecked separately for errors and anomalies by the Hengjaya mine technical team and PT Danmar Explorindo database team and results were compared and agreed<br>• Based on analysis of the downhole statistical data additional top cut constraints were applied to Ni% content to impose a domain limit of no greater than 1.5 X IQR (Inter Quartile Range) for Saprolite and Limonite, to avoid over-estimation of nickel content due to possible nugget effect. |
| *Location of data points* | • *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*<br>• *Specification of the grid system used.*<br>• *Quality and adequacy of topographic control.* | • All recent drilling located by ground RTK GPS survey methods<br>• From a total of holes 14,704 holes 402 holes had GPS coordinates only. For this reason these holes were not used in this Resource assessment<br>• UTM (Universal Traverse Mercator) Projection; WGS 1984 UTM Zone 515 grid is being applied in the Resource estimation<br>• LiDAR topographic surface was used<br>• Average mis-close between the LiDAR and 14,704 drill collar survey is 0.19m |
| *Data spacing and distribution* | • *Data spacing for reporting of Exploration Results.*<br>• *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.*<br>• *Whether sample compositing has been applied.* | • 100m grid drilling used for Inferred Resource, 50m grid for Indicated Resources and 25m for Measured Resource<br>• Sample intervals were mostly 1m<br>• Geostatistical analysis of Ni mineralization was used to confirm the direction and distances to be applied to the Nickel Resource model<br>• Semi-variogram models for each domain were calculated using statistical top-cuts applied to composites and constrained by hard boundary surfaces of Limonite and Saprolite lithologies to prevent over-estimation of nickel grades<br>• Sample compositing was applied so that where samples up to 1.5m at a geological boundary were absorbed into the previous (overlying) composite. Where samples >1.5m the interval >1m was assumed to |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | be an additional composite |
| *Orientation of data in relation to geological structure* | • *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*<br>• *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.* | • Vertical drilling is appropriate for nickel laterite as the laterite is relatively horizontal so the drilling intersects a true thickness<br>• No bias is considered to be introduced as a result of the drilling orientation |
| *Sample security* | • *The measures taken to ensure sample security.* | • Samples left in the field are properly stored, covered and guarded by night security at each rig<br>• Sample stores are locked and continuously guarded<br>• Sample bags are double layered when moved from the field to lab to avoid sample loss and contamination |
| *Audits or reviews* | • *The results of any audits or reviews of sampling techniques and data.* | • Sampling review was carried out by the Competent Person in the field and regular progress reports were provided by the onsite lab documenting improvements and forward planning<br>• High confidence in the laboratory analyses results are supported by rigorous quality assurance and quality control protocols including; sample blanks, sample standards, duplicate samples and interlaboratory checking. A complete report on this is provided in the Appendix 6<br>• In June 2024 mine reconciliation of grades verses predictions shows reasonable correlation between predicted grades and actual mining |

## Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Mineral tenement and land tenure status* | • *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*<br>• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.* | • Mining rights are held under an Operation and Production Mining Business Permit (IUPOP), Area Code 540/345/IUP-OP-PENCUITAN/DPMPTSP/2020. The area covers 5,983Ha and gives HM the right to mine nickel and its associated minerals. The IUPOP was originally granted by the Regent of Morowali in 2011, and was updated by the Governor of Central Sulawesi in 2020 and is valid until 26th May 2031.The Operation Production IUP may be renewed twice, each for a period of 10 years. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | • Two Forestry permits (IPPKH) covering 993.83ha and 874.45ha to allow open cut mining have been granted by the Minister of Forestry, until 26 May 2031.<br>• The mining permit does not overlap with any Protected Forests or Nature Reserves |
| *Exploration done by other parties* | • *Acknowledgment and appraisal of exploration by other parties.* | • The exploration work has been carried out over various stages since 2007 until 2017, under the direction of experienced nickel laterite geologists. All the historic data, (pre April 2019) relating to the project was obtained from HM for the purpose of Resource assessment in 2020<br>• Exploration of the area began in 2007 when the state owned minerals company, PT Aneka Tambang, explored the nickel potential of a broad area which included the location of where the HM project is located today. The work included mapping and wide spaced drilling. The data is poorly documented with many holes having ambiguous hole identification, coordinate location and or no analysis information. This data is now excluded from Resource estimates<br>• HM started drilling in 2010. At least 3 separate phases of drilling were implemented. Initially wide spaced drilling on a 400m X 400m grid was conducted followed by 200 X 200m spacing and eventually 25 X 25m grids in subsequent mining areas. |
| *Geology* | • *Deposit type, geological setting and style of mineralisation.* | • Laterization of Ophiolite bedrocks, formed in a tropical, high rainfall, climate environment through a process of surface leaching over time. Two distinct enriched zones of Limonite clays and Saprolite clays & weathered rocks are typically found in this type of geological setting where concentrations of Ni, Co, Fe, Si and other associated minerals are common |
| *Drill hole Information* | • *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*<br>o *easting and northing of the drill hole collar*<br>o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*<br>o *dip and azimuth of the hole*<br>o *down hole length and interception depth* | • The validated drill database at HM contains 14,704 holes with a cumulative total depth of 350,210m. Assays total 358,268 samples<br>• Drill hole data tabulation is attached<br>• Ni laterite deposits are at relatively low concentrations (1.2% Ni average) and the Resource can best be represented by a compilation of large numbers of points of observations. For this reason, the report has described the deposit using maps of borehole locations, Ni grade |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | o *hole length.*<br>• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.* | isopacs and thickness isopacs, statistical analyses of assay results, variograms and swath plots of the data to understand the data and check its validity and variability<br>• A drillhole table, including laterite thickness, is also included in Appendix 8 |
| *Data aggregation methods* | • *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*<br>• *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*<br>• *The assumptions used for any reporting of metal equivalent values should be clearly stated.* | • Only assay data from the validated database from included holes (INCL) were extracted for use in the compositing process. Composite lengths of 1m were used, which correlates with the majority of the sample length records and within statistical ranges suggested by the variography modeling. Composites were split into 7 lithologies; clay, limonite, saprolite, boulder, boxwork, bedrock, calcium carbonate<br>• Based on analysis of the downhole statistical data additional top cut constraints were applied to Ni% content to ensure grades were not over estimated<br>• metal equivalents for Nickel content were shown in the Resource table with ore grades as wet and dry tons |
| *Relationship between mineralisation widths and intercept lengths* | • *These relationships are particularly important in the reporting of Exploration Results.*<br>• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*<br>• *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').* | • Vertical drilling provides good representation of the deposit geometry and depth and reasonably assumed to represent true thickness, 1m core and assay sampling procedures were sufficient to provide accurate wellsite observations and reconciliation of logs<br>• Mineralization is basically horizontally orientated<br>• Total depths of drilling were guided by the interpretation of the GPR surfaces to target at least 2m of bedrock was intersected at the end of each hole |
| *Diagrams* | • *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.* | • Diagrams, isopac maps, sections and location and topography maps are all included in the body of the report to describe and represent the exploration results |
| *Balanced reporting* | • *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.* | • All reliable(validated) data included without prejudice<br>• Thickness established through drilling intercepts, core photography, supported with Ground Penetrating Radar (UltraGPR) geophysics, reliable assays and exposed lithological layers observed in the open cut mining operation |
| *Other substantive* | • *Other exploration data, if meaningful and material, should be reported* | • Approx. 900km of ground penetrating radar (UltraGPR) survey lines |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *exploration data* | *including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.* | were completed since Jan 2019, providing excellent section profiles views of limonite, saprolite and bedrock layers, global volumes and thickness grids were used for exploration planning and understanding of the weathering patterns of the nickel laterites to best optimize the drilling patterns by domains, however, it must be stated that geophysical data is only used as indicative data for planning further investigations and cannot be used as points of observation for Resource estimation<br>• Reconciliation of mining production in several ongoing mine areas, providing additional information of ore characteristic's, materials handling, densities, recoveries and dilution of grades |
| *Further work* | • *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*<br>• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.* | • Plans for infill drilling in Indicated and Inferred Resource areas are on going<br>• Exploration Target and extension areas will be drilled to focus on the thickest laterite areas.<br>• Exploration Target areas map is provided in the report |

## Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Database integrity* | • *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*<br>• *Data validation procedures used.* | • The collar survey, assay and geology tables of both these datasets were validated to correct data error issues such as:<br>  • missing or duplicate collar records<br>  • overlapping intervals in the assay records<br>  • collar elevation errors compared to current LiDAR topography<br>  • downhole accuracy issues, total depths, from/to intervals<br>  • core recoveries and swelling<br>  • lithology description from wellsite geologists<br>  • reconciliation of lithology with laboratory assay results<br>  • moisture records from core lab analysis<br>  • downhole statistical analysis<br>• If these errors could not be fixed to a suitable level of confidence or failed to meet the accuracy standards during the validation process they were removed from the dataset. Approximately 98% of the excluded data was from the historical records supplied by Hengjaya. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Site visits* | • *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*<br>• *If no site visits have been undertaken indicate why this is the case.* | • Numerous site visits by all the CP's have been completed since the end of 2018 to review exploration progress; drilling, and sampling procedures, review and optimize sample handling, preparation and analyses laboratory. Reconciliations of ore production against predicted Resource modelling have also been carried out<br>• All the CP's for this work have an intimate knowledge of the HM site |
| *Geological interpretation* | • *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*<br>• *Nature of the data used and of any assumptions made.*<br>• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*<br>• *The use of geology in guiding and controlling Mineral Resource estimation.*<br>• *The factors affecting continuity both of grade and geology.* | • Due to a very large systematic drill program on the same grid as more then 900km of UltraGPR survey, allows for a relatively high confidence in geological interpretation of the Hengjaya nickel laterite deposit. Historical records for surface mapping, drilling, assay & mine production combined with the more recent UltraGPR survey traverse on 50-100m spaced infill grids over more than 90% of the Resource area provides good correlation and understanding if the laterization distribution, bulk volumes and mineralization. Considered sufficient in statement of the Mineral Resource<br>• All data included into the geological interpretation was validated to be free of errors and downhole wellsite logging reconciled with assay results into composited zones of Limonite, Saprolite & Bedrock lithology zones<br>• Use of Ground Penetrating Radar (UltraGPR) interpretative data source was used in combination with points of observations from the validated database in extrapolating between holes<br>• Laterite grades are not laterally or vertically persistent and tend to be relatively random distributed through the leaching of minerals during the laterization process. The inclusion of the GPR interpretive data provides increased confidence of the geological model controls between points of observation for transition contacts between Limonite-Saprolite-Bedrock<br>• Geological structure and bedrock topology, which are often displayed on Ultra-GPR interpretations, helped to target thick, high grade laterite areas |
| *Dimensions* | • *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.* | • Resource dimensions; approximately 6500m in length, 3500m in width, laterization thickness for up to 40m to bedrock in some places<br>• Limonite thickness average 13.3m and saprolite thickness average is consistently 7.85m<br>• Clay soil cover is average 4.2m thick |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Estimation and modelling techniques* | • *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*<br>• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*<br>• *The assumptions made regarding recovery of by-products.*<br>• *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).*<br>• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*<br>• *Any assumptions behind modelling of selective mining units.*<br>• *Any assumptions about correlation between variables.*<br>• *Description of how the geological interpretation was used to control the resource estimates.*<br>• *Discussion of basis for using or not using grade cutting or capping.*<br>• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.* | • Modelling techniques & assumptions applied were considered appropriate for estimation of Mineral Resource for this style of Nickel laterite deposit based on the CP's experience. Key assumption's include;<br>  • Domaining by stratigraphy, laterite thickness, mineralogical, characteristics, distinct statistical population & geological environment, variable orientation was performed to confirm continuity each layer<br>  • Downhole and spatial geo-statistical analysis of the data & domain sub-sets of data providing search ellipsoids ranges for grade interpolation and maximum extrapolation distances for Ni between data points<br>• Geological modelling and Mineral Resource estimates were completed using Sequent Leapfrog Geo Version 2025.3 mining software. Ordinary Kriging (OK) algorithm was used in the grade interpolation for Ni, Co, Fe, MgO, SiO2 grades for limonite and saprolite laterite zones.<br>• Since Jan 2020, limonite (by product of mining high grade saprolite ores) was stockpiles in expectation for supply to HPAL processing facilities at IMIP. Limonite shipments have started since Nov 2021<br>• Deleterious elements or acid drainage of the mineral resource was not considered in the model at time of Mineral Resource estimation as pits are shallow, backfilled and rehabilitated progressively<br>• Block size was determined based on Kriging Neighborhood Analysis and 12.5m x 12.5m x 1m was used and Octree block model was applied to detail the Resource volume of each domain.<br>• Wireframing was used to create a 10X10m grid over the entire database to develop a wireframe using Radial Basis Function (RBF).<br>• Final block model and interpolated grades were validated using several visual and geostatistical techniques to gain further confidence in the Mineral Resource estimates stated in this report. visual inspection of the block models in plan and sectional views to assess the grade interpolations performed conform with the lithological wireframes, surface models and drilling database. Further statistical validation, including swath plots of the Nickel Resource estimate was completed by comparing global averages of the sample composites against the block model global averages. |
| *Moisture* | • *Whether the tonnages are estimated on a dry basis or with natural* | • Since April, 2019 a total 329.716 Moisture measurements using the |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | *moisture, and the method of determination of the moisture content.* | JIS 1996 Moisture Measurement in Garinierite Nickel SOP were used in this Resource estimate<br>• In areas where Moisture content measurements were not available from core lab analysis the domain default weighted average was applied to the corresponding composite zone<br>• Moisture content were used to adjust Wet to Dry tonnage for mineral Resource estimates |
| *Cut-off parameters* | • *The basis of the adopted cut-off grade(s) or quality parameters applied.* | • Based on statistical analysis of the domain databases & ongoing ore mining operations a 0.70% cutoff for nickel was applied to both Limonite and Saprolite to best represent the global Mineral Resource estimate for representation of eventual economic extraction. A range of Ni cut-off up to 2.0% split by laterite type to better understand the other elements (Co, Fe, MgO, SiO2, Al2O3, CaO, Density & Moisture) in relation to Nickel (Ni) was also supplied |
| *Mining factors or assumptions* | • *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.* | • no mining or modifying factors were applied to the Mineral Resource statement that would result in a conversion to Ore Reserve.<br>• assumptions for open cut mining operation similar to current production and supply agreements with nearby IMIP smelter provide sufficient evidence for determination of reasonable prospects of eventual economic extraction of the Hengjaya Mineral Resource<br>• since 2022 more than 13 million wet tonnes of saprolite and 10 million wet tonnes of limonite have been produced from open pits designed to suit the geotechnical conditions which are based on 3m high benches and overall batter slopes of 29 degrees while waste dump slopes are designed at 18 degrees slope which comply with geotechnical study recommendations<br>• proximity to the smelter and the prospect of direct haul road access in addition to barging indicates excellent prospect for eventual economic extraction<br>• a slurry pipeline currently under construction is an additional option for transportation which adds to the prospect for eventual economic extraction of HM limonite |
| *Metallurgical factors or assumptions* | • *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made* | • Metallurgical factors and assumption based on ongoing supply requirement to the RKEF and HPAL smelters (majority owned by NIC) at the IMIP smelter facility 22km by road from the mine were considered when selecting the cutoff ranges for the Mineral Resource and by product splits between Limonite & Saprolite ores. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | *when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.* | • More than 13 million wet tonnes of Hengjaya saprolite has been RKEF processed for more than 10 years at the IMIP smelter giving evidence of its suitability for refinement<br>• Hengjaya limonite is now also being consumed by HPAL operations at IMIP and more than 10million wet tonnes has been consumed to date, providing good evidence for the continued economic extraction moving forward |
| *Environmental factors or assumptions* | • *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.* | • Environmental Impact studies were completed as part of the mining operation permitting process,<br>• In 2024 Hengjaya Mineralindo received 3 awards for Proper Environmental Compliance from the Indonesian Ministry of Environment and Forestry<br>• Geotechnical surveys and ground water monitoring has also began at the Hengjaya mine in preparation for the back filling of pits with HPAL waste in the future. |
| *Bulk density* | • *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*<br>• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.*<br>• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.* | • 2,744 insitu density measurements using JIS 1996 SOP for density measurement on drill core samples have been used in this Resource assessment. Density was measured on solid core from each stratigraphic layer in every bore hole. Density was measured by measuring the volume by displacement of water and the weight of the fresh sample<br>• Insitu density used in the Resource estimate was the weighted average laboratory core density for each particular lithology for that particular domain. |
| *Classification* | • *The basis for the classification of the Mineral Resources into varying confidence categories.*<br>• *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).*<br>• *Whether the result appropriately reflects the Competent Person's view of the deposit.* | • Determination of the Resource classes, were applied to the Mineral Resource with a digitized polygon boundary based on the spatial continuity of each geological domain around regular spaced drilling grids of 25, 50, 100m from included points of observation in the final validated database. Also taken into account was the GPR grid lines between the drilling locations increasing confidence in interpretation of the laterization contact surface between the points of observation in the model. Resources were classified as follows;<br>• MEASURED - Areas of 25m of drilling spacing on a |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | continuous grid pattern, 12.5m extrapolation from the last line of drilling.<br>• INDICATED - Areas of 50m of drilling spacing on a continuous grid pattern, 25m extrapolation from the last line of drilling.<br>• INFERRED - Areas of 100m of drilling spacing on a continuous grid pattern, 50m extrapolation from the last line of drilling.<br>• Some Measured & Indicated Resources were downgraded to Inferred Resources as in pit dumping has been identified in some areas on top of existing Resource areas |
| *Audits or reviews* | • *The results of any audits or reviews of Mineral Resource estimates.* | • No external audits or reviews were done before release of the Mineral Resource statement for Nickel, dated 31 Dec 2025<br>• Charles Watson and Tobias Maya provided peer reviews during the report drafting process in collaboration with principle author Daniel Madre |
| *Discussion of relative accuracy/ confidence* | • *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*<br>• *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*<br>• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.* | • Sufficient exploration and mining has been carried out at the Hengjaya project to delineate a significant deposit of laterite nickel. The drilling used for the Mineral Resource estimate is based on systematic drill grids ranging from 25 to 50 to 100m apart. The Resource classifications are based on this spacing of points of observation. According to the geostatistical analysis, provides sufficient detail for the purpose of this report.<br>• It is likely with further infill and exploration drilling in all domains the Mineral Resources estimated in this report will increase<br>• Confidence of these estimates are greatly improved with the reconciliation of the historical mining of the same laterite nickel deposit since 2013. These comparisons show acceptable correlation of actual produced ores of high grade saprolite and predicted Resources. Long term supply contracts to refining facilities already in operation nearby significantly increase the potential for eventual economic extraction of the Hengjaya nickel laterite Mineral Resource |

## Section 4 Estimation and Reporting of Ore Reserves (Not Required)

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Mineral Resource estimate for conversion to Ore Reserves* | • *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.*<br>• *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.* | • Insert your commentary here… |
| *Site visits* | • *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*<br>• *If no site visits have been undertaken indicate why this is the case.* | • |
| *Study status* | • *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.*<br>• *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.* | • |
| *Cut-off parameters* | • *The basis of the cut-off grade(s) or quality parameters applied.* | • |
| *Mining factors or assumptions* | • *The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).*<br>• *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.*<br>• *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.*<br>• *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).*<br>• *The mining dilution factors used.*<br>• *The mining recovery factors used.*<br>• *Any minimum mining widths used.*<br>• *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.*<br>• *The infrastructure requirements of the selected mining methods.* | • |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| *Metallurgical factors or assumptions* | • *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.*<br>• *Whether the metallurgical process is well-tested technology or novel in nature.*<br>• *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.*<br>• *Any assumptions or allowances made for deleterious elements.*<br>• *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.*<br>• *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?* | • |
| *Environmen-tal* | • *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.* | • |
| *Infrastructure* | • *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.* | • |
| *Costs* | • *The derivation of, or assumptions made, regarding projected capital costs in the study.*<br>• *The methodology used to estimate operating costs.*<br>• *Allowances made for the content of deleterious elements.*<br>• *The source of exchange rates used in the study.*<br>• *Derivation of transportation charges.*<br>• *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.*<br>• *The allowances made for royalties payable, both Government and private.* | • |
| *Revenue factors* | • *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.*<br>• *The derivation of assumptions made of metal or commodity price(s),* | • |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | *for the principal metals, minerals and co-products.* | |
| *Market assessment* | • *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.*<br>• *A customer and competitor analysis along with the identification of likely market windows for the product.*<br>• *Price and volume forecasts and the basis for these forecasts.*<br>• *For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.* | • |
| *Economic* | • *The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.*<br>• *NPV ranges and sensitivity to variations in the significant assumptions and inputs.* | • |
| *Social* | • *The status of agreements with key stakeholders and matters leading to social licence to operate.* | • |
| *Other* | • *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:*<br>• *Any identified material naturally occurring risks.*<br>• *The status of material legal agreements and marketing arrangements.*<br>• *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.* | • |
| *Classification* | • *The basis for the classification of the Ore Reserves into varying confidence categories.*<br>• *Whether the result appropriately reflects the Competent Person's view of the deposit.*<br>• *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).* | • |
| *Audits or reviews* | • *The results of any audits or reviews of Ore Reserve estimates.* | • |
| *Discussion of relative* | • *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or* | • |

| Criteria | JORC Code explanation | Commentary |
| --- | --- | --- |
| *accuracy/ confidence* | *procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.*<br>• *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*<br>• *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.*<br>• *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.* | |

# APPENDIX 2

# LEGAL DOCUMENTS

PEMERINTAH PROVINSI SULAWESI TENGAH
DINAS PENANAMAN MODAL DAN
PELAYANAN TERPADU SATU PINTU
Jalan : Cik Ditiro No 29 Palu - Telp. (0451) 4017755 - Kode Pos.94111

**KEPUTUSAN GUBERNUR SULAWESI TENGAH**
**NOMOR : 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020**

**TENTANG**

**PENCIUTAN WILAYAH IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI PT. HENGJAYA MINERALINDO BERDASARKAN KEPUTUSAN BUPATI MOROWALI NOMOR : 540.3/SK.001/DESDM/VI/2011 TENTANG PERSETUJUAN PENINGKATAN IZIN USAHA PERTAMBANGAN EKSPLORASI MENJADI IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI KEPADA PT. HENGJAYA MINERALINDO**

**GUBERNUR SULAWESI TENGAH,**

Menimbang :

a. Bahwa berdasarkan pasal 74 ayat (1) Peraturan Pemerintah Nomor 23 Tahun 2010 tentang Pelaksanaan Kegiatan Usaha Pertambangan Mineral dan Batu Bara, Pemegang IUP sewaktu-waktu dapat mengajukan Permohonan kepada Gubernur untuk menciutkan sebagian atau mengembalikan seluruh WIUP;

b. bahwa dengan memperhatikan Surat Tim Teknis Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah Nomor : 540/9519/VI/BID.MINERBA/2020 Tanggal 23 Juni 2020, Perihal Pertimbangan Teknis Penciutan Wilayah IUP Operasi Produksi PT. Hengjaya Mineralindo telah memenuhi syarat untuk diberikan Penciutan IUP Operasi Produksi;

c. bahwa berdasarkan Pasal 173 C ayat (1) Undang-Undang Nomor 3 Tahun 2020 tentang perubahan atas Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara menyebutkan "Pelaksanaan kewenangan pengelolaan pertambangan mineral dan batubara oleh pemerintah provinsi yang telah dilaksanakan berdasarkan Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 4959) dan Undang-Undang lain yang mengatur tentang Kewenangan Pemerintah Daerah dibidang Pertambangan Mineral dan Batubara tetap berlaku untuk jangka waktu paling lama 6 (enam) bulan terhitung sejak Undang-Undang ini mulai berlaku atau sampai dengan diterbitkannya Peraturan Pelaksanaan Undang-Undang ini;

d. bahwa berdasarkan pertimbangan sebagaimana dimaksud huruf a, huruf b dan huruf c, perlu menetapkan Keputusan Gubernur tentang Penciutan Wilayah Izin Usaha Pertambangan Operasi Produksi PT. Hengjaya Mineralindo Berdasarkan Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 Tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi Menjadi Izin Usaha Pertambangan Operasi Produksi Kepada PT. Hengjaya Mineralindo;

Mengingat : 1. Undang-Undang Nomor 13 Tahun 1964 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 1964 tentang Pembentukan Daerah Tingkat I Sulawesi Tengah dan Daerah Tingkat I Sulawesi Tenggara dengan mengubah Undang-Undang Nomor 47 Prp Tahun 1960 tentang Pembentukan Daerah Tingkat I Sulawesi Utara-Tengah dan Daerah Tingkat I Sulawesi Selatan–Tenggara (Lembaran Negara Republik Indonesia Tahun 1964 Nomor 07), Menjadi Undang-Undang (Lembaran Negara Republik Indonesia Tahun 1964 Nomor 94, Tambahan Lembaran Negara Republik Indonesia Nomor 2687);

2. Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 4, Tambahan Lembaran Negara Republik Indonesia Nomor 4959) Sebagaimana telah diubah dengan Undang-Undang Nomor 03 Tahun 2020 tentang Perubahan atas Undang-Undang Nomor 4 Tahun 2009 tentang Pertambangan Mineral dan Batubara (Lembaran Negara Republik Indonesia Tahun 2020 Nomor 147, Tambahan Lembaran Negara Republik Indonesia Nomor 6525);
3. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah (Lembaran Negara Republik Indonesia Tahun 2014 Nomor 244, Tambahan Lembaran Negara Republik Indonesia Nomor 5587) sebagaimana telah diubah terakhir dengan Undang-Undang Nomor 9 Tahun 2015 tentang Perubahan Kedua atas Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 58, Tambahan Lembaran Negara Republik Indonesia Nomor 5679);
4. Peraturan Pemerintah Nomor 22 Tahun 2010 tentang Wilayah Pertambangan (Lembaran Negara Republik Indonesia Tahun 2010 Nomor 28, Tambahan Lembaran Negara Republik Indonesia Nomor 5110);
5. Peraturan Pemerintah Nomor 23 Tahun 2010 tentang Pelaksanaan Kegiatan Usaha Pertambangan Mineral dan Batubara (Lembaran Negara Republik Indonesia Tahun 2010 Nomor 29, Tambahan Lembaran Negara Republik Indonesia Nomor 5111), sebagaimana telah diubah terakhir dengan Peraturan Pemerintah Nomor 77 Tahun 2014 tentang Perubahan Ketiga atas Peraturan Pemerintah Nomor 23 Tahun 2010 tentang Pelaksanaan Kegiatan Usaha Pertambangan Mineral dan Batubara (Lembaran Negara Republik Indonesia Tahun 2014 Nomor 263, Tambahan Lembaran Negara Republik Indonesia Nomor 5597);
6. Peraturan Pemerintah Nomor 55 Tahun 2010 tentang Pembinaan dan Pengawasan Penyelenggaraan Pengelolaan Usaha Pertambangan Mineral dan Batubara ( Lembaran Negara Republik Indonesia Tahun 2010 Nomor 138, tambahan lembaran Negara Republik Indonesia Nomor 5172);
7. Peraturan Pemerintah Nomor 78 Tahun 2010 tentang Reklamasi dan Pascatambang (Lembaran Negara Republik Indonesia Tahun 2010 Nomor 138, Tambahan Lembaran Negara Republik Indonesia Nomor 5172);

8. Peraturan Pemerintah Nomor 9 Tahun 2012 tentang Jenis dan Tarif Atas Jenis Penerimaan Negara Bukan Pajak Yang Berlaku Pada Kementerian Energi dan Sumber Daya Mineral (Lembaran Negara Republik Indonesia Tahun 2012 Nomor 16, Tambahan Lembaran Negara Republik Indonesia Nomor 5276);
9. Peraturan Presiden Nomor 97 Tahun 2014 tentang Penyelenggaraan Pelayanan Terpadu Satu Pintu;
10. Peraturan Menteri Energi dan Sumber Daya Mineral Nomor 7 Tahun 2020 Tentang Tata Cara Pemberian Wilayah, Perizinan, dan Pelaporan Pada Kegiatan Usaha Pertambangan Mineral dan Batubara;
11. Peraturan Daerah Nomor 08 Tahun 2016 tentang pembentukan dan Susunan Perangkat Daerah Provinsi;
12. Peraturan Daerah Nomor 02 Tahun 2018 tentang Pengelolaan Pertambangan Mineral dan Batubara;
13. Peraturan Gubernur Sulawesi Tengah Nomor 71 Tahun 2016 tentang Tugas, Fungsi dan Tatacara Kerja Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi;
14. Peraturan Gubernur Sulawesi Tengah Nomor 43 Tahun 2016 tentang Kedudukan dan Susunan Organisasi Dinas Daerah;
15. Peraturan Gubernur Sulawesi Tengah Nomor 26 Tahun 2018 tentang Pendelegasian Kewenangan Penerbitan dan Penandatanganan Perizinan dan Non Perizinan;

Memperhatikan :

1. Keputusan Menteri Energi dan Sumber Daya Mineral Nomor : 2737.K/30/MEM/2013 tentang Penetapan Wilayah Pertambangan Pulau Sulawesi;
2. Surat Edaran Menteri Dalam Negeri Republik Indonesia Nomor: 120/253/Sj tentang Penyelenggaraan Urusan Pemerintahan Setelah Ditetapkan Undang–Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah;
3. Surat Direktorat Jenderal Mineral dan Batubara Kementerian Energi dan Sumber Daya Mineral Republik Indonesia Nomor : 321/06/SDB/2015 Perihal Pelayanan Urusan ESDM setelah Pemberlakuan UU 23 Tahun 2014;
4. Keputusan Bupati Morowali Nomor : 540.3/SK.001/DESDM/VI/2011 Tanggal 16 Juni 2011 Tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi Menjadi Izin Usaha Pertambangan Operasi Produksi Kepada PT. Hengjaya Mineralindo;
5. Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah Nomor 800/09.90.A/DPMPTSP Tanggal 28 Juni 2018 tentang Standar Pelayanan dan Standar Operasional Prosedur Perizinan dan Non Perizinan.
6. Surat Tim Teknis Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah Nomor : 540/9519/VI/BID.MINERBA/2020 Tanggal 23 Juni 2020, Perihal Pertimbangan Teknis Penciutan Wilayah IUP Operasi Produksi PT. Hengjaya Mineralindo;
7. Surat Permohonan Direktur Utama PT. Hengjaya Mineralindo Nomor : 020/LGD.DIR-HM/II/2020 Tanggal 17 Februari 2020, Perihal Permohonan Penciutan Areal IUP Operasi Produksi PT. Hengjaya Mineralindo;

8. Surat Direktur Utama PT. Hengjaya Mineralindo Nomor : 035/LGD.DIR-HM/IV/2020 Tanggal 23 April 2020 Perihal Pemenuhan Persyaratan Penciutan Areal IUP-OP;

MEMUTUSKAN:

Menetapkan : KEPUTUSAN GUBERNUR SULAWESI TENGAH TENTANG PENCIUTAN WILAYAH IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI PT. HENGJAYA MINERALINDO BERDASARKAN KEPUTUSAN BUPATI MOROWALI NOMOR 540.3/SK.001/DESDM/VI/2011 TENTANG PERSETUJUAN PENINGKATAN IZIN USAHA PERTAMBANGAN EKSPLORASI MENJADI IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI KEPADA PT. HENGJAYA MINERALINDO

KESATU : Melakukan Penciutan Wilayah Izin Usaha Pertambangan (IUP) Operasi Produksi PT. Hengjaya Mineralindo Berdasarkan Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 Tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi Menjadi Izin Usaha Pertmabangan Operasi Produksi Kepada PT. Hengjaya Mineralindo.

KEDUA : Penciutan sebagaimana dimaksud dalam dictum KESATU adalah dari luas Wilayah semula 6.249 Ha (Enam Ribu Dua Ratus Empat Puluh Sembilan) menjadi 5.983 Ha (Lima Ribu Sembilan Ratus Delapan Puluh Tiga) yang menjadi Wilayah Izin Usaha Pertambangan Operasi Produksi setelah dilakukan Penciutan, sesuai dengan Peta dan Daftar Koordinat sebagaimana tercantum dalam lampiran I dan lampiran II yang merupakan bagian tidak terpisahkan dari Keputusan Gubernur ini.

KETIGA Hak dan kewajiban pemegang IUP Operasi Produksi PT. Hengjaya Mineralindo tetap berpedoman pada Ketentuan Peraturan Perundang-Undangan yang Berlaku.

KEEMPAT : Keputusan Gubernur ini mulai berlaku pada tanggal ditetapkan.

Ditetapkan di : Palu
pada tanggal : 10 Juli 2020

**a.n GUBERNUR SULAWESI TENGAH**
**KEPALA DINAS PENANAMAN MODAL DAN**
**PELAYANAN TERPADU SATU PINTU**
**PROVINSI SULAWESI TENGAH**

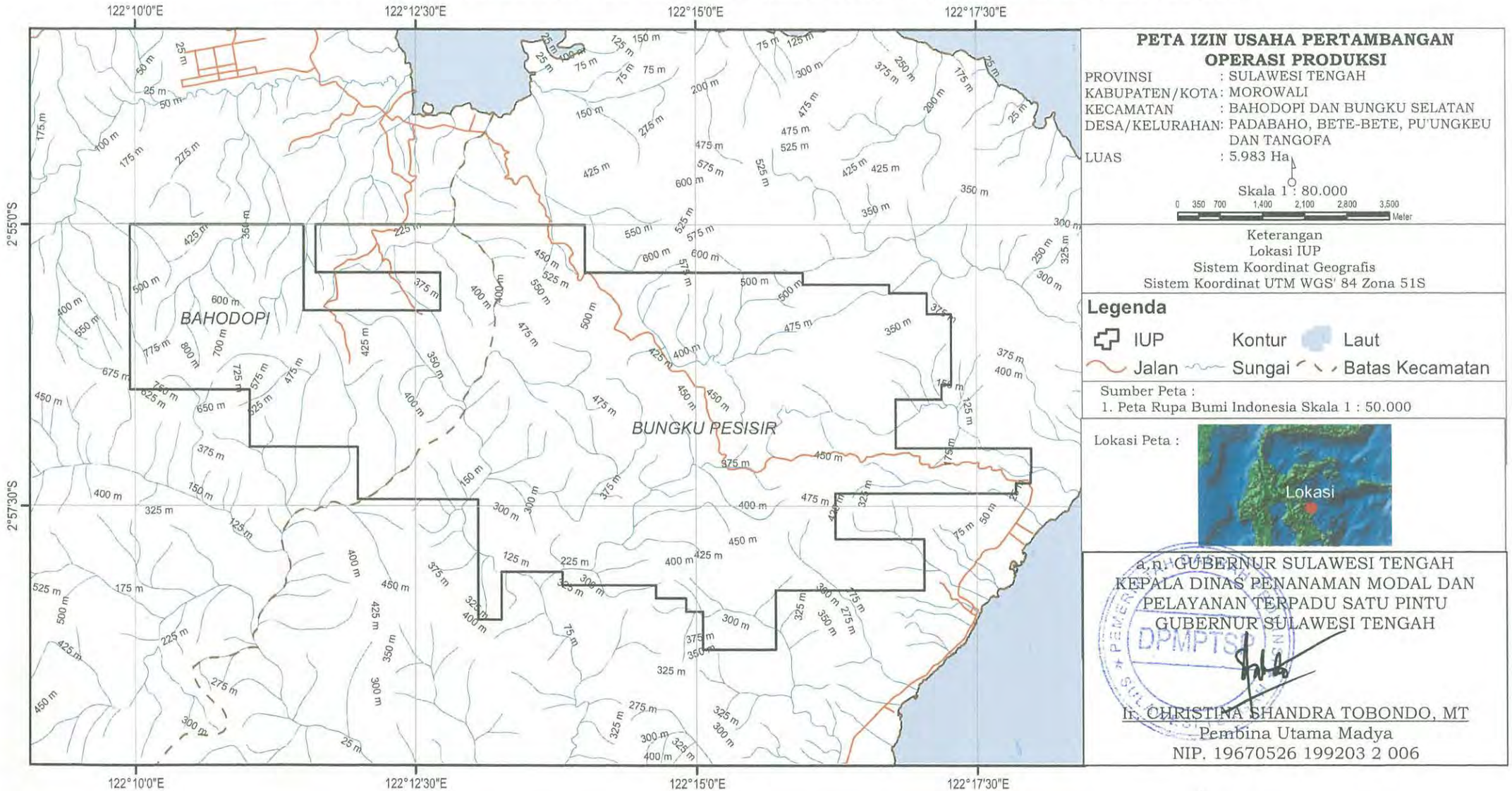
DPMPTSP

**Ir. CHRISTINA SHANDRA TOBONDO, MT**
**Pembina Utama Madya**
**NIP. 19670526 199203 2 006**

**Tembusan Yth. :**
1. Gubernur Sulawesi Tengah (sebagai laporan) di Palu;
2. Sekretaris Daerah Provinsi Sulawesi Tengah di Palu;
3. Bupati Morowali di Bungku;
4. Kepala Dinas ESDM Provinsi Sulawesi Tengah di Palu;
5. Kepala Badan Pendapatan Daerah Provinsi Sulawesi Tengah di Palu;
6. Kepala Dinas PM-PTSP Kabupaten Morowali di Bungku;
7. Direktur Utama PT. HENGJAYA MINERALINDO.

LAMPIRAN I
KEPUTUSAN GUBERNUR SULAWESI TENGAH
NOMOR : 540/345/IUP-OP-penciutan/DPMPTSP/2020
TENTANG : PENCIUTAN WILAYAH IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI PT. HENGJAYA MINERALINDO BERDASARKAN KEPUTUSAN BUPATI MOROWALI NOMOR: 540.3/SK.001/DESDM/VI/2011 TENTANG PERSETUJUAN PENINGKATAN IZIN USAHA PERTAMBANGAN EKSPLORASI MENJADI IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI KEPADA PT. HENGJAYA MINERALINDO

PETA LOKASI IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI PT. HENGJAYA MINERALINDO




**PETA IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI**

PROVINSI : SULAWESI TENGAH
KABUPATEN/KOTA : MOROWALI
KECAMATAN : BAHODOPI DAN BUNGKU SELATAN
DESA/KELURAHAN : PADABAHO, BETE-BETE, PU'UNGKEU DAN TANGOFA
LUAS : 5.983 Ha

Skala 1 : 80.000
0 350 700 1,400 2,100 2,800 3,500 Meter

Keterangan
Lokasi IUP
Sistem Koordinat Geografis
Sistem Koordinat UTM WGS' 84 Zona 51S

**Legenda**
IUP Kontur Laut
Jalan Sungai Batas Kecamatan

Sumber Peta :
1. Peta Rupa Bumi Indonesia Skala 1 : 50.000

Lokasi Peta :




a.n. GUBERNUR SULAWESI TENGAH
KEPALA DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU
GUBERNUR SULAWESI TENGAH

Ir. CHRISTINA SHANDRA TOBONDO, MT
Pembina Utama Madya
NIP. 19670526 199203 2 006

LAMPIRAN II
KEPUTUSAN GUBERNUR SULAWESI TENGAH
NOMOR : 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020
TANGGAL : PALU, 10 JULI 2020
TENTANG : PENCIUTAN WILAYAH IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI PT. HENGJAYA MINERALINDO BERDASARKAN KEPUTUSAN BUPATI MOROWALI NOMOR: 540.3/SK.001/ DESDM/VI/2011 TENTANG PERSETUJUAN PENINGKATAN IZIN USAHA PERTAMBANGAN EKSPLORASI MENJADI IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI KEPADA PT. HENGJAYA MINERALINDO

KOORDINAT IZIN USAHA PERTAMBANGAN OPERASI PRODUKSI
PT. HENGJAYA MINERALINDO

LOKASI
DESA : PADABAHO, BETE-BETE, PU'UNGKEU DAN TANGOFA
KECAMATAN : BAHODOPI DAN BUNGKU SELATAN
KABUPATEN : MOROWALI
PROVINSI : SULAWESI TENGAH
LUAS : 5.983 Ha

| NO | BUJUR TIMUR | | | LINTANG SELATAN | | |
|---|---|---|---|---|---|---|
| | ° | ' | " | ° | ' | " |
| 1 | 122 | 15 | 3.21 | 2 | 58 | 46.15 |
| 2 | 122 | 15 | 3.21 | 2 | 58 | 25.82 |
| 3 | 122 | 14 | 54.21 | 2 | 58 | 25.82 |
| 4 | 122 | 14 | 54.21 | 2 | 58 | 18.74 |
| 5 | 122 | 14 | 38.25 | 2 | 58 | 18.74 |
| 6 | 122 | 14 | 38.25 | 2 | 58 | 11.84 |
| 7 | 122 | 13 | 48.27 | 2 | 58 | 11.84 |
| 8 | 122 | 13 | 48.27 | 2 | 58 | 4.76 |
| 9 | 122 | 13 | 15.69 | 2 | 58 | 4.76 |
| 10 | 122 | 13 | 15.69 | 2 | 58 | 30.21 |
| 11 | 122 | 13 | 3.34 | 2 | 58 | 30.21 |
| 12 | 122 | 13 | 3.34 | 2 | 57 | 26.14 |
| 13 | 122 | 11 | 59.03 | 2 | 57 | 26.14 |
| 14 | 122 | 11 | 59.03 | 2 | 56 | 58.25 |
| 15 | 122 | 11 | 1.10 | 2 | 56 | 58.25 |
| 16 | 122 | 11 | 1.10 | 2 | 56 | 27.81 |
| 17 | 122 | 9 | 57.11 | 2 | 56 | 27.81 |
| 18 | 122 | 9 | 57.11 | 2 | 54 | 59.84 |
| 19 | 122 | 11 | 29.99 | 2 | 54 | 59.84 |
| 20 | 122 | 11 | 29.99 | 2 | 55 | 45.58 |
| 21 | 122 | 12 | 43.24 | 2 | 55 | 45.58 |
| 22 | 122 | 12 | 43.24 | 2 | 55 | 25.34 |
| 23 | 122 | 11 | 36.37 | 2 | 55 | 25.34 |
| 24 | 122 | 11 | 36.37 | 2 | 54 | 59.84 |
| 25 | 122 | 14 | 0.47 | 2 | 54 | 59.84 |
| 26 | 122 | 14 | 0.47 | 2 | 55 | 25.18 |
| 27 | 122 | 15 | 57.13 | 2 | 55 | 25.18 |
| 28 | 122 | 15 | 57.13 | 2 | 55 | 31.55 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 29 | 122 | 16 | 43.09 | 2 | 55 | 31.55 |
| 30 | 122 | 16 | 43.09 | 2 | 55 | 36.02 |
| 31 | 122 | 17 | 3.20 | 2 | 55 | 36.02 |
| 32 | 122 | 17 | 3.20 | 2 | 55 | 47.17 |
| 33 | 122 | 17 | 16.12 | 2 | 55 | 47.17 |
| 34 | 122 | 17 | 16.12 | 2 | 56 | 24.78 |
| 35 | 122 | 17 | 11.01 | 2 | 56 | 24.78 |
| 36 | 122 | 17 | 11.01 | 2 | 56 | 32.75 |
| 37 | 122 | 16 | 46.44 | 2 | 56 | 32.75 |
| 38 | 122 | 16 | 46.44 | 2 | 56 | 58.73 |
| 39 | 122 | 17 | 58.99 | 2 | 56 | 58.73 |
| 40 | 122 | 17 | 58.99 | 2 | 57 | 11.48 |
| 41 | 122 | 17 | 58.73 | 2 | 57 | 11.48 |
| 42 | 122 | 17 | 58.73 | 2 | 57 | 17.38 |
| 43 | 122 | 17 | 50.75 | 2 | 57 | 17.38 |
| 44 | 122 | 17 | 50.75 | 2 | 57 | 22.80 |
| 45 | 122 | 16 | 14.20 | 2 | 57 | 22.80 |
| 46 | 122 | 16 | 14.20 | 2 | 57 | 47.18 |
| 47 | 122 | 17 | 1.60 | 2 | 57 | 47.18 |
| 48 | 122 | 17 | 1.60 | 2 | 58 | 14.43 |
| 49 | 122 | 15 | 42.29 | 2 | 58 | 14.43 |
| 50 | 122 | 15 | 42.29 | 2 | 58 | 46.15 |

a.n. GUBERNUR SULAWESI TENGAH
KEPALA DINAS PENANAMAN MODAL DAN
PELAYANAN TERPADU SATU PINTU
PROVINSI SULAWESI TENGAH

DPMPTSP

Ir. CHRISTINA CHANDRA TOBONDO, MT
Pembina Utama Madya
NIP. 19670526 199203 2 006

CONFIDENTIAL

**MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN**
**REPUBLIK INDONESIA**

KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA
NOMOR : SK.644/MENLHK/SETJEN/PLA.0/6/2023

TENTANG

PERUBAHAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN DAN PENGGABUNGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI BIJIH NIKEL, PEMBANGUNAN JALAN ANGKUT PERTAMBANGAN BIJIH NIKEL/*MINE HAULING ROAD* DAN SARANA PENUNJANGNYA ATAS NAMA PT HENGJAYA MINERALINDO DARI SELUAS ± 875,72 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN TUJUH PULUH DUA PERSERATUS HEKTARE) MENJADI SELUAS ± 875,45 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN EMPAT PULUH LIMA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TERBATAS DI KABUPATEN MOROWALI, PROVINSI SULAWESI TENGAH

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

Menimbang : a. bahwa PT Hengjaya Mineralindo sebagai perusahaan pemegang izin pertambangan, berdasarkan :

1) Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juli 2011 tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi menjadi Izin Usaha Pertambangan Operasi Produksi kepada PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 6.249 Ha (enam ribu dua ratus empat puluh sembilan hektare), berlaku selama 20 (dua puluh) tahun sampai dengan tanggal 26 Mei 2031;
2) Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020 tentang Penciutan Wilayah Izin Usaha Pertambangan Operasi Produksi atas nama PT Hengjaya Mineralindo berdasarkan Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi menjadi Izin Usaha Pertambangan Operasi Produksi kepada PT Hengjaya Mineralindo seluas 6.249 Ha (enam ribu dua ratus empat puluh sembilan hektare) menjadi seluas 5.983 Ha (lima ribu sembilan ratus delapan puluh tiga hektare);

b. bahwa PT Hengjaya Mineralindo telah mendapatkan Persetujuan Penggunaan Kawasan Hutan/PPKH (d/h. Izin Pinjam Pakai Kawasan Hutan/IPPKH) untuk :

1) Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas di Kecamatan Bahodopi dan Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare), sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013, berlaku sampai dengan tanggal 16 Juni 2031;

2) Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas ± 994,32 Ha (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus hektare), sesuai Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460 /MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 menjadi seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare), berlaku sampai dengan tanggal 26 Mei 2031;

3) Kegiatan Pembangunan jalan angkut pertambangan bijih nikel/*mine hauling road* dan sarana penunjangnya sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/ 2022 tanggal 7 Oktober 2022 seluas ± 24,58 Ha (dua puluh empat dan lima puluh delapan perseratus hektare) di Kabupaten Morowali, Provinsi Sulawesi Tengah, berlaku sampai dengan tanggal 26 Mei 2031, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/ PLA.0/1/2023 tanggal 11 Januari 2023 menjadi seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare);

c. bahwa Direktur PT Hengjaya Mineralindo dengan surat Nomor 032/LGD.DIR-HM/IV/2023 tanggal 3 April 2023 dan Nomor 054/LGD.DIR-HM/V/2023 tanggal 10 Mei 2023, mengajukan permohonan Perubahan Persetujuan Penggunaan Kawasan Hutan untuk Jalan Tambang/*Main Hauling Road* Kegiatan Pertambangan

Bijih Nikel seluas ± 60,319 Ha (enam puluh dan tiga ratus sembilan belas perseribu hektare) di Kabupaten Morowali, Provinsi Sulawesi Tengah;

d. bahwa Plt. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan sesuai surat Nomor S.616/PKTL/REN/PLA.0/6/2023 tanggal 12 Juni 2023, menyampaikan hasil penilaian dan penelaahan terhadap pengembalian dan penambahan areal Persetujuan Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo :

1) berdasarkan hasil penilaian kelengkapan persyaratan, permohonan PT Hengjaya Mineralindo telah melampirkan persyaratan teknis sesuai ketentuan Pasal 380, Pasal 381 dan Pasal 410 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan serta Penggunaan Kawasan Hutan;

2) areal IPPKH yang dikembalikan :

a) berdasarkan perhitungan ulang, areal yang dikembalikan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) berada pada IPPKH untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas di Kecamatan Bahodopi dan Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 851,22 Ha, sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013;

b) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/10/2021 tanggal 27 Oktober 2021, areal yang dimohon seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) berada pada kawasan Hutan Produksi Terbatas:

c) berdasarkan *overlay* dengan citra satelit planet 2022, areal yang dikembalikan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) berada pada tutupan lahan berupa

hutan lahan kering primer, hutan lahan kering sekunder, pertanian lahan kering dan tanah terbuka. Terkait tutupan lahan berupa tanah terbuka merupakan area sliver (tubuh air/tebing sungai);

d) berdasarkan Laporan evaluasi Dinas Kehutanan Provinsi Sulawesi Tengah, bahwa pengembalian seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) direkomendasikan untuk diajukan permohonan revisi berupa pengembalian sebagian areal PPKH kepada Menteri Lingkungan Hidup dan Kehutanan dan areal yang dikembalikan dilakukan pengawasan sebagai bentuk perlindungan hutan;

3) areal penambahan IPPKH :

a) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/ MenLHK /Setjen/Pla.0/11/2020 tanggal 30 November 2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/ 10/2021 tanggal 27 Oktober 2021, areal yang dimohon seluas ± 60,28 Ha (enam puluh dan dua puluh delapan perseratus hektare) berada pada Kawasan Hutan Produksi Terbatas, dengan penjelasan :

1. berdasarkan overlay dengan citra satelit planet 2022 dan Penutupan Lahan tahun 2021, areal seluas ± 60,28 Ha (enam puluh dan dua puluh delapan perseratus hektare) berada pada tutupan lahan berupa hutan lahan kering primer, hutan lahan kering sekunder, pertanian lahan kering dan tanah terbuka. Terkait tutupan lahan berupa tanah terbuka merupakan area sliver (tubuh air/tebing sungai);
2. seluas ± 0,23 Ha (dua puluh tiga perseratus hektare) tumpang tindih dengan Persetujuan Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/ REN/PLA.0/1/2023 tanggal 11 Januari 2023, sehingga yang dapat ditelaah lebih lanjut seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare);

3. seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) berada pada wilayah pengelolaan KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

b) seluruh areal yang dimohon berada di wilayah sebaran satwa liar Babirusa, sesuai Instruksi Menteri Lingkungan Hidup dan Kehutanan Nomor INS.1/MENLHK/SETJEN/KUM.1/6/2022 tanggal 17 Juni 2022 tentang Perlindungan Satwa Liar atas Ancaman Penjeratan dan Perburuan Liar di Dalam dan di Luar Kawasan Hutan. Berdasarkan Instruksi Menteri tersebut, disebut bahwa agar menghindari pinjam pakai kawasan hutan yang merupakan habitat satwa liar. Terhadap hal tersebut dapat dijelaskan rencana pengelolaan lingkungan sesuai dokumen ANDAL :

1. mengoptimalkan pelaksanaan pengelolaan dampak hilangnya flora darat;
2. memasang papan larangan untuk tidak menangkap hewan endemik di sekitar lokasi kegiatan;
3. memasang rambu pengingat agar tidak mengganggu satwa/fauna darat yang ditemui selama kegiatan pembukaan lahan;
4. memasang papan larangan berburu satwa/fauna darat yang ada;
5. memasang papan pengingat untuk tidak mengganggu dan/atau menangkap beberapa jenis satwa/fauna yang dilindungi, yaitu Anoa Dataran Rendah (*bubalus depressicornis*), Rusa (*cervus kuhli*), Kuskus Beruang (*ailurops ursinus*) dan Babirusa (*babyrousa celebensis*), Moyet Butung/Digo (*macaca ochreata*), Tarsius, Julang Sulawesi (*aceros cassidix*), Kangkareng Sulawesi (*penelopides exarhatus*), Serindit Sulawesi (*loriculus stigmatus*) dan Betet Kelapa Punggung Biru (*tanygnathus sumatranus*);
6. kawasan bernilai konservasi/buffer zone dan vegetasi alami yang merupakan habitat satwa liar semaksimal mungkin diupayakan tidak terganggu dan tetap dilakukan pengayaan tanaman sehingga keberadaan tanaman tetap dipertahankan;
7. memindahkan satwa liar dan atau satwa yang dilindungi ketempat lain sesuai dengan kondisi ekosistem satwa tersebut;
8. melibatkan Dinas Kehutanan (KSDA) dalam penanganan satwa yang dilindungi;

4) dalam rangka efektifitas dan efisiensi pengelolaan areal Persetujuan Penggunaan Kawasan Hutan, mengingat areal permohonan pengembalian

merupakan bagian dari areal PPKH sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare) dan areal penambahan berhimpitan dengan areal PPKH sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/ PLA.0/10/ 2022 tanggal 7 Oktober 2022 tentang PPKH untuk Kegiatan Pembangunan jalan angkut pertambangan bijih nikel/mine hauling road dan sarana penunjangnya a.n. PT Hengjaya Mineralindo seluas ± 24,58 Ha (dua puluh empat dan lima puluh delapan perseratus hektare), sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023 menjadi seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare), maka permohonan diproses sebagai perubahan PPKH dan penggabungan 2 (dua) PPKH, sehingga keseluruhan PPKH menjadi seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) atau merupakan penjumlahan dari seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare) ditambah seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare) dikurangi seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) ditambah seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare;

5) areal perubahan seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare):

   a) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/ MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK-PKTL/ KUH/PLA.2/10/2021 tanggal 27 Oktober 2021, areal yang dimohon seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare), seluruhnya

berada pada kawasan Hutan Produksi Terbatas dan berada pada wilayah pengelolaan KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

b) berkenaan dengan kuota 10% (sepuluh persen) di kawasan Hutan Produksi untuk kegiatan pertambangan, dikarenakan permohonan PT Hengjaya Mineralindo merupakan permohonan pengembalian seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) dan penambahan seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare), maka tidak mengubah beban kuota pada KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah, sehingga dapat diproses lebih lanjut;

6) berdasarkan hasil penilaian dan penelaahan, maka permohonan pengembalian sebagian areal PPKH dan penambahan areal PPKH a.n. PT Hengjaya Mineralindo ditelaah sebagai perubahan dan penggabungan PPKH :

a) perubahan PPKH sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare), berupa pengembalian sebagian areal PPKH seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare);

b) perubahan PPKH sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/ SETJEN/ PLA.0/10/2022 tanggal 7 Oktober 2022 seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare), berupa penambahan areal PPKH seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare);

c) penggabungan kedua PPKH tersebut huruf a) dan huruf b);

secara teknis dapat dipertimbangkan untuk diproses lebih lanjut seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya berada pada Kawasan Hutan Produksi Terbatas dan berada pada di wilayah KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah di Kabupaten Morowali, Provinsi Sulawesi Tengah, dengan jatuh tempo pembayaran PNBP PKH a.n. PT Hengjaya Mineralindo menjadi setiap tanggal 16 Juni;

e. bahwa berdasarkan :

1) Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan:

a) Pasal 90 ayat (2), Penggunaan Kawasan Hutan dilakukan tanpa mengubah fungsi pokok Kawasan Hutan dengan mempertimbangkan batasan luas dan jangka waktu tertentu serta kelestarian lingkungan;

b) Pasal 91 ayat (1) dan ayat (2) huruf b, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan meliputi kegiatan pertambangan;

c) Pasal 94 ayat (1) dan Pasal 96 ayat (1), Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan dilakukan berdasarkan Persetujuan Penggunaan Kawasan Hutan dan diberikan oleh Menteri berdasarkan permohonan;

d) Pasal 94 ayat (5) dan ayat (7), Persetujuan Penggunaan Kawasan Hutan pada provinsi yang terlampaui kecukupan luas Kawasan Hutannya wajib membayar PNBP Penggunaan Kawasan Hutan dan wajib melakukan penanaman dalam rangka rehabilitasi DAS;

e) Pasal 99 ayat (2), ayat (4) dan ayat (5), Pemegang Persetujuan Penggunaan Kawasan Hutan wajib melaksanakan tata batas areal Persetujuan Penggunaan Kawasan Hutan paling lama dalam jangka waktu 1 (satu) tahun setelah diterbitkan Persetujuan Penggunaan Kawasan Hutan dan tidak dapat diperpanjang dan dalam hal telah menyelesaikan pelaksanaan tata batas areal Penggunaan Kawasan Hutan, Menteri menetapkan batas areal kerja Penggunaan Kawasan Hutan serta dalam hal tidak menyelesaikan pelaksanaan tata batas areal Penggunaan Kawasan Hutan dalam jangka waktu yang telah ditentukan, Persetujuan Penggunaan Kawasan Hutan menjadi batal dan dinyatakan tidak berlaku;

f) Pasal 104 ayat (1), Jangka waktu Persetujuan Penggunaan Kawasan Hutan diberikan sama dengan jangka waktu Perizinan Berusaha sesuai bidangnya dan dilakukan sesuai dengan ketentuan peraturan perundang-undangan;

g) Pasal 252 ayat (2), Perlindungan Hutan atas Kawasan Hutan yang telah menjadi areal kerja pemegang Perizinan Berusaha Pemanfaatan Hutan, persetujuan Perhutanan Sosial, dan persetujuan Penggunaan Kawasan Hutan dilaksanakan dan menjadi tanggung jawab pemegang Perizinan Berusaha Pemanfaatan Hutan, persetujuan Perhutanan Sosial, dan

persetujuan Penggunaan Kawasan Hutan yang bersangkutan;

h) Pasal 294 huruf b, Kawasan Hutan Produksi Terbatas sebelum berlakunya Peraturan Pemerintah ini, dinyatakan tetap berlaku sesuai dengan tahap pengukuhannya serta diberlakukan peruntukan dan fungsinya sebagai Kawasan Hutan Produksi Tetap;

i) Pasal 296 huruf i, Persetujuan Penggunaan Kawasan Hutan pada areal yang belum dilakukan penetapan kecukupan luas Kawasan Hutan provinsi sebelum berlakunya Peraturan Pemerintah ini, tetap diproses berdasarkan batasan kecukupan luas Kawasan Hutan yang telah ditetapkan sebelumnya;

2) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, serta Penggunaan Kawasan Hutan :

a) Pasal 366 ayat (1) dan ayat (2) huruf a, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan dilakukan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan keputusan Menteri;

b) Pasal 367 huruf b, Penggunaan Kawasan Hutan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan keputusan Menteri, meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, *conveyor* dan *smelter*;

c) Pasal 369 ayat (1) huruf a, Penggunaan Kawasan Hutan untuk kegiatan komersial dilakukan dengan ketentuan pada provinsi yang melampaui kecukupan luas kawasan hutan wajib membayar PNBP Penggunaan Kawasan Hutan, dan melakukan penanaman dalam rangka Rehabilitasi DAS terutama pada Kawasan Hutan untuk Penggunaan Kawasan Hutan dengan ratio 1:1 (satu berbanding satu);

d) Pasal 372 ayat (6) dan ayat (7), Dalam hal Persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan mineral dan batubara di Kawasan Hutan Produksi pada suatu provinsi berada pada areal yang dibebani Perizinan Berusaha Pemanfaatan Hutan kuota yang dapat dipertimbangkan paling banyak 10% (sepuluh persen) dari luas efektif setiap

Perizinan Berusaha Pemanfaatan Hutan dan dalam hal Persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan mineral dan batubara di Kawasan Hutan Produksi pada suatu provinsi berada pada areal KPH, kuota yang dapat dipertimbangkan paling banyak 10% (sepuluh persen) dari luas Kawasan Hutan Produksi pada masing-masing KPH yang tidak dibebani Perizinan Berusaha Pemanfaatan Hutan;

e) Pasal 390 ayat (4), Dalam hal Pemegang Persetujuan Penggunaan Kawasan Hutan tidak menyelesaikan pelaksanaan Tata Batas areal Persetujuan Penggunaan Kawasan Hutan dalam jangka waktu yang ditentukan, Persetujuan Penggunaan Kawasan Hutan menjadi batal dan dinyatakan tidak berlaku;

f) Pasal 392 ayat (1) dan ayat (2), Pemegang Persetujuan Penggunaan Kawasan Hutan dilarang melakukan kegiatan di lapangan sebelum menyelesaikan pemenuhan Komitmen, dikecualikan untuk penyelesaian pemenuhan Komitmen dan kegiatan lainnya, yaitu membuat kegiatan persiapan, diantaranya pembangunan direksi kit (*basecamp* sementara); pengukuran sarana dan prasarana; sarana penunjang keselamatan umum; penanganan bencana alam; dan sarana dan prasarana penunjang pada kondisi darurat;

g) Pasal 395 ayat (1) dan (2), Direktur Jenderal melakukan pengawasan terhadap Pemegang Persetujuan Penggunaan Kawasan Hutan atas pelaksanaan penyelesaian pemenuhan Komitmen sebagaimana dimaksud dalam Pasal 389 sampai dengan Pasal 391 dan Pengawasan pelaksanaan penyelesaian pemenuhan Komitmen sebagaimana dimaksud pada ayat (1) terdiri atas tenggang waktu penyelesaian pemenuhan Komitmen; dan proses penyelesaian pemenuhan Komitmen sesuai dengan ketentuan peraturan perundang-undangan;

h) Pasal 396 ayat (1), Pemegang Persetujuan Penggunaan Kawasan Hutan menyampaikan laporan penyelesaian pemenuhan Komitmen dengan dilampiri dokumen asli sebagaimana dimaksud dalam Pasal 389 dan Pasal 390 dan mengajukan permohonan Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan kepada Direktur Jenderal melalui Direktur;

i) Pasal 397 ayat (1) huruf a dan ayat (2) :

(1) huruf a, berdasarkan hasil pengecekan dan penelaahan atas pemenuhan komitmen

yang disampaikan oleh pemegang Persetujuan Penggunaan Kawasan Hutan, Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan menetapkan Keputusan tentang Penetapan Batas Areal Kerja Persetujuan Penggunaan Kawasan Hutan apabila seluruh komitmen telah terpenuhi dengan tenggang waktu yang ditentukan dan proses pemenuhan komitmen sesuai dengan ketentuan peraturan perundang-undangan;

(2) Dalam hal Direktur Jenderal atas nama Menteri telah menetapkan batas Areal Kerja Penggunaan Kawasan Hutan, Persetujuan Penggunaan Kawasan Hutan berlaku efektif dan Pemegang Persetujuan Penggunaan Kawasan Hutan dapat langsung menjalankan kegiatan usaha

j) Pasal 399 ayat (4) dan ayat (5):

(4) Bagi Pemegang Persetujuan Penggunaan Kawasan Hutan selain sebagaimana dimaksud pada ayat (3) dengan kompensasi membayar PNBP Penggunaan Kawasan Hutan, pembayaran PNBP Penggunaan Kawasan Hutan dilaksanakan sejak terbitnya Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan;

(5) Pembayaran PSDH/DR, PNBP Penggunaan Kawasan Hutan, ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil Rehabilitasi atau biaya investasi pengelolaan pemanfaatan hutan kepada pengelola/Pemegang Perizinan Berusaha Pemanfaatan Hutan dalam hal areal Persetujuan Penggunaan Kawasan Hutan berada dalam Areal Kerja Pengelolaan Hutan/Perizinan Berusaha Pemanfaatan Hutan dapat dilakukan tanpa harus menunggu pemegang Persetujuan Penggunaan Kawasan Hutan mendapatkan Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan;

k) Pasal 400 ayat (1) dan ayat (2) :

(1) Penggantian biaya investasi dibayarkan oleh Pemegang Persetujuan Penggunaan Kawasan Hutan kepada pengelola hutan atau Pemegang Perizinan Berusaha Pemanfaatan Hutan berdasarkan kesepakatan paling lama 1 (satu) tahun;

(2) Dalam hal tidak terjadi kesepakatan nilai penggantian biaya investasi sebagaimana

dimaksud pada ayat (1) antara Pemegang Persetujuan Penggunaan Kawasan Hutan dengan Pengelola/Pemegang Perizinan Berusaha Pemanfaatan Hasil Hutan sampai dengan 1 (satu) tahun sejak ditetapkan batas areal penggunaan Kawasan Hutan, Direktur Jenderal yang membidangi Pengelolaan Hutan Lestari menetapkan nilai penggantian biaya investasi;

l) Pasal 406 ayat (2) huruf a, Persetujuan Penggunaan Kawasan Hutan diberikan dalam jangka waktu paling lama sesuai perizinan di bidangnya atau keputusan tentang tahap kegiatan untuk kegiatan eksplorasi dan kegiatan operasi produksi pertambangan meliputi pertambangan minyak dan gas bumi, mineral, dan batubara termasuk sarana dan prasarana;

m) Pasal 409 ayat (4), Persetujuan Penggunaan Kawasan Hutan dapat dilakukan perubahan berdasarkan permohonan atau tanpa permohonan dari Pemegang Persetujuan Penggunaan Kawasan Hutan apabila terdapat perubahan perizinan/perjanjian dibidangnya; perubahan dokumen lain yang menjadi dasar penerbitan Persetujuan Penggunaan Kawasan Hutan; dan/atau ketidaksesuaian Penggunaan Kawasan Hutan dengan perizinan/perjanjian di bidangnya dan/atau dokumen lingkungan;

n) Pasal 410 ayat (1), ayat (4),ayat (6), ayat (7), ayat (8), ayat (9), ayat (10), ayat (11) dan ayat (12) :

(1) Dalam hal areal Persetujuan Penggunaan Kawasan Hutan akan dilakukan perubahan berupa pengembalian sebagian dan pengembalian sebagian yang disertai penambahan, Pemegang Persetujuan Penggunaan Kawasan Hutan mengajukan permohonan kepada Menteri melalui Direktur, disertai hasil evaluasi;

(4) Hasil evaluasi antara lain memuat pemenuhan kewajiban pemegang Persetujuan Penggunaan Kawasan Hutan; kondisi tutupan areal yang akan dikembalikan; dan rekomendasi kelayakan areal Persetujuan Penggunaan Kawasan Hutan yang akan dikembalikan;

(6) Terhadap areal Persetujuan Penggunaan Kawasan Hutan yang telah dikembalikan sebagaimana dimaksud pada ayat (1) dan ayat (2) tidak dapat dimohonkan kembali oleh yang bersangkutan;

(7) Pemegang Persetujuan Penggunaan Kawasan Hutan yang mengajukan permohonan pengembalian sebagian areal, tetap dapat melakukan kegiatan di lapangan pada areal yang tidak dikembalikan;

(8) Pengembalian sebagian areal Persetujuan Penggunaan Kawasan Hutan tidak membebaskan Pemegang Persetujuan Penggunaan Kawasan Hutan untuk menyelesaikan kewajiban Persetujuan Penggunaan Kawasan Hutan pada areal yang dikembalikan;

(9) Besaran PNBP Penggunaan Kawasan Hutan yang wajib dibayarkan pada periode berikutnya berdasarkan pada luasan Persetujuan Penggunaan Kawasan Hutan perubahan sejak ditetapkan keputusan perubahan oleh Menteri;

(10) Dalam hal sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan merupakan areal yang belum terganggu, Pemegang Persetujuan Penggunaan Kawasan Hutan dapat mengajukan pengurangan luas areal penanaman dalam rangka Rehabilitasi DAS;

(11) Dalam hal pemegang perubahan Persetujuan Penggunaan Kawasan Hutan tidak dapat menyelesaikan Komitmen dalam jangka waktu 1 (satu) tahun, Persetujuan Penggunaan Kawasan Hutan dinyatakan tidak berlaku;

(12) Atas sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan dilakukan serah terima areal Persetujuan Penggunaan Kawasan Hutan, dengan ketentuan:

a) pada wilayah kerja perum perhutani dilakukan antara direktur utama perum perhutani dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

b) pada Kawasan Hutan yang telah dibebani izin pemanfaatan hutan dilakukan antara pemegang izin pemanfaatan dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

c) pada Kawasan Hutan selain huruf a) dan huruf b), dilakukan antara Kepala Dinas Provinsi dengan Pemegang

Persetujuan Penggunaan Kawasan Hutan;

o) Pasal 531 huruf m, permohonan Persetujuan Penggunaan Kawasan Hutan pada areal yang belum dilakukan penetapan Kecukupan Luas Kawasan Hutan provinsi sebelum berlakunya Peraturan Menteri ini, tetap diproses berdasarkan batasan Kecukupan Luas Kawasan Hutan yang telah ditetapkan sebelumnya;

p) Pasal 532 ayat (5), Dalam hal pada areal permohonan Persetujuan Penggunaan Kawasan Hutan belum dilakukan penetapan kecukupan luas Kawasan Hutan provinsi, batasan kecukupan luas Kawasan Hutan adalah 30 % (tiga puluh persen) dari luas provinsi;

3) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, Serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi :

a) Pasal 28 huruf a dan Pasal 29 ayat (1), Penggantian biaya investasi sebagai akibat adanya persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, *conveyor*, dan *smelter* pada sebagian areal kerja pengelola/pemegang pengelolaan/PBPH dilaksanakan dengan prinsip kelestarian Hutan, keberlanjutan usaha, keadilan, kelayakan/kepatutan, transparansi, dan bertanggung gugat dan besarnya nilai penggantian biaya investasi ditetapkan Direktur Jenderal;

b) Pasal 32 ayat (1) dan ayat (2), Pemegang persetujuan Penggunaan Kawasan Hutan menyampaikan permohonan penetapan besarnya nilai penggantian biaya investasi kepada Direktur Jenderal dan pihak terkait dan permohonan penghitungan penggantian biaya investasi diajukan setelah terbitnya penetapan batas areal kerja persetujuan Penggunaan Kawasan Hutan;

c) Pasal 33 ayat (1) dan ayat (3), Direktur Jenderal menetapkan besarnya nilai penggantian biaya investasi setelah menerima hasil kajian dari tim dan penetapan penggantian biaya investasi sebagaimana dimaksud pada ayat (1) bersifat final dan mengikat kedua belah pihak;

d) Pasal 34 ayat (1) dan ayat (4), Pemegang Persetujuan Penggunaan Kawasan Hutan menyelesaikan pembayaran penggantian biaya investasi kepada pengelola/pemegang pengelolaan/PBPH paling lama 1 (satu) tahun setelah tanggal penetapan nilai penggantian biaya investasi dan dalam hal pembayaran sebagaimana dimaksud pada ayat (1) tidak diselesaikan sesuai batas waktu yang ditetapkan, Menteri melalui direktur jenderal yang membidangi urusan planologi kehutanan dan tata lingkungan, mengenakan Sanksi Administratif sesuai dengan ketentuan peraturan perundang-undangan;

f. bahwa berdasarkan pertimbangan tersebut huruf a sampai dengan huruf e, perlu menetapkan Keputusan Menteri Lingkungan Hidup dan Kehutanan tentang Perubahan Persetujuan Penggunaan Kawasan Hutan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo dari seluas ± 875,72 Ha (delapan ratus tujuh puluh lima dan tujuh puluh dua perseratus hektare) menjadi seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah;

Mengingat : 1. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumberdaya Alam Hayati dan Ekosistemnya;

2. Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

3. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

4. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

5. Undang-Undang Nomor 18 Tahun 2013 tentang Pencegahan dan Pemberantasan Perusakan Hutan,

sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

6. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;
7. Undang-Undang Nomor 9 Tahun 2018 tentang Penerimaan Negara Bukan Pajak;
8. Peraturan Pemerintah Nomor 26 Tahun 2008 tentang Rencana Tata Ruang Wilayah Nasional, sebagaimana telah diubah beberapa kali, terakhir dengan Peraturan Pemerintah Nomor 21 Tahun 2021 tentang Penyelenggaraan Penataan Ruang;
9. Peraturan Pemerintah Nomor 12 Tahun 2014 tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berlaku pada Kementerian Kehutanan;
10. Peraturan Pemerintah Nomor 33 Tahun 2014 tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berasal dari Penggunaan Kawasan Hutan untuk Kepentingan Pembangunan di Luar Kegiatan Kehutanan yang Berlaku pada Kementerian Kehutanan;
11. Peraturan Pemerintah Nomor 26 Tahun 2020 tentang Rehabilitasi dan Reklamasi Hutan;
12. Peraturan Pemerintah Nomor 1 Tahun 2021 tentang Tata Cara Pemeriksaan Penerimaan Negara Bukan Pajak;
13. Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup;
14. Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan;
15. Peraturan Pemerintah Nomor 24 Tahun 2021 tentang Tata Cara Pengenaan Sanksi Administratif dan Tata Cara Penerimaan Negara Bukan Pajak yang berasal dari Denda Administratif Bidang Kehutanan;
16. Peraturan Pemerintah Nomor 43 Tahun 2021 tentang Penyelesaian Ketidaksesuaian Tata Ruang, Kawasan Hutan, Izin dan/atau Hak atas Tanah;
17. Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara, sebagaimana telah diubah dengan Peraturan Presiden Nomor 32 Tahun 2021;
18. Peraturan Presiden Nomor 92 Tahun 2020 tentang Kementerian Lingkungan Hidup dan Kehutanan;

19. Instruksi Presiden Nomor 5 Tahun 2019 tentang Penghentian Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut;
20. Peraturan Menteri Kehutanan Nomor P.56/Menhut-II/2008 tentang Tata Cara Penentuan Luas Areal Terganggu dan Areal Reklamasi dan Revegetasi untuk Perhitungan Penerimaan Negara Bukan Pajak Penggunaan Kawasan Hutan, sebagaimana telah beberapa kali diubah terakhir dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.51/Menlhk/Setjen/Kum.1/9/2019;
21. Peraturan Menteri Kehutanan Nomor P.60/Menhut-II/2009 tentang Pedoman Penilaian Keberhasilan Reklamasi Hutan;
22. Peraturan Menteri Keuangan Nomor 91/PMK.02/2009 tentang Tata Cara Pengenaan, Pemungutan dan Penyetoran Penerimaan Negara Bukan Pajak yang Berasal dari Penggunaan Kawasan Hutan untuk Kepentingan Pembangunan di Luar Kegiatan Kehutanan;
23. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.32/MenLHK/Setjen/Kum.1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan;
24. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.59/Menlhk/Setjen/Kum.1/10/2019 tentang Penanaman Dalam Rangka Rehabilitasi Daerah Aliran Sungai;
25. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 4 Tahun 2021 tentang Daftar Usaha dan/atau Kegiatan yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup, Upaya Pengelolaan Lingkungan Hidup dan Upaya Pemantauan Lingkungan Hidup atau Surat Pernyataan Kesanggupan Pengelolaan dan Pemantauan Lingkungan Hidup;
26. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, Serta Penggunaan Kawasan Hutan;
27. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, Serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi;
28. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 15 Tahun 2021 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan;
29. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.5050/MenLHK-PKTL/KUH/PLA.2/9/2020 tentang Peta Indikatif Alokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria /TORA (Revisi V);

30. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.7594/MENLHK-PKTL/IPSDH/PLA.1/9/2022 tentang Penetapan Peta Indikatif Penghentian Pemberian Perizinan Berusaha, Persetujuan Penggunaan Kawasan Hutan, atau Persetujuan Perubahan Peruntukan Kawasan Hutan Baru pada Hutan Alam Primer dan Lahan Gambut Tahun 2022 Periode II;
31. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.8/MENLHK-PKTL/REN/PLA.0/1/2023 tentang Peta Indikatif dan Areal Perhutanan Sosial (Revisi VIII);

Memperhatikan :

1. Dokumen Adenddum ANDAL dan RKL-RPL untuk Kegiatan Kegiatan Pertambangan Bijih Nikel PT Hengjaya Mineralindo;
2. Dokumen Adenddum ANDAL dan RKL-RPL untuk Rencana Kegiatan Pembangunan Jalan Angkut Kegiatan Pertambangan Bijih Nikel/*Mine Hauling Road* (MHR) a.n. PT Hengjaya Mineralindo, Tahun 2021;
3. Dokumen Adendum ANDAL Rencana Perubahan Jalan Angkut Nikel A1-B1 sepanjang ± 9.944 m menjadi segmen A1-A2-A3-B-B1 sepanjang ± 6.284 m a.n. PT Hengjaya Mineralindo, Tahun 2022;
4. Keputusan Bupati Morowali Nomor 11/HM/IX/2011 tanggal 19 September 2011 tentang Kelayakan Lingkungan Hidup Kegiatan Pertambangan Bijih Nikel di Kabupaten Morowali, Provinsi Sulawesi Tengah oleh PT Hengjaya Mineralindo;
5. Keputusan Kepala Dinas PMPTSP Kabupaten Morowali Nomor 188.4/KEP.038/ DPMPTSP/VI/2021 tanggal 14 Juni 2021 tentang Kelayakan Lingkungan Hidup Rencana Kegiatan Pembangunan Jalan Angkut Kegiatan Pertambangan Bijih Nikel/Mine Hauling Road (MHR) oleh PT Hengjaya Mineralindo dari Desa Bete-Bete ke Kawasan Industri PT Indonesia Morowali Industrial Park;
6. Keputusan Kepala Dinas PMPTSP Kabupaten Morowali Nomor 188.4/Kep.039/IL/DPMPTSP/VI/2021 tanggal 14 Juni 2021 tentang Izin Lingkungan Rencana Kegiatan Pembangunan Jalan Angkut Kegiatan Pertambangan Bijih Nikel/Mine Hauling Road (MHR) oleh PT Hengjaya Mineralindo dari Desa Bete-Bete ke Kawasan Industri PT Indonesia Morowali Industrial Park;
7. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.943/MENLHK/SETJEN/PLA.4/8/2022 tanggal 26 Agustus 2022 tentang Kelayakan Lingkungan Hidup Kegiatan Perubahan Jalan Angkut Nikel pada Segmen A1-B1 sepanjang ± 9.944 m menjadi segmen A1-A2-A3-B-B1 sepanjang ± 6.284 m

di Kabupaten Morowali, Provinsi Sulawesi Tengah oleh PT Hengjaya Mineralindo;

8. Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 522/01.84/Bid.P2H tanggal 7 Januari 2022 hal Pertimbangan Teknis atas Permohonan Rekomendasi PPKH untuk Kegiatan Pembangunan Jalan Tambang a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah;
9. Surat Gubernur Sulawesi Tengah Nomor 522/08/ DISHUT tanggal 11 Januari 2022 hal Rekomendasi Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Pembangunan Jalan Tambang a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah;
10. Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 522/17-86/Bid.P2H tanggal 8 Mei 2023 hal Pengantar Laporan Hasil Evaluasi Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo;
11. Laporan Hasil Evaluasi Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah;
12. Matrik dan peta baseline persetujuan penggunaan kawasan hutan skala 1 : 20.000, a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah yang ditandatangani oleh Direktur PT Hengjaya Mineralindo;
13. Peta Citra Resolusi Tinggi Planet Scope, Liputan bulan September 2022 skala 1: 20.000;
14. Pernyataan Komitmen sesuai Akta Nomor 04 tanggal 10 April 2023 yang dibuat di hadapan Indriana, S.H., M.Kn; Notaris di Kota Tanggerang;
15. Pakta Integritas sesuai Akta Nomor 05 tanggal 10 April 2023 yang dibuat di hadapan Indriana, S.H., M.Kn; Notaris di Kota Tanggerang
16. Kronologis dan Telaah Perubahan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/Mine Hauling Road, dan Sarana Penunjangnya a.n. PT Hengjaya Mineralindo pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas ± 875,45 Ha, Lampiran surat Plt. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor S.616/PKTL/REN/PLA.0/6/2023 tanggal 12 Juni 2023;

MEMUTUSKAN:

Menetapkan : KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN TENTANG PERUBAHAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN DAN PENGGABUNGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI BIJIH NIKEL, PEMBANGUNAN JALAN ANGKUT PERTAMBANGAN BIJIH NIKEL/*MINE HAULING ROAD* DAN SARANA PENUNJANGNYA ATAS NAMA PT HENGJAYA MINERALINDO DARI SELUAS ± 875,72 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN TUJUH PULUH DUA PERSERATUS HEKTARE) MENJADI SELUAS ± 875,45 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN EMPAT PULUH LIMA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TERBATAS DI KABUPATEN MOROWALI, PROVINSI SULAWESI TENGAH.

KESATU : Memberikan Perubahan Persetujuan Penggunaan Kawasan Hutan berupa Pengembalian Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) dan Penambahan Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) serta Penggabungan Persetujuan Penggunaan Kawasan Hutan berdasarkan Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 dan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober 2022, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/ PLA.0/1/2023 tanggal 11 Januari 2023 untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya kepada PT Hengjaya Mineralindo dari seluas ± 875,72 Ha (delapan ratus tujuh puluh lima dan tujuh puluh dua perseratus hektare) menjadi seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana peta lampiran Keputusan ini, dengan rincian :

1. Areal Pengembalian Persetujuan Penggunaan Kawasan Hutan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013;
2. Areal Penambahan Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober

2022, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/ MENLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023;

3. Areal yang dipertahankan seluas 815,40 Ha (delapan ratus lima belas dan empat puluh perseratus hektare) berdasarkan Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 dan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober 2022, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023;
4. Areal Perubahan berupa Penggabungan Persetujuan Penggunaan Kawasan Hutan seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) untuk untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya.

KEDUA : Pemberian Perubahan dan Penggabungan Persetujuan sebagaimana dimaksud dalam Amar KESATU adalah untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo, bukan untuk kegiatan lain serta arealnya tetap berstatus sebagai kawasan hutan.

KETIGA : PT Hengjaya Mineralindo berhak :

a. berada, menempati dan mengelola serta melakukan kegiatan-kegiatan yang meliputi rencana Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya, serta melakukan kegiatan-kegiatan lainnya yang berhubungan dengan kegiatan tersebut dalam kawasan hutan yang digunakan;
b. memanfaatkan hasil kegiatan yang dilakukan sehubungan dengan rencana Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya dalam kawasan hutan yang digunakan;
c. melakukan penebangan pohon dalam rangka pembukaan lahan yang tidak dapat dielakkan dengan membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan.

KEEMPAT : Dalam jangka waktu paling lama 1 (satu) tahun setelah Perubahan Persetujuan Penggunaan Kawasan Hutan ini ditetapkan, PT Hengjaya Mineralindo wajib:

a. menyelesaikan tata batas areal perubahan Persetujuan Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan dengan supervisi Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu dan tidak dapat diperpanjang;

b. menyampaikan perubahan *baseline* penggunaan kawasan hutan dan peta baseline skala paling kecil 1:50.000 atau skala terbesar pada lokasi tersebut dengan informasi luas kawasan hutan yang dimohon dalam bentuk *hardcopy* dan *softcopy* format *shapefile* (shp) dengan koordinat sistem UTM Datum WGS 84 sesuai dengan hasil tata batas dan dokumen lingkungan;

c. menyampaikan pernyataan bersedia mengganti biaya investasi pengelolaan/pemanfaatan hutan kepada pengelola/pemegang Perizinan Berusaha Pemanfaatan Hutan dalam bentuk Akta Notariil, dalam hal ini kepada Pengelolaan Wilayah KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah.

KELIMA : Dalam hal PT Hengjaya Mineralindo tidak memenuhi kewajiban sebagaimana dimaksud pada Amar KEEMPAT, Persetujuan Penggunaan Kawasan Hutan dibatalkan sesuai ketentuan peraturan perundang-undangan.

KEENAM : Penetapan Areal Kerja Persetujuan Penggunaan Kawasan Hutan oleh Menteri Lingkungan Hidup dan Kehutanan, dilaksanakan dengan ketentuan :

a. pemegang Persetujuan Penggunaan Kawasan Hutan menyampaikan permohonan penetapan areal kerja berdasarkan hasil tata batas areal Persetujuan Penggunaan Kawasan Hutan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;

b. permohonan penetapan areal kerja sebagaimana dimaksud pada huruf a, dilampiri dengan bukti pemenuhan kewajiban sebagaimana dimaksud Amar KEEMPAT.

KETUJUH : PT Hengjaya Mineralindo wajib :

a. melakukan penanaman dalam rangka rehabilitasi Daerah Aliran Sungai (DAS) sesuai dengan ketentuan peraturan perundang-undangan;

b. membuat rencana dan melaksanakan reklamasi, revegetasi dan/atau reboisasi pada Kawasan Hutan yang diberikan Persetujuan Penggunaan Kawasan Hutan yang sudah tidak digunakan sesuai dengan ketentuan peraturan perundang-undangan;

c. membayar PNBP Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan;

d. mengganti biaya investasi kepada pengelola/pemegang pengelolaan Perizinan Berusaha Pemanfaatan Hutan

sesuai dengan ketentuan peraturan perundang-undangan;

e. melaksanakan inventarisasi tegakan sesuai dengan rencana kerja penggunaan kawasan hutan tahunan;

f. membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan;

g. membayar ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil rehabilitasi;

h. melaksanakan Perlindungan Hutan atas areal Persetujuan Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan, paling sedikit meliputi kegiatan :

   h.1. mengamankan areal kerjanya yang menyangkut hutan, kawasan hutan, dan hasil hutan termasuk tumbuhan dan satwa;

   h.2. mencegah kerusakan hutan dari perbuatan manusia dan ternak, kebakaran hutan, hama, dan penyakit serta daya-daya alam;

   h.3. mengambil tindakan pertama yang diperlukan terhadap adanya gangguan keamanan hutan di areal kerjanya;

   h.4. melaporkan setiap adanya kejadian pelanggaran hukum di areal kerjanya kepada instansi Kehutanan yang terdekat;

   h.5. menyediakan sarana dan prasarana, serta tenaga pengamanan hutan yang sesuai dengan kebutuhan;

i. melaksanakan perlindungan satwa liar dan/atau satwa yang dilindungi khususnya jenis satwa babirusa, jenis satwa liar endemik, langka dan dilindungi lainnya pada areal Persetujuan Penggunaan Kawasan Hutan sesuai Standar Operasional Prosedur/SOP perlindungan satwa liar, diantaranya dengan:

   i.1. membantu pengayaan konservasi jenis-jenis flora dan fauna endemik, langka dan dilindungi yang dijumpai di kawasan ini oleh instansi pemerintah daerah setempat, sebagai bagian dari program pelestarian sumberdaya alam dan lingkungan hidup;

   i.2. melakukan kerjasama/konsultasi dengan instansi /institusi terkait dalam mendukung upaya rehabilitasi flora dan fauna serta melakukan kerjasama dengan berbagai pihak lainnya untuk memberikan penyuluhan tentang pentingnya pelestarian areal konservasi dan agar masyarakat tidak berburu terutama pada hewan yang dilindungi;

   i.3. melakukan identifikasi flora dan fauna pada areal-areal terganggu untuk kegiatan pertambangan dan pembersihan dilakukan dengan menekan

seminimal mungkin areal-areal terganggu pada semua pit tambang serta melakukan identifikasi pohon-pohon di lokasi pembersihan lahan yang merupakan habitat atau sumber pangan satwa liar untuk dikembalikan keberadaannya sesuai peruntukan kawasan pada saat pasca tambang (reklamasi dan revegetasi);

i.4. melakukan inventarisasi (*identifikasi*) flora (tumbuhan) dan fauna (satwa) pada areal-areal terganggu dalam kegiatan operasi produksi;

i.5. memasang papan informasi terkait perlindungan flora dan fauna di lokasi-lokasi yang dilindungi di dalam lokasi tambang dan mengenai pentingnya kelestarian hutan dan larangan menebang pohon, membakar dan larangan perburuan terhadap satwa liar pada lokasi strategis yang mudah dibaca;

i.6. menjaga kawasan lindung (sempadan sungai, danau, sumber mata air dan lain-lain) sesuai dengan ketentuan peraturan perundang-undangan;

i.7. melakukan beberapa pendekatan diantaranya sosial ekonomi yaitu dengan mengarahkan tenaga kerja untuk tidak melakukan penangkapan hewan liar yang dilindungi, pendekatan teknologi yaitu dengan pembuatan koridor satwa, dan pendekatan institusi yaitu dengan melakukan koordinasi dengan instansi terkait;

i.8. kegiatan pembukaan dan pembersihan lahan hanya dilakukan pada luas minimal yang diperlukan saja dan agar managemen perusahaan mudah dalam mengontrol kegiatan pembukaan dan pembersihan lahan di lapangan, maka pelaksanaannya sesuai dengan perencanaan yang telah ditetapkan;

i.9. mencadangkan adanya kawasan konservasi sebagai kantong-kantong flora dan fauna pada tahap pra konstruksi, menyiapkan kantong-kantong satwa pada tahap konstruksi, dan melakukan penggiringan satwa-satwa ke kantong satwa tersebut;

i.10. apabila memungkinkan menghindari penebangan pohon-pohon dalam daerah yang dilewati di luar wilayah front kerja penambangan dan melakukan kegiatan penanaman kembali (revegetasi) pada lahan-lahan terbuka yang sudah tidak dipergunakan (pasca tambang);

i.11. pada lahan terbuka di sepanjang jalan tambang dilakukan penanaman pohon/revegetasi untuk melindungi lingkungan (*buffer zone*) khususnya dalam upaya pengendalian dampak terhadap kualitas udara di sekitarnya. Apabila di areal tersebut di atas masih dijumpai vegetasi dengan

kondisi yang cukup baik, maka vegetasi tersebut perlu dijaga jangan sampai rusak untuk dimanfaatkan sebagai *buffer zone*;

i.12. kawasan bernilai konservasi/*buffer zone* dan vegetasi alami yang merupakan habitat satwa liar semaksimal mungkin diupayakan tidak terganggu dan tetap dilakukan pengayaan tanaman sehingga keberadaan tanaman tetap dipertahankan;

i.13. melaksanakan perlindungan satwa liar sesuai Standar Operasional Prosedur dari surat Plt. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem Nomor SOP.1/KSDAE/SET.3/KSA.2/12/2022 tanggal 7 Desember 2022 tentang Perlindungan Satwa Liar di Dalam dan di Luar Kawasan Hutan.

j. melakukan pengendalian kebakaran hutan dan lahan, berupa antara lain:

j.1. menyiapkan Sumberdaya Manusia pengendalian kebakaran hutan dalam Brigade Pengendalian Kebakaran Hutan dan Lahan (Brigdalkarhutla);

j.2. menempatkan sekurang-kurangnya 1 (satu) Regu Inti Pengendali Kebakaran Hutan;

j.3. merekrut karyawan pada perusahaan sebagai anggota Regu Pendukung Pengendali Kebakaran Hutan;

j.4. menyiapkan sarana dan prasarana (sarpras) untuk menunjang kegiatan Brigdalkarhutla antara lain sarpras pencegahan kebakaran hutan dan sarpras pemadaman kebakaran hutan

k. melakukan pemeliharaan batas areal Persetjuan Penggunaan Kawasan Hutan;

l. mengamankan kawasan Hutan Konservasi dan Hutan Lindung dalam hal areal penggunaan kawasan hutan berbatasan dengan kawasan hutan konservasi dan Hutan Lindung sesuai dengan ketentuan peraturan perundang-undangan, dan berkoordinasi dengan :

l.1. Kepala Balai Besar/Kepala Unit Pelaksana Teknis (UPT) yang membidangi urusan kawasan hutan konservasi, untuk kawasan hutan konservasi;

l.2. Kepala Dinas Provinsi atau Direktur Utama Perum Perhutani dalam hal berada pada wilayah kerja Perum Perhutani, untuk Kawasan Hutan Lindung;

l.3. Kepala Kesatuan Pengelolaan Hutan/KPH;

m. memberikan kemudahan bagi aparat Kementerian Lingkungan Hidup dan Kehutanan baik pusat maupun daerah pada saat melakukan monitoring dan evaluasi di lapangan;

n. mengkoordinasikan kegiatan kepada Instansi Lingkungan Hidup dan Kehutanan setempat dan/atau kepada pemegang perizinan berusaha pemanfaatan hutan atau pengelola hutan;

o. melakukan pemberdayaan masyarakat sekitar areal Persetujuan Penggunaan Kawasan Hutan;

p. melakukan kegiatan persiapan penggunaan kawasan hutan secara bertahap untuk menjaga penurunan emisi karbon sampai dengan 0 % (nol persen) sesuai rencana tahun 2030;

q. melaksanakan kewajiban lain yang ditetapkan oleh Menteri;

r. membuat laporan berkala setiap 6 (enam) bulan sekali secara *online* kepada Menteri Lingkungan Hidup dan Kehutanan mengenai penggunaan kawasan hutan dengan tembusan disampaikan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan, Direktur Jenderal Pengelolaan Hutan Lestari, Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan, Kepala Dinas Kehutanan Provinsi Sulawesi Tengah, Kepala Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu, dan Kepala Balai Pengelolaan Daerah Aliran Sungai Palu Poso.

KEDELAPAN : PT Hengjaya Mineralindo dilarang:

a. memindahtangankan Persetujuan Penggunaan Kawasan Hutan kepada pihak lain atau melakukan perubahan nama pemegang Persetujuan Penggunaan Kawasan Hutan tanpa persetujuan Menteri;

b. menjaminkan atau mengagunkan areal Penggunaan Kawasan Hutan kepada pihak lain;

c. melakukan kegiatan penambangan di dalam areal Penggunaan Kawasan Hutan :

   1. seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) pada areal yang dikembalikan, kecuali untuk melakukan kewajiban yang belum dilaksanakan;

   2. seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) pada areal penambahan sebelum memperoleh penetapan batas areal kerja Penggunaan Kawasan Hutan, dikecualikan untuk kegiatan penyelesaian pemenuhan Komitmen dan persiapan berupa membuat kegiatan persiapan, diantaranya pembangunan direksi kit (*basecamp* sementara); pengukuran sarana dan prasarana; dan penyusunan dokumen lingkungan, dalam hal Persetujuan Penggunaan Kawasan Hutan diterbitkan belum memiliki dokumen lingkungan;

d. menggunakan merkuri dalam melakukan kegiatan pertambangan;

e. melakukan kegiatan lainnya yang dilarang sesuai ketentuan peraturan perundang-undangan.

KESEMBILAN : PT Hengjaya Mineralindo wajib menyelesaikan hak-hak pihak ketiga, apabila terdapat hak-hak pihak ketiga di dalam areal Persetujuan Penggunaan Kawasan Hutan dengan meminta bimbingan dan fasilitasi Pemerintah Daerah setempat.

KESEPULUH : Perubahan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan ini dicabut dan pemegang persetujuan dikenakan sanksi sesuai peraturan perundang-undangan, apabila melakukan pelanggaran atas ketentuan dalam Keputusan ini.

KESEBELAS : Perubahan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan ini berlaku dan melekat sebagai persetujuan pemanfaatan kayu, serta persetujuan pemasukan dan penggunaan peralatan.

KEDUA BELAS : Perpanjangan Persetujuan Penggunaan Kawasan Hutan diberikan dengan mempertimbangkan hasil evaluasi terhadap pemenuhan kewajiban Persetujuan Penggunaan Kawasan Hutan dan diajukan oleh pemegang Persetujuan Penggunaan Kawasan Hutan sebelum berakhirnya Persetujuan Penggunaan Kawasan Hutan.

KETIGA BELAS : 1. PT Hengjaya Mineralindo sebagai Pemegang Persetujuan Penggunaan Kawasan Hutan yang mengajukan permohonan pengembalian sebagian areal yang disertai dengan penambahan areal, tetap dapat melakukan kegiatan di lapangan pada areal seluas 815,40 Ha (delapan ratus lima belas dan empat puluh perseratus hektare) yang tidak dikembalikan dan/atau yang dipertahankan, bersamaan dengan melakukan kegiatan untuk menyelesaikan kewajiban komitmen dalam jangka waktu paling lama 1 (satu) tahun sebagaimana dimaksud dalam Amar KEEMPAT.

2. Terhadap areal seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) yang dikembalikan, tidak membebaskan PT Hengjaya Mineralindo untuk menyelesaikan kewajiban persetujuan penggunaan kawasan hutan yang belum dilakukan dan areal yang telah dikembalikan tidak dapat dimohonkan kembali oleh PT Hengjaya Mineralindo. Namun untuk kewajiban penanaman dalam rangka rehabilitasi DAS, dalam hal sebagian areal persetujuan penggunaan kawasan hutan yang dikembalikan merupakan areal yang belum terganggu, PT Hengjaya Mineralindo selaku pemegang persetujuan penggunaan kawasan hutan dapat mengajukan pengurangan luas areal penanaman dalam rangka rehabilitasi DAS;

3. Pembayaran PNBP Penggunaan Kawasan Hutan yang wajib dibayarkan oleh PT Hengjaya Mineralindo pada periode berikutnya berdasarkan pada luasan perubahan Persetujuan Penggunaan Kawasan Hutan sejak ditetapkan oleh Menteri, dengan jatuh tempo pembayaran PNBP PKH untuk PT Hengjaya Mineralindo menjadi setiap tanggal 16 Juni.

4. Atas sebagian areal yang dikembalikan oleh PT Hengjaya Mineralindo seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) dilakukan serah terima, dengan ketentuan pada kawasan hutan yang telah dibebani izin pemanfaatan hutan dilakukan antara pemegang izin pemanfaatan hutan dengan PT Hengjaya Mineralindo selaku pemegang persetujuan penggunaan kawasan hutan, sedangkan selain kawasan hutan yang telah dibebani izin pemanfaatan hutan, dilakukan antara Kepala Dinas Provinsi yang membidangi kehutanan dengan PT Hengjaya Mineralindo selaku Pemegang Persetujuan Penggunaan Kawasan Hutan;

5. Dengan ditetapkannya Keputusan ini, maka :
   a. Keputusan Menteri Kehutanan Nomor SK.443/ Menhut-II/2013 tanggal 20 Juni 2013 tentang IPPKH untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas a.n. PT Hengjaya Mineralindo, yang terletak di Kecamatan Bahodopi dan Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus) hektare beserta peta lampirannya, dicabut dan dinyatakan tidak berlaku;
   b. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/ PLA.0/10/2022 tanggal 7 Oktober 2022 tentang Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya atas nama PT. Hengjaya Mineralindo seluas ± 24,58 Ha (dua puluh empat dan lima puluh delapan perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/PLA.0/ 1/2023 tanggal 11 Januari 2023 menjadi seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare) beserta peta lampirannya, dicabut dan dinyatakan tidak berlaku.

KEEMPAT BELAS : Keputusan ini mulai berlaku pada tanggal ditetapkan untuk jangka waktu paling lama sampai dengan tanggal 26 Mei 2031, kecuali apabila dicabut oleh Menteri Lingkungan Hidup dan Kehutanan.

Ditetapkan di Jakarta
pada tanggal 19 Juni 2023

Salinan sesuai dengan aslinya
KEPALA BIRO HUKUM,

SUPARDI

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

ttd.

SITI NURBAYA

Salinan Keputusan ini disampaikan kepada Yth.:
1. Menteri Koordinator Bidang Kemaritiman dan Investasi;
2. Menteri Investasi/Kepala Badan Koordinasi Penanaman Modal;
3. Menteri Energi dan Sumber Daya Mineral;
4. Gubernur Sulawesi Tengah;
5. Sekretaris Jenderal Kementerian Lingkungan Hidup dan Kehutanan;
6. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;
7. Direktur Jenderal Pengelolaan Hutan Lestari;
8. Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan;
9. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem;
10. Direktur Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan;
11. Direktur Jenderal Pengendalian Pencemaran dan Kerusakan Lingkungan;
12. Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral;
13. Direktur Rencana dan Penggunaan Kawasan Hutan dan Pembentukan Wilayah Pengelolaan Hutan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan;
14. Direktur Pencegahan Dampak Lingkungan Usaha dan Kegiatan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan;
15. Direktur Konservasi Tanah dan Air, Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan;
16. Bupati Morowali;
17. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah;
18. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah;
19. Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah;
20. Kepala Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah;
21. Kepala Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu;
22. Kepala Balai Pengelolaan Hutan Lestari Wilayah XII Palu;
23. Kepala Balai Pengelolaan Daerah Aliran Sungai Palu Poso;
24. Kepala KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;
25. Direktur PT Hengjaya Mineralindo.

APL

HL

HPT

KPH Unit XIV - KPHP Tepe Asa Maroso Sulawesi Tengah

APL

2°51'0"S

2°54'30"S

LAMPIRAN KE
KI
NOMOR
TANGGAL
MENTERI LINGKUNG

KETERANGAN :

- Batas areal izin usaha pertam
- Batas areal IPPKH/PPKH a.n. P
  Menteri Kehutanan Nomor SK.4
  Kehutanan Nomor SK.1060/Mer
  Direktur Jenderal Planologi Keh
  tanggal 11 Januari 2023 seluas
- Batas sebagian areal IPPKH ses
- Batas areal penambahan PPKH
- Pal atau Tanda Batas
- HL — Kawasan Hutan Lindung
- HPT — Kawasan Hutan Produksi Terbe
  (Berdasarkan Pasal 294 huruf b
  Terbatas sebelum berlakunya p
  fungsinya sebagai Hutan Produ
- HPK — Kawasan Hutan Produksi yang
- APL — Areal Penggunaan Lain
- Batas KPH
- Areal PPKH Lainnya
- Sungai dan anak sungai
- Jalan

Catatan :

*Batas areal pengelolaan hutan dan batas areal PPKH lain*

DASAR :

- Instruksi Presiden Republik Indonesia Nomor 5 Tah
- Keputusan Menteri Kehutanan Nomor SK.443/Men
- Keputusan Menteri Kehutanan Nomor SK.869/Men
  dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla
- Keputusan Menteri Lingkungan Hidup dan Kehutan
- Keputusan Menteri Lingkungan Hidup dan Kehutan
- Keputusan Menteri Lingkungan Hidup dan Kehutan
- Surat Gubernur Sulawesi Tengah Nomor SK.522/0E
- Surat Kepala Dinas Kehutanan Provinsi Sulawesi T
- Keputusan Bupati Morowali Nomor 540.3/SK.001/D
- Keputusan Kepala Dinas Penanaman Modal dan P
  540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tan
- Keputusan Direktur Jenderal Planologi Kehutanan
  tanggal 11 Januari 2023
- Surat Kepala Dinas Provinsi Sulawesi Tenggara No
- Berita Acara Hasil Evaluasi Dinas Provinsi Sulawesi
- Surat Direktur Utama PT Hengjaya Mineralindo Nor

SUMBER :

- Peta Rupa Bumi Indonesia (RBI), skala 1 : 50.000
- Peta Kawasan Hutan dan Konservasi Perairan Pro
  tanggal 29 September 2014) sebagaimana telah di
  tanggal 30 November 2020
- Peta lampiran Keputusan Menteri Kehutanan Nom
- Peta lampiran Keputusan Menteri Lingkungan Hidu
- Peta lampiran Keputusan Menteri Lingkungan Hidu
- Peta lampiran Keputusan Direktur Jenderal Planolo
  SK.53/MenbLHK-PKTL/Ren/Pla.0/1/2023 tanggal 1
- Peta lampiran Keputusan Bupati Morowali Nomor 5
- Peta lampiran Keputusan Kepala Dinas Penanaman
  a.n. Gubernur Sulawesi Tengah Nomor 540/345/IU
- Peta lampiran Surat Gubernur Sulawesi Tengah No
- Peta lampiran Surat Direktur Utama PT Hengjaya M
  10 Mei 2023

121°40'0"E 121°50'0"E

PETA SITUASI
SKALA 1 : 1.000.000

# PETA
## PERUBAHAN DAN PENGGABUNGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI BIJIH NIKEL, PEMBANGUNAN JALAN ANGKUT PERTAMBANGAN BIJIH NIKEL DAN SARANA PENUNJANGNYA PADA KAWASAN HUTAN PRODUKSI TERBATAS (HPT)

## a.n. PT HENGJAYA MINERALINDO

**DI KABUPATEN MOROWALI**
**PROVINSI SULAWESI TENGAH**
**LUAS ± 875,45 Ha**
**SKALA 1 : 50.000**

0 0,5 1 2,5 5 Km
0 1 2 5 10 Cm

U

**LAMPIRAN KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA**

**NOMOR** : SK.644/MENLHK/SETJEN/PLA.0/6/2023
**TANGGAL** : 19 Juni 2023

**MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,**

**Ir. SITI NURBAYA**

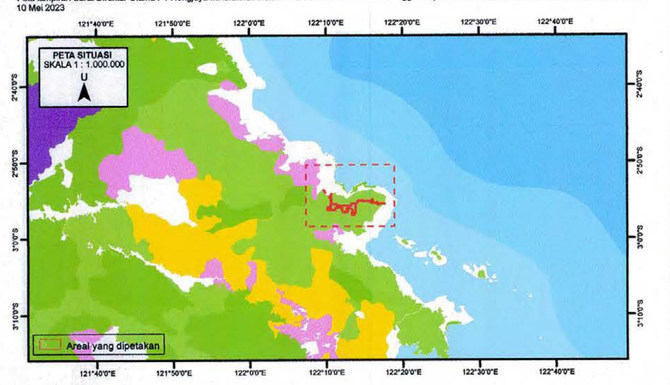
**KETERANGAN :**

- Batas areal izin usaha pertambangan operasi produksi bijih nikel a.n. PT Hengjaya Mineralindo
- Batas areal IPPKH/PPKH a.n. PT Hengjaya Mineralindo yang terdiri dari IPPKH sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 seluas 851,22 Ha, dan sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1050/MenLHK/Setjen/Pla.0/10/2022 tanggal 7 Oktober 2022 yang telah mendapatkan Penetapan Areal Kerja sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MenLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023 seluas 24,50 Ha
- Batas sebagian areal IPPKH sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 yang dikembalikan seluas ±60,32 Ha
- Batas areal penambahan PPKH seluas ±60,05 Ha
- Pal atau Tanda Batas
- HL — Kawasan Hutan Lindung
- HPT — Kawasan Hutan Produksi Terbatas (Berdasarkan Pasal 294 huruf b Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan, bahwa Kawasan Hutan Produksi Terbatas sebelum berlakunya peraturan ini, dinyatakan tetap berlaku sesuai dengan tahap pengukuhannya serta diberlakukan peruntukan dan fungsinya sebagai Hutan Produksi Tetap)
- HPK — Kawasan Hutan Produksi yang dapat di Konversi
- APL — Areal Penggunaan Lain
- Batas KPH
- Areal PPKH Lainnya
- Sungai dan anak sungai
- Jalan

Catatan :
*Batas areal pengelolaan hutan dan batas areal PPKH lainnya yang tergambar dalam peta tidak sepenuhnya dapat dijadikan acuan penentuan batas di lapangan.*

DASAR :
- Instruksi Presiden Republik Indonesia Nomor 5 Tahun 2019 tanggal 7 Agustus 2019
- Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013
- Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020
- Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.943/MENLHK/SETJEN/PLA.4/8/2022 tanggal 26 Agustus 2022
- Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober 2022
- Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK/SETJEN/PLA.0/10/2021 tanggal 27 Oktober 2021
- Surat Gubernur Sulawesi Tengah Nomor SK.522/08/DISHUT tanggal 11 Januari 2022
- Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 522/01.84/Bid.P2H tanggal 7 Januari 2022
- Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juli 2011
- Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/UP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020
- Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MenbLHK-PKTL/Ren/Pla.0/1/2023 tanggal 11 Januari 2023
- Surat Kepala Dinas Provinsi Sulawesi Tenggara Nomor 522/17-86/Bid.P2H tanggal 8 Mei 2023
- Berita Acara Hasil Evaluasi Dinas Provinsi Sulawesi Tenggara tanggal 8 Mei 2023
- Surat Direktur Utama PT Hengjaya Mineralindo Nomor 0032/LGD.DIR-HM/IV/2023 tanggal 3 April 2023 dan Nomor 054/LGD.DIR-HM/V/2023 tanggal 10 Mei 2023

SUMBER :
- Peta Rupa Bumi Indonesia (RBI), skala 1 : 50.000
- Peta Kawasan Hutan dan Konservasi Perairan Provinsi Sulawesi Tengah, skala 1 : 250.000 (Lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014) sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020
- Peta lampiran Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013
- Peta lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK/SETJEN/PLA.0/10/2021 tanggal 27 Oktober 2021
- Peta lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober 2022
- Peta lampiran Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MenbLHK-PKTL/Ren/Pla.0/1/2023 tanggal 11 Januari 2023
- Peta lampiran Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juli 2011
- Peta lampiran Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/UP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020
- Peta lampiran Surat Gubernur Sulawesi Tengah Nomor SK.522/08/DISHUT tanggal 11 Januari 2022
- Peta lampiran Surat Direktur Utama PT Hengjaya Mineralindo Nomor 032/LGD.DIR-HM/IV/2023 tanggal 3 April 2023 dan Nomor 054/LGD.DIR-HM/V/2023 tanggal 10 Mei 2023




Sumber : Peta Kawasan Hutan Provinsi Sulawesi Tengah, skala 1 : 250.000

**KEMENTERIAN LINGKUNGAN HIDUP DAN KEHUTANAN**

**MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN**
**REPUBLIK INDONESIA**

KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA
NOMOR : SK.644/MENLHK/SETJEN/PLA.0/6/2023

TENTANG

PERUBAHAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN DAN PENGGABUNGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI BIJIH NIKEL, PEMBANGUNAN JALAN ANGKUT PERTAMBANGAN BIJIH NIKEL/*MINE HAULING ROAD* DAN SARANA PENUNJANGNYA ATAS NAMA PT HENGJAYA MINERALINDO DARI SELUAS ± 875,72 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN TUJUH PULUH DUA PERSERATUS HEKTARE) MENJADI SELUAS ± 875,45 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN EMPAT PULUH LIMA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TERBATAS DI KABUPATEN MOROWALI, PROVINSI SULAWESI TENGAH

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

Menimbang : a. bahwa PT Hengjaya Mineralindo sebagai perusahaan pemegang izin pertambangan, berdasarkan :

1) Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juli 2011 tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi menjadi Izin Usaha Pertambangan Operasi Produksi kepada PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 6.249 Ha (enam ribu dua ratus empat puluh sembilan hektare), berlaku selama 20 (dua puluh) tahun sampai dengan tanggal 26 Mei 2031;
2) Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020 tentang Penciutan Wilayah Izin Usaha Pertambangan Operasi Produksi atas nama PT Hengjaya Mineralindo berdasarkan Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi menjadi Izin Usaha Pertambangan Operasi Produksi kepada PT Hengjaya Mineralindo seluas 6.249 Ha (enam ribu dua ratus empat puluh sembilan hektare) menjadi seluas 5.983 Ha (lima ribu sembilan ratus delapan puluh tiga hektare);

b. bahwa PT Hengjaya Mineralindo telah mendapatkan Persetujuan Penggunaan Kawasan Hutan/PPKH (d/h. Izin Pinjam Pakai Kawasan Hutan/IPPKH) untuk :

1) Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas di Kecamatan Bahodopi dan Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare), sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013, berlaku sampai dengan tanggal 16 Juni 2031;

2) Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas ± 994,32 Ha (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus hektare), sesuai Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460 /MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 menjadi seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare), berlaku sampai dengan tanggal 26 Mei 2031;

3) Kegiatan Pembangunan jalan angkut pertambangan bijih nikel/*mine hauling road* dan sarana penunjangnya sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/ 2022 tanggal 7 Oktober 2022 seluas ± 24,58 Ha (dua puluh empat dan lima puluh delapan perseratus hektare) di Kabupaten Morowali, Provinsi Sulawesi Tengah, berlaku sampai dengan tanggal 26 Mei 2031, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/ PLA.0/1/2023 tanggal 11 Januari 2023 menjadi seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare);

c. bahwa Direktur PT Hengjaya Mineralindo dengan surat Nomor 032/LGD.DIR-HM/IV/2023 tanggal 3 April 2023 dan Nomor 054/LGD.DIR-HM/V/2023 tanggal 10 Mei 2023, mengajukan permohonan Perubahan Persetujuan Penggunaan Kawasan Hutan untuk Jalan Tambang/*Main Hauling Road* Kegiatan Pertambangan

Bijih Nikel seluas ± 60,319 Ha (enam puluh dan tiga ratus sembilan belas perseribu hektare) di Kabupaten Morowali, Provinsi Sulawesi Tengah;

d. bahwa Plt. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan sesuai surat Nomor S.616/PKTL/REN/PLA.0/6/2023 tanggal 12 Juni 2023, menyampaikan hasil penilaian dan penelaahan terhadap pengembalian dan penambahan areal Persetujuan Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo :

1) berdasarkan hasil penilaian kelengkapan persyaratan, permohonan PT Hengjaya Mineralindo telah melampirkan persyaratan teknis sesuai ketentuan Pasal 380, Pasal 381 dan Pasal 410 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan serta Penggunaan Kawasan Hutan;

2) areal IPPKH yang dikembalikan :

a) berdasarkan perhitungan ulang, areal yang dikembalikan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) berada pada IPPKH untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas di Kecamatan Bahodopi dan Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 851,22 Ha, sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013;

b) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/10/2021 tanggal 27 Oktober 2021, areal yang dimohon seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) berada pada kawasan Hutan Produksi Terbatas:

c) berdasarkan *overlay* dengan citra satelit planet 2022, areal yang dikembalikan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) berada pada tutupan lahan berupa

hutan lahan kering primer, hutan lahan kering sekunder, pertanian lahan kering dan tanah terbuka. Terkait tutupan lahan berupa tanah terbuka merupakan area sliver (tubuh air/tebing sungai);

d) berdasarkan Laporan evaluasi Dinas Kehutanan Provinsi Sulawesi Tengah, bahwa pengembalian seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) direkomendasikan untuk diajukan permohonan revisi berupa pengembalian sebagian areal PPKH kepada Menteri Lingkungan Hidup dan Kehutanan dan areal yang dikembalikan dilakukan pengawasan sebagai bentuk perlindungan hutan;

3) areal penambahan IPPKH :

a) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/ MenLHK /Setjen/Pla.0/11/2020 tanggal 30 November 2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/ 10/2021 tanggal 27 Oktober 2021, areal yang dimohon seluas ± 60,28 Ha (enam puluh dan dua puluh delapan perseratus hektare) berada pada Kawasan Hutan Produksi Terbatas, dengan penjelasan :

1. berdasarkan overlay dengan citra satelit planet 2022 dan Penutupan Lahan tahun 2021, areal seluas ± 60,28 Ha (enam puluh dan dua puluh delapan perseratus hektare) berada pada tutupan lahan berupa hutan lahan kering primer, hutan lahan kering sekunder, pertanian lahan kering dan tanah terbuka. Terkait tutupan lahan berupa tanah terbuka merupakan area sliver (tubuh air/tebing sungai);
2. seluas ± 0,23 Ha (dua puluh tiga perseratus hektare) tumpang tindih dengan Persetujuan Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/ REN/PLA.0/1/2023 tanggal 11 Januari 2023, sehingga yang dapat ditelaah lebih lanjut seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare);

3. seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) berada pada wilayah pengelolaan KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

b) seluruh areal yang dimohon berada di wilayah sebaran satwa liar Babirusa, sesuai Instruksi Menteri Lingkungan Hidup dan Kehutanan Nomor INS.1/MENLHK/SETJEN/KUM.1/6/2022 tanggal 17 Juni 2022 tentang Perlindungan Satwa Liar atas Ancaman Penjeratan dan Perburuan Liar di Dalam dan di Luar Kawasan Hutan. Berdasarkan Instruksi Menteri tersebut, disebut bahwa agar menghindari pinjam pakai kawasan hutan yang merupakan habitat satwa liar. Terhadap hal tersebut dapat dijelaskan rencana pengelolaan lingkungan sesuai dokumen ANDAL :

1. mengoptimalkan pelaksanaan pengelolaan dampak hilangnya flora darat;
2. memasang papan larangan untuk tidak menangkap hewan endemik di sekitar lokasi kegiatan;
3. memasang rambu pengingat agar tidak mengganggu satwa/fauna darat yang ditemui selama kegiatan pembukaan lahan;
4. memasang papan larangan berburu satwa/fauna darat yang ada;
5. memasang papan pengingat untuk tidak mengganggu dan/atau menangkap beberapa jenis satwa/fauna yang dilindungi, yaitu Anoa Dataran Rendah (*bubalus depressicornis*), Rusa (*cervus kuhli*), Kuskus Beruang (*ailurops ursinus*) dan Babirusa (*babyrousa celebensis*), Moyet Butung/Digo (*macaca ochreata*), Tarsius, Julang Sulawesi (*aceros cassidix*), Kangkareng Sulawesi (*penelopides exarhatus*), Serindit Sulawesi (*loriculus stigmatus*) dan Betet Kelapa Punggung Biru (*tanygnathus sumatranus*);
6. kawasan bernilai konservasi/buffer zone dan vegetasi alami yang merupakan habitat satwa liar semaksimal mungkin diupayakan tidak terganggu dan tetap dilakukan pengayaan tanaman sehingga keberadaan tanaman tetap dipertahankan;
7. memindahkan satwa liar dan atau satwa yang dilindungi ketempat lain sesuai dengan kondisi ekosistem satwa tersebut;
8. melibatkan Dinas Kehutanan (KSDA) dalam penanganan satwa yang dilindungi;

4) dalam rangka efektifitas dan efisiensi pengelolaan areal Persetujuan Penggunaan Kawasan Hutan, mengingat areal permohonan pengembalian

merupakan bagian dari areal PPKH sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare) dan areal penambahan berhimpitan dengan areal PPKH sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/ PLA.0/10/ 2022 tanggal 7 Oktober 2022 tentang PPKH untuk Kegiatan Pembangunan jalan angkut pertambangan bijih nikel/mine hauling road dan sarana penunjangnya a.n. PT Hengjaya Mineralindo seluas ± 24,58 Ha (dua puluh empat dan lima puluh delapan perseratus hektare), sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023 menjadi seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare), maka permohonan diproses sebagai perubahan PPKH dan penggabungan 2 (dua) PPKH, sehingga keseluruhan PPKH menjadi seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) atau merupakan penjumlahan dari seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare) ditambah seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare) dikurangi seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) ditambah seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare;

5) areal perubahan seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare):

   a) berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang Ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/ MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK-PKTL/ KUH/PLA.2/10/2021 tanggal 27 Oktober 2021, areal yang dimohon seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare), seluruhnya

berada pada kawasan Hutan Produksi Terbatas dan berada pada wilayah pengelolaan KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

b) berkenaan dengan kuota 10% (sepuluh persen) di kawasan Hutan Produksi untuk kegiatan pertambangan, dikarenakan permohonan PT Hengjaya Mineralindo merupakan permohonan pengembalian seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) dan penambahan seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare), maka tidak mengubah beban kuota pada KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah, sehingga dapat diproses lebih lanjut;

6) berdasarkan hasil penilaian dan penelaahan, maka permohonan pengembalian sebagian areal PPKH dan penambahan areal PPKH a.n. PT Hengjaya Mineralindo ditelaah sebagai perubahan dan penggabungan PPKH :

a) perubahan PPKH sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus hektare), berupa pengembalian sebagian areal PPKH seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare);

b) perubahan PPKH sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/ SETJEN/ PLA.0/10/2022 tanggal 7 Oktober 2022 seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare), berupa penambahan areal PPKH seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare);

c) penggabungan kedua PPKH tersebut huruf a) dan huruf b);

secara teknis dapat dipertimbangkan untuk diproses lebih lanjut seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya berada pada Kawasan Hutan Produksi Terbatas dan berada pada di wilayah KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah di Kabupaten Morowali, Provinsi Sulawesi Tengah, dengan jatuh tempo pembayaran PNBP PKH a.n. PT Hengjaya Mineralindo menjadi setiap tanggal 16 Juni;

e. bahwa berdasarkan :

1) Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan:

a) Pasal 90 ayat (2), Penggunaan Kawasan Hutan dilakukan tanpa mengubah fungsi pokok Kawasan Hutan dengan mempertimbangkan batasan luas dan jangka waktu tertentu serta kelestarian lingkungan;

b) Pasal 91 ayat (1) dan ayat (2) huruf b, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan meliputi kegiatan pertambangan;

c) Pasal 94 ayat (1) dan Pasal 96 ayat (1), Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan dilakukan berdasarkan Persetujuan Penggunaan Kawasan Hutan dan diberikan oleh Menteri berdasarkan permohonan;

d) Pasal 94 ayat (5) dan ayat (7), Persetujuan Penggunaan Kawasan Hutan pada provinsi yang terlampaui kecukupan luas Kawasan Hutannya wajib membayar PNBP Penggunaan Kawasan Hutan dan wajib melakukan penanaman dalam rangka rehabilitasi DAS;

e) Pasal 99 ayat (2), ayat (4) dan ayat (5), Pemegang Persetujuan Penggunaan Kawasan Hutan wajib melaksanakan tata batas areal Persetujuan Penggunaan Kawasan Hutan paling lama dalam jangka waktu 1 (satu) tahun setelah diterbitkan Persetujuan Penggunaan Kawasan Hutan dan tidak dapat diperpanjang dan dalam hal telah menyelesaikan pelaksanaan tata batas areal Penggunaan Kawasan Hutan, Menteri menetapkan batas areal kerja Penggunaan Kawasan Hutan serta dalam hal tidak menyelesaikan pelaksanaan tata batas areal Penggunaan Kawasan Hutan dalam jangka waktu yang telah ditentukan, Persetujuan Penggunaan Kawasan Hutan menjadi batal dan dinyatakan tidak berlaku;

f) Pasal 104 ayat (1), Jangka waktu Persetujuan Penggunaan Kawasan Hutan diberikan sama dengan jangka waktu Perizinan Berusaha sesuai bidangnya dan dilakukan sesuai dengan ketentuan peraturan perundang-undangan;

g) Pasal 252 ayat (2), Perlindungan Hutan atas Kawasan Hutan yang telah menjadi areal kerja pemegang Perizinan Berusaha Pemanfaatan Hutan, persetujuan Perhutanan Sosial, dan persetujuan Penggunaan Kawasan Hutan dilaksanakan dan menjadi tanggung jawab pemegang Perizinan Berusaha Pemanfaatan Hutan, persetujuan Perhutanan Sosial, dan

persetujuan Penggunaan Kawasan Hutan yang bersangkutan;

h) Pasal 294 huruf b, Kawasan Hutan Produksi Terbatas sebelum berlakunya Peraturan Pemerintah ini, dinyatakan tetap berlaku sesuai dengan tahap pengukuhannya serta diberlakukan peruntukan dan fungsinya sebagai Kawasan Hutan Produksi Tetap;

i) Pasal 296 huruf i, Persetujuan Penggunaan Kawasan Hutan pada areal yang belum dilakukan penetapan kecukupan luas Kawasan Hutan provinsi sebelum berlakunya Peraturan Pemerintah ini, tetap diproses berdasarkan batasan kecukupan luas Kawasan Hutan yang telah ditetapkan sebelumnya;

2) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, serta Penggunaan Kawasan Hutan :

a) Pasal 366 ayat (1) dan ayat (2) huruf a, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan dilakukan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan keputusan Menteri;

b) Pasal 367 huruf b, Penggunaan Kawasan Hutan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan keputusan Menteri, meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, *conveyor* dan *smelter*;

c) Pasal 369 ayat (1) huruf a, Penggunaan Kawasan Hutan untuk kegiatan komersial dilakukan dengan ketentuan pada provinsi yang melampaui kecukupan luas kawasan hutan wajib membayar PNBP Penggunaan Kawasan Hutan, dan melakukan penanaman dalam rangka Rehabilitasi DAS terutama pada Kawasan Hutan untuk Penggunaan Kawasan Hutan dengan ratio 1:1 (satu berbanding satu);

d) Pasal 372 ayat (6) dan ayat (7), Dalam hal Persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan mineral dan batubara di Kawasan Hutan Produksi pada suatu provinsi berada pada areal yang dibebani Perizinan Berusaha Pemanfaatan Hutan kuota yang dapat dipertimbangkan paling banyak 10% (sepuluh persen) dari luas efektif setiap

Perizinan Berusaha Pemanfaatan Hutan dan dalam hal Persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan mineral dan batubara di Kawasan Hutan Produksi pada suatu provinsi berada pada areal KPH, kuota yang dapat dipertimbangkan paling banyak 10% (sepuluh persen) dari luas Kawasan Hutan Produksi pada masing-masing KPH yang tidak dibebani Perizinan Berusaha Pemanfaatan Hutan;

e) Pasal 390 ayat (4), Dalam hal Pemegang Persetujuan Penggunaan Kawasan Hutan tidak menyelesaikan pelaksanaan Tata Batas areal Persetujuan Penggunaan Kawasan Hutan dalam jangka waktu yang ditentukan, Persetujuan Penggunaan Kawasan Hutan menjadi batal dan dinyatakan tidak berlaku;

f) Pasal 392 ayat (1) dan ayat (2), Pemegang Persetujuan Penggunaan Kawasan Hutan dilarang melakukan kegiatan di lapangan sebelum menyelesaikan pemenuhan Komitmen, dikecualikan untuk penyelesaian pemenuhan Komitmen dan kegiatan lainnya, yaitu membuat kegiatan persiapan, diantaranya pembangunan direksi kit (*basecamp* sementara); pengukuran sarana dan prasarana; sarana penunjang keselamatan umum; penanganan bencana alam; dan sarana dan prasarana penunjang pada kondisi darurat;

g) Pasal 395 ayat (1) dan (2), Direktur Jenderal melakukan pengawasan terhadap Pemegang Persetujuan Penggunaan Kawasan Hutan atas pelaksanaan penyelesaian pemenuhan Komitmen sebagaimana dimaksud dalam Pasal 389 sampai dengan Pasal 391 dan Pengawasan pelaksanaan penyelesaian pemenuhan Komitmen sebagaimana dimaksud pada ayat (1) terdiri atas tenggang waktu penyelesaian pemenuhan Komitmen; dan proses penyelesaian pemenuhan Komitmen sesuai dengan ketentuan peraturan perundang-undangan;

h) Pasal 396 ayat (1), Pemegang Persetujuan Penggunaan Kawasan Hutan menyampaikan laporan penyelesaian pemenuhan Komitmen dengan dilampiri dokumen asli sebagaimana dimaksud dalam Pasal 389 dan Pasal 390 dan mengajukan permohonan Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan kepada Direktur Jenderal melalui Direktur;

i) Pasal 397 ayat (1) huruf a dan ayat (2) :

(1) huruf a, berdasarkan hasil pengecekan dan penelaahan atas pemenuhan komitmen

yang disampaikan oleh pemegang Persetujuan Penggunaan Kawasan Hutan, Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan menetapkan Keputusan tentang Penetapan Batas Areal Kerja Persetujuan Penggunaan Kawasan Hutan apabila seluruh komitmen telah terpenuhi dengan tenggang waktu yang ditentukan dan proses pemenuhan komitmen sesuai dengan ketentuan peraturan perundang-undangan;

(2) Dalam hal Direktur Jenderal atas nama Menteri telah menetapkan batas Areal Kerja Penggunaan Kawasan Hutan, Persetujuan Penggunaan Kawasan Hutan berlaku efektif dan Pemegang Persetujuan Penggunaan Kawasan Hutan dapat langsung menjalankan kegiatan usaha

j) Pasal 399 ayat (4) dan ayat (5):

(4) Bagi Pemegang Persetujuan Penggunaan Kawasan Hutan selain sebagaimana dimaksud pada ayat (3) dengan kompensasi membayar PNBP Penggunaan Kawasan Hutan, pembayaran PNBP Penggunaan Kawasan Hutan dilaksanakan sejak terbitnya Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan;

(5) Pembayaran PSDH/DR, PNBP Penggunaan Kawasan Hutan, ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil Rehabilitasi atau biaya investasi pengelolaan pemanfaatan hutan kepada pengelola/Pemegang Perizinan Berusaha Pemanfaatan Hutan dalam hal areal Persetujuan Penggunaan Kawasan Hutan berada dalam Areal Kerja Pengelolaan Hutan/Perizinan Berusaha Pemanfaatan Hutan dapat dilakukan tanpa harus menunggu pemegang Persetujuan Penggunaan Kawasan Hutan mendapatkan Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan;

k) Pasal 400 ayat (1) dan ayat (2) :

(1) Penggantian biaya investasi dibayarkan oleh Pemegang Persetujuan Penggunaan Kawasan Hutan kepada pengelola hutan atau Pemegang Perizinan Berusaha Pemanfaatan Hutan berdasarkan kesepakatan paling lama 1 (satu) tahun;

(2) Dalam hal tidak terjadi kesepakatan nilai penggantian biaya investasi sebagaimana

dimaksud pada ayat (1) antara Pemegang Persetujuan Penggunaan Kawasan Hutan dengan Pengelola/Pemegang Perizinan Berusaha Pemanfaatan Hasil Hutan sampai dengan 1 (satu) tahun sejak ditetapkan batas areal penggunaan Kawasan Hutan, Direktur Jenderal yang membidangi Pengelolaan Hutan Lestari menetapkan nilai penggantian biaya investasi;

l) Pasal 406 ayat (2) huruf a, Persetujuan Penggunaan Kawasan Hutan diberikan dalam jangka waktu paling lama sesuai perizinan di bidangnya atau keputusan tentang tahap kegiatan untuk kegiatan eksplorasi dan kegiatan operasi produksi pertambangan meliputi pertambangan minyak dan gas bumi, mineral, dan batubara termasuk sarana dan prasarana;

m) Pasal 409 ayat (4), Persetujuan Penggunaan Kawasan Hutan dapat dilakukan perubahan berdasarkan permohonan atau tanpa permohonan dari Pemegang Persetujuan Penggunaan Kawasan Hutan apabila terdapat perubahan perizinan/perjanjian dibidangnya; perubahan dokumen lain yang menjadi dasar penerbitan Persetujuan Penggunaan Kawasan Hutan; dan/atau ketidaksesuaian Penggunaan Kawasan Hutan dengan perizinan/perjanjian di bidangnya dan/atau dokumen lingkungan;

n) Pasal 410 ayat (1), ayat (4),ayat (6), ayat (7), ayat (8), ayat (9), ayat (10), ayat (11) dan ayat (12) :

(1) Dalam hal areal Persetujuan Penggunaan Kawasan Hutan akan dilakukan perubahan berupa pengembalian sebagian dan pengembalian sebagian yang disertai penambahan, Pemegang Persetujuan Penggunaan Kawasan Hutan mengajukan permohonan kepada Menteri melalui Direktur, disertai hasil evaluasi;

(4) Hasil evaluasi antara lain memuat pemenuhan kewajiban pemegang Persetujuan Penggunaan Kawasan Hutan; kondisi tutupan areal yang akan dikembalikan; dan rekomendasi kelayakan areal Persetujuan Penggunaan Kawasan Hutan yang akan dikembalikan;

(6) Terhadap areal Persetujuan Penggunaan Kawasan Hutan yang telah dikembalikan sebagaimana dimaksud pada ayat (1) dan ayat (2) tidak dapat dimohonkan kembali oleh yang bersangkutan;

(7) Pemegang Persetujuan Penggunaan Kawasan Hutan yang mengajukan permohonan pengembalian sebagian areal, tetap dapat melakukan kegiatan di lapangan pada areal yang tidak dikembalikan;

(8) Pengembalian sebagian areal Persetujuan Penggunaan Kawasan Hutan tidak membebaskan Pemegang Persetujuan Penggunaan Kawasan Hutan untuk menyelesaikan kewajiban Persetujuan Penggunaan Kawasan Hutan pada areal yang dikembalikan;

(9) Besaran PNBP Penggunaan Kawasan Hutan yang wajib dibayarkan pada periode berikutnya berdasarkan pada luasan Persetujuan Penggunaan Kawasan Hutan perubahan sejak ditetapkan keputusan perubahan oleh Menteri;

(10) Dalam hal sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan merupakan areal yang belum terganggu, Pemegang Persetujuan Penggunaan Kawasan Hutan dapat mengajukan pengurangan luas areal penanaman dalam rangka Rehabilitasi DAS;

(11) Dalam hal pemegang perubahan Persetujuan Penggunaan Kawasan Hutan tidak dapat menyelesaikan Komitmen dalam jangka waktu 1 (satu) tahun, Persetujuan Penggunaan Kawasan Hutan dinyatakan tidak berlaku;

(12) Atas sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan dilakukan serah terima areal Persetujuan Penggunaan Kawasan Hutan, dengan ketentuan:

a) pada wilayah kerja perum perhutani dilakukan antara direktur utama perum perhutani dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

b) pada Kawasan Hutan yang telah dibebani izin pemanfaatan hutan dilakukan antara pemegang izin pemanfaatan dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

c) pada Kawasan Hutan selain huruf a) dan huruf b), dilakukan antara Kepala Dinas Provinsi dengan Pemegang

Persetujuan Penggunaan Kawasan Hutan;

o) Pasal 531 huruf m, permohonan Persetujuan Penggunaan Kawasan Hutan pada areal yang belum dilakukan penetapan Kecukupan Luas Kawasan Hutan provinsi sebelum berlakunya Peraturan Menteri ini, tetap diproses berdasarkan batasan Kecukupan Luas Kawasan Hutan yang telah ditetapkan sebelumnya;

p) Pasal 532 ayat (5), Dalam hal pada areal permohonan Persetujuan Penggunaan Kawasan Hutan belum dilakukan penetapan kecukupan luas Kawasan Hutan provinsi, batasan kecukupan luas Kawasan Hutan adalah 30 % (tiga puluh persen) dari luas provinsi;

3) Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, Serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi :

a) Pasal 28 huruf a dan Pasal 29 ayat (1), Penggantian biaya investasi sebagai akibat adanya persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, *conveyor*, dan *smelter* pada sebagian areal kerja pengelola/pemegang pengelolaan/PBPH dilaksanakan dengan prinsip kelestarian Hutan, keberlanjutan usaha, keadilan, kelayakan/kepatutan, transparansi, dan bertanggung gugat dan besarnya nilai penggantian biaya investasi ditetapkan Direktur Jenderal;

b) Pasal 32 ayat (1) dan ayat (2), Pemegang persetujuan Penggunaan Kawasan Hutan menyampaikan permohonan penetapan besarnya nilai penggantian biaya investasi kepada Direktur Jenderal dan pihak terkait dan permohonan penghitungan penggantian biaya investasi diajukan setelah terbitnya penetapan batas areal kerja persetujuan Penggunaan Kawasan Hutan;

c) Pasal 33 ayat (1) dan ayat (3), Direktur Jenderal menetapkan besarnya nilai penggantian biaya investasi setelah menerima hasil kajian dari tim dan penetapan penggantian biaya investasi sebagaimana dimaksud pada ayat (1) bersifat final dan mengikat kedua belah pihak;

d) Pasal 34 ayat (1) dan ayat (4), Pemegang Persetujuan Penggunaan Kawasan Hutan menyelesaikan pembayaran penggantian biaya investasi kepada pengelola/pemegang pengelolaan/PBPH paling lama 1 (satu) tahun setelah tanggal penetapan nilai penggantian biaya investasi dan dalam hal pembayaran sebagaimana dimaksud pada ayat (1) tidak diselesaikan sesuai batas waktu yang ditetapkan, Menteri melalui direktur jenderal yang membidangi urusan planologi kehutanan dan tata lingkungan, mengenakan Sanksi Administratif sesuai dengan ketentuan peraturan perundang-undangan;

f. bahwa berdasarkan pertimbangan tersebut huruf a sampai dengan huruf e, perlu menetapkan Keputusan Menteri Lingkungan Hidup dan Kehutanan tentang Perubahan Persetujuan Penggunaan Kawasan Hutan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo dari seluas ± 875,72 Ha (delapan ratus tujuh puluh lima dan tujuh puluh dua perseratus hektare) menjadi seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah;

Mengingat : 1. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumberdaya Alam Hayati dan Ekosistemnya;

2. Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

3. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

4. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

5. Undang-Undang Nomor 18 Tahun 2013 tentang Pencegahan dan Pemberantasan Perusakan Hutan,

sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

6. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;
7. Undang-Undang Nomor 9 Tahun 2018 tentang Penerimaan Negara Bukan Pajak;
8. Peraturan Pemerintah Nomor 26 Tahun 2008 tentang Rencana Tata Ruang Wilayah Nasional, sebagaimana telah diubah beberapa kali, terakhir dengan Peraturan Pemerintah Nomor 21 Tahun 2021 tentang Penyelenggaraan Penataan Ruang;
9. Peraturan Pemerintah Nomor 12 Tahun 2014 tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berlaku pada Kementerian Kehutanan;
10. Peraturan Pemerintah Nomor 33 Tahun 2014 tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berasal dari Penggunaan Kawasan Hutan untuk Kepentingan Pembangunan di Luar Kegiatan Kehutanan yang Berlaku pada Kementerian Kehutanan;
11. Peraturan Pemerintah Nomor 26 Tahun 2020 tentang Rehabilitasi dan Reklamasi Hutan;
12. Peraturan Pemerintah Nomor 1 Tahun 2021 tentang Tata Cara Pemeriksaan Penerimaan Negara Bukan Pajak;
13. Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup;
14. Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan;
15. Peraturan Pemerintah Nomor 24 Tahun 2021 tentang Tata Cara Pengenaan Sanksi Administratif dan Tata Cara Penerimaan Negara Bukan Pajak yang berasal dari Denda Administratif Bidang Kehutanan;
16. Peraturan Pemerintah Nomor 43 Tahun 2021 tentang Penyelesaian Ketidaksesuaian Tata Ruang, Kawasan Hutan, Izin dan/atau Hak atas Tanah;
17. Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara, sebagaimana telah diubah dengan Peraturan Presiden Nomor 32 Tahun 2021;
18. Peraturan Presiden Nomor 92 Tahun 2020 tentang Kementerian Lingkungan Hidup dan Kehutanan;

19. Instruksi Presiden Nomor 5 Tahun 2019 tentang Penghentian Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut;
20. Peraturan Menteri Kehutanan Nomor P.56/Menhut-II/2008 tentang Tata Cara Penentuan Luas Areal Terganggu dan Areal Reklamasi dan Revegetasi untuk Perhitungan Penerimaan Negara Bukan Pajak Penggunaan Kawasan Hutan, sebagaimana telah beberapa kali diubah terakhir dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.51/Menlhk/Setjen/Kum.1/9/2019;
21. Peraturan Menteri Kehutanan Nomor P.60/Menhut-II/2009 tentang Pedoman Penilaian Keberhasilan Reklamasi Hutan;
22. Peraturan Menteri Keuangan Nomor 91/PMK.02/2009 tentang Tata Cara Pengenaan, Pemungutan dan Penyetoran Penerimaan Negara Bukan Pajak yang Berasal dari Penggunaan Kawasan Hutan untuk Kepentingan Pembangunan di Luar Kegiatan Kehutanan;
23. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.32/MenLHK/Setjen/Kum.1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan;
24. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.59/Menlhk/Setjen/Kum.1/10/2019 tentang Penanaman Dalam Rangka Rehabilitasi Daerah Aliran Sungai;
25. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 4 Tahun 2021 tentang Daftar Usaha dan/atau Kegiatan yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup, Upaya Pengelolaan Lingkungan Hidup dan Upaya Pemantauan Lingkungan Hidup atau Surat Pernyataan Kesanggupan Pengelolaan dan Pemantauan Lingkungan Hidup;
26. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, Serta Penggunaan Kawasan Hutan;
27. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, Serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi;
28. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 15 Tahun 2021 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan;
29. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.5050/MenLHK-PKTL/KUH/PLA.2/9/2020 tentang Peta Indikatif Alokasi Kawasan Hutan untuk Penyediaan Sumber Tanah Obyek Reforma Agraria /TORA (Revisi V);

30. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.7594/MENLHK-PKTL/IPSDH/PLA.1/9/2022 tentang Penetapan Peta Indikatif Penghentian Pemberian Perizinan Berusaha, Persetujuan Penggunaan Kawasan Hutan, atau Persetujuan Perubahan Peruntukan Kawasan Hutan Baru pada Hutan Alam Primer dan Lahan Gambut Tahun 2022 Periode II;
31. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.8/MENLHK-PKTL/REN/PLA.0/1/2023 tentang Peta Indikatif dan Areal Perhutanan Sosial (Revisi VIII);

Memperhatikan :

1. Dokumen Adenddum ANDAL dan RKL-RPL untuk Kegiatan Kegiatan Pertambangan Bijih Nikel PT Hengjaya Mineralindo;
2. Dokumen Adenddum ANDAL dan RKL-RPL untuk Rencana Kegiatan Pembangunan Jalan Angkut Kegiatan Pertambangan Bijih Nikel/*Mine Hauling Road* (MHR) a.n. PT Hengjaya Mineralindo, Tahun 2021;
3. Dokumen Adendum ANDAL Rencana Perubahan Jalan Angkut Nikel A1-B1 sepanjang ± 9.944 m menjadi segmen A1-A2-A3-B-B1 sepanjang ± 6.284 m a.n. PT Hengjaya Mineralindo, Tahun 2022;
4. Keputusan Bupati Morowali Nomor 11/HM/IX/2011 tanggal 19 September 2011 tentang Kelayakan Lingkungan Hidup Kegiatan Pertambangan Bijih Nikel di Kabupaten Morowali, Provinsi Sulawesi Tengah oleh PT Hengjaya Mineralindo;
5. Keputusan Kepala Dinas PMPTSP Kabupaten Morowali Nomor 188.4/KEP.038/ DPMPTSP/VI/2021 tanggal 14 Juni 2021 tentang Kelayakan Lingkungan Hidup Rencana Kegiatan Pembangunan Jalan Angkut Kegiatan Pertambangan Bijih Nikel/Mine Hauling Road (MHR) oleh PT Hengjaya Mineralindo dari Desa Bete-Bete ke Kawasan Industri PT Indonesia Morowali Industrial Park;
6. Keputusan Kepala Dinas PMPTSP Kabupaten Morowali Nomor 188.4/Kep.039/IL/DPMPTSP/VI/2021 tanggal 14 Juni 2021 tentang Izin Lingkungan Rencana Kegiatan Pembangunan Jalan Angkut Kegiatan Pertambangan Bijih Nikel/Mine Hauling Road (MHR) oleh PT Hengjaya Mineralindo dari Desa Bete-Bete ke Kawasan Industri PT Indonesia Morowali Industrial Park;
7. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.943/MENLHK/SETJEN/PLA.4/8/2022 tanggal 26 Agustus 2022 tentang Kelayakan Lingkungan Hidup Kegiatan Perubahan Jalan Angkut Nikel pada Segmen A1-B1 sepanjang ± 9.944 m menjadi segmen A1-A2-A3-B-B1 sepanjang ± 6.284 m

di Kabupaten Morowali, Provinsi Sulawesi Tengah oleh PT Hengjaya Mineralindo;

8. Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 522/01.84/Bid.P2H tanggal 7 Januari 2022 hal Pertimbangan Teknis atas Permohonan Rekomendasi PPKH untuk Kegiatan Pembangunan Jalan Tambang a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah;
9. Surat Gubernur Sulawesi Tengah Nomor 522/08/ DISHUT tanggal 11 Januari 2022 hal Rekomendasi Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Pembangunan Jalan Tambang a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah;
10. Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 522/17-86/Bid.P2H tanggal 8 Mei 2023 hal Pengantar Laporan Hasil Evaluasi Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo;
11. Laporan Hasil Evaluasi Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah;
12. Matrik dan peta baseline persetujuan penggunaan kawasan hutan skala 1 : 20.000, a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah yang ditandatangani oleh Direktur PT Hengjaya Mineralindo;
13. Peta Citra Resolusi Tinggi Planet Scope, Liputan bulan September 2022 skala 1: 20.000;
14. Pernyataan Komitmen sesuai Akta Nomor 04 tanggal 10 April 2023 yang dibuat di hadapan Indriana, S.H., M.Kn; Notaris di Kota Tanggerang;
15. Pakta Integritas sesuai Akta Nomor 05 tanggal 10 April 2023 yang dibuat di hadapan Indriana, S.H., M.Kn; Notaris di Kota Tanggerang
16. Kronologis dan Telaah Perubahan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/Mine Hauling Road, dan Sarana Penunjangnya a.n. PT Hengjaya Mineralindo pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas ± 875,45 Ha, Lampiran surat Plt. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor S.616/PKTL/REN/PLA.0/6/2023 tanggal 12 Juni 2023;

MEMUTUSKAN:

Menetapkan : KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN TENTANG PERUBAHAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN DAN PENGGABUNGAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI BIJIH NIKEL, PEMBANGUNAN JALAN ANGKUT PERTAMBANGAN BIJIH NIKEL/*MINE HAULING ROAD* DAN SARANA PENUNJANGNYA ATAS NAMA PT HENGJAYA MINERALINDO DARI SELUAS ± 875,72 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN TUJUH PULUH DUA PERSERATUS HEKTARE) MENJADI SELUAS ± 875,45 HA (DELAPAN RATUS TUJUH PULUH LIMA DAN EMPAT PULUH LIMA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TERBATAS DI KABUPATEN MOROWALI, PROVINSI SULAWESI TENGAH.

KESATU : Memberikan Perubahan Persetujuan Penggunaan Kawasan Hutan berupa Pengembalian Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) dan Penambahan Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) serta Penggabungan Persetujuan Penggunaan Kawasan Hutan berdasarkan Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 dan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober 2022, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/ PLA.0/1/2023 tanggal 11 Januari 2023 untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya kepada PT Hengjaya Mineralindo dari seluas ± 875,72 Ha (delapan ratus tujuh puluh lima dan tujuh puluh dua perseratus hektare) menjadi seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana peta lampiran Keputusan ini, dengan rincian :

1. Areal Pengembalian Persetujuan Penggunaan Kawasan Hutan seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) sesuai Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013;
2. Areal Penambahan Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober

2022, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/ MENLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023;

3. Areal yang dipertahankan seluas 815,40 Ha (delapan ratus lima belas dan empat puluh perseratus hektare) berdasarkan Keputusan Menteri Kehutanan Nomor SK.443/Menhut-II/2013 tanggal 20 Juni 2013 dan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/PLA.0/10/2022 tanggal 7 Oktober 2022, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/PLA.0/1/2023 tanggal 11 Januari 2023;
4. Areal Perubahan berupa Penggabungan Persetujuan Penggunaan Kawasan Hutan seluas ± 875,45 Ha (delapan ratus tujuh puluh lima dan empat puluh lima perseratus hektare) untuk untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya.

KEDUA : Pemberian Perubahan dan Penggabungan Persetujuan sebagaimana dimaksud dalam Amar KESATU adalah untuk Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo, bukan untuk kegiatan lain serta arealnya tetap berstatus sebagai kawasan hutan.

KETIGA : PT Hengjaya Mineralindo berhak :

a. berada, menempati dan mengelola serta melakukan kegiatan-kegiatan yang meliputi rencana Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya, serta melakukan kegiatan-kegiatan lainnya yang berhubungan dengan kegiatan tersebut dalam kawasan hutan yang digunakan;
b. memanfaatkan hasil kegiatan yang dilakukan sehubungan dengan rencana Kegiatan Operasi Produksi Bijih Nikel, Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya dalam kawasan hutan yang digunakan;
c. melakukan penebangan pohon dalam rangka pembukaan lahan yang tidak dapat dielakkan dengan membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan.

KEEMPAT : Dalam jangka waktu paling lama 1 (satu) tahun setelah Perubahan Persetujuan Penggunaan Kawasan Hutan ini ditetapkan, PT Hengjaya Mineralindo wajib:

a. menyelesaikan tata batas areal perubahan Persetujuan Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan dengan supervisi Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu dan tidak dapat diperpanjang;

b. menyampaikan perubahan *baseline* penggunaan kawasan hutan dan peta baseline skala paling kecil 1:50.000 atau skala terbesar pada lokasi tersebut dengan informasi luas kawasan hutan yang dimohon dalam bentuk *hardcopy* dan *softcopy* format *shapefile* (shp) dengan koordinat sistem UTM Datum WGS 84 sesuai dengan hasil tata batas dan dokumen lingkungan;

c. menyampaikan pernyataan bersedia mengganti biaya investasi pengelolaan/pemanfaatan hutan kepada pengelola/pemegang Perizinan Berusaha Pemanfaatan Hutan dalam bentuk Akta Notariil, dalam hal ini kepada Pengelolaan Wilayah KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah.

KELIMA : Dalam hal PT Hengjaya Mineralindo tidak memenuhi kewajiban sebagaimana dimaksud pada Amar KEEMPAT, Persetujuan Penggunaan Kawasan Hutan dibatalkan sesuai ketentuan peraturan perundang-undangan.

KEENAM : Penetapan Areal Kerja Persetujuan Penggunaan Kawasan Hutan oleh Menteri Lingkungan Hidup dan Kehutanan, dilaksanakan dengan ketentuan :

a. pemegang Persetujuan Penggunaan Kawasan Hutan menyampaikan permohonan penetapan areal kerja berdasarkan hasil tata batas areal Persetujuan Penggunaan Kawasan Hutan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;

b. permohonan penetapan areal kerja sebagaimana dimaksud pada huruf a, dilampiri dengan bukti pemenuhan kewajiban sebagaimana dimaksud Amar KEEMPAT.

KETUJUH : PT Hengjaya Mineralindo wajib :

a. melakukan penanaman dalam rangka rehabilitasi Daerah Aliran Sungai (DAS) sesuai dengan ketentuan peraturan perundang-undangan;

b. membuat rencana dan melaksanakan reklamasi, revegetasi dan/atau reboisasi pada Kawasan Hutan yang diberikan Persetujuan Penggunaan Kawasan Hutan yang sudah tidak digunakan sesuai dengan ketentuan peraturan perundang-undangan;

c. membayar PNBP Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan;

d. mengganti biaya investasi kepada pengelola/pemegang pengelolaan Perizinan Berusaha Pemanfaatan Hutan

sesuai dengan ketentuan peraturan perundang-undangan;

e. melaksanakan inventarisasi tegakan sesuai dengan rencana kerja penggunaan kawasan hutan tahunan;

f. membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan;

g. membayar ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil rehabilitasi;

h. melaksanakan Perlindungan Hutan atas areal Persetujuan Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan, paling sedikit meliputi kegiatan :

   h.1. mengamankan areal kerjanya yang menyangkut hutan, kawasan hutan, dan hasil hutan termasuk tumbuhan dan satwa;

   h.2. mencegah kerusakan hutan dari perbuatan manusia dan ternak, kebakaran hutan, hama, dan penyakit serta daya-daya alam;

   h.3. mengambil tindakan pertama yang diperlukan terhadap adanya gangguan keamanan hutan di areal kerjanya;

   h.4. melaporkan setiap adanya kejadian pelanggaran hukum di areal kerjanya kepada instansi Kehutanan yang terdekat;

   h.5. menyediakan sarana dan prasarana, serta tenaga pengamanan hutan yang sesuai dengan kebutuhan;

i. melaksanakan perlindungan satwa liar dan/atau satwa yang dilindungi khususnya jenis satwa babirusa, jenis satwa liar endemik, langka dan dilindungi lainnya pada areal Persetujuan Penggunaan Kawasan Hutan sesuai Standar Operasional Prosedur/SOP perlindungan satwa liar, diantaranya dengan:

   i.1. membantu pengayaan konservasi jenis-jenis flora dan fauna endemik, langka dan dilindungi yang dijumpai di kawasan ini oleh instansi pemerintah daerah setempat, sebagai bagian dari program pelestarian sumberdaya alam dan lingkungan hidup;

   i.2. melakukan kerjasama/konsultasi dengan instansi /institusi terkait dalam mendukung upaya rehabilitasi flora dan fauna serta melakukan kerjasama dengan berbagai pihak lainnya untuk memberikan penyuluhan tentang pentingnya pelestarian areal konservasi dan agar masyarakat tidak berburu terutama pada hewan yang dilindungi;

   i.3. melakukan identifikasi flora dan fauna pada areal-areal terganggu untuk kegiatan pertambangan dan pembersihan dilakukan dengan menekan

seminimal mungkin areal-areal terganggu pada semua pit tambang serta melakukan identifikasi pohon-pohon di lokasi pembersihan lahan yang merupakan habitat atau sumber pangan satwa liar untuk dikembalikan keberadaannya sesuai peruntukan kawasan pada saat pasca tambang (reklamasi dan revegetasi);

i.4. melakukan inventarisasi (*identifikasi*) flora (tumbuhan) dan fauna (satwa) pada areal-areal terganggu dalam kegiatan operasi produksi;

i.5. memasang papan informasi terkait perlindungan flora dan fauna di lokasi-lokasi yang dilindungi di dalam lokasi tambang dan mengenai pentingnya kelestarian hutan dan larangan menebang pohon, membakar dan larangan perburuan terhadap satwa liar pada lokasi strategis yang mudah dibaca;

i.6. menjaga kawasan lindung (sempadan sungai, danau, sumber mata air dan lain-lain) sesuai dengan ketentuan peraturan perundang-undangan;

i.7. melakukan beberapa pendekatan diantaranya sosial ekonomi yaitu dengan mengarahkan tenaga kerja untuk tidak melakukan penangkapan hewan liar yang dilindungi, pendekatan teknologi yaitu dengan pembuatan koridor satwa, dan pendekatan institusi yaitu dengan melakukan koordinasi dengan instansi terkait;

i.8. kegiatan pembukaan dan pembersihan lahan hanya dilakukan pada luas minimal yang diperlukan saja dan agar managemen perusahaan mudah dalam mengontrol kegiatan pembukaan dan pembersihan lahan di lapangan, maka pelaksanaannya sesuai dengan perencanaan yang telah ditetapkan;

i.9. mencadangkan adanya kawasan konservasi sebagai kantong-kantong flora dan fauna pada tahap pra konstruksi, menyiapkan kantong-kantong satwa pada tahap konstruksi, dan melakukan penggiringan satwa-satwa ke kantong satwa tersebut;

i.10. apabila memungkinkan menghindari penebangan pohon-pohon dalam daerah yang dilewati di luar wilayah front kerja penambangan dan melakukan kegiatan penanaman kembali (revegetasi) pada lahan-lahan terbuka yang sudah tidak dipergunakan (pasca tambang);

i.11. pada lahan terbuka di sepanjang jalan tambang dilakukan penanaman pohon/revegetasi untuk melindungi lingkungan (*buffer zone*) khususnya dalam upaya pengendalian dampak terhadap kualitas udara di sekitarnya. Apabila di areal tersebut di atas masih dijumpai vegetasi dengan

kondisi yang cukup baik, maka vegetasi tersebut perlu dijaga jangan sampai rusak untuk dimanfaatkan sebagai *buffer zone*;

i.12. kawasan bernilai konservasi/*buffer zone* dan vegetasi alami yang merupakan habitat satwa liar semaksimal mungkin diupayakan tidak terganggu dan tetap dilakukan pengayaan tanaman sehingga keberadaan tanaman tetap dipertahankan;

i.13. melaksanakan perlindungan satwa liar sesuai Standar Operasional Prosedur dari surat Plt. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem Nomor SOP.1/KSDAE/SET.3/KSA.2/12/2022 tanggal 7 Desember 2022 tentang Perlindungan Satwa Liar di Dalam dan di Luar Kawasan Hutan.

j. melakukan pengendalian kebakaran hutan dan lahan, berupa antara lain:

j.1. menyiapkan Sumberdaya Manusia pengendalian kebakaran hutan dalam Brigade Pengendalian Kebakaran Hutan dan Lahan (Brigdalkarhutla);

j.2. menempatkan sekurang-kurangnya 1 (satu) Regu Inti Pengendali Kebakaran Hutan;

j.3. merekrut karyawan pada perusahaan sebagai anggota Regu Pendukung Pengendali Kebakaran Hutan;

j.4. menyiapkan sarana dan prasarana (sarpras) untuk menunjang kegiatan Brigdalkarhutla antara lain sarpras pencegahan kebakaran hutan dan sarpras pemadaman kebakaran hutan

k. melakukan pemeliharaan batas areal Persetjuan Penggunaan Kawasan Hutan;

l. mengamankan kawasan Hutan Konservasi dan Hutan Lindung dalam hal areal penggunaan kawasan hutan berbatasan dengan kawasan hutan konservasi dan Hutan Lindung sesuai dengan ketentuan peraturan perundang-undangan, dan berkoordinasi dengan :

l.1. Kepala Balai Besar/Kepala Unit Pelaksana Teknis (UPT) yang membidangi urusan kawasan hutan konservasi, untuk kawasan hutan konservasi;

l.2. Kepala Dinas Provinsi atau Direktur Utama Perum Perhutani dalam hal berada pada wilayah kerja Perum Perhutani, untuk Kawasan Hutan Lindung;

l.3. Kepala Kesatuan Pengelolaan Hutan/KPH;

m. memberikan kemudahan bagi aparat Kementerian Lingkungan Hidup dan Kehutanan baik pusat maupun daerah pada saat melakukan monitoring dan evaluasi di lapangan;

n. mengkoordinasikan kegiatan kepada Instansi Lingkungan Hidup dan Kehutanan setempat dan/atau kepada pemegang perizinan berusaha pemanfaatan hutan atau pengelola hutan;

o. melakukan pemberdayaan masyarakat sekitar areal Persetujuan Penggunaan Kawasan Hutan;

p. melakukan kegiatan persiapan penggunaan kawasan hutan secara bertahap untuk menjaga penurunan emisi karbon sampai dengan 0 % (nol persen) sesuai rencana tahun 2030;

q. melaksanakan kewajiban lain yang ditetapkan oleh Menteri;

r. membuat laporan berkala setiap 6 (enam) bulan sekali secara *online* kepada Menteri Lingkungan Hidup dan Kehutanan mengenai penggunaan kawasan hutan dengan tembusan disampaikan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan, Direktur Jenderal Pengelolaan Hutan Lestari, Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan, Kepala Dinas Kehutanan Provinsi Sulawesi Tengah, Kepala Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu, dan Kepala Balai Pengelolaan Daerah Aliran Sungai Palu Poso.

KEDELAPAN : PT Hengjaya Mineralindo dilarang:

a. memindahtangankan Persetujuan Penggunaan Kawasan Hutan kepada pihak lain atau melakukan perubahan nama pemegang Persetujuan Penggunaan Kawasan Hutan tanpa persetujuan Menteri;

b. menjaminkan atau mengagunkan areal Penggunaan Kawasan Hutan kepada pihak lain;

c. melakukan kegiatan penambangan di dalam areal Penggunaan Kawasan Hutan :

   1. seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) pada areal yang dikembalikan, kecuali untuk melakukan kewajiban yang belum dilaksanakan;

   2. seluas ± 60,05 Ha (enam puluh dan lima perseratus hektare) pada areal penambahan sebelum memperoleh penetapan batas areal kerja Penggunaan Kawasan Hutan, dikecualikan untuk kegiatan penyelesaian pemenuhan Komitmen dan persiapan berupa membuat kegiatan persiapan, diantaranya pembangunan direksi kit (*basecamp* sementara); pengukuran sarana dan prasarana; dan penyusunan dokumen lingkungan, dalam hal Persetujuan Penggunaan Kawasan Hutan diterbitkan belum memiliki dokumen lingkungan;

d. menggunakan merkuri dalam melakukan kegiatan pertambangan;

e. melakukan kegiatan lainnya yang dilarang sesuai ketentuan peraturan perundang-undangan.

KESEMBILAN : PT Hengjaya Mineralindo wajib menyelesaikan hak-hak pihak ketiga, apabila terdapat hak-hak pihak ketiga di dalam areal Persetujuan Penggunaan Kawasan Hutan dengan meminta bimbingan dan fasilitasi Pemerintah Daerah setempat.

KESEPULUH : Perubahan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan ini dicabut dan pemegang persetujuan dikenakan sanksi sesuai peraturan perundang-undangan, apabila melakukan pelanggaran atas ketentuan dalam Keputusan ini.

KESEBELAS : Perubahan dan Penggabungan Persetujuan Penggunaan Kawasan Hutan ini berlaku dan melekat sebagai persetujuan pemanfaatan kayu, serta persetujuan pemasukan dan penggunaan peralatan.

KEDUA BELAS : Perpanjangan Persetujuan Penggunaan Kawasan Hutan diberikan dengan mempertimbangkan hasil evaluasi terhadap pemenuhan kewajiban Persetujuan Penggunaan Kawasan Hutan dan diajukan oleh pemegang Persetujuan Penggunaan Kawasan Hutan sebelum berakhirnya Persetujuan Penggunaan Kawasan Hutan.

KETIGA BELAS : 1. PT Hengjaya Mineralindo sebagai Pemegang Persetujuan Penggunaan Kawasan Hutan yang mengajukan permohonan pengembalian sebagian areal yang disertai dengan penambahan areal, tetap dapat melakukan kegiatan di lapangan pada areal seluas 815,40 Ha (delapan ratus lima belas dan empat puluh perseratus hektare) yang tidak dikembalikan dan/atau yang dipertahankan, bersamaan dengan melakukan kegiatan untuk menyelesaikan kewajiban komitmen dalam jangka waktu paling lama 1 (satu) tahun sebagaimana dimaksud dalam Amar KEEMPAT.

2. Terhadap areal seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) yang dikembalikan, tidak membebaskan PT Hengjaya Mineralindo untuk menyelesaikan kewajiban persetujuan penggunaan kawasan hutan yang belum dilakukan dan areal yang telah dikembalikan tidak dapat dimohonkan kembali oleh PT Hengjaya Mineralindo. Namun untuk kewajiban penanaman dalam rangka rehabilitasi DAS, dalam hal sebagian areal persetujuan penggunaan kawasan hutan yang dikembalikan merupakan areal yang belum terganggu, PT Hengjaya Mineralindo selaku pemegang persetujuan penggunaan kawasan hutan dapat mengajukan pengurangan luas areal penanaman dalam rangka rehabilitasi DAS;

3. Pembayaran PNBP Penggunaan Kawasan Hutan yang wajib dibayarkan oleh PT Hengjaya Mineralindo pada periode berikutnya berdasarkan pada luasan perubahan Persetujuan Penggunaan Kawasan Hutan sejak ditetapkan oleh Menteri, dengan jatuh tempo pembayaran PNBP PKH untuk PT Hengjaya Mineralindo menjadi setiap tanggal 16 Juni.

4. Atas sebagian areal yang dikembalikan oleh PT Hengjaya Mineralindo seluas ± 60,32 Ha (enam puluh dan tiga puluh dua perseratus hektare) dilakukan serah terima, dengan ketentuan pada kawasan hutan yang telah dibebani izin pemanfaatan hutan dilakukan antara pemegang izin pemanfaatan hutan dengan PT Hengjaya Mineralindo selaku pemegang persetujuan penggunaan kawasan hutan, sedangkan selain kawasan hutan yang telah dibebani izin pemanfaatan hutan, dilakukan antara Kepala Dinas Provinsi yang membidangi kehutanan dengan PT Hengjaya Mineralindo selaku Pemegang Persetujuan Penggunaan Kawasan Hutan;

5. Dengan ditetapkannya Keputusan ini, maka :
   a. Keputusan Menteri Kehutanan Nomor SK.443/ Menhut-II/2013 tanggal 20 Juni 2013 tentang IPPKH untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya pada Kawasan Hutan Produksi Terbatas a.n. PT Hengjaya Mineralindo, yang terletak di Kecamatan Bahodopi dan Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 851,22 Ha (delapan ratus lima puluh satu dan dua puluh dua perseratus) hektare beserta peta lampirannya, dicabut dan dinyatakan tidak berlaku;
   b. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1060/MENLHK/SETJEN/ PLA.0/10/2022 tanggal 7 Oktober 2022 tentang Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Pembangunan Jalan Angkut Pertambangan Bijih Nikel/*Mine Hauling Road* dan Sarana Penunjangnya atas nama PT. Hengjaya Mineralindo seluas ± 24,58 Ha (dua puluh empat dan lima puluh delapan perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.53/MENLHK-PKTL/REN/PLA.0/ 1/2023 tanggal 11 Januari 2023 menjadi seluas 24,50 Ha (dua puluh empat dan lima puluh perseratus hektare) beserta peta lampirannya, dicabut dan dinyatakan tidak berlaku.

KEEMPAT BELAS : Keputusan ini mulai berlaku pada tanggal ditetapkan untuk jangka waktu paling lama sampai dengan tanggal 26 Mei 2031, kecuali apabila dicabut oleh Menteri Lingkungan Hidup dan Kehutanan.

Ditetapkan di Jakarta
pada tanggal 19 Juni 2023

Salinan sesuai dengan aslinya
KEPALA BIRO HUKUM,

SUPARDI

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

ttd.

SITI NURBAYA

Salinan Keputusan ini disampaikan kepada Yth.:
1. Menteri Koordinator Bidang Kemaritiman dan Investasi;
2. Menteri Investasi/Kepala Badan Koordinasi Penanaman Modal;
3. Menteri Energi dan Sumber Daya Mineral;
4. Gubernur Sulawesi Tengah;
5. Sekretaris Jenderal Kementerian Lingkungan Hidup dan Kehutanan;
6. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;
7. Direktur Jenderal Pengelolaan Hutan Lestari;
8. Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan;
9. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem;
10. Direktur Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan;
11. Direktur Jenderal Pengendalian Pencemaran dan Kerusakan Lingkungan;
12. Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral;
13. Direktur Rencana dan Penggunaan Kawasan Hutan dan Pembentukan Wilayah Pengelolaan Hutan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan;
14. Direktur Pencegahan Dampak Lingkungan Usaha dan Kegiatan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan;
15. Direktur Konservasi Tanah dan Air, Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan;
16. Bupati Morowali;
17. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah;
18. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah;
19. Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah;
20. Kepala Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah;
21. Kepala Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu;
22. Kepala Balai Pengelolaan Hutan Lestari Wilayah XII Palu;
23. Kepala Balai Pengelolaan Daerah Aliran Sungai Palu Poso;
24. Kepala KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;
25. Direktur PT Hengjaya Mineralindo.

APL

HL

HPT

KPH Unit XIV - KPHP Tepe Asa Maroso Sulawesi Tengah

APL

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2°54'30"S

LAMPIRAN KE
KI
NOMOR
TANGGAL
MENTERI LINGKUNG

KETERANGAN :

- Batas areal izin usaha pertam
- Batas areal IPPKH/PPKH a.n. P
  Menteri Kehutanan Nomor SK.4
  Kehutanan Nomor SK.1060/Mer
  Direktur Jenderal Planologi Keh
  tanggal 11 Januari 2023 seluas
- Batas sebagian areal IPPKH ses
- Batas areal penambahan PPKH
- Pal atau Tanda Batas
- HL — Kawasan Hutan Lindung
- HPT — Kawasan Hutan Produksi Terbe
  (Berdasarkan Pasal 294 huruf b
  Terbatas sebelum berlakunya p
  fungsinya sebagai Hutan Produ
- HPK — Kawasan Hutan Produksi yang
- APL — Areal Penggunaan Lain
- Batas KPH
- Areal PPKH Lainnya
- Sungai dan anak sungai
- Jalan

Catatan :

*Batas areal pengelolaan hutan dan batas areal PPKH lain*

DASAR :

- Instruksi Presiden Republik Indonesia Nomor 5 Tah
- Keputusan Menteri Kehutanan Nomor SK.443/Men
- Keputusan Menteri Kehutanan Nomor SK.869/Men
  dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla
- Keputusan Menteri Lingkungan Hidup dan Kehutan
- Keputusan Menteri Lingkungan Hidup dan Kehutan
- Keputusan Menteri Lingkungan Hidup dan Kehutan
- Surat Gubernur Sulawesi Tengah Nomor SK.522/0E
- Surat Kepala Dinas Kehutanan Provinsi Sulawesi T
- Keputusan Bupati Morowali Nomor 540.3/SK.001/D
- Keputusan Kepala Dinas Penanaman Modal dan P
  540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tan
- Keputusan Direktur Jenderal Planologi Kehutanan
  tanggal 11 Januari 2023
- Surat Kepala Dinas Provinsi Sulawesi Tenggara No
- Berita Acara Hasil Evaluasi Dinas Provinsi Sulawesi
- Surat Direktur Utama PT Hengjaya Mineralindo Nor

SUMBER :

- Peta Rupa Bumi Indonesia (RBI), skala 1 : 50.000
- Peta Kawasan Hutan dan Konservasi Perairan Pro
  tanggal 29 September 2014) sebagaimana telah di
  tanggal 30 November 2020
- Peta lampiran Keputusan Menteri Kehutanan Nom
- Peta lampiran Keputusan Menteri Lingkungan Hidu
- Peta lampiran Keputusan Menteri Lingkungan Hidu
- Peta lampiran Keputusan Direktur Jenderal Planolo
  SK.53/MenbLHK-PKTL/Ren/Pla.0/1/2023 tanggal 1
- Peta lampiran Keputusan Bupati Morowali Nomor 5
- Peta lampiran Keputusan Kepala Dinas Penanaman
  a.n. Gubernur Sulawesi Tengah Nomor 540/345/IU
- Peta lampiran Surat Gubernur Sulawesi Tengah No
- Peta lampiran Surat Direktur Utama PT Hengjaya M
  10 Mei 2023

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PETA SITUASI
SKALA 1 : 1.000.000

**MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN**
**REPUBLIK INDONESIA**

KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN
REPUBLIK INDONESIA

NOMOR 1132 TAHUN 2024

TENTANG

PERUBAHAN ATAS KEPUTUSAN KEPALA BADAN KOORDINASI PENANAMAN MODAL ATAS NAMA MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN NOMOR 3/1/IPPKH/PMA/2018 TANGGAL 6 FEBRUARI 2018 TENTANG IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI NIKEL DAN SARANA PENUNJANGNYA ATAS NAMA PT HENGJAYA MINERALINDO SELUAS ± 994,32 (SEMBILAN RATUS SEMBILAN PULUH EMPAT DAN TIGA PULUH DUA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TERBATAS DI KABUPATEN MOROWALI, PROVINSI SULAWESI TENGAH

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,

Menimbang : a. bahwa PT Hengjaya Mineralindo sebagai Perusahaan Pertambangan Pemegang Izin Usaha Pertambangan, berdasarkan :

1. Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juni 2011 tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi menjadi Izin Usaha Pertambangan Operasi Produksi kepada PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas 6.249 Ha (enam ribu dua ratus empat puluh sembilan hektare), berlaku selama 20 (duapuluh) tahun sampai dengan tanggal 26 Mei 2031 dan masuk dalam pengumuman *Clear and Clean (CnC)* tahap ke-2 (kedua) rekonsiliasi Izin Usaha Pertambang yang diterbitkan oleh Direktorat Jenderal Mineral dan Batubara Kementerian Energi dan Sumber Daya Mineral;
2. Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020 tentang Penciutan Wilayah Izin Usaha Pertambangan Operasi Produksi a.n. PT Hengjaya Mineralindo berdasarkan Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tentang Persetujuan Peningkatan Izin Usaha Pertambangan Eksplorasi menjadi Izin Usaha Pertambangan Operasi Produksi kepada PT

Hengjaya Mineralindo seluas 6.249 Ha (enam ribu dua ratus empat puluh sembilan hektare) menjadi 5.983 Ha (lima ribu sembilan ratus delapan puluh tiga hektare), dengan penjelasan :

2.1. Izin Usaha Pertambangan PT Hengjaya Mineralindo telah terdaftar dalam portal perizinan *Minerba One Data Indonesia (MODI) dan Minerba One Map Indonesia (MOMI)* Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral (data diakses pada tanggal 26 Juni 2024);

2.2. Izin Usaha Pertambangan PT Hengjaya Mineralindo telah mendapatkan perintah penempatan jaminan reklamasi tahap operasi produksi PT Hengjaya Mineralindo periode tahun 2021-2025 sesuai surat Plt. Direktur Jenderal Mineral dan Batubara a.n. Menteri Energi dan Sumber Daya Mineral Nomor T.2403/MB.07/DJB.T/2023 tanggal 19 Desember 2023, dengan Jaminan Reklamasi periode tahun 2021-2025 sebesar Rp. 29.759.192.290,03,-(dua puluh sembilan miliar tujuh ratus lima puluh sembilan juta seratus sembilan puluh dua ribu dua ratus sembilan puluh dan nol tiga rupiah) dan telah menempatkan jaminan reklamasi dalam bentuk deposito berjangka periode tahun 2021-2023 dengan total sebesar Rp. 11.868.387.692,42 (sebelas miliar delapan ratus enam puluh delapan juta tiga ratus delapan puluh tujuh ribu enam ratus sembilan puluh dua dan empat puluh dua rupiah);

b. bahwa berdasarkan Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, kepada PT Hengjaya Mineralindo diberikan Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya seluas ± 994,32 Ha (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana telah ditetapkan areal kerjanya sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460 /MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 menjadi seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare), berlaku sampai dengan tanggal 26 Mei 2031, dengan penjelasan terkait beberapa kewajiban pemegang Persetujuan Penggunaan Kawasan Hutan, diantaranya :

1. PT Hengjaya Mineralindo telah melakukan kewajiban pembayaran PNBP Penggunaan Kawasan Hutan sampai dengan tahun 2024;
2. PT Hengjaya Mineralindo telah mendapat Penetapan Lokasi Dalam Rangka Rehabilitasi DAS sesuai Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.953/MENLHK-PDASHL/KTA/DAS.1/1/ 2019 tanggal 28 Januari 2019 dan Nomor SK.6580/MENLHK - PDASHL/KTA/DAS.1/10/2021 tanggal 28 Oktober 2021 seluas 1.094 Ha (seribu sembilan puluh empat hektare). Terhadap areal seluas 1.094 Ha (seribu sembilan puluh empat hektare) tersebut, PT Hengjaya Mineralindo telah melakukan serah terima seluas 452 Ha (empat ratus lima puluh dua hektare), sesuai Berita Acara Serah Terima Nomor 072/LGD.DIR-HM/IX/2022 tanggal 22 September 2022 dan Nomor 059/LGD.DIR-HM/VI/2023 tanggal 15 Juni 2023, dan sisanya seluas 642 Ha (enam ratus empat puluh dua hektare) masih tahap penilaian;

c. bahwa Direktur PT Hengjaya Mineralindo dengan surat Nomor 034/LGD.DIR-HM/IV/2024 tanggal 25 April 2024, mengajukan permohonan Perubahan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel dan Sarana Penunjangnya seluas ± 10,91 Ha (sepuluh dan sembilan puluh satu perseratus hektare) di Kabupaten Morowali, Provinsi Sulawesi Tengah;

d. bahwa Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan dengan Nota Dinas Nomor ND.1193/PKTL/REN/PLA.0/8/2024 tanggal 20 Agustus 2024, menyampaikan hasil penilaian dan penelaahan terhadap permohonan Perubahan Persetujuan Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo :
   1. berdasarkan hasil penilaian kelengkapan persyaratan, permohonan PT Hengjaya Mineralindo telah melampirkan persyaratan administrasi dan teknis sesuai ketentuan Pasal 380, Pasal 381 dan Pasal 410 Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan serta Penggunaan Kawasan Hutan;
   2. berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014, sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MENLHK/SETJEN/PLA.0/11/2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutan

Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/10/2021, serta berdasarkan hasil perhitungan ulang secara digital, areal yang dikembalikan menjadi seluas ± 11,00 Ha (sebelas hektare) seluruhnya berada pada Kawasan Hutan Produksi Terbatas dan berdasarkan *overlay* dengan citra satelit planet scope liputan 1 September 2023, areal yang dikembalikan seluas ± 11,00 Ha (sebelas hektare) berada pada tutupan lahan berupa hutan lahan kering sekunder dan semak/belukar;

3. berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014, sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MENLHK/SETJEN/PLA.0/11/2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutan Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/10/2021, serta berdasarkan hasil perhitungan ulang secara digital, areal penambahan menjadi seluas ± 10,73 Ha (sepuluh dan tujuh puluh tiga perseratus hektare), seluruhnya berada pada Kawasan Hutan Produksi Terbatas, dengan penjelasan :
   3.1. seluas ± 0,09 Ha (sembilan perseratus hektare) terindikasi sebagai hutan alam primer dan lahan gambut berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.12764/MENLHK - PKTL/IPSDH/PLA.1/11/2023 tanggal 22 November 2023, sehingga areal yang ditelaah lebih lanjut seluas ± 10,64 Ha (sepuluh dan enam puluh empat perseratus hektare);
   3.2. seluas ± 0,03 Ha (tiga perseratus hektare) tumpang tindih dengan Persetujuan Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo sesuai Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, sehingga yang dapat ditelaah lebih lanjut seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare);
   3.3. berdasarkan overlay dengan citra satelit planet 2023 dan Penutupan Lahan tahun 2022, areal seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare), berupa hutan lahan kering primer, hutan lahan kering sekunder dan semak/belukar;

3.4. seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare) berada pada wilayah pengelolaan KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

3.5. seluruh areal yang dimohon berada di wilayah sebaran satwa liar babirusa, agar PT Hengjaya Mineralindo dalam pelaksanaan kegiatan mempedomani Standar Operasional Prosedur (SOP) Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem Nomor SOP.1/KSDAE/SET.3/KSA.2/12/2022 tanggal 7 Desember 2022 tentang Perlindungan Satwa Liar di Dalam dan di Luar Kawasan Hutan;

4. berkenaan dengan telaah tersebut diatas, maka permohonan perubahan Persetujuan Penggunaan Kawasan Hutan berupa pengembalian sebagian areal Persetujuan Penggunaan Kawasan Hutan seluas ± 11,00 Ha (sebelas hektare) dan penambahan areal Persetujuan Penggunaan Kawasan Hutan seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare) dapat ditelaah sebagai perubahan Persetujuan Penggunaan Kawasan Hutan, sehingga luas keseluruhan PPKH menjadi seluas ± 993,83 Ha (sembilan ratus sembilan puluh tiga dan delapan puluh tiga perseratus hektare);

5. berdasarkan Peta Kawasan Hutan dan Konservasi Perairan serta Wilayah Tertentu yang ditunjuk Sebagai Kawasan Hutan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014, sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MENLHK/SETJEN/PLA.0/11/2020 dan Peta Perkembangan Pengukuhan Provinsi Sulawesi Tengah lampiran Keputusan Menteri Lingkungan Hidup dan Kehutan Nomor SK.6624/MENLHK-PKTL/KUH/PLA.2/10/2021, areal seluas ± 993,83 Ha (sembilan ratus sembilan puluh tiga dan delapan puluh tiga perseratus hektare) berada pada pada Kawasan Hutan Produksi Terbatas, dengan penjelasan :

   5.1. areal seluas ± 993,83 Ha (sembilan ratus sembilan puluh tiga dan delapan puluh tiga perseratus hektare) tersebut berada pada wilayah pengelolaan KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

   5.2. berkenaan dengan kuota 10% (sepuluh persen) pada Kawasan Hutan Produksi untuk kegiatan pertambangan, karena permohonan PT Hengjaya Mineralindo merupakan permohonan pengembalian seluas ± 11,00 Ha (sebelas hektare) lebih besar dari permohonan penambahan seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare), maka

tidak mengubah beban kuota pada KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;

6. berdasarkan hasil penilaian dan penelaahan, maka permohonan Perubahan Persetujuan Penggunaan Kawasan Hutan PT Hengjaya Mineralindo berdasarkan Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 berupa Pengembalian Sebagian Areal PPKH seluas ± 11,00 Ha (sebelas hektare) dan Penambahan Areal PPKH seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare), sehingga luas total berubah dari semula seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare) menjadi seluas ± 993,83 Ha (sembilan ratus sembilan puluh tiga dan delapan puluh tiga perseratus hektare) untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya berada pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah secara teknis dapat dipertimbangkan untuk diproses lebih lanjut;

e. bahwa berdasarkan :

1. Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan :

1.1. Pasal 90 ayat (2), Penggunaan Kawasan Hutan dilakukan tanpa mengubah fungsi pokok Kawasan Hutan dengan mempertimbangkan batasan luas dan jangka waktu tertentu serta kelestarian lingkungan;

1.2. Pasal 91 ayat (1) dan ayat (2) huruf b, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan meliputi kegiatan pertambangan;

1.3. Pasal 94 ayat (1) dan Pasal 96 ayat (1), Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan dilakukan berdasarkan Persetujuan Penggunaan Kawasan Hutan dan diberikan oleh Menteri berdasarkan permohonan;

1.4. Pasal 94 ayat (5) dan ayat (7), Persetujuan Penggunaan Kawasan Hutan pada provinsi yang terlampaui kecukupan luas Kawasan Hutannya wajib membayar PNBP Penggunaan Kawasan Hutan dan wajib melakukan penanaman dalam rangka rehabilitasi DAS;

1.5. Pasal 99 ayat (2), ayat (4) dan ayat (5) :

(2) Pemegang Persetujuan Penggunaan Kawasan Hutan wajib melaksanakan tata batas areal Persetujuan Penggunaan Kawasan Hutan paling lama dalam jangka waktu 1 (satu) tahun setelah diterbitkan Persetujuan Penggunaan Kawasan Hutan dan tidak dapat diperpanjang;

(4) dalam hal telah menyelesaikan pelaksanaan tata batas areal Penggunaan Kawasan Hutan, Menteri menetapkan batas areal kerja Penggunaan Kawasan Hutan;

(5) dalam hal tidak menyelesaikan pelaksanaan tata batas areal Penggunaan Kawasan Hutan dalam jangka waktu yang telah ditentukan, Persetujuan Penggunaan Kawasan Hutan menjadi batal dan dinyatakan tidak berlaku;

1.6. Pasal 104 ayat (1), Jangka waktu Persetujuan Penggunaan Kawasan Hutan diberikan sama dengan jangka waktu Perizinan Berusaha sesuai bidangnya dan dilakukan sesuai dengan ketentuan peraturan perundang-undangan;

1.7. Pasal 252 ayat (2), Perlindungan Hutan atas Kawasan Hutan yang telah menjadi areal kerja pemegang Perizinan Berusaha Pemanfaatan Hutan, persetujuan Perhutanan Sosial, dan persetujuan Penggunaan Kawasan Hutan dilaksanakan dan menjadi tanggung jawab pemegang Perizinan Berusaha Pemanfaatan Hutan, persetujuan Perhutanan Sosial, dan persetujuan Penggunaan Kawasan Hutan yang bersangkutan;

1.8. Pasal 294 huruf b, Kawasan Hutan Produksi Terbatas sebelum berlakunya Peraturan Pemerintah ini, dinyatakan tetap berlaku sesuai dengan tahap pengukuhannya serta diberlakukan peruntukan dan fungsinya sebagai Kawasan Hutan Produksi Tetap;

1.9. Pasal 296 huruf i, pada saat Peraturan Pemerintah ini mulai berlaku, permohonan Persetujuan Penggunaan Kawasan Hutan pada areal yang belum dilakukan penetapan kecukupan luas Kawasan Hutan provinsi sebelum berlakunya Peraturan Pemerintah ini, tetap diproses berdasarkan batasan kecukupan luas Kawasan Hutan yang telah ditetapkan sebelumnya;

2. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan

Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, serta Penggunaan Kawasan Hutan :

2.1. Pasal 366 ayat (1) dan ayat (2) huruf a, Penggunaan Kawasan Hutan untuk kepentingan pembangunan di luar kegiatan Kehutanan hanya dapat dilakukan untuk kegiatan yang mempunyai tujuan strategis yang tidak dapat dielakkan dilakukan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan Keputusan Menteri;

2.2. Pasal 367 huruf b, Penggunaan Kawasan Hutan dengan mekanisme Persetujuan Penggunaan Kawasan Hutan dengan Keputusan Menteri, meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, *conveyor* dan *smelter*;

2.3. Pasal 369 ayat (1) huruf a, Penggunaan Kawasan Hutan untuk kegiatan komersial dilakukan dengan ketentuan pada provinsi yang melampaui kecukupan luas kawasan hutan wajib membayar PNBP Penggunaan Kawasan Hutan, dan melakukan penanaman dalam rangka Rehabilitasi DAS terutama pada Kawasan Hutan untuk Penggunaan Kawasan Hutan dengan ratio 1:1 (satu berbanding satu);

2.4. Pasal 372 ayat (6) dan ayat (7) :

(6) Dalam hal Persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan mineral dan batubara di Kawasan Hutan Produksi pada suatu provinsi berada pada areal yang dibebani Perizinan Berusaha Pemanfaatan Hutan, kuota yang dapat dipertimbangkan paling banyak 10% (sepuluh persen) dari luas efektif setiap Perizinan Berusaha Pemanfaatan Hutan;

(7) Dalam hal Persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan mineral dan batubara di Kawasan Hutan Produksi pada suatu provinsi berada pada areal KPH, kuota yang dapat dipertimbangkan paling banyak 10% (sepuluh persen) dari luas Kawasan Hutan Produksi pada masing-masing KPH yang tidak dibebani Perizinan Berusaha Pemanfaatan Hutan;

2.5. Pasal 390 ayat (4), Dalam hal Pemegang Persetujuan Penggunaan Kawasan Hutan tidak menyelesaikan pelaksanaan Tata Batas areal Persetujuan Penggunaan Kawasan Hutan dalam jangka waktu yang ditentukan,

Persetujuan Penggunaan Kawasan Hutan menjadi batal dan dinyatakan tidak berlaku;

2.6. Pasal 392 ayat (1) dan ayat (2), Pemegang Persetujuan Penggunaan Kawasan Hutan dilarang melakukan kegiatan di lapangan sebelum menyelesaikan pemenuhan Komitmen, dikecualikan untuk penyelesaian pemenuhan Komitmen dan kegiatan lainnya, yaitu membuat kegiatan persiapan, diantaranya pembangunan direksi kit (*basecamp* sementara); pengukuran sarana dan prasarana; sarana penunjang keselamatan umum; penanganan bencana alam; dan sarana dan prasarana penunjang pada kondisi darurat;

2.7. Pasal 395 ayat (1) dan (2), Direktur Jenderal melakukan pengawasan terhadap Pemegang Persetujuan Penggunaan Kawasan Hutan atas pelaksanaan penyelesaian pemenuhan Komitmen sebagaimana dimaksud dalam Pasal 389 sampai dengan Pasal 391 dan Pengawasan pelaksanaan penyelesaian pemenuhan Komitmen sebagaimana dimaksud pada ayat (1) terdiri atas tenggang waktu penyelesaian pemenuhan Komitmen; dan proses penyelesaian pemenuhan Komitmen sesuai dengan ketentuan peraturan perundang-undangan;

2.8. Pasal 396 ayat (1), Pemegang Persetujuan Penggunaan Kawasan Hutan menyampaikan laporan penyelesaian pemenuhan Komitmen dengan dilampiri dokumen asli sebagaimana dimaksud dalam Pasal 389 dan Pasal 390 dan mengajukan permohonan Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan kepada Direktur Jenderal melalui Direktur;

2.9. Pasal 397 ayat (1) huruf a dan ayat (2) :

(1) huruf a, berdasarkan hasil pengecekan dan penelaahan atas pemenuhan komitmen yang disampaikan oleh pemegang Persetujuan Penggunaan Kawasan Hutan, Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan atas nama Menteri Lingkungan Hidup dan Kehutanan menetapkan Keputusan tentang Penetapan Batas Areal Kerja Persetujuan Penggunaan Kawasan Hutan apabila seluruh komitmen telah terpenuhi dengan tenggang waktu yang ditentukan dan proses pemenuhan komitmen sesuai dengan ketentuan peraturan perundang-undangan;

(2) Dalam hal Direktur Jenderal atas nama Menteri telah menetapkan batas Areal Kerja Penggunaan Kawasan Hutan,

Persetujuan Penggunaan Kawasan Hutan berlaku efektif dan Pemegang Persetujuan Penggunaan Kawasan Hutan dapat langsung menjalankan kegiatan usaha;

2.10. Pasal 399 ayat (4) dan ayat (5) :

(4) Bagi Pemegang Persetujuan Penggunaan Kawasan Hutan dengan kompensasi membayar PNBP Penggunaan Kawasan Hutan, pembayaran PNBP Penggunaan Kawasan Hutan dilaksanakan sejak terbitnya Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan;

(5) Pembayaran PSDH/DR, PNBP Penggunaan Kawasan Hutan, ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil Rehabilitasi atau biaya investasi pengelolaan pemanfaatan hutan kepada pengelola/Pemegang Perizinan Berusaha Pemanfaatan Hutan dalam hal areal Persetujuan Penggunaan Kawasan Hutan berada dalam Areal Kerja Pengelolaan Hutan/Perizinan Berusaha Pemanfaatan Hutan dapat dilakukan tanpa harus menunggu pemegang Persetujuan Penggunaan Kawasan Hutan mendapatkan Penetapan Batas Areal Kerja Penggunaan Kawasan Hutan;

2.11. Pasal 400 ayat (1) dan ayat (2) :

(1) Penggantian biaya investasi dibayarkan oleh Pemegang Persetujuan Penggunaan Kawasan Hutan kepada pengelola hutan atau Pemegang Perizinan Berusaha Pemanfaatan Hutan berdasarkan kesepakatan paling lama 1 (satu) tahun;

(2) Dalam hal tidak terjadi kesepakatan nilai penggantian biaya investasi sebagaimana dimaksud pada ayat (1) antara Pemegang Persetujuan Penggunaan Kawasan Hutan dengan Pengelola/Pemegang Perizinan Berusaha Pemanfaatan Hasil Hutan sampai dengan 1 (satu) tahun sejak ditetapkan batas areal penggunaan Kawasan Hutan, Direktur Jenderal yang membidangi Pengelolaan Hutan Lestari menetapkan nilai penggantian biaya investasi;

2.12. Pasal 409 ayat (4) dan ayat (5) :

(4) Persetujuan Penggunaan Kawasan Hutan dapat dilakukan perubahan berdasarkan permohonan atau tanpa permohonan dari Pemegang Persetujuan Penggunaan Kawasan Hutan apabila terdapat

perubahan perizinan/perjanjian dibidangnya; perubahan dokumen lain yang menjadi dasar penerbitan Persetujuan Penggunaan Kawasan Hutan; dan/atau ketidaksesuaian Penggunaan Kawasan Hutan dengan perizinan/perjanjian di bidangnya dan/atau dokumen lingkungan;

(5) Pemegang Persetujuan Penggunaan Kawasan Hutan yang Areal Kerjanya dikurangi tetap dapat melakukan kegiatan di lapangan pada Areal Kerja yang tidak dikurangi atau berubah;

2.13. Pasal 410 ayat (1), ayat (4),ayat (6), ayat (7), ayat (8), ayat (9), ayat (10), ayat (11) dan ayat (12) :

(1) Dalam hal areal Persetujuan Penggunaan Kawasan Hutan akan dilakukan perubahan berupa pengembalian sebagian dan pengembalian sebagian yang disertai penambahan, Pemegang Persetujuan Penggunaan Kawasan Hutan mengajukan permohonan kepada Menteri melalui Direktur, disertai hasil evaluasi;

(4) Hasil evaluasi antara lain memuat pemenuhan kewajiban pemegang Persetujuan Penggunaan Kawasan Hutan; kondisi tutupan areal yang akan dikembalikan; dan rekomendasi kelayakan areal Persetujuan Penggunaan Kawasan Hutan yang akan dikembalikan;

(6) Terhadap areal Persetujuan Penggunaan Kawasan Hutan yang telah dikembalikan sebagaimana dimaksud pada ayat (1) dan ayat (2) tidak dapat dimohonkan kembali oleh yang bersangkutan;

(7) Pemegang Persetujuan Penggunaan Kawasan Hutan yang mengajukan permohonan pengembalian sebagian areal, tetap dapat melakukan kegiatan di lapangan pada areal yang tidak dikembalikan;

(8) Pengembalian sebagian areal Persetujuan Penggunaan Kawasan Hutan tidak membebaskan Pemegang Persetujuan Penggunaan Kawasan Hutan untuk menyelesaikan kewajiban Persetujuan Penggunaan Kawasan Hutan pada areal yang dikembalikan;

(9) Besaran PNBP Penggunaan Kawasan Hutan yang wajib dibayarkan pada periode berikutnya berdasarkan pada luasan Persetujuan Penggunaan Kawasan

Hutan perubahan sejak ditetapkan Keputusan perubahan oleh Menteri;

(10) Dalam hal sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan merupakan areal yang belum terganggu, Pemegang Persetujuan Penggunaan Kawasan Hutan dapat mengajukan pengurangan luas areal penanaman dalam rangka Rehabilitasi DAS;

(11) Dalam hal pemegang perubahan Persetujuan Penggunaan Kawasan Hutan tidak dapat menyelesaikan Komitmen dalam jangka waktu 1 (satu) tahun, Persetujuan Penggunaan Kawasan Hutan dinyatakan tidak berlaku;

(12) Atas sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan dilakukan serah terima areal Persetujuan Penggunaan Kawasan Hutan, dengan ketentuan:

a) pada wilayah kerja perum perhutani dilakukan antara direktur utama perum perhutani dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

b) pada Kawasan Hutan yang telah dibebani izin pemanfaatan hutan dilakukan antara pemegang izin pemanfaatan dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

c) pada Kawasan Hutan selain huruf a) dan huruf b), dilakukan antara Kepala Dinas Provinsi dengan Pemegang Persetujuan Penggunaan Kawasan Hutan;

2.14. Pasal 531 huruf a, izin atau perjanjian pinjam pakai Kawasan Hutan yang diterbitkan dan telah memenuhi seluruh kewajiban sebelum berlakunya Peraturan Menteri ini, dinyatakan tetap berlaku sampai dengan berakhirnya izin atau perjanjian pinjam pakai Kawasan Hutan dan diberlakukan sebagai persetujuan Penggunaan Kawasan Hutan;

2.15. Pasal 531 huruf m, permohonan Persetujuan Penggunaan Kawasan Hutan pada areal yang belum dilakukan penetapan Kecukupan Luas Kawasan Hutan provinsi sebelum berlakunya Peraturan Menteri ini, tetap diproses berdasarkan batasan Kecukupan Luas Kawasan Hutan yang telah ditetapkan sebelumnya;

2.16. Pasal 532 ayat (5), Dalam hal pada areal permohonan Persetujuan Penggunaan Kawasan Hutan belum dilakukan penetapan kecukupan luas Kawasan Hutan provinsi, batasan kecukupan luas Kawasan Hutan adalah 30 % (tiga puluh persen) dari luas provinsi;

3. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, Serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi :

3.1. Pasal 28 huruf a dan Pasal 29 ayat (1), Penggantian biaya investasi sebagai akibat adanya persetujuan Penggunaan Kawasan Hutan untuk kegiatan pertambangan meliputi pertambangan mineral, batubara, minyak dan gas bumi, pertambangan lain, termasuk sarana dan prasarana antara lain jalan, pipa, *conveyor*, dan *smelter* pada sebagian areal kerja pengelola/pemegang pengelolaan/PBPH dilaksanakan dengan prinsip kelestarian Hutan, keberlanjutan usaha, keadilan, kelayakan/kepatutan, transparansi, dan bertanggung gugat dan besarnya nilai penggantian biaya investasi ditetapkan Direktur Jenderal;

3.2. Pasal 32 ayat (1) dan ayat (2), Pemegang persetujuan Penggunaan Kawasan Hutan menyampaikan permohonan penetapan besarnya nilai penggantian biaya investasi kepada Direktur Jenderal dan pihak terkait dan permohonan penghitungan penggantian biaya investasi diajukan setelah terbitnya penetapan batas areal kerja persetujuan Penggunaan Kawasan Hutan;

3.3. Pasal 33 ayat (1) dan ayat (3), Direktur Jenderal menetapkan besarnya nilai penggantian biaya investasi setelah menerima hasil kajian dari tim dan penetapan penggantian biaya investasi sebagaimana dimaksud pada ayat (1) bersifat final dan mengikat kedua belah pihak;

3.4. Pasal 34 ayat (1) dan ayat (4), Pemegang Persetujuan Penggunaan Kawasan Hutan menyelesaikan pembayaran penggantian biaya investasi kepada pengelola/pemegang pengelolaan/PBPH paling lama 1 (satu) tahun setelah tanggal penetapan nilai penggantian biaya investasi dan dalam hal pembayaran sebagaimana dimaksud pada ayat (1) tidak diselesaikan sesuai batas waktu yang ditetapkan, Menteri melalui direktur jenderal yang membidangi urusan planologi kehutanan

dan tata lingkungan, mengenakan Sanksi Administratif sesuai dengan ketentuan peraturan perundang-undangan;

f. bahwa berdasarkan pertimbangan tersebut huruf a sampai dengan huruf e, perlu menetapkan Keputusan Menteri Lingkungan Hidup dan Kehutanan tentang Perubahan atas Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo seluas ± 994,32 (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah;

Mengingat : 1. Undang-Undang Nomor 5 Tahun 1990 tentang Konservasi Sumberdaya Alam Hayati dan Ekosistemnya, sebagaimana telah diubah dengan Undang-Undang Nomor 32 Tahun 2024;

2. Undang-Undang Nomor 41 Tahun 1999 tentang Kehutanan, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

3. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

4. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

5. Undang-Undang Nomor 18 Tahun 2013 tentang Pencegahan dan Pemberantasan Perusakan Hutan, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

6. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah, sebagaimana telah diubah beberapa kali, terakhir dengan Undang – Undang Nomor 6 Tahun 2023 tentang Penetapan Peraturan Pemerintah Pengganti Undang-Undang Nomor 2 Tahun 2022 tentang Cipta Kerja menjadi Undang - Undang;

7. Undang-Undang Nomor 9 Tahun 2018 tentang Penerimaan Negara Bukan Pajak;
8. Peraturan Pemerintah Nomor 26 Tahun 2008 tentang Rencana Tata Ruang Wilayah Nasional, sebagaimana telah diubah beberapa kali, terakhir dengan Peraturan Pemerintah Nomor 21 Tahun 2021 tentang Penyelenggaraan Penataan Ruang;
9. Peraturan Pemerintah Nomor 33 Tahun 2014 tentang Jenis dan Tarif atas Jenis Penerimaan Negara Bukan Pajak yang Berasal dari Penggunaan Kawasan Hutan untuk Kepentingan Pembangunan di Luar Kegiatan Kehutanan yang Berlaku pada Kementerian Kehutanan;
10. Peraturan Pemerintah Nomor 26 Tahun 2020 tentang Rehabilitasi dan Reklamasi Hutan;
11. Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Penyelenggaraan Perlindungan dan Pengelolaan Lingkungan Hidup;
12. Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan;
13. Peraturan Pemerintah Nomor 24 Tahun 2021 tentang Tata Cara Pengenaan Sanksi Administratif dan Tata Cara Penerimaan Negara Bukan Pajak yang berasal dari Denda Administratif Bidang Kehutanan;
14. Peraturan Presiden Nomor 92 Tahun 2020 tentang Kementerian Lingkungan Hidup dan Kehutanan;
15. Instruksi Presiden Nomor 5 Tahun 2019 tentang Penghentian Pemberian Izin Baru dan Penyempurnaan Tata Kelola Hutan Alam Primer dan Lahan Gambut;
16. Peraturan Menteri Kehutanan Nomor P.56/Menhut-II/2008 tentang Tata Cara Penentuan Luas Areal Terganggu dan Areal Reklamasi dan Revegetasi untuk Perhitungan Penerimaan Negara Bukan Pajak Penggunaan Kawasan Hutan, sebagaimana telah beberapa kali diubah terakhir dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.51/Menlhk/Setjen/Kum.1/9/2019;
17. Peraturan Menteri Kehutanan Nomor P.60/Menhut-II/2009 tentang Pedoman Penilaian Keberhasilan Reklamasi Hutan;
18. Peraturan Menteri Keuangan Nomor 91/PMK.02/2009 tentang Tata Cara Pengenaan, Pemungutan dan Penyetoran Penerimaan Negara Bukan Pajak yang Berasal dari Penggunaan Kawasan Hutan untuk Kepentingan Pembangunan di Luar Kegiatan Kehutanan;
19. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.32/MenLHK/Setjen/Kum.1/3/2016 tentang Pengendalian Kebakaran Hutan dan Lahan;
20. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.59/Menlhk/Setjen/Kum.1/10/2019 tentang

Penanaman Dalam Rangka Rehabilitasi Daerah Aliran Sungai;

21. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 4 Tahun 2021 tentang Daftar Usaha dan/atau Kegiatan yang Wajib Memiliki Analisis Mengenai Dampak Lingkungan Hidup, Upaya Pengelolaan Lingkungan Hidup dan Upaya Pemantauan Lingkungan Hidup atau Surat Pernyataan Kesanggupan Pengelolaan dan Pemantauan Lingkungan Hidup;
22. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 7 Tahun 2021 tentang Perencanaan Kehutanan, Perubahan Peruntukan Kawasan Hutan dan Perubahan Fungsi Kawasan Hutan, serta Penggunaan Kawasan Hutan;
23. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 8 Tahun 2021 tentang Tata Hutan dan Penyusunan Rencana Pengelolaan Hutan, serta Pemanfaatan Hutan di Hutan Lindung dan Hutan Produksi;
24. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 15 Tahun 2021 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan, sebagaimana telah diubah dengan Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor 5 Tahun 2024;
25. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.12764/MENLHK-PKTL/IPSDH/PLA.1/11/2023 tentang Penetapan Peta Indikatif Penghentian Pemberian Perizinan Berusaha, Persetujuan Penggunaan Kawasan Hutan, atau Persetujuan Perubahan Peruntukan Kawasan Hutan Baru pada Hutan Alam Primer dan Lahan Gambut Tahun 2023 Periode II;
26. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor 6132 Tahun 2024 tentang Peta Indikatif Penyelesaian Penguasaan Tanah (PPTPKH) dan Sumber Tanah Obyek Reforma Agraria (TORA) dan Peta Realisasi PPTPKH dan TORA Revisi III;
27. Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor 6642 TAHUN 2024 tentang Peta Indikatif Areal Perhutanan Sosial (Revisi IX);

Memperhatikan :

1. Dokumen Lingkungan :
   a. Dokumen Addendum ANDAL dan RKL-RPL Pertambangan Bijih Nikel di Kecamatan Bahodopi dan Bungku Pesisir Kabupaten Morowali, Provinsi Sulawesi Tengah a.n. PT Hengjaya Mineralindo Tahun 2021;
   b. Keputusan Bupati Morowali Nomor 660.1/71.A/KHL/2011 tanggal 13 Juni 2011 tentang Kelayakan Lingkungan Kegiatan Pertambangan Bijih Nikel di Kabupaten Morowali, Provinsi Sulawesi Tengah oleh PT Hengjaya Mineralindo;

c. Keputusan Kepala Dinas PMPTSP Kabupaten Morowali Nomor 188.4/KEP.023/IL/ DPMPTSP/IV/ 2021 tanggal 21 April 2021 tentang Izin Lingkungan addendum ANDAL dan RKL, RPL, Tipe A Rencana Kegiatan Pertambangan Bijih Nikel di Kecamatan Bahodopi dan di Kecamatan Bungku Pesisir Kabupaten Morowali, Provinsi Sulawesi Tengah oleh PT Hengjaya Mineralindo;

2. Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 500.4.3.11/304/Bid.P2H tanggal 13 Maret 2024 hal Pertimbangan Teknis atas Permohonan Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel dan Sarana Prasarana Penunjangnya a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah seluas ± 10,79 Ha;
3. Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 500.4.3.11/434/Bid.P2H tanggal 2 April 2024 hal Pengantar Laporan Hasil Evaluasi Penggunaan Kawasan Hutan a.n. PT Hengjaya Mineralindo;
4. Laporan Hasil Evaluasi Penggunaan Kawasan Hutan guna pengembalian sebagian areal PPKH PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah berupa kewajiban dan pemenuhan kewajiban;
5. Matrik dan peta baseline persetujuan penggunaan kawasan hutan skala 1 : 30.000, a.n. PT Hengjaya Mineralindo di Kabupaten Morowali, Provinsi Sulawesi Tengah yang ditandatangani oleh Direktur PT Hengjaya Mineralindo, seluas 10,914 Ha;
6. Peta Citra Resolusi Tinggi Planet Scope, Liputan bulan 1 September 2023 skala 1: 10.000;
7. Pernyataan Komitmen sesuai Akta Nomor 02 tanggal 4 Maret 2024 yang dibuat di hadapan Dherwina Asih Pranawati, S.H., M.Kn Notaris di Kabupaten Tangerang;
8. Pakta Integritas sesuai Akta Nomor 03 tanggal 4 Maret 2024 yang dibuat di hadapan Dherwina Asih Pranawati, S.H., M.Kn; Notaris di Kabupaten Tangerang;
9. Kronologis dan Telaah Perubahan Persetujuan Penggunaan Kawasan Hutan berupa Pengembalian Sebagian Areal dan Penambahan Areal Persetujuan Penggunaan Kawasan Hutan untuk Kegiatan Operasi Produksi Bijih Nikel dan Sarana Penunjangnya a.n. PT Hengjaya Mineralindo pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah dari seluas 994,22 Ha menjadi seluas ± 993,83 Ha, Lampiran Nota Dinas Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan Nomor ND.1193/ PKTL/REN/PLA.0/8/2024 tanggal 20 Agustus 2024;

MEMUTUSKAN :

Menetapkan : KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN TENTANG PERUBAHAN ATAS KEPUTUSAN KEPALA BADAN KOORDINASI PENANAMAN MODAL ATAS NAMA MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN NOMOR 3/1/IPPKH/PMA/2018 TANGGAL 6 FEBRUARI 2018 TENTANG IZIN PINJAM PAKAI KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI NIKEL DAN SARANA PENUNJANGNYA ATAS NAMA PT HENGJAYA MINERALINDO SELUAS ± 994,32 (SEMBILAN RATUS SEMBILAN PULUH EMPAT DAN TIGA PULUH DUA PERSERATUS HEKTARE) PADA KAWASAN HUTAN PRODUKSI TERBATAS DI KABUPATEN MOROWALI, PROVINSI SULAWESI TENGAH.

Pasal I

Mengubah ketentuan dalam Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo seluas ± 994,32 (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana telah ditetapkan areal kerjanya berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 menjadi seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare), sehingga ketentuan Amar KESATU sampai dengan Amar KESEBELAS menjadi sebagai berikut :

KESATU : Memberikan Perubahan Persetujuan Penggunaan Kawasan Hutan berupa Pengembalian Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 11,00 Ha (sebelas hektare) dan Penambahan Areal Persetujuan Penggunaan Kawasan Hutan seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare) untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya kepada PT Hengjaya Mineralindo dari seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare) menjadi seluas ± 993,83 Ha (sembilan ratus sembilan puluh tiga dan delapan puluh tiga perseratus hektare) berada pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana peta lampiran Keputusan ini, dengan rincian :

a. Areal PPKH seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare) berdasarkan Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, sebagaimana telah ditetapkan areal kerjanya berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/

MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019;

b. Areal PPKH yang dikembalikan seluas ± 11,00 Ha (sebelas hektare);

c. Areal PPKH yang dipertahankan seluas ± 983,22 Ha (sembilan ratus delapan puluh tiga dan dua puluh dua perseratus hektare) berdasarkan Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, sebagaimana telah ditetapkan areal kerjanya berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019;

d. Areal Penambahan PPKH seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare);

e. Areal Perubahan PPKH seluas ± 993,83 Ha (sembilan ratus sembilan puluh tiga dan delapan puluh tiga perseratus hektare).

KEDUA : Pemberian Perubahan Persetujuan Penggunaan Kawasan Hutan sebagaimana dimaksud dalam Amar KESATU adalah untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo, bukan untuk kegiatan lain serta arealnya tetap berstatus sebagai kawasan hutan.

KETIGA : PT Hengjaya Mineralindo berhak:

a. berada, menempati dan mengelola serta melakukan kegiatan-kegiatan yang meliputi rencana Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya, serta melakukan kegiatan-kegiatan lainnya yang berhubungan dengan kegiatan tersebut dalam kawasan hutan yang digunakan;

b. memanfaatkan hasil kegiatan yang dilakukan sehubungan dengan rencana Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya dalam kawasan hutan yang digunakan;

c. melakukan penebangan pohon dalam rangka pembukaan lahan yang tidak dapat dielakkan dengan membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan

KEEMPAT : Dalam jangka waktu paling lama 1 (satu) tahun setelah Perubahan Persetujuan Penggunaan Kawasan Hutan ini ditetapkan, PT Hengjaya Mineralindo wajib :

a. melaksanakan dan menyelesaikan Tata Batas Areal Perubahan Persetujuan Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan dengan supervisi Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu dan tidak dapat diperpanjang;

b. menyampaikan perubahan *baseline* Persetujuan Penggunaan Kawasan Hutan dan peta *baseline* skala paling kecil 1:50.000 atau skala terbesar pada lokasi tersebut dengan informasi luas kawasan hutan yang dimohon dalam bentuk *hardcopy* dan *softcopy* format *shapefile* (shp) dengan koordinat sistem UTM Datum WGS 84 sesuai dengan hasil tata batas dan dokumen lingkungan;

c. menyampaikan pernyataan bersedia mengganti biaya investasi pengelolaan/pemanfaatan hutan kepada pengelola/pemegang Perizinan Berusaha Pemanfaatan Hutan dalam bentuk Akta Notariil, dalam hal ini kepada KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah.

KELIMA : Dalam hal PT Hengjaya Mineralindo tidak memenuhi kewajiban sebagaimana dimaksud pada Amar KEEMPAT, Perubahan Persetujuan Penggunaan Kawasan Hutan dibatalkan sesuai ketentuan peraturan perundang-undangan.

KEENAM : Penetapan Areal Kerja Perubahan Persetujuan Penggunaan Kawasan Hutan oleh Menteri Lingkungan Hidup dan Kehutanan, dilaksanakan dengan ketentuan :

a. pemegang Perubahan Persetujuan Penggunaan Kawasan Hutan menyampaikan permohonan penetapan areal kerja berdasarkan hasil tata batas areal Persetujuan Penggunaan Kawasan Hutan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;

b. permohonan penetapan areal kerja sebagaimana dimaksud pada huruf a, dilampiri dengan bukti pemenuhan kewajiban sebagaimana dimaksud Amar KEEMPAT.

KETUJUH : PT Hengjaya Mineralindo wajib :

a. melakukan penanaman dalam rangka rehabilitasi Daerah Aliran Sungai (DAS) sesuai dengan ketentuan peraturan perundang-undangan;

b. membuat rencana dan melaksanakan reklamasi, revegetasi dan/atau reboisasi pada Kawasan Hutan yang diberikan Persetujuan Penggunaan Kawasan Hutan yang sudah tidak digunakan sesuai dengan ketentuan peraturan perundang-undangan;

c. membayar PNBP Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan;

d. mengganti biaya investasi kepada pengelola/pemegang pengelolaan Perizinan Berusaha Pemanfaatan Hutan sesuai dengan ketentuan peraturan perundang-undangan;

e. melaksanakan inventarisasi tegakan sesuai dengan rencana kerja penggunaan kawasan hutan tahunan;

f. membayar Provisi Sumber Daya Hutan (PSDH) dan/atau Dana Reboisasi (DR) sesuai dengan ketentuan peraturan perundang-undangan;

g. membayar ganti rugi nilai tegakan kepada pemerintah apabila areal yang dimohon merupakan hutan tanaman hasil rehabilitasi;

h. melaksanakan Perlindungan Hutan atas areal Persetujuan Penggunaan Kawasan Hutan sesuai dengan ketentuan peraturan perundang-undangan, paling sedikit meliputi kegiatan :

   h.1. mengamankan areal kerjanya yang menyangkut hutan, kawasan hutan, dan hasil hutan termasuk tumbuhan dan satwa;

   h.2. mencegah kerusakan hutan dari perbuatan manusia dan ternak, kebakaran hutan, hama, dan penyakit serta daya-daya alam;

   h.3. mengambil tindakan pertama yang diperlukan terhadap adanya gangguan keamanan hutan di areal kerjanya;

   h.4. melaporkan setiap adanya kejadian pelanggaran hukum di areal kerjanya kepada instansi Kehutanan yang terdekat;

   h.5. menyediakan sarana dan prasarana, serta tenaga pengamanan hutan yang sesuai dengan kebutuhan;

i. melaksanakan perlindungan satwa liar dan/atau satwa yang dilindungi khususnya jenis satwa liar babirusa, jenis satwa liar endemik, langka dan dilindungi lainnya pada areal Persetujuan Penggunaan Kawasan Hutan sesuai Standar Operasional Prosedur/SOP perlindungan satwa liar, diantaranya dengan:

   i.1. membantu pengayaan konservasi jenis-jenis flora dan fauna endemik, langka dan dilindungi yang dijumpai di kawasan ini oleh instansi pemerintah daerah setempat, sebagai bagian dari program pelestarian sumber daya alam dan lingkungan hidup;

   i.2. melakukan kerjasama/konsultasi dengan instansi /institusi terkait dalam mendukung upaya rehabilitasi flora dan fauna serta melakukan kerjasama dengan berbagai pihak lainnya untuk memberikan penyuluhan tentang pentingnya pelestarian areal konservasi dan agar masyarakat tidak berburu terutama pada hewan yang dilindungi;

   i.3. melakukan identifikasi flora dan fauna pada areal-areal terganggu untuk kegiatan pertambangan dan pembersihan dilakukan dengan menekan seminimal mungkin areal-areal terganggu pada semua kegiatan pertambangan serta melakukan identifikasi pohon-pohon di lokasi pembersihan lahan yang merupakan habitat atau sumber pangan satwa liar untuk dikembalikan keberadaannya sesuai peruntukan kawasan pada saat pasca kegiatan pertambangan (reklamasi dan revegetasi);

i.4. melakukan inventarisasi flora (tumbuhan) dan fauna (satwa) pada areal-areal terganggu dalam kegiatan pertambangan;

i.5. memasang papan informasi terkait perlindungan flora dan fauna di lokasi-lokasi yang dilindungi di dalam lokasi kegiatan pertambangan dan mengenai pentingnya kelestarian hutan dan larangan menebang pohon, membakar dan larangan perburuan terhadap satwa liar pada lokasi strategis yang mudah dibaca, diantaranya menempatkan poster jenis – jenis satwa liar dilindungi di kantor Balai Desa setempat, kantor Perusahaan dan mes karyawan dan tempat – tempat strategis lainnya;

i.6. menjaga kawasan lindung (sempadan sungai, danau, sumber mata air dan lain-lain) sesuai dengan ketentuan peraturan perundang-undangan;

i.7. melakukan beberapa pendekatan diantaranya sosial ekonomi yaitu dengan mengarahkan tenaga kerja untuk tidak melakukan penangkapan hewan liar yang dilindungi, pendekatan teknologi yaitu dengan pembuatan koridor satwa, dan pendekatan institusi yaitu dengan melakukan koordinasi dengan instansi terkait;

i.8. melakukan kegiatan pembukaan dan pembersihan lahan hanya dilakukan pada luas minimal yang diperlukan saja dan agar managemen perusahaan mudah dalam mengontrol kegiatan pembukaan dan pembersihan lahan di lapangan, maka pelaksanaannya sesuai dengan perencanaan yang telah ditetapkan;

i.9. mencadangkan adanya kawasan konservasi sebagai kantong-kantong flora dan fauna pada tahap pra konstruksi, menyiapkan kantong-kantong satwa pada tahap konstruksi, dan melakukan penggiringan satwa-satwa ke kantong satwa tersebut;

i.10. mengupayakan apabila memungkinkan menghindari penebangan pohon-pohon dalam daerah yang dilewati di luar wilayah front kerja eksploitasi/kegiatan pertambangan dan melakukan kegiatan penanaman kembali (revegetasi) pada lahan-lahan terbuka yang sudah tidak dipergunakan (pasca kegiatan pertambangan);

i.11. mengupayakan pada lahan terbuka di sepanjang jalan menuju kegiatan pertambangan dilakukan penanaman pohon/ revegetasi untuk melindungi lingkungan (*buffer zone*) khususnya dalam upaya pengendalian dampak terhadap kualitas udara di sekitarnya. Apabila di areal tersebut di atas masih dijumpai vegetasi dengan kondisi yang cukup baik,

maka vegetasi tersebut perlu dijaga jangan sampai rusak untuk dimanfaatkan sebagai *buffer zone*;

i.12. mengupayakan kawasan bernilai konservasi/ *buffer zone* dan vegetasi alami yang merupakan habitat satwa liar semaksimal mungkin diupayakan tidak terganggu dan tetap dilakukan pengayaan tanaman sehingga keberadaan tanaman tetap dipertahankan;

i.13. melakukan kegiatan lainnya :

1. melokalisir dan/atau mempertahankan komunitas hutan yang dapat berfungsi sebagai koridor satwa/Green Belt maupun habitat satwa sangat khas/unik yang dapat memperlancar migrasi dan/atau pergerakan satwa liar untuk mengakses sumber pakan, air minum dan lain-lain;
2. melakukan pekerjaan revegetasi/penanaman paska reklamasi lahan, diawali dengan spesies lokal cepat tumbuh yang disertai dengan penanaman tanaman sisipan spesies unggulan termasuk spesies yang berpotensi sebagai sumber pakan, sarang satwa liar maupun atribut lainnya (spesies yang dipilih tidak bersifat invasif dan mempertimbangkan kearifan lokal);
3. memperkaya vegetasi pada kawasan lindung, penyangga hutan lindung maupun di areal dalam lokasi kegiatan, terutama pada areal yang rendah kerapatannya dengan spesies lokal yang juga berpotensi sebagai sumber pakan maupun sarang fauna alami/satwa liar;

i.14. melaksanakan perlindungan satwa liar sesuai Standar Operasional Prosedur dari surat Plt. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem Nomor SOP.1/KSDAE/SET.3/ KSA.2/12/2022 tanggal 7 Desember 2022 tentang Perlindungan Satwa Liar di Dalam dan di Luar Kawasan Hutan.

j. melakukan pengendalian kebakaran hutan dan lahan, berupa antara lain:

j.1. menyiapkan Sumber Daya Manusia pengendalian kebakaran hutan dalam Brigade Pengendalian Kebakaran Hutan dan Lahan (Brigdalkarhutla);

j.2. menempatkan sekurang-kurangnya 1 (satu) Regu Inti Pengendali Kebakaran Hutan;

j.3. merekrut karyawan pada perusahaan sebagai anggota Regu Pendukung Pengendali Kebakaran Hutan;

j.4. menyiapkan sarana dan prasarana (sarpras) untuk menunjang kegiatan Brigdalkarhutla antara lain sarpras pencegahan kebakaran hutan dan sarpras pemadaman kebakaran hutan

k. melakukan pemeliharaan batas areal Persetujuan Penggunaan Kawasan Hutan;

l. mengamankan kawasan Hutan Konservasi dan Hutan Lindung dalam hal areal penggunaan kawasan hutan berbatasan dengan kawasan hutan konservasi dan Hutan Lindung sesuai dengan ketentuan peraturan perundang-undangan, dan berkoordinasi dengan :

l.1. Kepala Balai Besar/Kepala Unit Pelaksana Teknis (UPT) yang membidangi urusan kawasan hutan konservasi, untuk kawasan hutan konservasi;

l.2. Kepala Dinas Provinsi atau Direktur Utama Perum Perhutani dalam hal berada pada wilayah kerja Perum Perhutani, untuk Kawasan Hutan Lindung;

l.3. Kepala Kesatuan Pengelolaan Hutan/KPH;

m. memberikan kemudahan bagi aparat Kementerian Lingkungan Hidup dan Kehutanan baik pusat maupun daerah pada saat melakukan monitoring dan evaluasi di lapangan;

n. mengkoordinasikan kegiatan kepada Instansi Lingkungan Hidup dan Kehutanan setempat dan/atau kepada pemegang perizinan berusaha pemanfaatan hutan atau pengelola hutan;

o. melakukan pemberdayaan masyarakat sekitar areal Persetujuan Penggunaan Kawasan Hutan;

p. melakukan kegiatan persiapan penggunaan kawasan hutan secara bertahap untuk menjaga penurunan emisi karbon sampai dengan 0 % (nol persen) sesuai rencana tahun 2030;

q. melaksanakan kewajiban lain yang ditetapkan oleh Menteri;

r. membuat laporan berkala setiap 6 (enam) bulan sekali secara *online* kepada Menteri Lingkungan Hidup dan Kehutanan mengenai penggunaan kawasan hutan dengan tembusan disampaikan kepada Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan, Direktur Jenderal Pengelolaan Hutan Lestari, Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem, Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan, Kepala Dinas Kehutanan Provinsi Sulawesi Tengah, Kepala Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu, dan Kepala Balai Pengelolaan Daerah Aliran Sungai Palu Poso.

KEDELAPAN : PT Hengjaya Mineralindo dilarang :

a. memindahtangankan Persetujuan Penggunaan Kawasan Hutan kepada pihak lain atau melakukan perubahan nama pemegang Persetujuan Penggunaan Kawasan Hutan tanpa persetujuan Menteri;

b. menjaminkan atau mengagunkan areal Penggunaan Kawasan Hutan kepada pihak lain;

c. melakukan kegiatan penambangan di dalam areal Penggunaan Kawasan Hutan :

1. seluas ± 11,00 Ha (sebelas hektare) pada areal yang dikembalikan, kecuali untuk melakukan kewajiban yang belum dilaksanakan;
2. seluas ± 10,61 Ha (sepuluh dan enam puluh satu perseratus hektare) pada areal penambahan sebelum memperoleh penetapan batas areal kerja Penggunaan Kawasan Hutan, dikecualikan untuk kegiatan penyelesaian pemenuhan Komitmen dan persiapan berupa membuat kegiatan persiapan, diantaranya pembangunan direksi kit (*basecamp* sementara); pengukuran sarana dan prasarana; dan penyusunan dokumen lingkungan, dalam hal Persetujuan Penggunaan Kawasan Hutan diterbitkan belum memiliki dokumen lingkungan;

d. menggunakan merkuri dalam melakukan kegiatan pertambangan/eksploitasi;

e. melakukan kegiatan lainnya yang dilarang sesuai ketentuan peraturan perundang-undangan.

KESEMBILAN : PT Hengjaya Mineralindo wajib menyelesaikan hak-hak pihak ketiga, apabila terdapat hak-hak pihak ketiga di dalam areal Persetujuan Penggunaan Kawasan Hutan dengan meminta bimbingan dan fasilitasi Pemerintah Daerah setempat.

KESEPULUH : Perubahan Persetujuan Penggunaan Kawasan Hutan ini dicabut dan pemegang Perubahan Persetujuan dikenakan sanksi sesuai peraturan perundang-undangan, apabila melakukan pelanggaran atas ketentuan dalam Keputusan ini.

KESEBELAS : 1. Perubahan Persetujuan Penggunaan Kawasan Hutan ini berlaku dan melekat sebagai persetujuan pemanfaatan kayu, serta persetujuan pemasukan dan penggunaan peralatan;

2. Perubahan Persetujuan Penggunaan Kawasan Hutan dapat diberikan Perpanjangan dengan mempertimbangkan hasil evaluasi terhadap pemenuhan kewajiban Perubahan Persetujuan Penggunaan Kawasan Hutan dan diajukan oleh pemegang Perubahan Persetujuan Penggunaan Kawasan Hutan sebelum berakhirnya Perubahan Persetujuan Penggunaan Kawasan Hutan;

3. Terhadap areal seluas ± 983,22 Ha (sembilan ratus delapan puluh tiga dan dua puluh dua perseratus hektare) yang dipertahankan berdasarkan Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018, sebagaimana telah ditetapkan areal kerjanya berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019, PT Hengjaya Mineralindo sebagai

Pemegang Perubahan Persetujuan Penggunaan Kawasan Hutan tetap dapat melakukan kegiatan di lapangan bersamaan dengan melakukan kegiatan untuk menyelesaikan kewajiban komitmen dalam jangka waktu paling lama 1 (satu) tahun sebagaimana dimaksud dalam Amar KEEMPAT;

4. Besaran Pembayaran PNBP Penggunaan Kawasan Hutan (PNBP – PKH) yang wajib dibayarkan oleh PT Hengjaya Mineralindo pada periode berikutnya berdasarkan pada luasan Perubahan Persetujuan Penggunaan Kawasan Hutan sejak ditetapkan oleh Menteri;
5. PT Hengjaya Mineralindo sebagai Pemegang Perubahan Persetujuan Penggunaan Kawasan Hutan, apabila tidak dapat menyelesaikan Komitmen dalam jangka waktu paling lama 1 (satu) tahun, Persetujuan Perubahan Penggunaan Kawasan Hutan dinyatakan tidak berlaku;
6. Terhadap areal yang dikembalikan oleh PT Hengjaya Mineralindo seluas ± 11,00 Ha (sebelas hektare) dilakukan serah terima, dengan ketentuan pada kawasan hutan yang telah dibebani izin pemanfaatan hutan dilakukan antara pemegang izin pemanfaatan hutan dengan PT Hengjaya Mineralindo selaku pemegang Perubahan Persetujuan Penggunaan Kawasan Hutan, sedangkan selain kawasan hutan yang telah dibebani izin pemanfaatan hutan, dilakukan antara Kepala Dinas Provinsi yang membidangi kehutanan dengan PT Hengjaya Mineralindo selaku Pemegang Perubahan Persetujuan Penggunaan Kawasan Hutan;
7. Terhadap areal seluas ± 11,00 Ha (sebelas hektare) yang dikembalikan, tidak membebaskan PT Hengjaya Mineralindo untuk menyelesaikan kewajiban Persetujuan Penggunaan Kawasan Hutan yang belum dilakukan dan areal yang telah dikembalikan tidak dapat dimohonkan kembali oleh PT Hengjaya Mineralindo. Namun untuk kewajiban penanaman dalam rangka rehabilitasi DAS, dalam hal sebagian areal Persetujuan Penggunaan Kawasan Hutan yang dikembalikan merupakan areal yang belum terganggu, PT Hengjaya Mineralindo selaku pemegang Perpanjangan dan Perubahan Persetujuan Penggunaan Kawasan Hutan dapat mengajukan pengurangan luas areal penanaman dalam rangka rehabilitasi DAS.

Pasal II

1. Dengan ditetapkannya Keputusan ini, maka:
   a. Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo seluas ± 994,32 (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus

hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana telah ditetapkan areal kerjanya berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 menjadi seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare), dinyatakan tetap berlaku sepanjang tidak diubah dengan Keputusan ini;

b. Peta Lampiran Keputusan Kepala Badan Koordinasi Penanaman Modal atas nama Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 tentang Izin Pinjam Pakai Kawasan Hutan untuk Kegiatan Operasi Produksi Nikel dan Sarana Penunjangnya atas nama PT Hengjaya Mineralindo seluas ± 994,32 (sembilan ratus sembilan puluh empat dan tiga puluh dua perseratus hektare) pada Kawasan Hutan Produksi Terbatas di Kabupaten Morowali, Provinsi Sulawesi Tengah, sebagaimana telah ditetapkan areal kerjanya berdasarkan Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 menjadi seluas 994,22 Ha (sembilan ratus sembilan puluh empat dan dua puluh dua perseratus hektare), dicabut dan dinyatakan tidak berlaku.

2. Keputusan ini mulai berlaku pada tanggal ditetapkan untuk jangka waktu paling lama sampai dengan tanggal 26 Mei 2031, kecuali apabila dicabut oleh Menteri Lingkungan Hidup dan Kehutanan.

Ditetapkan di Jakarta
pada tanggal 30 Agustus 2024

Salinan sesuai dengan aslinya
KEPALA BIRO HUKUM

SUPARDI

MENTERI LINGKUNGAN HIDUP DAN
KEHUTANAN REPUBLIK INDONESIA

ttd.

SITI NURBAYA

Salinan Keputusan ini disampaikan kepada Yth.:
1. Menteri Koordinator Bidang Kemaritiman dan Investasi;
2. Menteri Investasi/Kepala Badan Koordinasi Penanaman Modal;
3. Menteri Energi dan Sumber Daya Mineral;
4. Gubernur Sulawesi Tengah;
5. Sekretaris Jenderal Kementerian Lingkungan Hidup dan Kehutanan;
6. Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan;
7. Direktur Jenderal Pengelolaan Hutan Lestari;
8. Direktur Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan;
9. Direktur Jenderal Konservasi Sumber Daya Alam dan Ekosistem;
10. Direktur Jenderal Penegakan Hukum Lingkungan Hidup dan Kehutanan;
11. Direktur Jenderal Mineral dan Batubara, Kementerian Energi dan Sumber Daya Mineral;
12. Direktur Rencana dan Penggunaan Kawasan Hutan dan Pembentukan Wilayah Pengelolaan Hutan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan;
13. Direktur Pencegahan Dampak Lingkungan Usaha dan Kegiatan, Direktorat Jenderal Planologi Kehutanan dan Tata Lingkungan;

14. Direktur Konservasi Tanah dan Air, Direktorat Jenderal Pengendalian Daerah Aliran Sungai dan Rehabilitasi Hutan;
15. Bupati Morowali;
16. Kepala Dinas Kehutanan Provinsi Sulawesi Tengah;
17. Kepala Dinas Lingkungan Hidup Provinsi Sulawesi Tengah;
18. Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah;
19. Kepala Dinas Energi dan Sumber Daya Mineral Provinsi Sulawesi Tengah;
20. Kepala Balai Pemantapan Kawasan Hutan dan Tata Lingkungan Wilayah XVI Palu;
21. Kepala Balai Pengelolaan Hutan Lestari Wilayah XII Palu;
22. Kepala Balai Pengelolaan Daerah Aliran Sungai Palu Poso;
23. Kepala KPH Unit XIV - KPHP Tepe Asa Maroso Morowali Sulawesi Tengah;
24. Direktur PT Hengjaya Mineralindo.

# PETA

## PERUBAHAN PERSETUJUAN PENGGUNAAN KAWASAN HUTAN BERUPA PENGEMBALIAN SEBAGIAN AREAL DAN PENAMBAHAN AREAL PERSETUJUAN PENGGUNAAN KAWASAN HUTAN UNTUK KEGIATAN OPERASI PRODUKSI BIJIH NIKEL DAN SARANA PENUNJANGNYA PADA KAWASAN HUTAN PRODUKSI TERBATAS (HPT)

## a.n. PT HENGJAYA MINERALINDO

**DI KABUPATEN MOROWALI**
**PROVINSI SULAWESI TENGAH**
**DARI SELUAS 994,22 HA MENJADI SELUAS ± 993,83 HA**
**SKALA 1 : 50.000**

0 0,5 1 2,5 5 Km
0 1 2 5 10 Cm

U

**LAMPIRAN KEPUTUSAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA**

**NOMOR** : 1132 TAHUN 2024
**TANGGAL** : 30 Agustus 2024

**MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,**

**SITI NURBAYA**

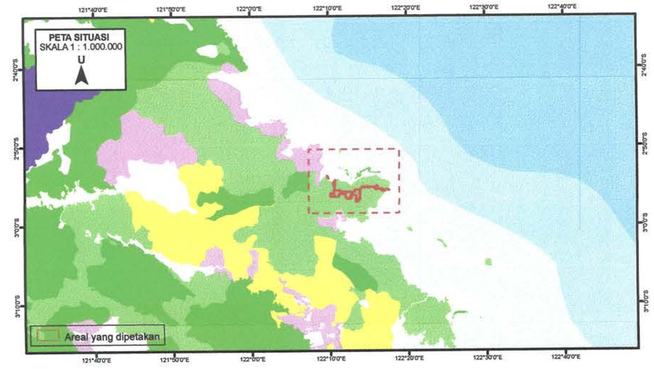
**KETERANGAN :**

- Batas areal izin usaha pertambangan operasi produksi bijih nikel a.n. PT Hengjaya Mineralindo
- Batas areal IPPKH/PPKH a.n. PT Hengjaya Mineralindo sesuai Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 yang telah mendapatkan penetapan areal kerja sesuai Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019 seluas 994,22 Ha
- Batas sebagian areal IPPKH sesuai Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018 yang dikembalikan seluas ± 11,00 Ha
- Batas areal penambahan seluas ± 10,64 Ha
- HL — Kawasan Hutan Lindung
- HPT — Kawasan Hutan Produksi Terbatas (Berdasarkan Pasal 294 huruf b Peraturan Pemerintah Nomor 23 Tahun 2021 tentang Penyelenggaraan Kehutanan, bahwa Kawasan Hutan Produksi Terbatas sebelum berlakunya peraturan ini, dinyatakan tetap berlaku sesuai dengan tahap pengukuhannya serta diberlakukan peruntukan dan fungsinya sebagai Hutan Produksi Tetap)
- HP — Kawasan Hutan Produksi Tetap
- HPK — Kawasan Hutan Produksi yang dapat di Konversi
- APL — Areal Penggunaan Lain
- Batas KPH
- Areal PPKH Lainnya
- Sungai dan anak sungai
- Jalan
- Pemukiman

Catatan :
*Batas areal pengelolaan hutan dan batas areal PPKH lainnya yang tergambar dalam peta tidak sepenuhnya dapat dijadikan acuan penentuan batas di lapangan.*

DASAR :
- Instruksi Presiden Republik Indonesia Nomor 5 Tahun 2019 tanggal 7 Agustus 2019
- Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014 sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020
- Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018
- Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 500.4.3.11/304/Bid.P2H tanggal 13 Maret 2024
- Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juli 2011
- Keputusan Kepala Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020
- Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019
- Surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 500.4.3.11/434/Bid.P2H tanggal 2 April 2024
- Berita Acara Hasil Evaluasi Dinas Provinsi Sulawesi Tenggara tanggal 22 Mei 2024
- Berita Acara Pelaksanaan Penataan Batas IPPKH a.n. PT Hengjaya Mineralindo tanggal 22 Oktober 2018
- Surat Direktur Utama PT Hengjaya Mineralindo Nomor 034/LGD.DIR-HM/IV/2024 tanggal 25 April 2024

SUMBER :
- Peta Rupa Bumi Indonesia (RBI), skala 1 : 50.000
- Peta Kawasan Hutan dan Konservasi Perairan Provinsi Sulawesi Tengah, skala 1 : 250.000 (Lampiran Keputusan Menteri Kehutanan Nomor SK.869/Menhut-II/2014 tanggal 29 September 2014) sebagaimana telah diubah dengan Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.452/MenLHK/Setjen/Pla.0/11/2020 tanggal 30 November 2020
- Peta lampiran Keputusan Menteri Lingkungan Hidup dan Kehutanan Nomor SK.6624/MENLHK/SETJEN/PLA.0/10/2021 tanggal 27 Oktober 2021
- Peta lampiran Keputusan Kepala Badan Koordinasi Penanaman Modal a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor 3/1/IPPKH/PMA/2018 tanggal 6 Februari 2018
- Peta lampiran Keputusan Direktur Jenderal Planologi Kehutanan dan Tata Lingkungan a.n. Menteri Lingkungan Hidup dan Kehutanan Nomor SK.1460/MENLHK-PKTL/REN/PLA.0/2/2019 tanggal 27 Februari 2019
- Peta lampiran Keputusan Bupati Morowali Nomor 540.3/SK.001/DESDM/VI/2011 tanggal 16 Juli 2011
- Daftar koordinat Keputusan Kepala Dinas PMPTSP Provinsi Sulawesi Tengah a.n. Gubernur Sulawesi Tengah Nomor 540/345/IUP-OP-PENCIUTAN/DPMPTSP/2020 tanggal 10 Juli 2020
- Peta lampiran surat Kepala Dinas Kehutanan Provinsi Sulawesi Tengah Nomor 500.4.3.11/304/Bid.P2H tanggal 13 Maret 2024
- Peta lampiran Berita Acara Pelaksanaan Penataan Batas IPPKH a.n. PT Hengjaya Mineralindo tanggal 22 Oktober 2018 skala 1 : 25.000
- Peta lampiran Surat Direktur Utama PT Hengjaya Mineralindo Nomor 034/LGD.DIR-HM/IV/2024 tanggal 25 April 2024




Sumber : Peta Kawasan Hutan Provinsi Sulawesi Tengah, skala 1 : 250.000

**KEMENTERIAN LINGKUNGAN HIDUP DAN KEHUTANAN**

# APPENDIX 3

# ESG & SUSTAINABILITY

Sustainability Report | 2024

NICKEL INDUSTRIES



# Strengthening Our Sustainable Foundations

NICKEL INDUSTRIES LIMITED
and its controlled entities
A.B.N. 44 127 510 589

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# About the Report

Nickel Industries Limited ('Nickel Industries' or 'the Company') presents its 2024 Sustainability Report ('Report'), the Company's fourth sustainability report. This Report builds on the 2023 Sustainability Report and outlines the Company's sustainability performance and progress during the reporting period from 1 January to 31 December 2024.

## Sustainability Reporting Standards

The Report has been prepared with reference to IFRS Sustainability Disclosure Standards issued by the International Sustainability Standards Board, specifically IFRS S1 on General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 on Climate-related Disclosures. In addition, the Report refers to the Global Reporting Initiative (GRI) Standards for certain clauses, including GRI 14 Mining Sector. It also references the disclosure principles outlined in the Sustainability Accounting Standards Board (SASB) Standards for Metals and Mining and incorporates selected indicators from the Task Force on Climate-Related Financial Disclosures (TCFD). [2-3]

Nickel Industries recognises the shift from TCFD-aligned disclosure to the requirements of AASB S2, effective 1 January 2025. In preparation, we have initiated an internal readiness assessment and identified key reporting gaps, aiming to gradually align the company's disclosures with the AASB standards. There is a restatement of information from the previous report regarding the 2023 revenue due to the reclassification made in alignment with the Annual Report. Any updates or changes to previously reported information are clearly identified. [2-4]

## Scope and Assurance

The Report in its entirety was prepared through stakeholder input and aligned with the Company's strategic objectives, with final approval by the Board of Directors. It encompasses the operations of Nickel Industries and its subsidiaries, including Hengjaya Mine, Hengjaya Nickel, Ranger Nickel, Angel Nickel, and Oracle Nickel. The Company's Consolidated Financial Statements have been independently audited by KPMG. To ensure compliance with reporting requirements, Social Responsibility (SR) Asia has provided assurance on selected sustainability disclosures. [2-2, 2-5]




Contact information regarding this report: [2-3]

**Nickel Industries Limited**
**Level 2, 66 Hunter Street,**
**Sydney, NSW, 2000,**
**Australia**

+61 (2) 9300 3311

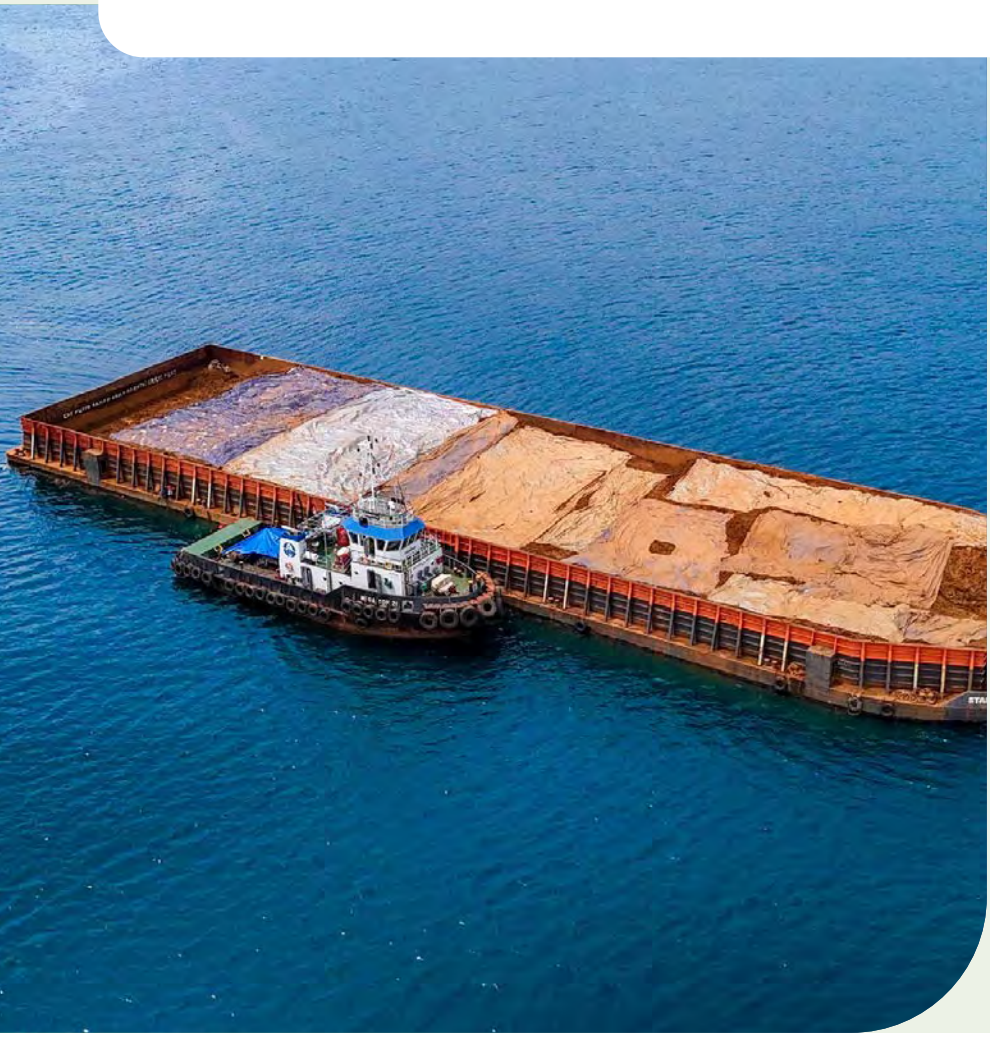
muchtazar@nickelindustries.com

https://nickelindustries.com/

# Disclaimer

This Report contains forward-looking statements prepared in accordance with the prevailing regulatory laws of applicable jurisdictions. Forward-looking statements are generally identified by terms such as “may,” “will,” “expect,” “intend,” “plan,” “estimate,” “anticipate,” “believe,” “continue,” “objectives,” “targets,” “outlook,” “guidance,” or similar expressions. These statements may include but are not limited to, estimates of reserves and resources, plans, strategies, management objectives, anticipated production schedules, construction timelines, expected costs, cash flow projections, production outputs, and the anticipated operational life of projects and mines.

Forward-looking statements are subject to inherent risks and uncertainties, which may result in actual developments differing materially from those anticipated. These statements are based on various assumptions regarding current conditions, future events, and the business environment in which the Company operates. The Company assumes no obligation to ensure that the forward-looking statements will lead to the anticipated results or outcomes.







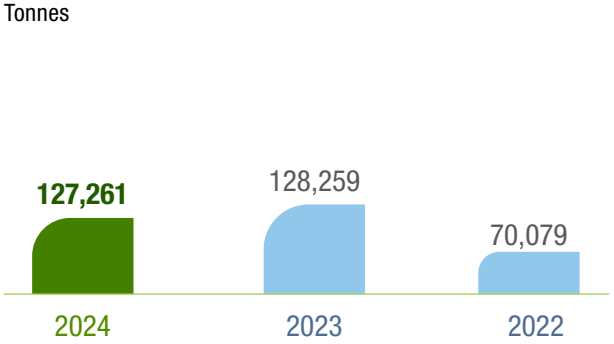
# Sustainability Performance Highlights

## Economic Development Highlights

### Production Performance

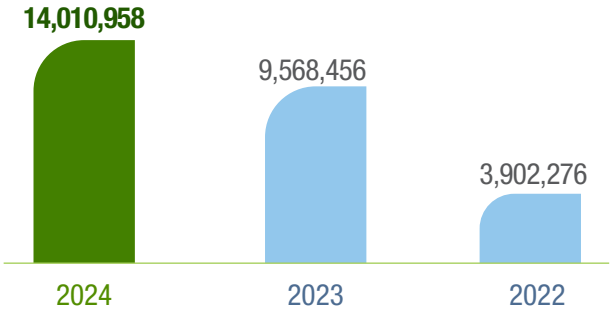
#### Nickel Metal Production (100% basis)

Tonnes



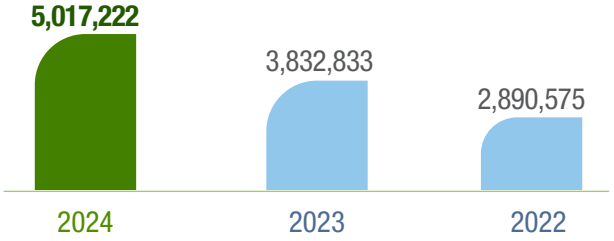

#### Limonite Ore Production (100% basis)

Tonnes



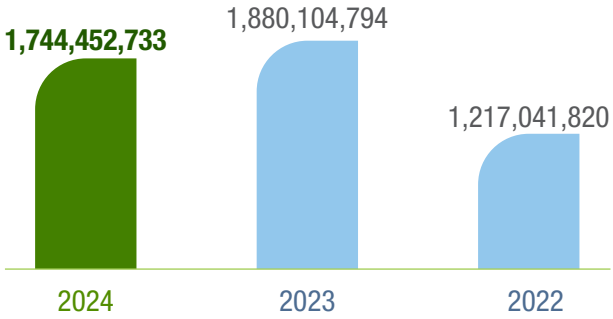

#### Saprolite Ore Production (100% basis)

Tonnes

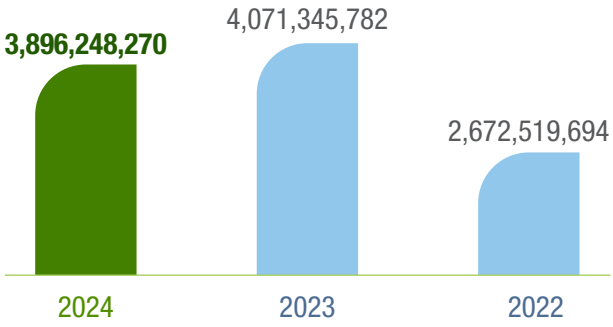



### Financial Performance (USD)

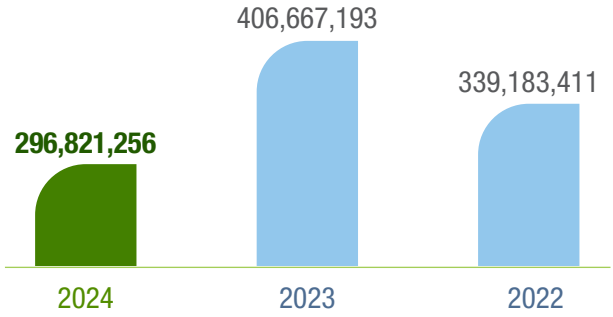
#### Total Revenue




#### Total Assets




#### Adjusted EBITDA



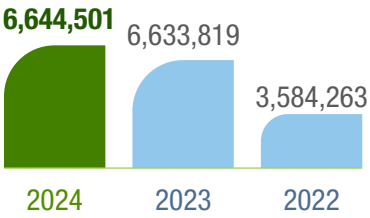
# Environmental Stewardship Highlights

## Environmental Performance

### Environmental Performance

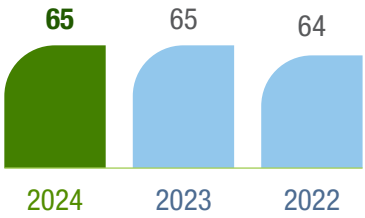
#### Green House Gas (GHG) Emissions (Scope 1 & 2)

Tonnes $CO_2eq$



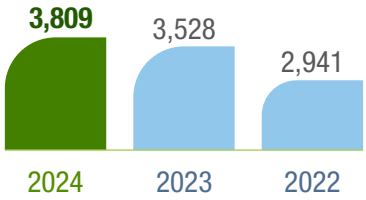

#### Emissions Intensity

$tCO_2e$/tonnes of Ni




#### Emissions Intensity per Generated Revenue

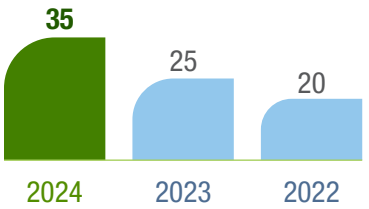
$tCO_2e$/ USD




### Rehabilitated Land Area at Hengjaya Mine

#### Rehabilitated Land Area at Hengjaya Mine

Ha




**Total Rehabilitated Area Since 2019 (Ha): 2,057**

**Total Trees Planted Since 2019 (Ha): 2,258,500**

# Social Responsibility Highlights



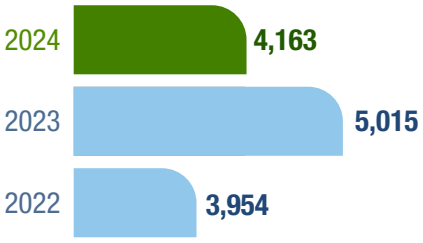
### 2024 Safety Performance

- LTIFR: **0.11**, with 2 lost time injuries (LTI) recorded across **17.4** million work hours.
- TRIFR: **1.43**, with 3 medical treatment injuries and 22 first aid injuries.
- Hengjaya Mine Achievement: Over **18.2** million work hours without a lost time injury since November 2021.

## Nickel Industries Employee Diversity

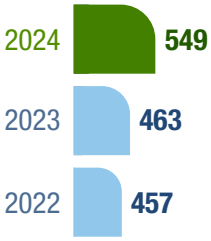
### Male

| | |
|---|---|
| <30 years old | |
| 2024 | 2,352 |
| 30-50 years old | |
| 2024 | 1,788 |
| >50 years old | |
| 2024 | 23 |




### Female

| | |
|---|---|
| <30 years old | |
| 2024 | 384 |
| 30-50 years old | |
| 2024 | 161 |
| >50 years old | |
| 2024 | 4 |




### Grand Total

2024: **4,712**

2023: **5,478**

2022: **4,411**

## Awards in 2024

**TOP CSR Awards**
Top Business Magazine

**Indonesia Social Responsibility Awards**
Prospect Indonesia

**Nusantara CSR Awards**
La Tofi School of Social Responibility

**IDX Channel ESG Awards**
PT Tivi Bursa Indonesia

**Environmental & Social Innovation Awards**
Sucofindo Indonesia

**Good Mining Practices Awards**
The Ministry of Energy and Natural Resources of Indonesia

**The Best Overall Sustainable Performance Awards 2024**
Indonesia Leadership Awards 2024

**Top Human Capital Awards**
TOP Business Magazine

**IDX Channel Anugerah Inovasi Indonesia Awards**
PT Tivi Bursa Indonesia

**Outstanding Social Welfare Award 2024 - IMIP**
China Chamber of Commerce in Indonesia

**Fortune Indonesia Change the World**
Fortune Indonesia

**Blue PROPER (Public Disclosure Program for Environmental Compliance) – Ranger Nickel**
Indonesia Ministry of Environmental and Forestry

**Blue PROPER (Public Disclosure Program for Environmental Compliance) – Hengjaya Nickel**
Indonesia Ministry of Environmental and Forestry

**Green PROPER (Public Disclosure Program for Environmental Compliance) – Hengjaya Mine**
Indonesia Ministry of Environmental and Forestry

**ESG Rating**

- 'BBB' MSCI ESG Rating
- Continued improved ratings from S&P Global Corporate Sustainability Assessment, with our scores rising to 37 in 2024, above the global average of 29 for mining and metals worldwide.

# Message from the Chairman [2-22]



## Dear Fellow Stakeholders,

I am pleased to present Nickel Industries' 2024 Sustainability Report.

This year marked an important evolution in our sustainability journey as we continued to respond to the rising expectations of stakeholders and the growing emphasis on transparent disclosure. In 2024, Nickel Industries pivoted to refer with the ASX Climate-related Financial Disclosures and the IFRS Sustainability Disclosure Standards (IFRS S1 and S2), reinforcing our commitment to international best practices in governance, risk management and climate resilience.

Our efforts throughout the year were underpinned by measurable progress across key areas of sustainability. We strengthened environmental stewardship through initiatives in coral reef cultivation, mangrove preservation and biodiversity area development, while expanding our contribution to education through new scholarship programmes at both local and national levels. In parallel, we maintained a strong focus on operational safety, achieving a significant milestone of over 18.2 million work hours since the last reported LTI in November 2021 at Hengjaya Mine. Recognition of our environmental leadership was further reinforced as Hengjaya Mine received the Green PROPER rating for the third consecutive year.

At the same time, we intensified our approach to climate risk mitigation to support our long-term decarbonisation ambitions. The installation of a solar energy system at Hengjaya Mine, now supplying approximately 20% of the site's electricity needs, was complemented by the introduction of electric vehicle (EV) haul trucks and the adoption of electric loaders to improve operational efficiency and reduce emissions. In addition, through Oracle Nickel, we transitioned to the use of recycled furnace gas for industrial processes, reducing reliance on coal and further lowering our carbon footprint.

These achievements reflect our ongoing commitment to integrate sustainability into every aspect of our operations. As we pursue our targets of reducing carbon intensity by 50% by 2035 and achieving net zero emissions by 2050, we believe our growing high-pressure acid leach (HPAL) portfolio, renewable energy initiatives and operational innovations position us strongly to contribute to the global transition towards a low-carbon economy.

Looking ahead, we remain firmly committed to fostering shared value for our stakeholders and building long-term resilience across our operations. I invite you to explore this report to learn more about the progress we have made in 2024, and I thank you for your continued trust and support as we shape a sustainable future together.

Yours sincerely,
**Norman Seckold**
Chairman



# About the Company

# Company Profile [2-1]

Nickel Industries Limited was incorporated on 12 September 2007 under the laws of New South Wales, Australia. The Company is an Australian listed company which owns a portfolio of mining and low-cost downstream nickel processing assets which produce nickel for the stainless steel industry and the electric vehicle supply chain. Its head office is located at Level 2, 66 Hunter Street, Sydney, NSW, 2000, Australia. In addition to NPI production, the Company holds interests in HPAL projects, which produce mixed hydroxide precipitate (MHP) for use in the electric vehicle supply chain.

# Vision, Mission, & Values



## Vision

To become a global leader in low-cost nickel production.



## Mission

To deliver value to shareholders, employees, businesses and local communities over the long term through safe and responsible operations.



## Values

### Performance:

The Company has a performance-driven culture, striving to generate returns for shareholders by meeting strategy and targets developed to drive continuous improvement for all stakeholders.

### Safety, environment and community:

The Company prioritises safety, health, community and the environment. Operating safely with due regard to the environment and communities in which the Company operates enhances the sustainability and performance of the Company's business.

### Team work:

The Company encourages its people to work together as a high-performing team and values rewarding team success.

### Respect:

The Company encourages and values strong, open and inclusive communication and treats all people, within and outside the Company, ethically and with dignity and mutual respect.

### Governance:

The Company manages business risks through sound business processes and high-quality decision-making. The Company is committed to following all applicable rules, regulations and standards.

# 2024 Sustainability Milestones

**14 June 2024 – Coral reef cultivation and mangrove preservation**

Collaborating with Halu Oleo University in developing green ecosystems in the coastal and marine areas of Morowali.

**12 July 2024 – University Scholarship Program**

The Nickel Industries scholarship program with Hasanuddin University has started by providing opportunities for 10 local students annually in Morowali.

**2 August 2024 – Biodiversity Area Development**

The Central Sulawesi Natural Resources Conservation Agency Technical Implementation Unit of the Ministry of Environment and Forestry supports Nickel Industries' Hengjaya Mine's initiative to develop a 197-hectare high-conservation-value area at the IUP Nickel Mining Site Tangofa, Morowali.

**November - December 2024 – IMIP Scholarship**

The Indonesia Morowali Industrial Park (IMIP) scholarship awarded by IMIP Peduli Foundation to 1,000 undergraduate students in 30 universities in Sulawesi, Java, Sumatra, and Kalimantan, such as Polytechnic of Metal Industry Morowali, Polytechnic Academy of Industrial Engineering Makassar, Gorontalo State University, Gadjah Mada University, Tadulako University, Hasanuddin University, Halu Oleo University, Indonesia University, Bogor Agricultural Institute, and Bandung Institute of Technology.



# Association Membership and External Initiatives [2-28]

Nickel Industries actively engages in external initiatives and industry associations to advance its sustainability goals and support the collective growth of the nickel sector. These platforms enable the Company to collaborate with governments, regulators, communities, and other stakeholders to address key industry challenges and drive sustainable development.

| | Role | Scope |
|---|---|---|
| Asosiasi Penambang Nikel Indonesia (APNI) | Member | National |
| Forum Industri Nikel Indonesia (FINI) | | |

In 2024, the Company engaged in the following external initiatives:

| | | | |
|---|---|---|---|
| 26 June 2024 | Panelist | 26 July 2024 | Panelist |
| SMM LME Asia Week 2024 | | Automotive Electrical Indonesia Summit 2024 | |
| 8 August 2024 | Panelist | 29 July 2024 | Panelist |
| Digitalisation in Mining Indonesia 2024 Conference | | International Battery Summit 2024 | |
| 30 August 2024 | Panelist | 9 September 2024 | Panelist |
| Mine Maintenance, Asset Management Reliability Strategies 2024 Conference | | International Critical Minerals & Metals Summit 2024 | |
| 14 October 2024 | Panelist | 11 September 2024 | Panelist |
| Carnaval of Universities Virtual Career Expo | | Engineering Forum: Reliable Decarbonisation and Energy Efficiency in Mining 2024 | |
| 5 November 2024 | Panelist | 7 November 2024 | Panelist |
| The 9th APAC Stainless Steel Conference 2024 | | 294th Sydney Mining Club Lunchtime Event | |
| 29 November 2024 | Panelist | 19 November 2024 | Panelist |
| Coal Metal Outlook Conference 2024 | | ASEAN Mining Conference 2024 | |
| 5 December 2024 | Panelist | 12 December 2024 | Panelist |
| MarkPlus Conference 2024 | | Indonesia Social Investment Forum 2024 | |

# Certifications


































Nickel Industries has received ISO 14001: 2015 Environmental Management System certification and ISO 45001: 2018 Occupational Health and Safety Management System certification for Hengjaya Nickel, Ranger Nickel, Oracle Nickel, Angel Nickel and Hengjaya Mine. Furthermore, the Company's Angel Nickel has received ISO 9001:2015 Quality Management System.



# Sustainability at Nickel Industries

# 2024 Sustainability Report Theme

## Strengthening Our Sustainable Foundations

Nickel Industries continues strengthening its foundations in resource management, emissions reduction, and governance. This year's report outlines efforts to solidify sustainability frameworks and integrate them further into operational processes, ensuring long-term accountability and measurable progress.




# Sustainability Policy [2-23, 2-24]

The Company's sustainability policy drives long-term value creation through responsible production, addressing environmental impacts, supporting social progress, and prioritising employee and community well-being. Focused on sustainable operations, local development, and global sustainability, the policy shapes strategy and is reviewed annually to align with evolving priorities and ensure resource access, investments, and contributions to sustainable development.

### Sustainable Operations

Nickel Industries will act responsibly across the life cycle of its activities, from project conception, through to execution and operation, to the closure of the Company's activities, respecting the local people and customs where it operates.

- To meet or exceed the regulatory standards where the Company operates and continuously improve performance.
- To achieve zero harm to its employees, contractors and local communities by promoting active, genuine care inside and outside the Company.
- To continuously improve its activities, seeking increased efficiency in the use of natural resources.
- To manage risks and impacts by adopting elimination, mitigation, compensation, monitoring measures and maximising the positive benefits of our activities.
- To work with responsibility, ethics and transparency, engaging with its stakeholders.

### Stimulation of local development

Beyond the management of its activities, the Company seeks to stimulate local socioeconomic development that sustainably contributes to the livelihoods and wellbeing of the communities and environment around Nickel Industries' areas of operation.

- To support the development and hiring of local workforce and suppliers.
- To understand and monitor the key social and environmental indicators for the regions where we operate and make conscious decisions to improve social and environmental wellbeing in the most appropriate and meaningful ways.
- To develop programs related to social needs, with the long-term economic development vision, avoiding reactive social investments.
- To respect indigenous and local communities' connections to lands, waters and the environment and seek to develop mutually beneficial agreements with land-connected peoples, to promote engagement, free, prior and informed consultation and risk and impact evaluation.

## Contribution to global sustainability

Nickel Industries recognises its important role in addressing shared global challenges. Therefore, the Company will contribute to the dialogue and confrontation of the challenges in terms of sustainable development as appropriate to our scope of activities.

- To be transparent to the Company stakeholders in terms of governance, policy, procedures, practices, and performance.
- To contribute towards global goals related to the Company's business by continuously improving its operations and seeking partnerships, solutions, and technology to address sustainable development challenges.
- To contribute to creating a positive legacy for future generations, balancing the social, environmental and economic aspects of its business.
- To work with colleagues, partners and communities globally to deliver the products our customers need and learn from each other to improve the Company's performance.
- To promote active partnerships at international, national, regional and local levels based on mutual commitment and trust.
- To engage with our joint venture partners to share our practices and insights and learn from theirs.
- To recognise and respect diverse cultures, communities and points of view.
- To respect human rights and work with communities and organisations to create mutual value throughout and beyond the life of our operations.
- To strive to contribute to the Sustainable Development Goals (SDGs).



# Sustainability Strategy [2-25]

Nickel Industries' sustainability strategy integrates environmental, social, and governance considerations into its operations, aligning with global standards and stakeholder expectations. Developed through ongoing stakeholder engagement, the strategy is based on three core pillars supported by specific sub-pillars that address key aspects of the Company's activities. These pillars provide a structured approach to achieving both short- and long-term objectives while ensuring relevance to the Company's operations and its role in the global energy transition.

| Pillar | Sub-pillar | Description |
|---|---|---|
| Economic development | Financial performance<br>Indirect economic impacts<br>Procurement practices | • Long-term vision to grow the business in a way that provides optimum benefit to the lives of people in the community.<br>• Continuously improve the Company's performance to generate indirect economic impacts on the local community.<br>• Help the local community grow simultaneously alongside the Company. |
| Environmental stewardship | Biodiversity<br>Energy<br>Emissions<br>Waste<br>Water and effluent | • Environmental sustainability is a core part of Nickel Industries' existence.<br>• Our products are essential for the global energy transition and the stability of our operating environment.<br>• Committed to reducing our carbon footprint – HNC has one of the lowest carbon intensities per tonnes of nickel produced. |
| Social responsibility | Anti-corruption<br>Community development<br>Donation and sponsorship<br>Education<br>Gender and diversity<br>Health and safety<br>Human rights<br>Infrastructure | • Committed to stimulating local socioeconomic development.<br>• Sustainably contribute to the livelihoods and well-being of the communities and environment around our areas of operation.<br>• Respect the local people and customs wherever we operate. |

# Materiality and Stakeholder Engagement [2-29, 3-1, 3-2, 3-3, 14.1.1]

Nickel Industries conducts an annual materiality assessment to align its sustainability strategy with industry developments and stakeholder expectations. This process includes stakeholder engagement, analysis of global and local industry trends, and identification of key sustainability priorities. The Stakeholder Engagement and Identification Base framework supports this process by categorising stakeholder relationships based on six dimensions: Dependency, Responsibility, Tension, Influence, Diverse Perspective, and Proximity. It enables the Company to identify, prioritise, and engage with stakeholders, including investors, employees, business partners, governments, and local communities. The assessment informs decision-making and sustainability initiatives.

## Stakeholder Engagement and Identification Base

### Dependency (D)

The extent to which Nickel Industries relies on a specific individual or organisation, or vice versa.

| Internal Stakeholders | | External Stakeholders | |
|---|---|---|---|
| Investors and Shareholders | √ | Customers | √ |
| Management | √ | Contractors | √ |
| Employees | √ | Business Partners | √ |
| | | Local Communities | √ |

### Responsibility (R)

The legal, commercial, or ethical obligations that Nickel Industries holds toward an individual or organisation.

| Internal Stakeholders | | External Stakeholders | |
|---|---|---|---|
| Investors and Shareholders | √ | Customers | √ |
| Management | √ | Contractors | √ |
| Employees | √ | Business Partners | √ |
| | | Governments | √ |
| | | Local Communities | √ |

### Tension (T)

The degree of influence exerted by an individual or organisation on the Company regarding specific economic, social, or environmental matters.

| Internal Stakeholders | | External Stakeholders | |
|---|---|---|---|
| Management | √ | Contractors | √ |
| Employees | √ | Business Partners | √ |
| | | Governments | √ |
| | | Local Communities | √ |

## Influence (I)

The ability of an individual or organisation to impact Nickel Industries' strategic direction, stakeholder policies, or broader business operations.

**Internal Stakeholders**

- Investors and Shareholders √
- Management √
- Employees √

**External Stakeholders**

- Customers √
- Contractors √
- Business Partners √
- Governments √
- Local Communities √

## Diverse Perspective (DP)

The presence of differing viewpoints from individuals or organisations that may shape decision-making processes and drive actions previously unconsidered.

**External Stakeholders**

- Governments √
- Local Communities √

## Proximity (P)

The geographical or operational closeness of an individual or organisation to Nickel Industries, which may affect engagement and collaboration.

**Internal Stakeholders**

- Investors and Shareholders √
- Management √
- Employees √

**External Stakeholders**

- Customers √
- Contractors √
- Business Partners √
- Local Communities √

Based on the assessment in 2024, material topics for the Company's are energy and emissions, biodiversity, water and effluent, waste, local communities, occupational health and safety, human capital development, and ethical business practices. These topics reinforce the relevance of the Company's sustainability commitments and strategic priorities within its sphere of influence.

## Energy & Emission




### Importance/Impact

As part of our climate change mitigation efforts, we are increasing the use of renewable energy and utilising technological advances for emission reduction.

### Strategy

- Establishing 2050 net zero roadmap.
- Implemented energy efficiency measures to reduce energy consumption.
- Undertake GHG reduction initiatives through the transition strategy.
- Using of renewable energy.

### Achievements 2024

- Hengjaya Mine has introduced EV trucks to reduce emissions and fuel consumption.
- Hengjaya Nickel and Ranger Nickel have utilised eight electric loaders to reduce fuel consumption. The electric loaders are recharged at designated stations within the facilities and are used for loading and unloading of ore. The electric loaders use 3.6 times less energy than diesel-powered ones, reducing fuel consumption.
- In October 2024, Oracle Nickel transitioned to using coke oven gas, a byproduct of coking plants within the IMIP area, after it underwent cleaning by the Tsingshan Gas Department to meet stainless-steel production standards. Distributed via a 3-kilometre pipeline, this gas now replaces approximately 800 tonnes of coal per day in the kiln plants.

### Responsible Department and Evaluation Method

PIC: Sustainability Manager, Operations Department, Environmental Department.

Evaluation: Oversees energy management and reports GHG emissions and analysis on a regular basis.

### Impacted Stakeholders

Internal: Management, Investors and Shareholders.

External: Government, Contractors and Business Partners.

## Biodiversity




### Importance/Impact

To maintain biodiversity and reduce negative impacts, we ensure a percentage of success in reclamation areas. We also participate in protecting marine life through conservation programs.

### Strategy

- Conduct regular biodiversity assessment.
- Take the initiative to improve the marine ecosystem.
- Collaborating with the government in preparing high biodiversity conservation areas.

### Achievements 2024

- Up to 2,057 Ha of total rehabilitation area in 2024.
- Restored 8,244 Acropora coral seedlings using 1,439 artificial reef units.
- Restored more than 5,000 mangrove seeds.

### Responsible Department and Evaluation Method

PIC: Environmental Department.

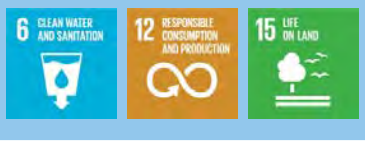
Evaluation: Oversees the conservation and protection of biodiversity

### Impacted Stakeholders

Internal: Investors, Shareholders and Employees.

External: Government and Local Communities.

## Water and Effluent




### Importance/Impact

Efficient management of water extraction volumes ensures the availability of water resources for operational needs. Control of water discharge volume and quality is required to prevent environmental pollution and minimise negative impacts on surrounding communities.

### Strategy

- Fulfill wastewater quality standards in accordance with applicable regulations.
- Monitoring the amount and quality of discharged water.

### Achievements 2024

- Meeting the regulatory standards set by the Indonesian government.

### Responsible Department and Evaluation Method

PIC: Environmental Department.

Evaluation: Oversees water and effluent management.

### Impacted Stakeholders

Internal: Management.

External: Government and Local Communities.

## Waste




### Importance/Impact

The Company strives to minimise the impact on the environment and surrounding communities through waste management, especially domestic waste, which is a concern around the operational area. Internally, the Company tries to manage waste utilisation.

### Strategy

- Conducting waste management by 4R principles - Reduce, Reuse, Recycle, and Recover.
- Provides a Domestic Material Recovery Facility.

### Achievements 2024

- Established a Domestic Material Recovery Facility at the Hengjaya Mine.

### Responsible Department and Evaluation Method

PIC: Environmental Department and Corporate Social Responsibility Team.

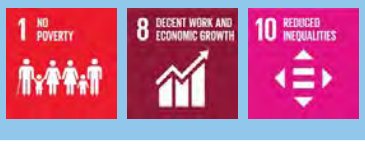
Evaluation: Oversee the environmental and community impacts from waste management initiative, evaluate the actual waste reduction regularly through actual waste generation data.

### Impacted Stakeholders

Internal: Management.

External: Government and Local Communities.

## Local Communities




### Importance/Impact

As a part of the community, the Company engaged in local development in terms of economy, health, education, and collaboration with the government in providing infrastructure.

### Strategy

- Established eight focus areas for the Community Empowerment Program (PPM)/Corporate Social Resonsibility (CSR).
- Conduct social mapping periodically.

### Achievements 2024

- Eight surrounding villages benefited from the PPM and CSR program.
- 10 university scholarship beneficiaries from the local residents.

### Responsible Department and Evaluation Method

PIC: CSR Department.

Evaluation: The evaluation is conducted on a regular basis, and the team provides a monthly newsletter on community relations and development to the management.

### Impacted Stakeholders

Internal: Management.

External: Local Communities, Government and Business Partners.

## Occupational Health & Safety




### Importance/Impact

Employees are valuable assets for the Company. Hence, ensuring health and safety at work is the Company's responsibility, both physically and mentally. OHS Management ensures that employees are in good health so that they can perform efficiently.

### Strategy

- Established 8 Golden Rules while working.
- Implemented OHS Management System.
- Increasing awareness regarding the importance of OHS implementation through various activities.
- Operating a 24-hour emergency clinic.

### Achievements 2024

- LTIFR: 0.11, with 2 lost time injuries recorded across 17.4 million work hours in the reporting year.
- TRIFR: 1.43, with 3 medical treatment injuries and 22 first aid injuries in the reporting year.
- Over 18.2 million work hours without a lost time injury since November 2021 at the Hengjaya Mine.

### Responsible Department and Evaluation Method

PIC: Safety Department.

Evaluation: OHS Management Audit, Contractor Compliance Check, planned and unplanned inspections.

### Impacted Stakeholders

Internal: Management and Employees.

External: Government and Contractors.

## Human Capital Development




### Importance/Impact

To ensure work is carried out efficiently, every employee receives training and education in their respective fields. Opportunities and equality at work are also provided according to individual abilities.

### Strategy

- Provide training that is required by the individual.
- Require employees to take certification according to their position.

### Achievements 2024

- 4,712 people were employed by the Company in 2024.

### Responsible Department and Evaluation Method

PIC: Human Resources and Department Heads.
Evaluation: Carried out by each individual's respective superiors and overseen by the HR.

### Impacted Stakeholders

Internal: Management and Employees.
External: Government.

## Ethical Business Practices




### Importance/Impact

The implementation of anti-corruption principles, respect for human rights, diversity and inclusion, and whistleblowing systems are key factors in creating transparent and ethical governance for the Company.

### Strategy

- Has established a Code of Conduct, Anti-Bribery and Corruption Policy, Whistleblower Policy, and Securities Trading Policy, which can be accessed through the Company's website.

### Achievements 2024

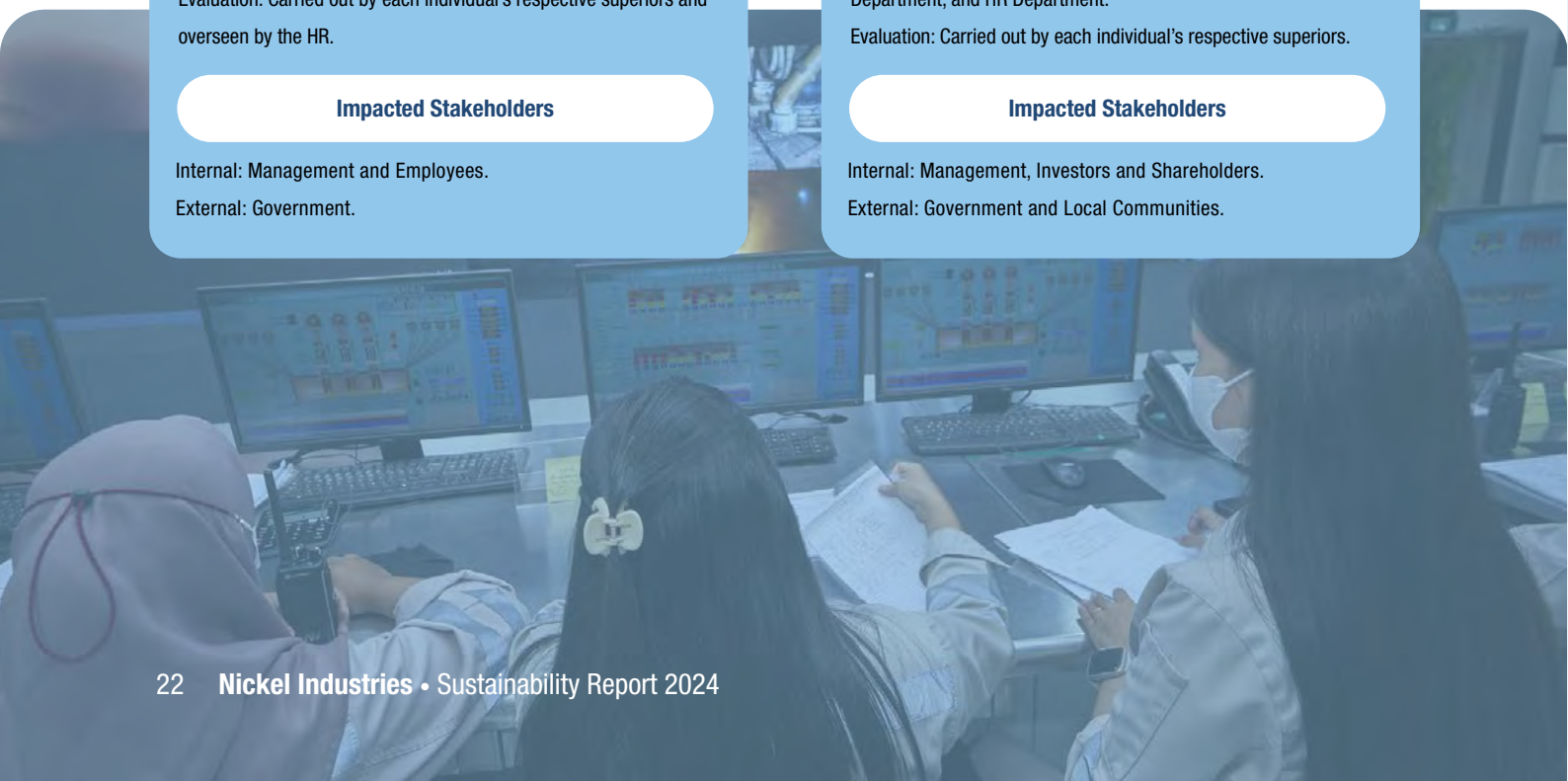
- Zero case for conflict of interest or corruption.
- Zero complaints related to discrimination, freedom of association, or indigenous rights.

### Responsible Department and Evaluation Method

PIC: Corporate Secretary, Sustainability Department, CSR Department, and HR Department.
Evaluation: Carried out by each individual's respective superiors.

### Impacted Stakeholders

Internal: Management, Investors and Shareholders.
External: Government and Local Communities.



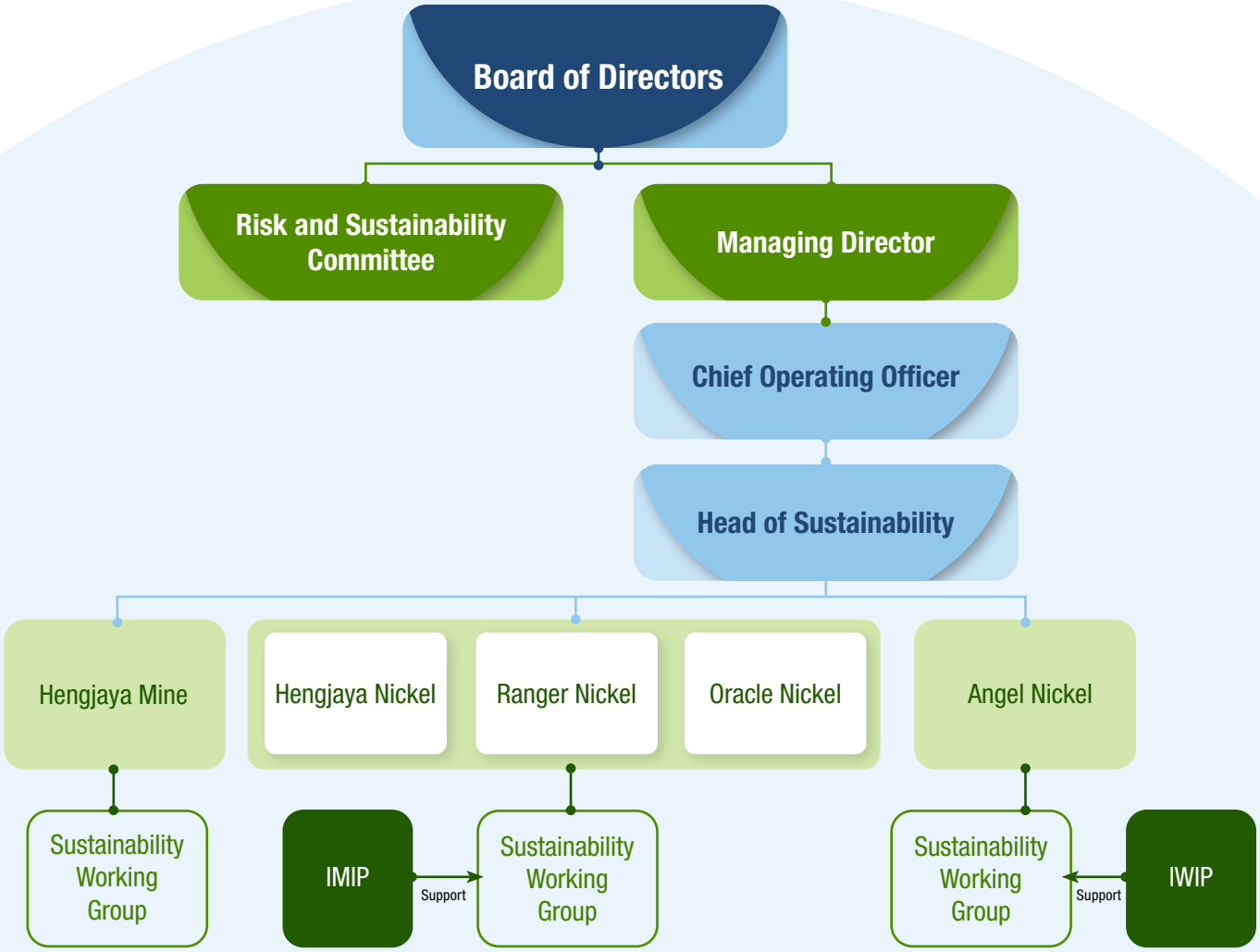
# Sustainability Governance [2-9, 2-11]

Nickel Industries integrates sustainability governance within its corporate governance framework to ensure effective oversight of Environmental, Social, and Governance (ESG) matters. The Board oversees sustainability-related risks and opportunities, incorporating ESG considerations into decision-making processes. The Company aligns its sustainability governance with international best practices and regulatory requirements, ensuring compliance with applicable laws and industry standards.

The Company's Corporate Governance Statement outlines the Company's application of the ASX Corporate Governance Council's Corporate Governance Principles and Recommendations. Any deviations are disclosed on an "if not, why not" basis. The statement and related policies are available on the Company's website at www.nickelindustries.com.au/corporate-governance.

In 2024, the Company incurred no fines for non-compliance with laws or regulations. No legal actions were reported concerning anti-competitive behaviour, anti-trust, or monopoly practices. [2-27]

## Sustainability Governance Structure



## Risk and Sustainability Committee [2-14]

The Risk and Sustainability Committee supports the Board of Directors in overseeing sustainability policies, climate-related risks, and stakeholder engagement. It reviews and monitors the Company's sustainability strategy, making recommendations to the Board of Directors to ensure alignment with operational, local, and global sustainability objectives. The Committee also evaluates climate-related performance metrics and their integration into corporate governance and risk management processes.

The Committee has the authority to conduct investigations, engage external experts, and request information from employees and management. It meets at least four times per year, reporting quarterly to the Board of Directors. Comprising at least three Board members, with additional senior executives as associate members, the Committee is chaired by an independent director whenever possible. While it provides recommendations, final decisions remain with the Board of Directors.

## Risk Management [2-12, 2-13]

Nickel Industries is exposed to economic, environmental, and social sustainability risks, including market volatility and operational challenges. The Company mitigates these risks through structured management strategies:

| Risk | Mitigation |
|---|---|
| Economic risk | The Company continues to focus on minimising the cost of production, which we believe provides a level of cash flow protection through the cycle. The Company's continued diversification of its product offering, including once the ENC HPAL is in production, increased MHP as well as nickel cathode and nickel sulphate - these products all have different price drivers that, over the medium to long-term, should increase the stability of the Company's earnings. |
| Environmental risk | The Company seeks to minimise these risks by conducting its activities (including its operating entities where within its control) in an environmentally responsible manner, in accordance with applicable laws and regulations. |
| Social risk | The Company maintains strong community relations to ensure that the local stakeholders are supportive of the Company's operations in Indonesia. |

## Anti-Corruption and Ethical Compliance [2-23, 205-3, 14.22.4]

Nickel Industries upholds strict anti-corruption measures to comply with legal requirements, maintain ethical standards, and ensure operational sustainability. The Company adheres to the Criminal Code Act 1995 (Australia) and relevant anti-corruption laws in all jurisdictions where it operates, including Indonesia. These standards apply to all personnel, including directors, officers, employees, consultants, contractors, and advisors.

The Company enforces a Code of Conduct, Anti-Bribery and Corruption Policy, Whistleblower Policy, and Securities Trading Policy, all accessible via its website. Regular policy reviews, internal training, and compliance monitoring support its zero-tolerance approach to corruption. In 2024, no reports of conflicts of interest or corruption were recorded. The Company continues to strengthen its anti-corruption framework with expanded training programs and broader distribution of its Code of Ethics to employees. [2-26, 205-2]

## Upholding Human Rights

Nickel Industries ensures compliance with human rights standards, prohibiting child and forced labour while adhering to local laws. The Company's Human Rights Policy focuses on risk identification, employee awareness, impact assessments, and stakeholder engagement, with continuous evaluations to strengthen compliance. In 2024, no complaints were reported related to discrimination, freedom of association, or indigenous rights. [406-1, 407-1, 408-1, 409-1, 411-1]

In 2024, the Company reviewed its operations for compliance with Indonesian laws and the Australian Modern Slavery Act 2018, identifying areas for improvement. While policies regulate living conditions, occupational health and safety, and worker protections, the Company aims to strengthen land acquisition frameworks, contractor obligations for worker welfare, and grievance handling oversight to enhance its commitment to human rights and modern slavery prevention.



# Sustainability Performance

# Economic Development

Nickel Industries integrates economic development into its sustainability strategy, recognising its operations' direct impact on local communities. The Company prioritises financial strength and operational efficiency to drive regional economic benefits. Its strategic focus on producing value added products such as NPI and MHP, enhances financial performance and supports local employment and supplier engagement. By fostering economic growth in surrounding communities, Nickel Industries reinforces its role as a responsible corporate entity.



## Operations [2-1, 2-6]

The Company's principal operations are located in Indonesia. Additional information regarding our operations can be accessed via the website.

| Operations | Description | Ownership Structure |
|---|---|---|
| Hengjaya Mine | The Hengjaya Mine is a large tonnage nickel deposit located in Morowali Regency near the IMIP covering 5,983 hectares. | Nickel Industries holds an 80% interest in the share capital of PT Hengjaya Mineralindo, an Indonesian PMA Company. The remaining 20% interest is owned by the Company's Indonesian partner, the Wijoyo family. |
| Hengjaya Nickel Project | The Hengjaya Nickel Project, located within IMIP, consists of two RKEF lines with a nameplate capacity of 15 ktpa. NPI production began in March 2019, and the project benefits from a seven-year corporate income tax exemption, followed by a two-year period at 50% of the prevailing tax rate. In 2022, the Company transitioned production from NPI to nickel matte, entering the EV battery supply chain. | Nickel Industries holds an 80% interest in the Hengjaya Nickel Project, with the remaining 20% owned by Decent Investment International Private Limited, a related party of the Company's partner Shanghai Decent Investment (Group) Co., Ltd. |
| Rangel Nickel Project | The Ranger Nickel Project, located within IMIP, consists of two RKEF lines with a nameplate capacity of 15 ktpa. NPI production began in May 2019, and the project benefits from a seven-year corporate income tax exemption, followed by a two-year period at 50% of the prevailing tax rate. | Nickel Industries holds an 80% interest in the Ranger Nickel Project, with the remaining 20% owned by Decent Investment International Private Limited, a related party of the Company's partner Shanghai Decent Investment (Group) Co., Ltd. |

| Operations | Description | Ownership Structure |
|---|---|---|
| Angel Nickel Project | The Angel Nickel Project is a development project within the Indonesia Weda Bay Industrial Park (IWIP) on Halmahera Island in Indonesia's North Maluku province comprising four 54 KVA RKEF lines with an annual nameplate production capacity of 36,000 tonnes of nickel metal (in nickel pig iron) and a 380MW power plant. Commissioned in January 2022, the Project was awarded material tax concessions, paying no income tax for a period of 10 years followed by an additional 2-year period paying 50% of the prevailing corporate income tax rate. | Nickel Industries holds an 80% interest in the Angel Nickel Project, with the remaining 20% owned by Decent Resource Limited, a related party of the Company's partner Shanghai Decent Investment (Group) Co., Ltd. |
| Oracle Nickel Project | The Oracle Nickel Project, located within IMIP, consists of four RKEF lines with a nameplate capacity of 36 ktpa and a 380MW power plant. NPI production commenced in November 2022, and the project benefits from a 10-year corporate income tax exemption, followed by a two-year period at 50% of the prevailing tax rate. | Nickel Industries holds an 80% interest in the Oracle Nickel Project, with the remaining 20% owned by a related party of the Company's partner Shanghai Decent Investment (Group) Co., Ltd. |
| Huayue Nickel Cobalt HPAL Project | Nickel Industries holds a 10% interest in the Huayue Nickel Cobalt HPAL project, currently producing low-carbon battery-grade nickel for the EV market. | Nickel Industries holds a 10% interest in Huayue Nickel Cobalt, acquired from Shanghai Decent, for a total consideration of US$270 million. |
| Excelsior Nickel Project (ENC) | The Excelsior Nickel Cobalt project is an HPAL facility under construction at the IMIP in Central Sulawesi, Indonesia. Designed to produce 72,000 metric tons of nickel per annum, producing MHP, nickel sulphate, and nickel cathode for the EV battery market. The project has a 15-year corporate income tax holiday and a USD 2.3 billion cost guarantee, including slurry pipeline from Hengjaya Mine, dry-stack tailings storage and a sulphuric acid plant for renewable energy. | Nickel Industries holds a 44% interest and is acquiring an additional 11% interest in the Excelsior Nickel Cobalt HPAL project. |

## Direct Economic Value [2-1, 2-6, 201-1]

### Direct Economic Value Generated and Distributed

| Description | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| **Economic Value Generated** | | | | |
| Revenue | USD | 1,744,452,733 | 1,880,104,794 | 1,217,041,820 |
| **Economic Value Distributed** | | | | |
| Cost of sales | USD | 1,429,798,345 | 1,430,421,113 | 856,617,781 |
| **Economic Value Retained** | | | | |
| EBITDA | USD | 296,821,256 | 406,667,193 | 339,183,411 |

### Organisational Scale

| Description | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| Total assets | USD | 3,896,248,270 | 4,071,345,782 | 2,672,519,694 |

**Production Performance**

| Description | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| NPI production | tonnes | 1,042,655 | 954,014 | 473,116 |
| NPI grade | % | 12.2 | 13.4 | 13.8 |
| Nickel metal production | tonnes | 127,261 | 128,259 | 70,079 |
| Saprolite ore production | tonnes | 5,017,222 | 3,832,833 | 2,890,575 |
| Limonite ore production | tonnes | 14,010,958 | 9,568,456 | 3,902,276 |

## Defined Benefit Plan Obligations and Other Retirement Plans [201-3, 401-2, 14.17.4]

Liabilities for wages, salaries, annual leave, and sick leave due within 12 months are recognised at undiscounted amounts, based on applicable remuneration rates, including related on-costs such as workers' compensation insurance and payroll tax. In compliance with government regulations, Nickel Industries enrols employees in a Defined Contribution Pension Program administered by the Financial Institution Pension Fund, along with the Old Age Security Program and the Pension Security Program managed by BPJS Ketenagakerjaan.

In 2024, the working schedules across operational sites, including IMIP, were structured based on different work systems and shift arrangements. Non-shift employees adhered to an eight-hour workday supplemented by one hour of mandatory overtime. Employees operating under a two-shift, three-squad system were assigned 12-hour shifts, while those under a three-shift, three-squad system worked eight-hour shifts with an additional two hours of overtime. All scheduling structures were established to meet operational requirements while remaining in full compliance with applicable labour regulations.

## Tax Compliance [207-1, 207-2, 207-3, 207-4, 14.23.4, 14.23.5, 14.23.6, 14.23.7]

Nickel Industries ensures full compliance with Indonesian tax regulations across its operating subsidiaries. The Company's taxation division, overseen by the Chief Finance Officer (CFO), is responsible for tax strategy, planning, and compliance, aligning with applicable laws and mitigating tax risks. A whistleblowing system is in place to uphold integrity in tax-related matters.

Regular internal and external reviews are conducted to monitor tax compliance, including assessing the tax implications of transactions and ensuring adherence to transfer pricing regulations with guidance from Tax Advisors. The Company engages with key government agencies, including the Directorate General of Taxes, the Ministry of Energy and Mineral Resources, and the Ministry of Environment and Forestry, and participates in tax-related training and seminars to stay updated on regulatory developments.

## Supply Chain [2-6, 204-1, 14.9.5]

Nickel Industries' supply chain in Indonesia includes suppliers, vendors, contractors, consultants, and other partners, with no significant changes reported in 2024. The Company engages local (Indonesian) and international suppliers.

## Mining Operations

### Suppliers – Hengjaya Mine

| Description | Unit | 2024 | | 2023 | | 2022 | |
|---|---|---|---|---|---|---|---|
| | | Total | % | Total | % | Total | % |
| Local suppliers | entities | 440 | 100 | 310 | 100 | 250 | 100 |
| International suppliers | entities | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | entities | **440** | **100** | **310** | **100** | **250** | **100** |

### Supplier Contract Value – Hengjaya Mine

| Description | Unit | 2024 | | 2023 | | 2022 | |
|---|---|---|---|---|---|---|---|
| | | Total | % | Total | % | Total | % |
| Local suppliers | USD | 9,789,173 | 100 | 7,424,403 | 100 | 4,972,705 | 100 |
| International suppliers | USD | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | USD | **9,789,173** | **100** | **7,424,403** | **100** | **4,972,705** | **100** |

## RKEF Operations

### Suppliers

| Description | Unit | 2024 | | 2023 | | 2022 | |
|---|---|---|---|---|---|---|---|
| | | Total | % | Total | % | Total | % |
| Local suppliers | entities | 649 | 94 | 703 | 93 | 414 | 94 |
| International suppliers | entities | 44 | 6 | 52 | 7 | 28 | 6 |
| **Total** | entities | **693** | **100** | **755** | **100** | **442** | **100** |

### Supplier Contract Value

| Description | Unit | 2024 | | 2023 | | 2022 | |
|---|---|---|---|---|---|---|---|
| | | Total | % | Total | % | Total | % |
| Local suppliers | USD | 1,165,184,676 | 87 | 1,428,832,647 | 90 | 872,745,914 | 68 |
| International suppliers | USD | 168,812,320 | 13 | 154,577,433 | 10 | 413,915,940 | 32 |
| **Total** | USD | **1,333,996,996** | **100** | **1,583,410,080** | **100** | **1,286,661,854** | **100** |



## Indirect Economic Impact [203-2, 14.9.4]

The Company places a strong emphasis on its indirect economic impact by giving priority to local workforces and suppliers in its operational areas, thereby fostering local economic development. Additionally, we design programs and initiatives that align with the needs of local communities and our long-term strategy, avoiding reactive social investments. Nickel Industries expects that our operations can continue to stimulate the growth of the local economy in the future.

The downstream development of the nickel industry has significantly contributed to economic growth in Central Sulawesi and North Maluku. Between 2015 and 2022, the region recorded an average annual economic growth rate of 11.7%, with manufacturing GDP increasing by 73% over the same period. In North Maluku, GDP grew by 22.9% in 2023, further illustrating the sector's regional impact. These growth rates notably exceed Indonesia's national average of 5% per year over the 2015–2024 period, underscoring the nickel industry's role in accelerating local economic development.

### Infrastructure Investments and Services Provided [203-1, 14.9.3]

The Company invests in infrastructure and services through a strategic approach that prioritises long-term sustainability and growth. These investments are aimed at enhancing our operational capabilities, improving efficiency, and ensuring that we can continue to deliver high-quality products and services to our customers. Additionally, it not only strengthens our own operations but also has a ripple effect, contributing to indirect economic growth by fostering job creation, supporting local businesses, and stimulating economic activity in the regions where we operate.



# Environmental Stewardship

Nickel Industries recognises environmental sustainability as essential to its operations and long-term stability. Given the role of its products in the global energy transition, the Company prioritises a stable operating environment. It is committed to zero environmental harm and responsible resource management.

Hengjaya Nickel and Ranger Nickel were awarded the Blue PROPER for the first time in 2024, paving the pathway of their position as responsible nickel producers by demonstrating the companies' commitment to the fulfilment of environmental compliance obligations referred to Indonesia's regulatory compliance standards.

In 2024, Hengjaya Mine was awarded the Green PROPER (beyond compliance) for the third year running, maintaining its government recognition from 2022 for demonstrating proactive environmental management and exceeding Indonesia's regulatory compliance standards.



## Our Approach

The Company's environmental and climate approach stems from its environmental policy that establishes a commitment to zero environmental harm and responsible management across all phases, from exploration to rehabilitation and closure. The policy is regularly reviewed, documented, and implemented to ensure compliance and accountability. It is communicated to employees, contractors, visitors, and stakeholders. Key environmental considerations include biodiversity, energy management, emissions reduction, water and effluent management, and waste management.

## Climate Risks

- Increased rainwater runoff, land erosion, and flood risk.
- Decreased river flow, higher drought risk downstream, and increased water consumption.
- Declining biodiversity on land, in rivers, and at sea.
- Increased coastal abrasion, sedimentation, and water pollution (surface, groundwater, and seawater).
- Depletion of surface water reservoirs and groundwater levels.
- Higher production of hazardous waste and associated sanitation and health risks.
- Increased air and noise pollution.

## Strategy

- Minimise land clearing based on construction progress, establish topsoil storage with erosion control and develop green space and green belts as forest buffers.
- Construct runoff drainage, sedimentation ponds, and water reservoirs; assist with water supply and flood management through socio-environmental programs.
- Provide sediment barriers (silt curtains, gabions, sand sacks), transplant and monitor coral reefs, and protect coastal areas through mangrove planting as a part of the socio-environmental program.
- Continuously monitor flue gas emissions, maintain equipment and vehicles, implement noise suppression, and use dust suppression measures (spraying, covers).
- Recycle water, monitor cooling water and wastewater discharge, establish port Standard Operational Procedures (SOPs) for spill prevention, and expand wastewater treatment and waste collection.
- Maintain nursery areas, educate employees on biodiversity, and promote environmental stewardship to internal & external stakeholders.
- Implement ground lining and leakage control for stockpiles to prevent contamination.
- Optimise utilisation of generated byproducts for energy savings and other supporting activities.
- Reduce reliance on fossil fuel usage from fleet utilisation by transitioning to electric-powered vehicles.

## Commitments and Actions

- Ensure adherence to environmental laws and regulations while proactively consulting authorities on potential future changes.
- Establish, evaluate, and refine environmental targets to align with evolving needs and expectations.
- Design and operate projects in compliance with the Company's Environmental Management System, incorporating inspections, audits, and performance evaluations.
- Foster an environmentally conscious culture through management leadership, employee education, contractor training and stakeholder partnership.
- Involve internal and external stakeholders in discussions on development, operations, and mine closure, recognising the interconnected environmental, economic, social, and cultural aspects.
- Report environmental performance openly, accurately, and consistently to all stakeholders.

# Climate Adaptation and Mitigation

## Governance

The Risk and Sustainability Committee at Nickel Industries oversees climate-related risks and opportunities, reporting to the Board of Directors quarterly. The Committee monitors and integrates climate considerations into strategic decisions and risk management whilst engaging external experts when required. The Company is committed to fostering an environmentally conscious culture through leadership, training, and stakeholder engagement. Employees, contractors, and suppliers receive climate awareness education to ensure the sustainability strategy is embedded at every operational level.

The Committee at Nickel Industries Limited derives its governance and authority from the Board of Directors, with its responsibilities outlined in the Risk and Sustainability Committee Charter. It is tasked with supporting the Board in formulating, implementing, and overseeing sustainability policies, ensuring these align with the Company's long-term ESG commitments. The Committee provides a critical advisory role, making recommendations to the Board on sustainability strategies and disclosure practices. The Committee possesses several key powers, including the ability to conduct evaluations of sustainability-related matters and retain external consultants or legal advisors at the Company's expense. Additionally, it has the right to request information from employees and external parties, ensuring transparency and accountability in sustainability reporting. To maintain oversight, the Committee meets at least four times a year, with additional meetings convened as needed to address emerging ESG issues.

As reference to the TCFD recommendations, Nickel Industries ensures that climate-related risks and opportunities are embedded in its governance structure. The Committee, along with senior management, plays a central role in monitoring and reporting on climate risk strategies. These risks are integrated into investment decisions, operational planning, and long-term sustainability initiatives. Management is responsible for identifying and mitigating physical risks, such as extreme weather events, and transition risks, including regulatory changes like carbon taxation.



## Strategy

Nickel Industries is committed to supporting the global transition to a low-carbon economy while effectively managing climate risks and taking advantage of opportunities. The Company has conducted a climate scenario analysis to assess the resilience of its strategy under different climate futures. The Company evaluates both physical and transition risks by referencing projections from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), incorporating models such as the Representative Concentration Pathway (RCP) 4.5 and 8.5 scenarios as well as the IEA's Sustainable Development Scenario.

Over the short term, the Company has developed a comprehensive GHG inventory, identified key emission sources (coal combustion and electricity use), and prioritised energy efficiency improvements. In 2024, the Hengjaya Mine utilised solar panels with a capacity of 396 kWp alongside a 250 kWh storage system that has been installed since 2022. This solar power system now fulfils approximately 20% of the mine's electricity needs, lessening dependence on fossil fuels and aiding in reducing its carbon footprint. Alongside the solar initiative, the mine has launched a strategy to cut energy consumption by gradually introducing EV trucks. In 2024, EV trucks were integrated into the mining operations to decrease greenhouse gas emissions. Oracle Nickel has enhanced resource efficiency in energy production by replacing conventional coal with recycled furnace gas for its drying and grinding processes, which has decreased coal usage by approximately 800 tonnes of coal per day.

In addition, Hengjaya Nickel and Ranger Nickel have switched to electric loaders, moving away from traditional diesel-powered versions. These eight electric loaders are charged at specific stations within the facilities and are utilised for loading and unloading ore. Electric loaders consume 3.6 times less energy than their diesel counterparts, leading to a reduction in fuel usage.

Our medium-term plan emphasises the adoption of carbon-related regulations, proactive investments in renewable energy and the optimisation of low-carbon technologies to align with emerging standards. The HPAL technology has been implemented to process nickel ores with lower emissions and energy requirements, utilising power from the captive waste heat boiler system from the acid plant, which can provide up to 40% of power needs. This new technology is capable of processing limonite nickel ore, which can be moved through a slurry pipeline instead of conventional truck transportation. The ENC HPAL expansion is anticipated to lower the Group's emissions intensity by 37%.

Our long-term vision aims for net-zero emissions by 2050 by enhancing renewable energy capacity, fully embedding sustainability into the Company's operational framework, and replacing fossil fuels in nickel smelting with innovative low-carbon technologies. The Company is also dedicated to increasing water recycling and refining waste management practices.

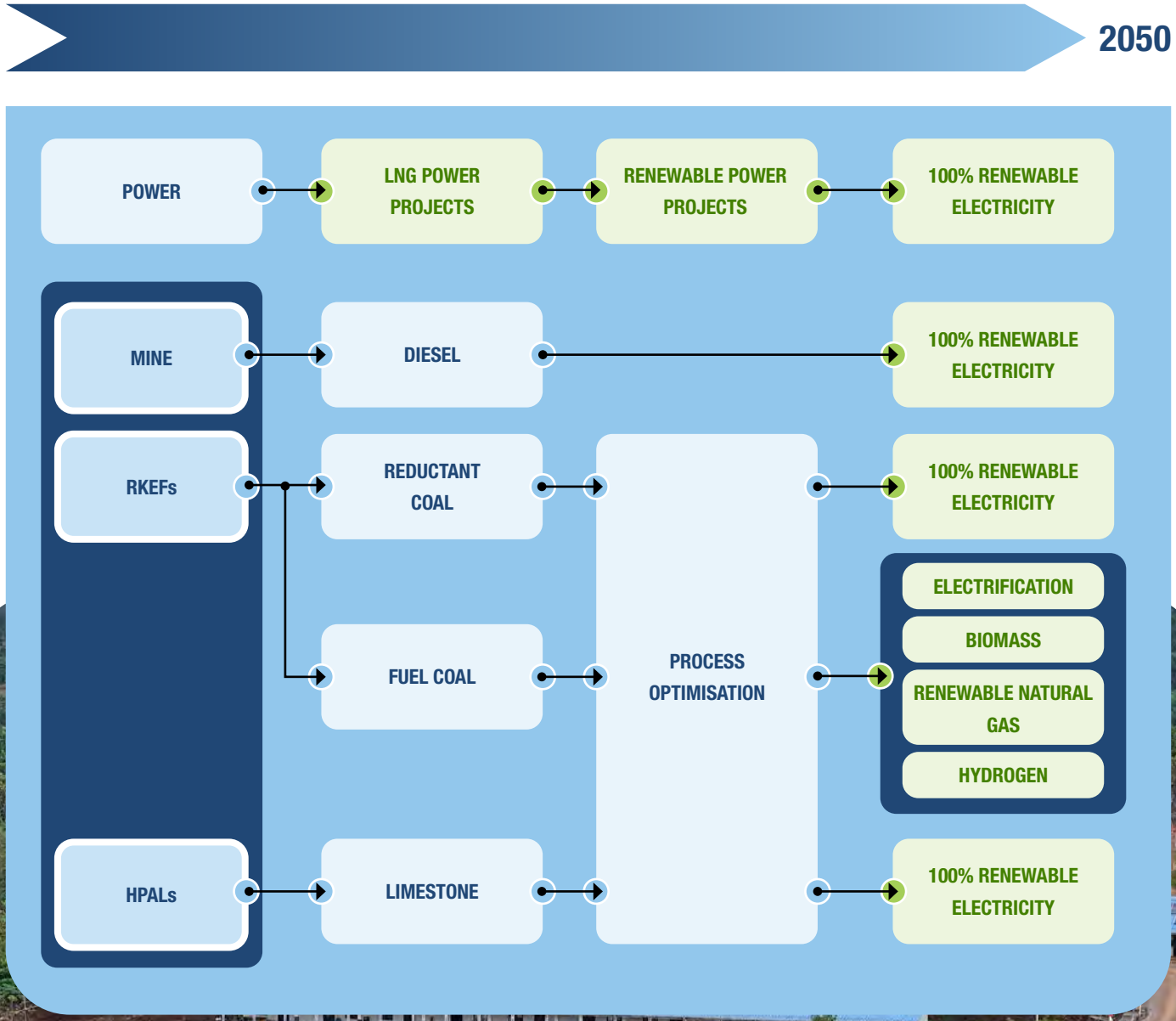


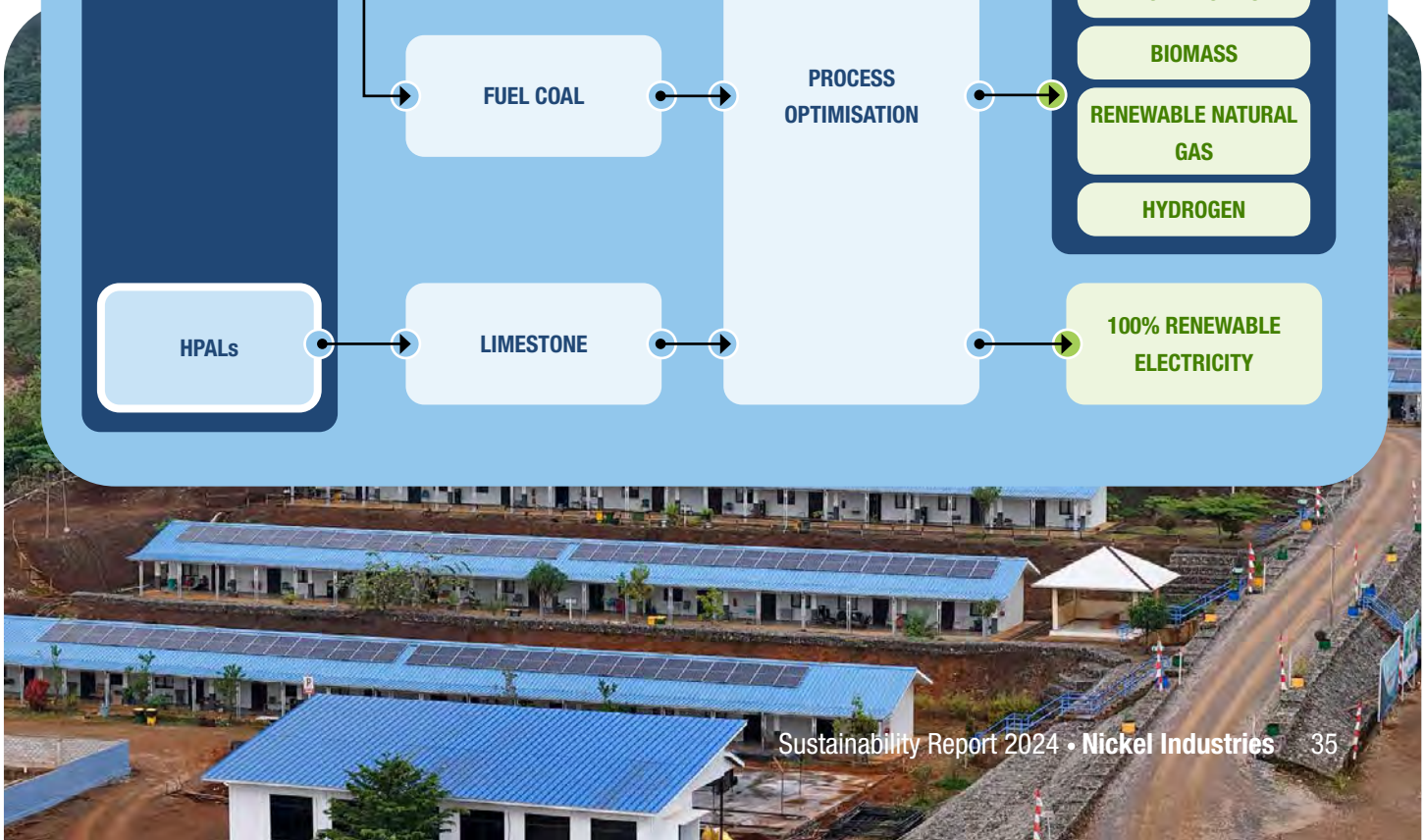
## Net Zero Roadmap

The Company's key initiatives to achieve net zero include:

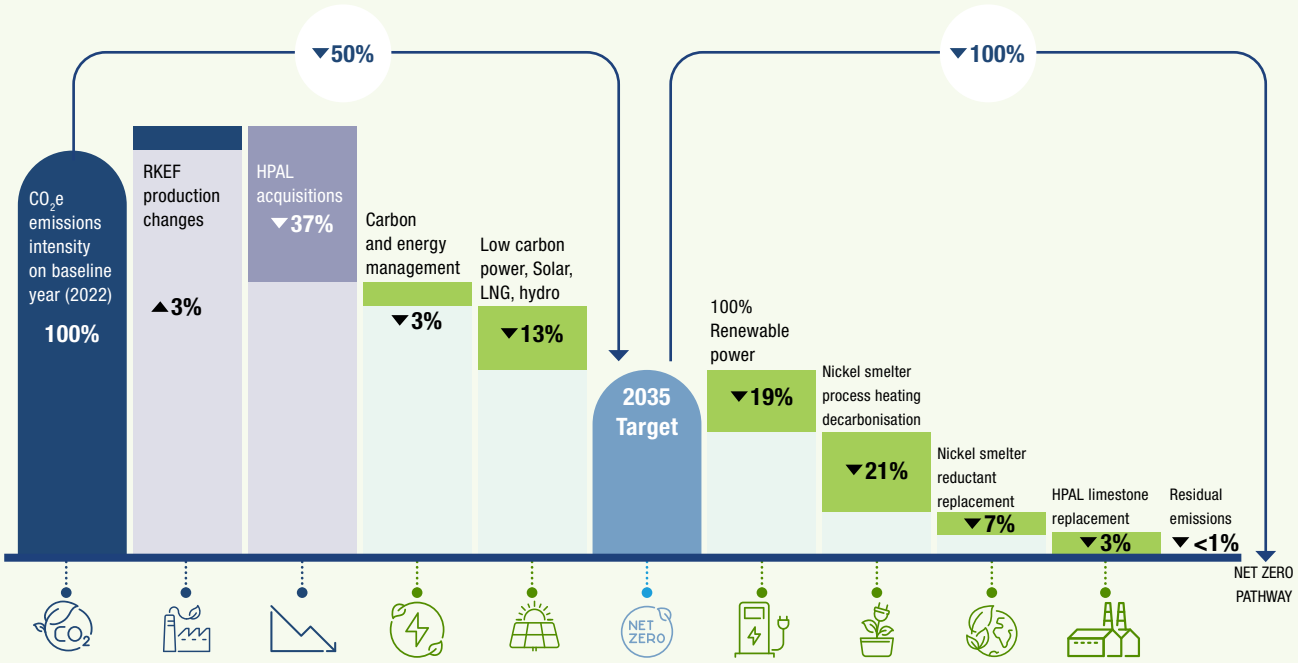
- **Utilising low-carbon technologies to process nickel ores by** constructing the new nickel processing plants using the latest HPAL technology, which is going to be much more efficient than the existing RKEF operations in terms of the carbon footprint.
- **Transitioning to renewable energy sources,** decarbonising its power supply. Tsingshan Group, the Company's key partner, has committed to no new coal power projects to support this transition. As a concrete step, the Company has introduced solar cells at the Hengjaya Mine since 2022 and is developing a 255 MWp photovoltaic and 80 MWh Battery Energy System Storage (BESS) solar project in Morowali.
- **Substituting fossil fuels and carbon reductants in nickel smelting,** exploring other alternatives to mitigate hard-to-abate emissions. Further technological development will be required.

### 2050 Decarbonisation Roadmap



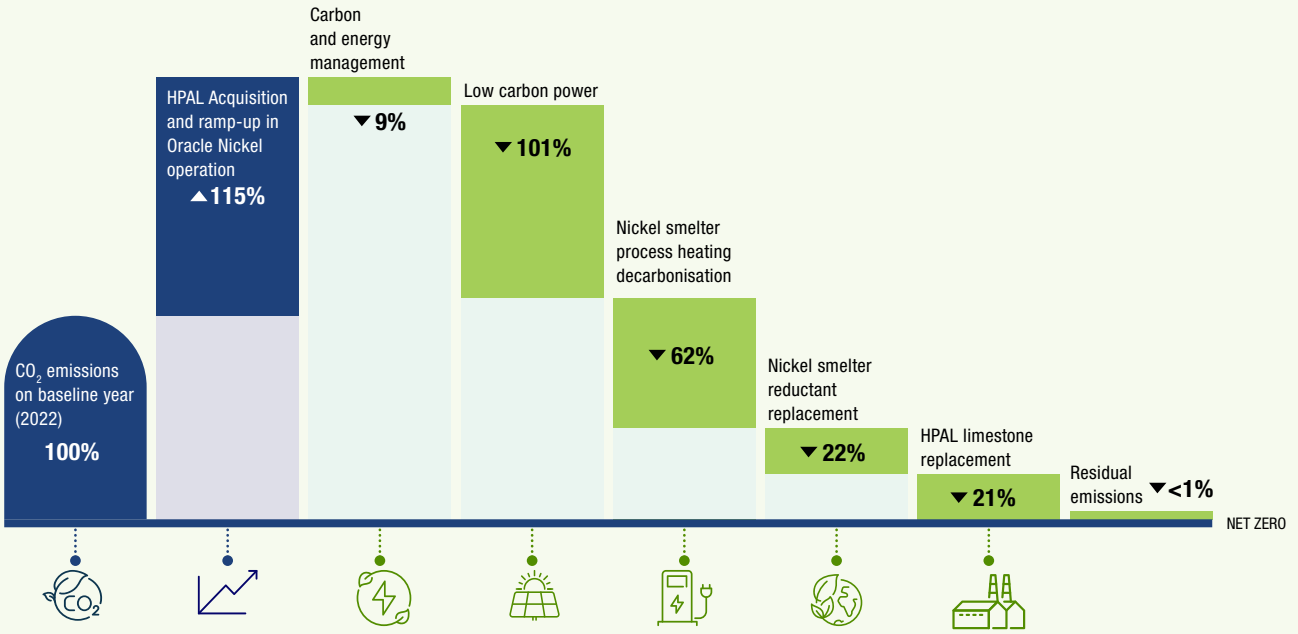
### Net Zero Pathway – Emissions Intensity




To achieve net zero emissions by 2050, Nickel Industries has identified three priorities corresponding to the Company's largest GHG emissions sources:

- **Transition to renewable power by 2050.** Achieving net zero will require complete decarbonisation of the Company's power supply by 2050. This effort is supported by one of its major partners, Tsingshan Group, with its commitment not to build new coal power projects.
- **Replacement of fossil fuels and carbon reductants at the nickel smelters.** Options to mitigate hard-to-abate emissions include electrification, hydrogen, and biomass decarbonisation pathways. Additional development will be required to achieve net zero.
- **Replacement of limestone used for neutralisation at the HPAL facilities.** $CO_2$ emissions are inherent to limestone usage. Eliminating these emissions will require substitution with new materials like low-carbon lime.

### Net Zero Pathway – Absolute Emissions





## Risk Management [201-2, 14.2.2]

Nickel Industries actively addresses climate-related risks by integrating climate considerations into its risk management framework. The Company prioritises the systematic assessment of its most significant climate-related risks to safeguard operations and financial stability.

### Physical Risk

Nickel Industries recognises the physical risks posed by climate change, including extreme weather events and long-term shifts in weather patterns that may affect operations. These risks could lead to production delays, increased costs, loss of productivity, and heightened liabilities. To assess both current and future risks, the Company utilises various climate scenarios, each providing distinct projections based on greenhouse gas concentration levels.

Physical risks are evaluated using the IPCC RCP 4.5 and 8.5 scenarios, which represent medium and high greenhouse gas concentration trajectories. RCP 4.5 is a moderate scenario where emissions peak around 2040 before declining, whereas RCP 8.5 represents a high-emissions trajectory in which emissions continue rising throughout the twenty-first century. By incorporating these scenarios, the Company can better understand and prepare for the potential impacts of climate change on its operations.

**Temperature**

IMIP and IWIP are experiencing temperature increases, with both scenarios projecting a rise to 28–29°C, approximately 0.6°C higher than current levels. This additional warming may result in harsher working conditions in the field and an increased demand for water.

**Precipitation**

In both scenarios, IWIP is projected to experience an increase in average annual precipitation, ranging from 2,500 to 2,700 mm, while precipitation around IMIP is expected to decrease from 2,300 to 1,900 mm per year. Despite the increased rainfall in IWIP, a study using the RCP 8.5 scenario indicates that North Maluku Province is likely to experience longer dry periods, lasting up to six months, compared to three months in Central Maluku Province. Additionally, surface water quality may become a challenge in Central Halmahera, where IWIP is located.

**Sea Level Rise**

Both IMIP and IWIP are located in coastal areas. Currently, available data does not indicate any significant increase in sea levels. However, data on the rise in sea level remains limited. High tide events were recorded in Central Sulawesi Province in 2015 and 2018, but they have not had a significant impact on IMIP operations.

**Disasters**

From 2015 to 2021, Central Sulawesi and North Maluku experienced flooding, landslides, storms, and forest fires, though the Company's operations remained unaffected. The only indirect impact occurred in 2019 when flooding in North Konawe Regency disrupted logistics and reduced mine production from 127,000 to 78,000 wet metric tonnes due to damaged infrastructure, including three broken bridges.

# Transition Risk

Nickel Industries acknowledges that the global transition to low-carbon development, in line with the Paris Agreement, may impact its business, particularly in the mining and metal production sectors, which are characterised by energy-intensive operations and significant greenhouse gas emissions. To assess transitional risks, the Company utilises the IEA World Energy Outlook (WEO) 2021 Announced Policy and Sustainable Development Scenarios for the period 2021 to 2050. These scenarios provide a structured framework for evaluating the Company's preparedness for anticipated changes in the global energy landscape.



## Policy

Nickel Industries faces medium risks from policy changes under the IEA WEO 2021 'Announced Pledges' and 'Sustainable Development' scenarios, particularly as Indonesian regulations increasingly promote low-carbon development in the energy and power sectors. This policy shift also influences the nickel market.

The Indonesian Government is advancing climate policies to meet its Nationally Determined Contribution (NDC) target, aligning with the IEA WEO 2021 'Announced Pledges' scenario. Key regulations include a ban on new coal power plants from 2030 and a mandate for an energy mix comprising 14% natural gas and 30% renewables.

Under the 'Sustainable Development' scenario, policies focus on supporting Carbon Capture Storage (CCS), Carbon Capture Utilisation and Storage (CCUS), hydrogen adoption in industries, and fuel transformation. Hydrogen is emerging as a potential renewable resource with applications in major industrial processes.

In Indonesia, hydrogen and CCS/CCUS remain in the study and planning phase. While the government is drafting regulations to enable CCS/CCUS adoption for hard-to-abate industries, its widespread application remains uncertain due to ongoing debates and scepticism.



## Technology

Nickel Industries faces medium- to long-term cost risks due to policy-driven technological shifts in the energy and power sectors. The IEA WEO 2021 scenarios project increased reliance on low-carbon technologies, which, while expected to become more cost-effective, require significant capital investment.

Rising carbon taxes also add to business costs, given the high emissions from fossil fuel-based technologies. Under the IEA WEO 2021 'Sustainable Development' scenario, carbon prices are expected to rise from 40 USD/tonnes $CO_2$ in 2030 to 160 USD/tonnes $CO_2$ in 2050. Indonesia's planned carbon tax system in 2025 will further impact cost structures.



## Market

Nickel Industries faces low market risk under the IEA WEO 2021 scenarios, as nickel remains essential for future industries. Positioned as an integrated producer, the Company supplies the stainless steel and battery markets through nickel pig iron and nickel matte production. In October 2022, it commissioned RKEF lines to produce nickel matte, expanding its market reach. Rising EV demand and growth in battery industries, particularly in China and Indonesia, further strengthen market opportunities. With a diversified product strategy, the Company anticipates no significant market risks in the near future.



## Reputation

Nickel Industries faces medium reputational risks, as mining and processing industries are often linked to climate change, environmental impact, and social conflicts. With the global shift toward low-carbon development to meet the Paris Agreement's 1.5°C target and increasing national commitments to net zero by 2050, scrutiny of the sector has intensified. Investors closely monitor climate policies, and financial institutions increasingly integrate climate considerations into lending decisions, reinforcing the need for the Company to align with sustainability expectations.

To mitigate the risks above, some measures are taken as detailed below:

**a. Physical Risk Management Measures:**

- Monitoring acute and chronic climate risks through annual data collection.
- Developing and implementing water management plans.
- Enhancing water recycling to reduce losses from waste, leakage, and evaporation.
- Establishing contingency plans for extreme climate events.

**b. Transition Risk Management Measures:**

- Continuing the 'Future Energy' collaboration to accelerate renewable energy adoption.
- Proactively integrating green practices in anticipation of carbon taxation.
- Developing and utilising low-carbon technologies for processing nickel ores.
- Strengthening its reputation as a responsible nickel producer to foster investor and public trust.
- Expanding its market presence in high-grade nickel to position itself as a leader in sustainable mining and EV battery supply chains.
- Monitoring Indonesian and global climate policies to remain adaptive and explore strategic collaborations.

## Metrics and Targets

Nickel Industries acknowledges its responsibility to support the global transition to a low-carbon economy while mitigating climate risks across its operations. The Company is committed to a 50% reduction in carbon intensity by 2035 and achieving net-zero emissions by 2050, using 2022 as a baseline. While early-stage initiatives have been implemented, the full impact on absolute and intensity metrics reduction is expected to materialise from 2025 onward. The expected commissioning of the ENC HPAL project in the second half of 2025 is expected to deliver material reductions in carbon emissions intensity, which remains a focus area for execution and monitoring.

## Emissions [305-1, 305-2, 305-3, 305-4, 14.1.5, 14.1.6, 14.1.7, 14.1.8, 14.1.9] [EM-MM-110a.1, EM-MM-120a.1]

Nickel Industries calculates its GHG emissions in accordance with ISO 14064-1:2018 and the Greenhouse Gas Protocol Standard, covering operations at Hengjaya Mine and its RKEF facilities: Hengjaya Nickel, Ranger Nickel, Angel Nickel, and Oracle Nickel.

In 2024, Oracle Nickel transitioned from using recycled furnace gas to coke oven gas sourced from IMIP coking plants to enhance resource efficiency. Distributed via a 3-kilometre pipeline, this cleaner fuel replaces approximately 800 tonnes of coal per day, reducing coal consumption per 1% nickel produced from 0.108 tonnes to 0.051 tonnes monthly.

In line with its energy transition strategy, Nickel Industries introduced eight electric loaders at Hengjaya Nickel and Ranger Nickel in early 2024, replacing diesel-powered units. Electric loaders, consuming 73% less energy, significantly reduce fuel costs and emissions. Compared to diesel loaders, which require 12.6 litres of biodiesel per hour, electric loaders operate at 34.62 kWh per hour, cutting operational energy demand and lowering the environmental footprint.

### GHG Emissions [305-1, 305-2, 305-4, 14.1.5, 14.1.6, 14.1.8] [EM-MM-110a.1]

| GHG Emissions | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| **Scope 1 - Direct Emissions Category** | | | | |
| Stationary fuel combustion | ($tCO_2e$) | 3,003,366 | 3,253,113 | 1,788,264 |
| Mobile fuel combustion | | 17,985 | 20,842 | 22,892 |
| Carbon fraction in the NPI | | -87,166 | -80,386 | -41,076 |
| Total Scope 1 | | 2,934,253 | 3,193,569 | 1,770,086 |
| **Scope 2 - Indirect Electricity Emissions Category** | | | | |
| **Total Scope 2** | ($tCO_2e$) | 3,710,248 | 3,440,250 | 1,814,177 |
| **Total Emissions** | **($tCO_2e$)** | **6.644.501** | **6,633,819** | **3,584,263** |
| Emissions intensity | $tCO_2e$ /tonnes of Ni | 65 | 65 | 64 |

## Energy [302-1, 302-2, 302-3, 302-4, 302-5, 14.1.2, 14.1.3, 14.1.4] [EM-MM-130a.1]

In 2024, Nickel Industries implemented energy efficiency measures to reduce consumption and emissions across its operations. At Hengjaya Mine, a 396 kWp solar system with 250 kWh storage was commissioned, supplying 20% of site electricity and reducing reliance on diesel generators. This initiative is expected to decrease diesel consumption by 31 million litres over 25 years. Additionally, EV trucks were integrated into operations, with 25 more planned in 2025 to replace diesel-powered haulage. This transition aims to lower emissions and operational fuel costs.

### Total Energy Consumption (GJ) [302-1, 14.1.4][EM-MM-130a.1]

| Type of Energy Source | 2024 | 2023 | 2022 |
|---|---|---|---|
| Coal (bituminous - smelting) | 27,170,425 | 29,705,562 | 13,526,902 |
| Coal (semi-coke-reductant) | 10,345,488 | 10,905,103 | 8,877,213 |
| Electrode paste | 291,758 | 258,713 | 153,044 |
| Electricity | 19,324,208 | 17,917,970 | 9,448,840 |
| Petrol | 50 | 38 | 72 |
| Biodiesel B30 | 488,945 | 558,013 | 312,924 |
| Diesel | - | - | 555,645 |
| Liquefied Petroleum Gas (LPG) | 582 | 448 | 533 |
| Acetylene (C2H2) | 0 | 0 | 0 |
| **Total Energy (GJ)** | **57.621.456** | **59,345,846** | **32,875,172** |

*The conversion factors are from the GHG Protocol tool for stationary combustion, Version 4.1. of the World Resources Institute (2015).

### Energy Intensity [302-3]

| Description | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| Total energy usage | GJ | 57,621,456 | 59,345,846 | 32,875,172 |
| Nickel metal production | tonnes of nickel equivalent | 127,263 | 128,259 | 70,079 |
| Energy intensity of the nickel production | GJ/ tonnes of nickel equivalent | 452.78 | 462.70 | 469.12 |



# Good Mining Practices [2-23]

Nickel Industries' Hengjaya Mine adheres to Good Mining Practices as mandated by the Indonesian Ministry of Energy and Mineral Resources (MEMR) Regulation No. 26 of 2018 and MEMR Decree 1827K/30/MEM/2018. Operations are systematically planned, executed in phases, and regularly evaluated to ensure compliance.

In 2024, the Ministry of Energy and Mineral Resources awarded Hengjaya Mine the Good Mining Practices Award, recognising its compliance with environmental regulations and operational excellence. Environmental management initiatives include reforestation, waste management, and ongoing audits to mitigate impacts and ensure sustainable resource utilisation.

## Mining Safety Management System

Nickel Industries' Mining Safety Management System (MSMS) ensures operational safety through structured policies, risk assessment, and continuous monitoring. Integrated into a multi-level planning framework from five years to daily intervals, it aligns geological modelling, pit design, equipment procurement, and project scheduling while considering natural topography, water flow, and ore-grade requirements.

To optimise excavation efficiency and minimise material rehandling, the Company repurposes materials for access construction, develops storage facilities in line with natural contours, refines material mixing for targeted ore grades, and establishes proportionate settling ponds. Pit designs maintain safe distances from license boundaries, with rehabilitation and landform planning ensuring long-term stability and regulatory compliance.

| Mining Activities at Hengjaya Mine | Good Mining Principles Framework | Mining Safety Management System Initiatives | Medium-Term Mining Operations Initiatives |
|---|---|---|---|
| • Preliminary exploration.<br>• Advanced exploration, resource, drilling and geological modelling.<br>• Geotechnical studies.<br>• Land clearing.<br>• Topsoil stripping and storage.<br>• Material transfer cover.<br>• Ore excavation and quarrying.<br>• Ore transport to temporary storage.<br>• Ore testing in laboratories.<br>• Ore shipping to end users for processing.<br>• Rehabilitation planning.<br>• Monitoring and operations.<br>• Community relations.<br>• Technical support.<br>• Medical services.<br>• Compliance and financial reporting. | • Exemplary technical implementation.<br>• Implementation of mineral conservation principles that utilise all minerals by the specified level limits.<br>• Conduct mining activities in accordance with the principles of Occupational Health and Safety.<br>• Implementing the environmental management system, including reclamation, in our mining operations. | • Conducting daily, weekly and monthly coordination meetings with mining contractors to discuss the achievement of periodic targets.<br>• Reviewing the plans submitted by the mining contractors so that they are in line with the annual targets and in compliance with licensing regulations.<br>• Conducting daily internal meetings for the implementation of routine and additional tasks.<br>• Periodic reviews of actual results versus planned production. | • Collecting data on available resources and reserves by level limits.<br>• Identifying new areas that are increasing the project's resources and reserves.<br>• Planning the drilling activities with a certain drilling spacing to understand the volume of resources and reserves better.<br>• Scheduling the mining process and sequencing in accordance with the capacity of the production equipment.<br>• Developing a pit design by the optimisation of the stripping ratio and content values.<br>• Carrying out periodic control and reconciliations over the mine's plans so those accurate adjustments can be made to the schedule or design of the mining pit. |

| Summary of Mined Materials and their Management | | |
|---|---|---|
| **Description** | **Related environmental risk** | **Management** |
| Overburden | • Landslide, erosion and sedimentation when it rains.<br>• Acid mine drainage from runoff discharge.<br>• Heavy metals contained such as chromite, manganese, and iron when chemical reaction between dissolved minerals with runoff water.<br>• Turbid water generated from mine drainage & runoff. | • Management of overburden disposal through geotechnical studies.<br>• Periodic monitoring to reduce the risk of landslides.<br>• Establish and update sequencing and scheduling of mine planning on pit and disposal regularly.<br>• Establish and update the mine water management plan regularly.<br>• Construct sediment ponds to maintain the mine wastewater discharge.<br>• Periodic monitoring of mine wastewater discharge in each compliance point to maintain its water quality.<br>• Usage of coagulant and flocculant agents to treat suspended solids and dissolved minerals within the wastewater discharge to meet water quality thresholds. |
| Rock | Landslide, erosion and sedimentation when it rains. | Utilisation of rock for road lining in the pits. |
| Tailing | No tailings are produced in the Hengjaya Mine area. | No tailings are produced in the Hengjaya Mine area. |
| Sludge | No sludge is produced in the Hengjaya Mine area. | No sludge is produced in the Hengjaya Mine area. |

| No. | Land Clearing Minimisation and Optimisation Measures | Limonite Conservation Optimisation Measures |
|---|---|---|
| 1 | Optimising the stripping ratio based on available geological information. | Collecting data on areas that have reserves of low-grade ore (limonite) according to the specified grade limit. |
| 2 | Optimising the selection of mining locations, especially avoiding areas with waterways, such as rivers and lakes, to reduce the potential of water flow contamination and allow successful rehabilitation. | Plan mining sequence so limonite materials can be easily identified and mined and could be utilised for metallurgical processing. |
| 3 | Maintaining the administrative boundaries given by the government and providing certain buffer distances between pits and disposal boundary limits to reduce the risk of over-clearing or unauthorised clearing activities. | Coordinating departments to separate limonite from saprolite ore according to the nickel grade and mineral elements so that it is separated from overburden material and sent to intermediate stockpiles. |
| 4 | Demarcate, design and install various controls to minimise soil erosion and sediment runoff from all active mine areas. | |
| 5 | Avoiding high biodiversity areas to be mined and establishing a high-conservation value area within the mining lease to be protected and maintained regularly. | |

## Water and Effluents [303-1, 303-2, 303-3, 303-4, 303-5, 14.7.2, 14.7.3, 14.7.4 14.7.5, 14.7.6]

Nickel Industries manages water use and effluent discharge in compliance with Indonesia Ministerial Decree No. 51 of 2004 on Seawater Quality Standards and Government Regulation No. 82 of 2001 on Water Quality Management and Pollution Control. Effluent quality is monitored at Hengjaya Mine to assess water-related risks and ensure regulatory compliance.

At Hengjaya Mine, rainwater runoff is processed through settling ponds, with daily internal testing of the Potential of Hydrogen and Total Suspended Solids and monthly independent laboratory testing in accordance with Indonesia Minister of Environment Regulation No. 09 of 2006 on Nickel Mining Wastewater Standards. At IMIP, water quality in RKEF operations is monitored at designated points by a certified laboratory, with wastewater recirculated within the production process to eliminate discharge. The Water Treatment Plant Department supplies water for production and domestic use.



Nickel Industries engages with local communities to address water access and resource management. The Company consults with relevant stakeholders to align water conservation efforts with local and regulatory requirements, ensuring the availability of clean water and supporting long-term resource sustainability.

### Water Management and Quality Control

The Company's water management aims to prevent soil erosion and protect water quality. Mining is conducted in phases, with reclamation and revegetation restoring disturbed land. Restrictions on mining in steep areas and near water bodies help minimise environmental impact, while terraces and sediment controls stabilise soil and reduce runoff. Drainage systems are in place to manage water flow and prevent accumulation in operational areas.

Water quality is monitored throughout the mining lifecycle, with measures in place to control runoff and prevent contamination. Wastewater discharge into natural water bodies is prohibited, and sediment deposition systems help maintain compliance with environmental standards. Vegetation along riverbanks reduces sedimentation, and post-mining restoration ensures that affected water sources are rehabilitated to meet regulatory requirements.

**Water Withdrawal - RKEF Operations**

| Source of Water | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| Produced Water | $m^3$ | 8,894,461 | 8,780,166 | 4,331,397 |

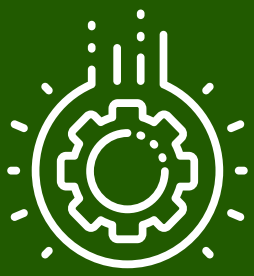
**Water Consumption - Mining Operations**

| Source of Water | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| Domestic water used in the office and basecamp of Hengjaya Mine | $m^3$ | 15,252 | 16,641 | 13,296 |

## Waste [306-1, 306-2, 306-3, 306-4, 306-5, 14.5.2, 14.5.3, 14.5.4, 14.5.5, 14.5.6]

Nickel Industries manages waste across all operational phases in compliance with Ministerial Regulation No. P.12/Menlhk/2020 on Hazardous Waste Storage and Government Regulation No.22 of 2021 on Implementation of Environmental Protection and Management, Environmental and Forestry Minister Regulation No. 10 of 2021 about Non-Hazardous and Toxic Waste Management. Waste is categorised as organic, inorganic, or hazardous, with hazardous waste managed by licensed transporters and each shipment recorded for regulatory compliance. Waste management follows the 4R principles—Reduce, Reuse, Recycle, and Recover— to ensure secure storage and proper disposal of process residues.

In 2024, Nickel Industries commissioned a Domestic Material Recovery Facility at Hengjaya Mine, reducing 14% of waste sent to disposal sites. The facility streamlines waste sorting, directing recyclable materials to third-party processors and converting organic waste into compost for mine rehabilitation.



### Technology-driven Approach

- Establishing sufficient temporary waste storage around the project site.
- Collecting waste from temporary waste storage periodically and transporting it to the landfill.
- Establishing a garbage disposal area around the activity site to prevent workers from throwing garbage carelessly and polluting the surrounding waters.
- Establishing a location for workers to dispose of feces (septic tank).
- Accommodating remnants of lubricating oil, fuel and or other hazardous waste that may pollute the waters.



### Socioeconomic Approach

- Instilling the discipline of properly disposing of waste in the entire workforce.
- Implementing healthy behaviour principles in the corporate environment.
- Completing permits for hazardous waste.
- Conducting specialised training for hazardous waste management workers.

### Waste Generated in 2024

| Waste Composition | Unit | RKEF Operations | |
|---|---|---|---|
| | | Waste Generated | Waste Diverted from Disposal |
| Slag nickel pig iron | Tonnes | 8,127,766.68 | 5,340,766.68 |
| Used oil | | 87.48 | 84.96 |
| Used battery | | 5.70 | 5.41 |
| Used filter | | 9.35 | 9.29 |
| Used clot | | 5.59 | 4.11 |

Moreover, hazardous and toxic waste at Hengjaya Mine is managed and processed by third parties, as listed in the table below. [306-3, 14.15.2]

| Type of Hazardous and Toxic Waste | Unit | 2024 | 2023 | 2022 |
|---|---|---|---|---|
| Used oil | Tonnes | 239.07 | 110.40 | 138.47 |
| Contaminated clot | | 20.75 | 2.90 | 0.46 |
| Used filter | | 33.68 | 10.53 | 8.76 |
| Used battery | | 8.67 | 5.77 | 4.59 |

## Domestic Waste: Material Recovery Facility

Nickel Industries has established a Domestic Material Recovery Facility at the Hengjaya Mine to improve waste management efficiency. The facility functions as a temporary holding and sorting centre, separating recyclable materials for processing by third-party companies. Organic waste is converted into compost for use in land rehabilitation. The facility has reduced waste sent to final disposal by approximately 14%, with further reductions expected as waste management processes improve. The inorganic waste collected in the domestic material recovery facility has been diverted to a local waste off-taker to be recycled. This initiative has reduced inorganic waste sent to landfills by stimulating the circular waste chain, and it aligns with the Company's strategy to minimise environmental impact and enhance resource recovery.



# Social Responsibility

Nickel Industries recognises its social responsibility and is committed to fostering local socioeconomic development while minimising disruptions to communities and the environment. The Company acknowledges that its operations may impact local livelihoods, economic conditions, and employment and actively engages with communities to mitigate conflicts, create business opportunities, and generate income.

The Company prioritises local employment, provides employee training, and has established a grievance redress unit to manage complaints. It is implementing long-term CSR programs for surrounding villages and facilitates community engagement through information workshops and centres. These initiatives support sustainable development and operational stability.




As of July 2024, Hengjaya Nickel, Ranger Nickel, and Oracle Nickel have adopted the International Labour Organisation-Sustaining Competitive and Responsible Enterprises (ILO-SCORE) program to improve management practices, productivity, and workplace conditions. The program enhances occupational health and safety, human resources, and employee rights through department and division-level improvement teams with diverse representation, including at least 10% female participation. Employees submit workplace improvement suggestions online, categorised into areas such as safety, health, and efficiency. Submissions are reviewed weekly, with management providing monthly evaluations and recognition.

## Human Capital [2-7, 2-19, 2-30]

As of December 2024, Nickel Industries employed 4,712 individuals, all covered under Indonesia's Government Regulations in Lieu of Law 2 of 2022 on Job Creation as the amendment of Labour Law No 11 of 2020. The Company enforces binding Company Regulations governing employer-employee agreements. Nickel Industries does not engage part-time employees, and all employees are remunerated in accordance with the Minimum Provincial Wage regulation.

### Total Employees by Position and Gender

| Location | 2024 | | 2023 | | 2022 | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| Management | 33 | 3 | 32 | 2 | 31 | 3 |
| Senior Officer | 394 | 55 | 707 | 46 | 409 | 48 |
| Officer | 3,736 | 491 | 4,276 | 415 | 3,514 | 406 |
| Total | 4,163 | 549 | 5,015 | 463 | 3,954 | 457 |
| | 4,712 | | 5,478 | | 4,411 | |

### Total Employees Based on Employment Status and Gender in 2024

| Employment Status | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | Total | % | Total | % | Total | % |
| Permanent Employees | 3,546 | 75 | 491 | 10 | 4,037 | 86 |
| Temporary Employees | 617 | 13 | 58 | 2 | 675 | 14 |
| Total | 4,163 | 88 | 549 | 12 | 4,712 | 100 |

### Total Employees Based on Employment Status and Placement in 2024

| Placement | Permanent Employees | | Temporary Employees | | Total | |
|---|---|---|---|---|---|---|
| | Total | % | Total | % | Total | % |
| Site | 3,752 | 80 | 671 | 14 | 4,423 | 94 |
| Office | 285 | 6 | 4 | 0 | 289 | 6 |
| Total | 4,037 | 86 | 675 | 14 | 4,712 | 100 |

### Total Employees Based on Age Group and Gender in 2024

| Age Group | 2024 | |
|---|---|---|
| | Male | Female |
| <30 years old | 2,352 | 384 |
| 30-50 years old | 1,788 | 161 |
| >50 years old | 23 | 4 |
| Total | 4,163 | 549 |
| Grand Total | 4,712 | |

### Turnover Rate

| Description | Turnover Rate | | | | | |
|---|---|---|---|---|---|---|
| | 2024 | | 2023 | | 2022 | |
| | Employees | % | Employees | % | Employees | % |
| Nickel Industries | 987 | 21 | 656 | 13 | 688 | 17 |



## Human Capital Development [404-1, 404-2, 14.21.4]

Nickel Industries invests in human capital development through structured programs that enhance employee skills and knowledge, ensuring operational efficiency and long-term growth. The Company supports professional advancement by fostering continuous learning and implementing best practices in workforce development.

**Total Training Participants by Employee Category and Gender**

| Employee Category | 2024 | |
|---|---|---|
| | Male | Female |
| Permanent | 3,886 | 519 |
| Contract | 277 | 30 |
| Total | 4,163 | 549 |

## Diversity and Equal Opportunity [2-8, 2-23, 405-1, 405-2, 14.21.5, 14.21.6]

Nickel Industries ensures equal opportunity for its employees. The Board of Directors oversees diversity initiatives, while management implements inclusion efforts and engages employees. All employees are expected to comply with the Company's diversity policy. Further details are available through the Company's website.



### Sustaining Competitive and Responsible Enterprises (SCORE) Implementation

SCORE Program enhances productivity and sustainability through workplace cooperation, quality management and adherence to international labour standards. Developed from the ILO Factory Improvement Programme, it promotes innovation, environmental responsibility and structured improvement initiatives such as Enterprise Improvement Teams (EITs) and the 5S (Sortir, Set in Order, Shine, Standardise, and Sustain) methodology.

At IMIP, targeted measures have been implemented to improve gender equality, focusing on workplace safety, accessibility and employee well-being. To reduce physical contact and enhance security, signage and separate queues were introduced at punch-in machines, while access to essential hygiene products was improved by providing menstrual supplies in control rooms and emergency kits in office and production areas. Employee comfort was further addressed with the installation of benches at bus stops for pregnant employees and designated seating in canteens and duty rooms. Restroom privacy concerns were resolved by sealing door gaps. Additionally, the Bus Station Management System enforces structured queuing, prohibits harassment, and establishes clear disciplinary actions. These initiatives align with SCORE's broader objective of fostering responsible business practices and long-term competitiveness.

## Occupational Health and Safety (OHS) [403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 403-7, 403-8, 14.16.2, 14.16.3, 14.16.4, 14.16.5, 14.16.7, 14.16.8, 14.16.9] [EM-MM-320a.1]

Nickel Industries enforces strict OHS standards to ensure safe operations for employees, contractors, suppliers, and surrounding communities. The Company is committed to a Zero-Harm objective, prioritising the safety and well-being of all personnel and stakeholders. OHS policies include hazard identification, risk assessment, incident prevention, safety training, and continuous evaluation through internal and external audits. All policies are documented, reviewed regularly, and communicated to employees, contractors, visitors, and stakeholders.

The Company complies with Indonesia's regulatory framework, including Law No. 1 of 1970 on Occupational Safety and Health and various MEMR regulations governing mining safety and operational standards as of the end of the reporting period. Additionally, Nickel Industries has established 8 Golden Rules applicable to all personnel.




### 8 Golden Rules

- Fit to work
- Do not work without appropriate Personal Protective Equipment
- Do not conduct work without appropriate tools and equipment
- Do not carry out work without permission and authority
- Obey to lockout and tagout
- Hazardous and toxic materials must be managed in accordance with procedures
- Do not disturb or damage flora and fauna, including reclamation areas.
- Do not disturb any area without approval

## OHS Management System

Nickel Industries implements an OHS Management System in compliance with Article 87 of Law 13 of 2003 on Manpower, which mandates an integrated OHS framework. The system is applied across all operational sites, including Hengjaya Mine, Hengjaya Nickel, Ranger Nickel, Angel Nickel, and Oracle Nickel, to maintain workplace safety and efficiency.

The Company applies a preventive approach to OHS risks through structured education and training programs focused on hazard identification, risk assessment, and control measures. These initiatives support workplace safety, operational continuity, and compliance across nickel smelting operations and business activities.



### Hazard Identification, Risk Assessment and Incident Investigation

| Types of High-Risk Jobs | Description of Activities and Risks | Mitigation |
|---|---|---|
| Working with heat | Welding, cutting, grinding | Implementing Hazard Identification and Risk Assessment Determining Control (HIRADC) process, enacting SOPs and Job Safety Analysis (JSA), inspection and observation, promoting Near Miss Report (NMR), training and education (internal), issuing permits to work, provision of Personal Protective Equipment (PPE) according to the type of work (face shield, apron, special hand Gloves, welding screen, etc.). |
| Working at height | All work is carried out at height (minimum 1.8 meters from ground/ floor level) | Implementing the HIRADC process, enacting the SOPs and JSA, inspection and observation, promoting NMR, training and education (internal), issuing permits to work, provision of PPE according to the type of work (full body harness with shock absorber, static line etc.). |

| Types of High-Risk Jobs | Description of Activities and Risks | Mitigation |
|---|---|---|
| Working at height | Falling down, struck down material | • Person fit for work.<br>• Completed risk assessment (JSEA/near miss report).<br>• PPE.<br>• Completed working at height training.<br>• Use standard full-body harness.<br>• Keep communicating with the correct channel radio communication.<br>• Barricade the area.<br>• Full supervisory. |
| Working near water | Activities around water (barging activity, water sampling, etc.) | Implementing the HIRADC process, enacting the SOPs and JSA, inspection and observation, promoting NMR, training and education (internal), issuing permits to work, provision of PPE according to the type of work (ring buoy, life jacket, etc.). |
| Work using electric tools | Use of electrical tools (hand grinding, hand drill, etc.) | Implementing the HIRADC process, enacting the SOPs and JSA, inspection and observation, promoting NMR, training and education (internal), issuing permits to work, provision of PPE according to the type of work. |
| Work using lifting equipment and transport | Lifting using lifting equipment (manitou forklift) and transport (heavy equipment, dump truck, etc.) | Implementing the HIRADC process, enacting the SOPs and JSA, inspection and observation, promoting NMR, training and education (internal), issuing permits to work, provision of PPE according to the type of work, and providing License of Competency. |
| General welding activity | Explosion, 3rd-degree burns, intoxicated, asphyxiated | • Person fit for work.<br>• Completed risk assessment (JSEA/near miss report).<br>• PPE.<br>• Barricade the area.<br>• Inspect all tolls and install tags properly.<br>• Conduct a pre-start check of all tools.<br>• Aware of pinch point.<br>• Permit to work (hot work).<br>• Competent person (certified).<br>• Clear the area from combustible.<br>• Isolation procedures.<br>• Authorised gas tester to check the air.<br>• Ventilation.<br>• Clear access in and out of the space.<br>• Additional PPE such as full body harness and gas mask.<br>• Full supervisory. |
| Furnace operator | Tapping and slagging: burn, explosion, CO, mechanical injury, electric shock | Craft control, water-liquid contact control, SOP and PPE. |
| Rotation kiln | Burn and explosion | Craft control, water-liquid contact control, SOP and PPE. |
| Indoor ore yard | Heavy vehicle activity | Traffic management plan. |

## Occupational Health Services & Employee Health Promotion [2-25]

Nickel Industries provides occupational health services to ensure employee well-being and workplace safety. Health facilities include first aid stations, clinic staff, and round-the-clock medical services. Employees undergo regular medical check-ups, annual Health Risk Assessments (HRAs) led by occupational medicine specialists, and monthly vitamin distributions. Workplace safety is further supported through the provision of labour protection equipment and regular inspections of canteen facilities.

To reinforce health awareness, the Company conducts employee health promotion initiatives through internal meetings, safety toolbox meetings, banners, and digital communication. In collaboration with IMIP, Nickel Industries also operates a 24-hour emergency clinic, providing outpatient, inpatient, and emergency care to ensure timely medical assistance for employees.



## Employee Engagement in OHS

Nickel Industries involves employees in OHS management through a Mining Safety Committee, led by the Chief Mine Officer and comprising supervisors, technical personnel, and safety experts. Employee representatives, including contractors, participate in monthly committee meetings, while General Safety Toolbox Meetings are held every Monday to reinforce safety awareness. At Hengjaya Nickel, Ranger Nickel, and Angel Nickel, employees contribute to OHS consultations, ensuring continuous improvement in workplace safety practices.

### OHS Consultation Topics

**Daily Safety Talks**
Ensuring all personnel are aware of safety procedures and concerns before work activities commenced.

**Safety Patrols for OHS Inspections**
Regular inspections are carried out to identify and rectify safety hazards.

**Safety Signage and OHS Banners**
Enhancing safety communication and awareness throughout the workplace.

**Emergency Response Procedures**
Well-defined procedures are in place to address emergencies promptly and effectively.

**Updating Laws and Regulations**
Ensuring compliance with all relevant OHS laws and regulations.

**Accident Investigations and Follow-up Evaluation**
Conducting the In-depth investigations, followed by evaluations, to prevent recurrence.

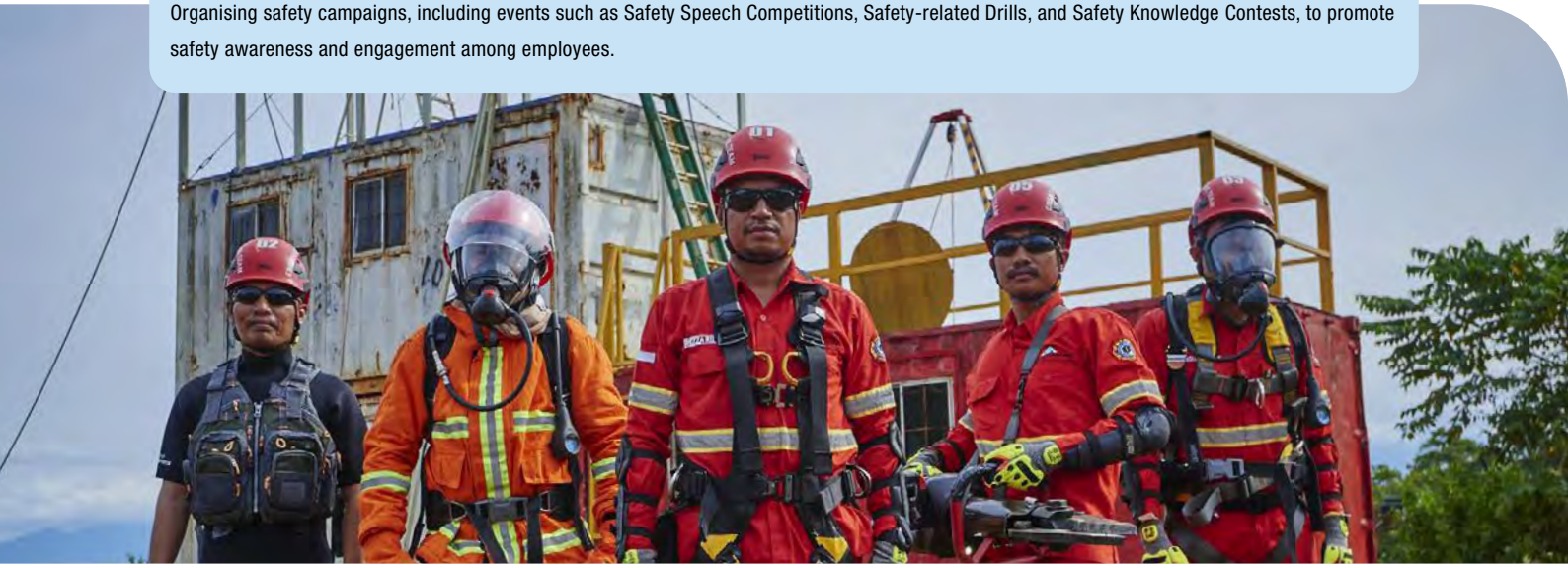
### Workplace Accident Reports and PAK
Maintaining a system for reporting workplace accidents and utilising the PAK system (Peraturan Analisis Kecelakaan or Accident Analysis Regulation).

### Internal/External OHS Consultations
Engaging in both internal and external consultations helps us foster a culture of safety.

### OHS Meetings
Regular meetings are held to address various health and safety-related matters.

### Weekly Safety Talks
Enhancing the communication between management and workers, which occurs four times a month at all levels.

### Safety Campaigns
Organising safety campaigns, including events such as Safety Speech Competitions, Safety-related Drills, and Safety Knowledge Contests, to promote safety awareness and engagement among employees.



## OHS Training and Education

### OHS Training and Education – Mining Operations

| Employee Occupational Health and Safety Training | | | |
|---|---|---|---|
| Training Type | 2024 | 2023 | 2022 |
| | Total Participants | Total Participants | Total Participants |
| Working at height | 24 | 0 | 0 |
| Near miss report | 67 | 43 | 40 |
| HIRADC | 7 | 0 | 0 |
| Incident investigation (ICAM Method) | 20 | 18 | 0 |
| Basic life support | 7 | 0 | 15 |
| Fire fighting | 26 | 16 | 24 |
| Kendrick extrication devices | 20 | 11 | 0 |
| Emergency reporting | 117 | 17 | 14 |
| Confined spaces | 7 | 0 | 0 |
| Lock Out Tag Out (LOTO) | 13 | 13 | 0 |

| Contractor Occupational Health and Safety Training | | | |
|---|---|---|---|
| Training Type | 2024 | 2023 | 2022 |
| | Total Participants | Total Participants | Total Participants |
| Working at height | 1,024 | 40 | 0 |
| Near miss report | 314 | 395 | 0 |
| HIRADC | 73 | 240 | 4 |
| Incident investigation (ICAM Method) | 15 | 76 | 0 |
| Basic life support | 1,024 | 63 | 0 |
| Fire fighting | 208 | 91 | 35 |
| Kendrick extrication devices | 9 | 38 | 0 |
| Emergency reporting | 1,024 | 716 | 0 |
| Confined spaces | 5 | 45 | 0 |
| Lock Out Tag Out (LOTO) | 137 | 140 | 37 |

### OHS Training and Education – RKEF Operations

| Employee Occupational Health and Safety Training | | | |
|---|---|---|---|
| Training Type | 2024 | 2023 | 2022 |
| | Total Participants | Total Participants | Total Participants |
| Working at heights | 239 | 299 | 488 |
| Occupational health and safety certification | 71 | 65 | 78 |
| 5S management training | 1,671 | 1,139 | 390 |
| Safety management basic knowledge training | 173 | 176 | 488 |
| Safe operating procedures | 1,001 | 745 | 206 |
| Environmental management knowledge training | 262 | 291 | 203 |
| Special operations personnel management training | 66 | 94 | 100 |
| Fire safety training | 287 | 319 | 488 |
| Accident case | 198 | 444 | 382 |
| Security management | 239 | 93 | 119 |
| Ferronickel production process safety | 1,327 | 1,145 | 1,040 |
| Job cycle check | 1,212 | 1,023 | 130 |
| Safety meeting | 520 | 480 | 180 |
| PPE requirement on site | 607 | 456 | 186 |
| Others | 3,455 | 3,637 | 3,705 |



## OHS Targets for 2025

### Mining Operations

- Strengthening human resource capacity to support the implementation of the Mining Safety Management System and improve productivity.
- Achieving 20 million work hours without a Lost Time Injury.
- Organising a Family Day event as part of Mining Safety Management System Element IV.11, promoting off-the-job safety awareness.
- The Emergency Response Team will participate in the Indonesia Fire Rescue Challenge competition in Sumatera.

### RKEF Operations

- Zero workplace fatalities, occupational diseases, poisoning incidents, fires, explosions, thefts, and traffic accidents.
- 100% safety training completion for all employees.
- Full compliance with accident and hazard rectifications within designated timelines.
- Strengthening safety management by refining processes, defining responsibilities, and improving interdepartmental coordination.
- Enhancing safety training through structured programs tailored to different job roles, integrating online and offline methods, and linking assessment results to employee performance.
- Conducting comprehensive risk assessments, implementing dynamic risk controls, and establishing a robust hazard identification and reporting system.
- Strengthening environmental controls, including hazardous waste management and emissions monitoring.
- Promoting a safety culture through ongoing awareness campaigns and employee engagement initiatives.
- Ensuring strict compliance with maintenance and repair safety protocols, including detailed work plans, task-specific briefings, and 24-hour supervision of high-risk activities.
- Enhancing emergency preparedness through regular drills, response team training, and continuous improvement of emergency plans.

# Local Communities [413-1, 14.10.2]

Nickel Industries is committed to supporting long-term economic development in communities surrounding its operations through sustainable CSR initiatives. These initiatives focus on education, healthcare, social welfare, and community self-reliance. The Company prioritises sustainable development, ensuring that efforts are aligned with the needs and aspirations of these communities. By focusing on long-term empowerment rather than short-term investments, the Company aims to help these communities thrive and maintain independence.

## CSR at Hengjaya Mine

The Hengjaya Mine has conducted social mapping across eight villages to identify local social and environmental issues, integrating findings into decision-making processes. The results are updated every four years through independent third-party reviews. An environmental impact study and social impact assessment were conducted before operations to fulfil regulatory requirements and ensure community engagement through transparent communication.

Aligned with the Indonesia Ministerial Decree No. 41/2016 and Governor Regulation No. 38/2019, Hengjaya Mine's Community Empowerment Program (PPM) focuses on eight key areas: economic development, education, healthcare, environmental sustainability, and local self-sufficiency. The 2024 PPM budget totaled IDR 5 billion, supporting eight villages near the mine.

### 8 Areas of Focus

#### Education

Supporting early childhood education, vocational training, religious schools, and teacher capacity-building to improve education access and quality. The program aligns educational outcomes with local workforce needs, enhancing literacy and lifelong learning.

#### Healthcare

Strengthening basic healthcare services for vulnerable groups by supporting local health posts and working with local authorities. The focus includes preventive, promotive, curative, and rehabilitative healthcare, addressing respiratory infections, tuberculosis, and waterborne diseases.

#### Employment and Income Generation

Strengthening basic healthcare services for vulnerable groups by supporting local health posts and working with local authorities. The focus includes preventive, promotive, curative, and rehabilitative healthcare, addressing respiratory infections, tuberculosis, and waterborne diseases.

#### Economic Self-Sufficiency

Supporting local entrepreneurship, Small Medium Enterprises (SMEs), and cooperatives to promote economic diversification. The program focuses on value-added production, market access, and financial literacy to strengthen the local economy.

#### Social, Cultural, and Religious Development

Supporting community events, interfaith cooperation, and disaster management initiatives to maintain social cohesion. The Company integrates local traditions and religious values into community programs.

#### Environmental Stewardship

Managing pollution control and post-mining land rehabilitation through community engagement in waste management, reforestation, and sustainable land use. The program addresses environmental impacts and promotes conservation.

#### Community Institutions

Strengthening local governance through capacity-building for village institutions, administrative support, and community participation. The Company promotes one-village-one-planning to improve resource allocation.

#### Infrastructure Development

Improving transportation networks, public facilities, and connectivity in remote areas of Morowali to enhance access to essential services and economic opportunities. The program aligns with regional development plans to support long-term growth.

Enhancing communities' well-being through thoughtful and impactful contributions is crucial. Nickel Industries is dedicated to implementing CSR initiatives that are deeply rooted in the needs and aspirations of the communities they serve. Instead of opting for quick, temporary solutions, the Company prioritises sustainable economic development that fosters resilience and growth over the long term. By doing so, Nickel Industries aims to empower these communities, ensuring they thrive and maintain their independence while cultivating a prosperous future.

Nickel Industries, through its Hengjaya Mine, has undertaken an extensive social mapping initiative across eight villages. This initiative aims to comprehensively understand the local communities' social landscapes and dynamics. By engaging with local communities, the Company seeks to identify each community's specific social and environmental issues, concerns, and demands. Recognising that these factors can significantly influence the success of mining operations, the Company is committed to integrating these insights into its decision-making processes. The social mapping results are not static; they will be updated every four years to reflect any changes in the communities. These updates will be conducted by independent third-party organisations to ensure objectivity and credibility in the findings.

In addition, Hengjaya Mine also carried out an Environmental Impact Study before commencing operations. This comprehensive study included a detailed social impact assessment to fulfil the regulatory requirements set forth by Indonesian law. The environmental impact study encompasses several critical components: environmental impact monitoring and management plans, known as *Rencana Pengelolaan Lingkungan dan Rencana Pemantauan Lingkungan.* It also incorporates a structured public engagement procedure to facilitate transparent communication with local communities, allowing them to provide input and feedback. This approach not only verifies the study's conclusions but also fosters a collaborative relationship between Nickel Industries and the communities in which it operates. By addressing both social and environmental considerations, Nickel Industries strives to ensure sustainable mining practices that benefit all stakeholders involved.

## Corporate Social Responsibility

### PPM Program Implementation:

In accordance with Indonesia Ministry of Energy and Mineral Resources Decree No. 41/2016 and Central Sulawesi Governor Regulation No. 38 of 2019, which emphasises the importance of community development and empowerment in the mineral and coal mining sectors, Hengjaya Mine has made a firm commitment to promote economic growth and enhance the quality of life for the communities in its vicinity.

Hengjaya Mine knows its operations must positively affect the local population and the surrounding environment. This commitment aligns with the objectives in the Blueprint for Community Empowerment Development of Central Sulawesi Province for 2020 to 2024. Hengjaya Mine is tasked with the comprehensive development, implementation, and ongoing evaluation of a PPM to meet its social and environmental stewardship obligations. This initiative will address eight critical dimensions: economic development, educational opportunities, socio-cultural engagement, healthcare access, environmental sustainability, overall community welfare, and fostering the self-sufficiency of the local populations surrounding the mining operations. By focusing on these aspects, Hengjaya Mine aims to cultivate a thriving and resilient community that benefits from and contributes to sustainable development. Until 2024, the PPM budget implementation was about IDR 5 billion for into eight villages around Hengjaya's mine site operation.

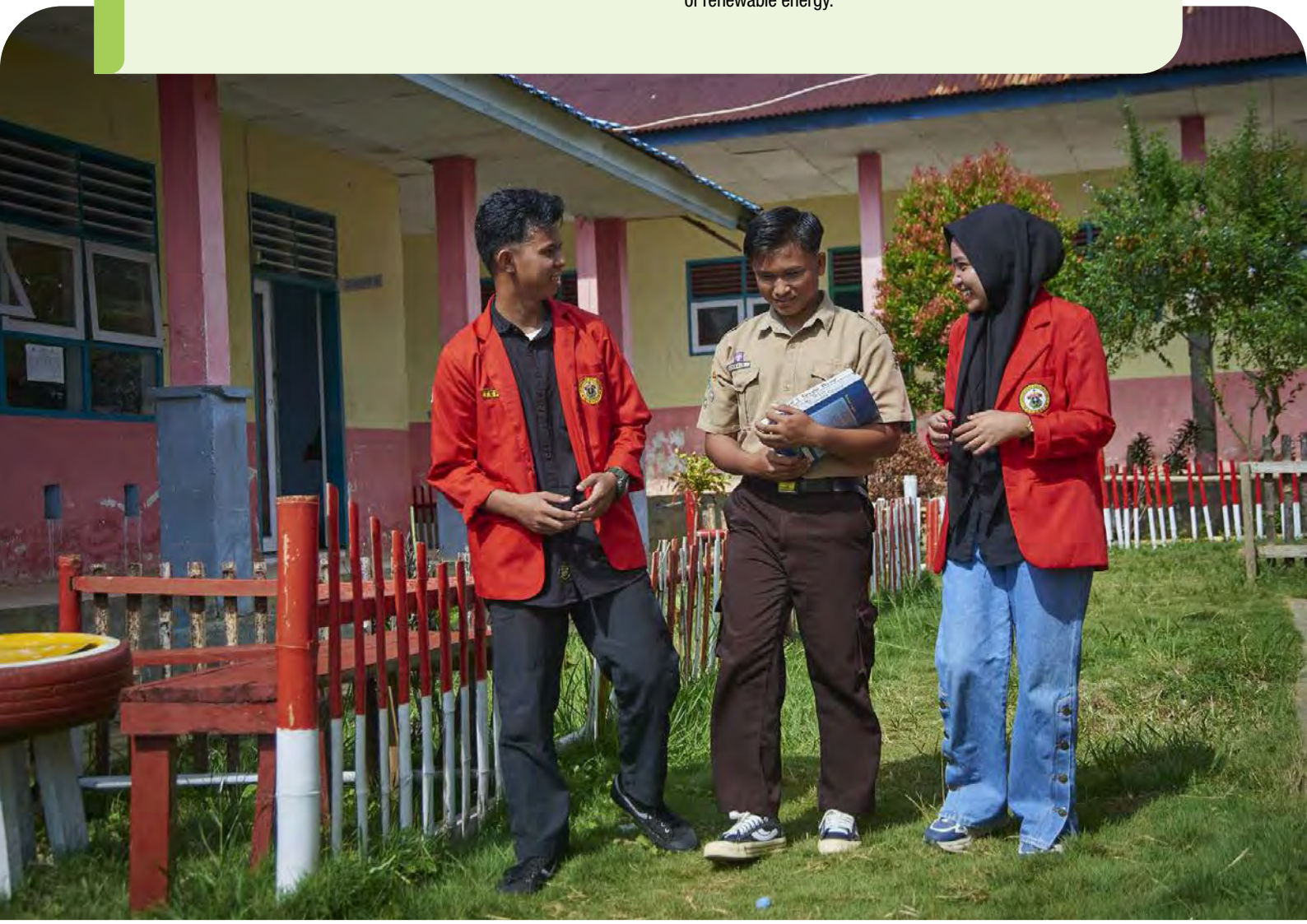
## Our Flagship Programs

### 1 University Scholarship Program

Nickel Industries has entered into a significant memorandum of understanding (MoU) with Hasanuddin University in 2024. This collaboration aims to foster educational opportunities for Indigenous students hailing from Morowali. It is focused on providing essential financial support to these students as they embark on their journey toward higher education. In a notable initiative for the year 2024, the university granted scholarships to ten deserving students pursuing undergraduate degrees in various fields, including geology, environmental science, electrical engineering, mining, law, accounting, and informatics. These programs are critical for shaping the future of both the students and the communities they represent.

Recent evaluations conducted for Semester 1 revealed that the academic performance of these scholarship recipients was impressive, with an average GPA of approximately 3.54 out of a perfect score of 4.00. This achievement is remarkable, highlighting their potential and dedication to their studies.

The scholarship program will strengthen the Company's support for the local communities living around its area of operation by enabling it to take a leadership role in a number of community-based initiatives, including, but not limited to, economic development, education, capacity building, health protection, waste management, women's empowerment, and the adoption of renewable energy.



## 2 Metana Bumi (Menanam Tanpa Merusak Bumi)

Metana Bumi, known as Planting Without Damaging the Earth, has been one of the Company's flagship five-year social and environmental program since 2023. It focuses on changing the old agricultural system into a new, environmentally friendly, inclusive farming system. This program seeks to produce and maximise natural resources in Morowali without reducing the existence of living things (biotic) and other resources (abiotic) through climate change mitigation and adaptation strategies.

Metana Bumi has also had social impacts, such as being able to (1) increase the knowledge and skills of 15 local farmers and local communities related to sustainable agricultural management through continuous training, mentoring, and collective learning at Metana Bumi Learning Centre, which till December 2024, it has attracted more than 100 people; (2) provide alternative employment space for the people of Makarti Village other than becoming mine workers; (3) reduce social conflict (individual) in the community due to the high level of cow dung which can result in poor air quality and odour in Makarti Village; and (4) reactivate village-owned enterprise structurally in supporting sustainable agricultural business processes in the village.

In 2024, Hengjaya Mine measured community satisfaction regarding the Metana Bumi program, resulting in a score of 3.5 with a converted community satisfaction index of 86.8. This score signifies that the Metana Bumi program, carried out in collaboration with the Pomponangi Group, has had a positive impact and is very satisfactory regarding program execution, program management, and the delivery of the program's services.

## 3 Srikandi Hijau (The Spirit of Women Farmers Makarti for Food Security and Independence through the Harmonisation of Sustainable Innovations)

Srikandi Hijau is the Company's premier socio-economic initiative launched in 2024. It focuses on uplifting women farmers in the vibrant community of Makarti Jaya Village. This innovative program seeks to inspire and empower women by enhancing their role in promoting family economic growth. It emphasises the cultivation of agriculture alongside the production of higher-value-added products that can significantly boost local livelihoods.

Hengjaya Mine is firmly committed to this cause. It invests in the development of women farmers by equipping them with vital knowledge and specialised skills. This initiative fosters a collaborative environment, bringing together diverse stakeholders to ensure comprehensive support and training for these women.

Currently, Hengjaya Mine has been providing support to 15 women farmers. The initial activities focus on cultivating oyster mushrooms, utilising 300 baglog units, which yield a daily harvest of 2 to 3 kilograms. In addition to mushroom farming, these women are also encouraged to process and package derivative products made from mushrooms and spinach for sale to companies and the general public.



## Planned Initiatives for 2025

The community development plan for 2025 will prioritise the continuation and expansion of existing CSR programs, including coral reef rehabilitation, mangrove restoration, and sustainable farming initiatives, which have shown promising results in promoting environmental conservation and community engagement. Building on this foundation, the plan will introduce two new programs to address pressing environmental and social challenges. The first initiative focuses on constructing waste-management facilities to improve local waste disposal practices, reduce pollution, and encourage recycling efforts. The second initiative involves training residents to repurpose used tyres into functional or decorative items, fostering creativity, generating income opportunities, and contributing to a circular economy. Together, these programs aim to enhance environmental sustainability while empowering the local community through skill development and improved infrastructure.

## CSR at IMIP

CSR initiatives at Hengjaya Nickel, Ranger Nickel, Angel Nickel, Oracle Nickel, and Huayue Nickel Cobalt are conducted collaboratively with IMIP, where Nickel Industries operates as a tenant. The Company's CSR efforts focus on five pillars: Education, Health, Environment, Social, and Economic development.



**Flagship CSR Programs**

| | |
|---|---|
| Education | IMIP's Guest Teacher program provided bi-monthly sessions from May to October 2024, covering topics like environmental conservation, energy use in nickel production, and career opportunities. National Children's Day included environmental competitions for various school levels. Thus, the Company has been partnering with Universitas Gadjah Mada Yogyakarta in the Social Community Voluntary Program (KKN) since 2022, which focuses on sustainable infrastructure and Micro, Small, and Medium Enterprises (MSME) development. In 2024, the KKN program benefited around 4,000 people around Makarti Jaya, Padabaho, and Bete-Bete villages. |
| Health | IMIP hosted multiple blood donation drives in 2024. The Company also implemented a deworming program in Bahodopi Village, distributing 879 doses to address stunting. Through The *Sinergi Berdaya* program, IMIP educated parents on stunting prevention, benefiting 61 children. |
| Environment | In 2024, IMIP conducted the Clean Environment Movement in the surrounding area, successfully collecting 700 tonnes of waste. On National Waste Awareness Day, the Genius Berdaya program emphasised waste management and initiated school waste banks. Additionally, as per data from 2024, IMIP also planted 10.000 mangrove saplings in Bete-Bete Village as part of its efforts to preserve the ecosystem. |
| Social | In 2024, The *IMIP Berbagi* program provided food and cash assistance to 625 individuals, including vulnerable groups such as the elderly and children. IMIP's Berkah Ramadhan event engaged 66 children in creative competitions, while IDR 65,000,000 was donated to flood relief in Kolaka and Tojo Una Una regencies. The Mass Circumcision program provided free health services to 150 children. |
| Economic | IMIP funded the development of Langala Island as a tourism destination, supporting local economic growth. In agriculture, IMIP assisted the Bumi Lere'a farmer group in Lele Village and the Pomponangi Farmers' Group at Makarti Jaya Village with fertilisers and equipment to improve crop yields. |

## CSR at Siduarsi Project

Nickel Industries is advancing its Siduarsi Nickel-Cobalt Project in Papua Province, Indonesia, with a strong emphasis on ESG principles. The project, held under a 6th generation Contract of Work by PT Iriana Mutiara Mining, spans 16,470 hectares and is strategically located along the geo-tectonic strike from the Ramu nickel-cobalt project in Papua New Guinea.

Recognising the importance of community engagement, Nickel Industries has initiated a comprehensive social mapping exercise in collaboration with Cendrawasih University. This study aims to understand the social dynamics, needs, and aspirations of local communities, ensuring that future community development programs are tailored and effective. Through these concerted efforts, the Company demonstrates its commitment to responsible mining practices that prioritise community well-being and environmental stewardship.



## Operations with Significant Actual and Potential Negative Impacts on Local Communities [413-2, 14.10.1]

Nickel Industries understands that its mining operations can significantly affect the communities located near its operational sites. The Company fully recognises that the extraction and processing of minerals can lead to a range of adverse environmental consequences. These may include disruptions to local ecosystems, contamination of soil and water resources, the generation of dust that can affect air quality, and noise pollution that can disturb both wildlife and residents alike.

In light of these potential impacts, Nickel Industries is deeply committed to operating in strict compliance with all relevant laws and environmental regulations. The Company prioritises the adoption of best mining practices to safeguard the health of the ecosystem and the well-being of nearby communities. By actively implementing effective environmental management strategies, Nickel Industries aims to prevent or minimise any negative consequences that may arise from its operations.



## Biodiversity [304-1, 304-2, 304-3, 304-4, 14.4.3, 14.4.5, 14.4.7, 14.4.8] [EM-MM-160a.1]

Nickel Industries integrates biodiversity management into its mining practices in compliance with Law Number 32 of 2024 about the Conservation of Biological Natural Resources and their Ecosystems, Government Regulation No. 28 of 2011, as amended by Government Regulation No. 108 of 2015 on the Conservation of Biological Natural Resources and Ecosystems. The Company implements conservation strategies to mitigate impacts on high-value biodiversity, with a focus on mine closure planning to support habitat restoration and sustainable land use.

Biodiversity management follows a technology-driven and socio-economic approach, ensuring compliance with local regulations and stakeholder engagement in land rehabilitation efforts. The Company coordinates with relevant authorities to align final land use plans with conservation objectives, minimising long-term environmental impact.

| Technology-Driven Approach | Socio-Economic Approach |
|---|---|
| Counselling employees and the general public on the prohibition of disturbing wildlife. | Counselling employees and society on the prohibition of disturbance on endemic and protected vegetation. This is related to one of the Company's eight golden rules. |
| Reclaiming and replanting each mined area. | Promote an environmental campaign about hunting prohibition through a bulletin board. The ban board is primarily located in the forest area that borders the activity site, avoiding disturbance of the land, rivers and adjacent forest areas. The ban board is designed to be informative, with the sanctions listed for each offence. |
| Optimising the impact management for the disturbances to the animal habitat and vegetation. | Counselling employees and the general public on the prohibition of disturbing wildlife. Employees and nearby residents receive counselling, focusing on the types of protected wildlife and their preservation. It also details mining-wide sanctions and violations. |
| Preserving wild animal habitats by limiting land clearing only to areas used for mining infrastructure development. | |

### 2024 Biodiversity Assessment

In 2024, biodiversity monitoring at the Hengjaya Mine recorded an increase in vegetation diversity in post-mining reclamation areas, with 71 species identified (22 tree species and 49 understory plants), compared to 60 species in natural forests (31 tree species and 29 understory plants). These findings indicate that habitat quality and ecological stability remain intact, supporting wildlife populations within the mining area.

Wildlife diversity in the Hengjaya Mine area falls within the moderate to high category, influenced by extensive natural forests and aquatic ecosystems. Monitoring identified 3 new mammal species, 12 bird species, 1 reptile/amphibian species, 9 butterfly species, and 5 dragonfly species, reflecting improved habitat conditions. The presence of rivers further supports species reliant on aquatic environments.

## Biodiversity Program

Nickel Industries' biodiversity initiatives aim to restore ecosystems and support conservation efforts across its operational areas.

### Watershed Rehabilitation

Since 2019, the Company has rehabilitated 2,057 hectares of watershed areas in Central Sulawesi and planted 2,258,500 trees, including pines, rattans, and durians. This initiative supports reforestation and local economic development, with a projected community income of USD 535 per hectare after eight years.

### SEA Tangofa (Coral Reef Restoration)

In 2024, Nickel Industries restored 8,244 Acropora coral seedlings using 1,439 artificial reef units, including 61 repurposed light vehicle tyres installed at the Bungku Pesisir seabed. This initiative, in collaboration with Halu Oleo University, local communities, and the village government, aims to enhance marine biodiversity and promote sustainable coral reef conservation.

### Green Shore (Mangrove Restoration)

In 2024, the Company planted 5,000 *Rhizophora mucronata* saplings to restore coastal mangrove ecosystems at One Ete Village. Routine weekly monitoring is conducted in partnership with local communities and Halu Oleo University to address threats from sea waves, tides, and herbivore activity. Protective barriers, including used dump truck tyres and rock piles, have been installed to safeguard saplings during their early growth.

### BIO-SPARKS Conservation Program

Nickel Industries has designated 197 hectares within the Hengjaya Mine as a High Conservation Value (HCV) area, which was recognised by the Central Sulawesi Natural Resources Conservation Agency in 2024. Located 400 metres from the Morowali highway, this area serves as a research site, seed cultivation centre, and ecological tourism destination. Infrastructure improvements, including trails and informational signage, facilitate conservation education and biodiversity research.

Furthermore, the Company's 80% owned Hengjaya Mine operation in Central Sulawesi has received formal endorsement from the Central Sulawesi Natural Resources Conservation Agency (BKSDA) to develop a high conservation biodiversity area within the Hengjaya Mine mining concession. The conservation area will further solidify Nickel Industries as a leader in responsible and sustainable mining in Indonesia.

Preparation for the establishment of the in-situ biodiversity conservation zone started in 2022, with research focusing on biodiversity hotspots around the Hengjaya Mine mining concession to determine the locations of high conservation value. Within the Hengjaya Mine concession, the Company has selected an initial area of 197 hectares, which includes a primary forest of large trees with a relatively closed canopy. This area will not only protect and maintain the biodiversity of flora and fauna, but also help it grow for years to come.

The initial conservation area at the Hengjaya Mine concession supports several Indonesian Government initiatives, including:

- the Indonesian Presidential instruction number one of 2023 focuses on integrating biodiversity conservation into sustainable development across the country;
- the Indonesian Minister of Environment instruction number one of 2022 focuses on protecting wild animals from threats of trapping and illegal hunting; and
- the Directorate General of Biodiversity Conservation program focuses on preservation efforts by mapping the distribution of wild plant and animal habitats.

This conservation area is designed as a centre for education, research, tourism, and nursery and the conservation of genetic diversity that can benefit the local community.

In the future, the conservation area will be developed based on the concept of development design, an approach that links conservation planning with a mitigation hierarchy starting from avoiding, minimising and restoring to avoid negative impacts on biodiversity. The Company will also continue to collaborate and coordinate with multi-stakeholders, including the government, academics, and the local communities, in managing the high biodiversity conservation area.



SRAI Reaching Great

AA1000 Licensed Assurance Provider 000-758

# Independent Assurance Statement

## The 2024 Sustainability Report of Nickel Industries Limited

Number : 16/000-758/V/2025/SRAI

Assurance Type : Type 1
Assurance Level : Moderate
Reporting Standards : Australian Accounting Standards Board (AASB)

Dear stakeholders,

**PT Sejahtera Rambah Asia** or "SRAI" is issuing an **Independent Assurance Statement** ("the Statement") of **the 2024 Sustainability Report** ("the Report") of **Nickel Industries Limited** ("the Company"). The Company is an Australian-listed company which own nickel mining and processing assets in Indonesia. The Report presents the commitment and efforts of the Company in managing its sustainability performance for the reporting period of **January 1st to December 31st, 2024**. As agreed with Management, SRAI's responsibility is to make an assessment based on the data and content of the Report for the year.

### Intended User and Purpose

The purpose of the Statement is to present our opinion including the findings and recommendations based on the results of assurance work to the Company's stakeholders. The assuror team in accordance with specific procedures and a specific scope of work carried out the assessment. Except for the areas covered in the scope of the assurance, we encourage all NOT to solely interpret the Statement as the basis to conclude the Company's overall sustainability performance.

### Responsibilities

Our obligations to the Management involve assessing the Report's content, generating findings, and recommendations, and issuing a Statement. Additionally, we are tasked with establishing conclusions and recommendations according to agreed-upon standards, methods, and approaches. Consequently, SRAI's evaluation is solely based on the most recent editorial and data received as of May 28th, 2025, regarding the final draft. SRAI's responsibility lies solely in providing assurance work, distinct from an audit, in accordance with the Non-Disclosure Agreement, the Assurance Engagement Agreement, Representation Letter, and Subsequent Event Testing. Management bears the sole responsibility for presenting data, information, and disclosures within the Report. Therefore, any parties relying on the Report and Statement must assume and manage their own risk.

### Independence, Impartiality, and Competency

SRAI confirms NO relationships between the assuror team and the clients that can influence their independence and impartiality to conduct the assessment and generate the Statements. The assuror team is mandated to follow a particular assurance protocol and professional ethical code of conduct to ensure their objectivity and integrity. We carried out a pre-engagement assessment before the assurance work was taken to verify the risks of engagement as well as the independence and impartiality of the team. The assuror team members have knowledge of ISO 26000, AA1000 AccountAbility standards and principles, and are experienced in sustainability report assessment based on various reporting regulations, standards, and principles.

SRAI Reaching Great

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## Type and Level of Assurance Service

1. **Type 1 assurance** on the Report content.
2. **A moderate level of assurance** to the procedure on the Report content and evidence, where the risks of information and conclusions of the Report being error is reduced, but not to very low, but not zero.

## Scope and Limitation of Assurance Service

1. Data and information in the Report for the period of **January 1st to December 31st, 2024.**
2. Material topics presented in the Report: **Energy and Emission; Biodiversity; Water and Effluent; Waste; Local Communities; Occupational Health and Safety; Human Capital Development; and Ethical Business Practices.**
3. Evaluation of publicly disclosed information, system, and process of the Company to ensure adherence of the Report content to the reporting principles.
4. SRAI does NOT include financial data, information, and figures in the Report content. We assumed that the Company, independent parties, or other parties associated with the Company have verified and/or audited financial statements, data, and information.
5. Adherence to the following reporting standard: Australian Accounting Standards Board (AASB).

## Exclusion

1. The expression of opinion, belief, expectation, advertisement, and also forward-looking statements, including future planning of the Company as specified in the Report content.
2. Analysis or assessment against regulations, principles, standards, guidelines, and indicators other than those indicated in the Statement.
3. Topics, data, and information outside the reporting period, or in the public domain not covered in the reporting period.
4. Financial performance data and information as presented in the Company's financial statements and documents, other than those mentioned in the Report.

## Methodology and Source Disclosure

1. Form an Assuror Team whose members are capable in sustainability report development and assurance.
2. Perform the pre-engagement phase to ensure the independence and impartiality of the Assuror Team.
3. Hold a kick-off meeting and initial analysis of the Report draft based on the SRAI Protocol on Assurance Analysis refers to the standards, principles, and indicators of AA1000AS v3, AA1000APS (2018), and standards/regulations used in the Report.
4. Discuss online the results of the analysis with the Management and data contributors.
5. Verify evidence and trace data and information as covered in the Report.
6. The Company incorporated our recommendations in the draft Report and release the final Report content.
7. Prepare the Statement and send it to AA1000 AccountAbility for review to get approval before submitting it to the Company.
8. Prepare a Management Letter detailing all aspects seen, recorded, and observed during the assurance work to the Management of the Company for further improvement of sustainability processes.

SRAI Reaching Great

AA1000 Licensed Assurance Provider 000-758

## Adherence to AA1000AP (2018) and AASB Reporting Standard

**Inclusivity** – The Company has identified its engagement with stakeholders. In the process of determining engagement, the Company conducted an analysis of global and local industry trends and identified key sustainability priorities. This aims to identify and prioritize the Company's engagement with stakeholders. Furthermore, we recommend that the Company explain the stakeholder engagement process for the next reporting.

**Materiality** – In determining material topics, the Company implements a discussion process involving internal and external stakeholders. The Company also maps topics that are of concern to stakeholders. We appreciate the Company for explaining the impact and strategy of each topic in the report. In the report describes the departments involved in each topic and the evaluations conducted to raise awareness of the topic.

**Responsiveness** – The Company has a dedicated unit that handles grievances and complaints. In order to improve oversight of complaint management, the Company evaluates its compliance with applicable regulations and identifies areas for improvement. As part of its responsiveness, the Company has a whistleblower policy. In 2024, the Company adopted the International Labor Organization-Competitive and Responsible Companies (ILO-SCORE) program, which aims to improve management practices, productivity, and workplace conditions. This program is implemented as a forum for employees to channel their aspirations, which will be reviewed and evaluated by management based on the results of the reviews received.

**Impact** – In terms of the environment, the Company has received a green PROPER (Corporate Performance Assessment Program in Environmental Management) rating for three consecutive years from the Ministry of Environmental Indonesia. The Company supports decarbonization efforts by installing a solar energy system at the Hengjaya Mine, which supplies electricity to the mining site to improve energy efficiency in operational activities and reduce emissions. This is evidenced by a decrease in energy consumption during 2024. Additionally, in the social aspect, the Company has developed programs as part of its employee engagement initiatives, with monthly evaluations. The Company has an Occupational Safety and Health (OSH) policy that includes identifying hazardous situations, risk assessment, incident prevention, safety training, and evaluations conducted by internal and external audits. Furthermore, the Company has a sustainability policy that serves as the foundation for its sustainability strategy, which is reviewed annually.

**AASB S1 Standards Principles** – As assurance work is carried out, the content of the report adequately demonstrates compliance with the Reporting Principles (disclosure of governance strategies, risk management, metrics and targets, and use of the conceptual basis for reporting such information). Management provided sufficient support during the assurance work by submitting the requested evidence and documents.

**AASB S2 Standards Principles** – As the assurance work was taken, the report content sufficiently indicates its adherence to the Reporting disclosure of information about their sustainability-related risks and opportunities in the general purpose financial reports. The Management provided sufficient support during the assurance work by submitting the requested evidence and documents.

**Recommendation**

1. The Company needs to incorporate environmental, social, and governance (ESG) aspects to the remuneration assessment of the highest governance body. This aims to strengthen the Company's sustainability strategy.
2. The Company may consider the financial impact of addressing risks based on the results of transition risk and physical risk analyses. This allows the Company to determine the likely costs of addressing the risks that have been analyzed, including climate-related risks. Furthermore, the Company may also identify aspects that have the potential to be maximized in cash flow.

The assurance provider,

Jakarta, May 28th 2025

**Lim Hendra**
*Assurance Director*
*PT Sejahtera Rambah Asia*
*(SRAI)*

AA1000 Licensed Report 000-758/V3-7KRIP

# GRI Standards Content Index

| | |
|---|---|
| **Statement of use** | Nickel Industries has reported the information cited in this GRI content index for the period January 1 to December 31 2024 with reference to the GRI Standards. |
| **GRI 1 used** | GRI 1: Foundation 2021 |

| GRI Standard | | Disclosure | Location | GRI Sector Standard |
|---|---|---|---|---|
| GRI 2: General Disclosures 2021 | 2-1 | Organisational details | 9, 26, 27 | |
| | 2-2 | Entities included in the organisation's sustainability reporting | 2 | |
| | 2-3 | Reporting period, frequency and contact point | 2 | |
| | 2-4 | Restatements of information | 2 | |
| | 2-5 | External assurance | 2, 66 | |
| | 2-6 | Activities, value chain and other business relationships | 26, 27, 28 | |
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| | 2-8 | Workers who are not employees | 48 | |
| | 2-9 | Governance structure and composition | 23 | |
| | 2-11 | Chair of the highest governance body | 23 | |
| | 2-12 | Role of the highest governance body in overseeing the management of impacts | 24 | |
| | 2-13 | Delegation of responsibility for managing impacts | 24 | |
| | 2-14 | Role of the highest governance body in sustainability reporting | 24 | |
| | 2-19 | Remuneration policies | 46 | |
| | 2-22 | Statement on sustainable development strategy | 7 | |
| | 2-23 | Policy commitments | 14, 24, 41, 48 | |
| | 2-24 | Embedding policy commitments | 14 | |
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| | 2-28 | Membership associations | 11 | |
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| GRI Standard | | Disclosure | Location | GRI Sector Standard |
|---|---|---|---|---|
| GRI 3: Material Topics 2021 | 3-1 | Process to determine material topics | 16 | |
| | 3-2 | List of material topics | 16 | |
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# Feedback Form

Nickel Industries Limited Sustainability Report 2024 provides an overview of our sustainability performance. We look forward to receiving any input from you regarding this Sustainability Report by sending an email, or completing this form.

## Your Profile

Name (if you wish) : .....
Profession : .....
Institution/Company : .....

1. This report is easy to understand

☐ Agree ☐ Neutral ☐ Disagree

2. The report has described positive and negative information concerning the Company:

☐ Agree ☐ Neutral ☐ Disagree

3. Material topic(s) which is(are) the most important to you: (score 1 = most important; score 10 = least important)

- Energy & Emission ☐
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- Water and Effluent ☐
- Waste ☐
- Local Communities ☐
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- Human Capital Development ☐
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Thank you for your feedback. Please send this feedback form to the contact listed in this report or directly to:

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# Sustainability Report | **2024**

NICKEL INDUSTRIES

**Nickel Industries Limited**

Nickel Industries Limited
Level 2, 66 Hunter Street,
Sydney, NSW, 2000
Australia

# APPENDIX 4

# GEOTECHNICAL REPORTS

ABHIPRAYA
nusa engineering

# FINAL REPORT

## GEOTECHNICAL INVESTIGATION
## OF MAIN HAUL ROAD PROPERTIES MATERIAL
## IUP PT HENGJAYA MINERALINDO



SUMMITTED TO :
PT HENGJAYA MINERALINDO

**SEPTEMBER 2025**

# DOCUMENT CONTROL

## FINAL REPORT

GEOTECHNICAL INVESTIGATION
OF MAIN HAUL ROAD PROPERTIES MATERIAL
IUP PT HENGJAYA MINERALINDO

**Prepared for :**

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| | | | | |
| | | | | |

Issued by : PT Abhipraya Nusa Engineering

**Andi Setia Rahardian**
*Prcject Manager*

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**APPENDIX D** – Laboratorium Result ( Soil )
**APPENDIX E** – Laboratorium Result ( Rock )

## TERM AND ABBREVIATIONS

The following terms and abbreviations are used throughout this report, figures, drawings and appendices.

All units of measure used in this report are metric, including tonne (metric tonne), hectares (unit of area) and kilometres (unit of distance).

| | | |
|---|---|---|
| **HM** | : | PT Hengjaya Mineralindo |
| **ANE** | : | PT Abhipraya Nusa Engineering |
| **MHR** | : | Main Haul Road |
| **Ha** | : | Hectare |
| **Km** | : | Kilometers |
| **Province** | : | Equivalent to a state area, a province is the Level 1 government area below the government, head of government is “Governor”. |
| **Regency** | : | Level 2 government, equivalent to a shire or country, the most powerful level of government under regional autonomy, several kabupaten are grouped under a province, head of government in a kabupaten is “Bupati”. |
| **District** | : | Level 3 government, several kecamatan are grouped into a kabupaten, head of government in a kabupaten is “Camat”. |
| **IUP** | : | Izin Usaha Pertambangan, a licence issued by the Department of Mines for Exploration and Exploitation of Mineral Resources, must be wholly owned through 100% Indonesian national shareholding. |

## SYNOPSIS

*This Factual Report documents the field work of Geotechnical Investigation of MHR Properties Material at IUP PT Hengjaya Mineralindo.*

*This report presents the factual findings and documents based on the fieldwork of the Geotechnical Investigation MHR Properties Material at IUP PT Hengjaya Mineralindo.*

*No interpretations, assessments, analyses and recommendations are provided in this factual report. Analysis and recommendations will be provided in the final report following completion of laboratory testing.*

## DISCLAIMER

*This Factual Report has been prepared on behalf of and for the exclusive use of* ***PT Hengjaya Mineralindo*** *issued in accordance with the agreement between* ***PT Hengjaya Mineralindo*** *and* ***PT Abhipraya Nusa Engineering****.*

***ANE*** *accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this draft report by any third party.*

*This review is made using various assumptions, conditions, limitations and abbreviations. Assumptions are listed without prejudice to probable omissions.*

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# 1. INTRODUCTION

PT Abhipraya Nusa Engineering **(ANE)** has been commissioned by PT Hengjaya Mineralindo **(HM)** to conduct Geotechnical Investigation of MHR Properties Material at IUP PT Hengjaya Mineralindo.

The project located in Tangofa, South Bungku District, Morowali Regency, Cetral Sulawesi Province with IUP area width 5,983 ha. The project area can be reached from Maleo Airport by car distance about 137 km for about 3 - 4 hours. The road condition from airport to project location is wide and good, some the road around the project location was damaged due to frequently passed by heavy vehicles. The location is shown on **Figure 1**.




**Figure 1. Site Location of IUP PT Hengjaya Mineralindo**

This FINAL report is a compilation of fieldwork results from June 1st to June 21st, 2025, the results of geotechnical drilling has been completed with a total depth of 79.65 m.

## 2. FIELD WORK

Geotechnical investigation was performed between June 1st to June 21st, 2025, including geotechnical fieldworks as follows:

- Geotechnical drilling supervision;
- Undertaking the geotechnical description towards all the layers of the rock through the core of the boreholes, including: soil and rock strength index, RQD, geological structure conditions, groundwater conditions, for the characterization of the mine aperture mass of the striped rock;
- Collect handling and shipping undisturbed samples (UDS) at appropriate intervals, for laboratory tests including density, Particle Size Distribution (PSD), Atterberg's limits, moisture content, consolidation testing and consolidated undrained triaxial testing as appropriate;
- Create the image of geotechnical core logs for all the boreholes;
- Determine the rock core samples prescribed for representative depth of drilling intervals and a change in strata. The samples are required for performing geotechnical laboratory testing;
- To ensure that all procedures of sample preparation, transporting or shipping sample to laboratory are applied; and
- Standar Penetration Test (SPT) to evaluate the soil bearing capacity within the proposed area, measure soil resistance to penetration of sampler pipe.

Hydrological fieldwork as follows:

- Groundwater measurement through the geotechnical holes.

### 2.1. Geotechnical Drilling

Geotechnical drilling (full coring method using HQ size) was carried out by drilling contractor (appointed by HM) using 1 (one) unit rig. There are 4 (four) boreholes located around the proposed main haul road area KM21, KM18 and KM15. 2 (two) of the completed boreholes in MHR area have been installed with stand pvc pipe as an instrument use for conducting hydrogeological measurement such as groundwater level. The summary of boreholes detail is presented in **Table 1**.

**Table 1. Summary of Boreholes**

| No | Borehole ID | Coordinate UTM 51S | | Surface RL | Depth (m) | | | Description |
|---|---|---|---|---|---|---|---|---|
| | | Easting (mE) | Northing (mN) | | Plan | Target | Actual | |
| 1 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 30.00 | 30.00 | 30.00 | EOH<br>Installed standpipe |
| 2 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 28.58 | 30.00 | 30.00 | EOH |
| 3 | HM_DG_02 | 410672.182 | 9676108.574 | 460.446 | 32.58 | 30.00 | 16.15 | EOH - client instruction<br>Installed standpipe |
| 4 | HM_DG_02R | 410672.182 | 9676108.574 | 460.446 | - | 5.00 | 3.50 | EOH - client instruction |




**Figure 2. Geotechnical Drilling Activity**

## 2.2. Geotechnical Logs and Sampling Activity

Geotechnical field logs will provide documentation on such the following information:

- Project information including project number, name and location of the project, name of person(s) preparing log and general remarks as appropriate;
- Borehole information including holes number (ID), coordinates, date and time start and finish, depth of borehole completed;
- Drilling information including type or model of drill rig, drilling method, size of drill rods, ground elevation at top of borehole, drilling inclination, etc;
- Subsurface description including soil types, colours, plasticity and/or grain size, moisture, consistency and/or density, and any other observation of the soil;
- Sampling information including sample types, sample depths and sample recovered; and
- Groundwater information from daily groundwater measurement (during drilling progress) using water level meter.

This work is required to classify and describe the soil/rock types. The classification and description of soil/rock will be documented in a geotechnical field log. The classification will refer to the Unified Soil Classification System (USCS) in accordance with ASTM D2487, and The Unified Rock Classification System (URCS) in accordance with ASTM D5878.

Core sample will be recorded in a geotechnical field log and labelled in accordance to the following information:

- Project information including project number, project tittle, client name, and project location;
- Sample information including holes number (ID), type of sample, depth of sample, sample recovered and date of sample taken.

Core samples are handled with special protection to prevent samples from damage, including damage during shipping and handling. Sample was wrapped using protective plastic and aluminium foil to avoid moisture change and minimize the reduction in sample strength, then the sample was put in a PVC tube with a sponge layer on both edges of the tube **Figure 4**




**Figure 3. Core Sample for Geotechnical Logging Description and Lab Analysis**



**Figure 4.** Core samples are handled with special protection

## 2.3. Core Documentation

Photo documentation will be taken at all samples and core boxes recovered using a digital camera to record permanently the unaltered appearance of the soil. The photos are taken under natural lighting available (daylight). The core should be cleaned prior to any photography. A commercially available colour strip chart is included in the photo frame to serve as a reference to check the accuracy of the photographic reproduction of the soil core colour.

The core box photos will be taken once it is filled to capacity. Include the inside of the box lid with appropriate identification data and a clearly visible length scale laid along one edge of the core box **Figure 5.**




**Figure 5. Rock Sample Documentation in Core box**

## 2.4. Standard Penetration Test (SPT) and UDS Sampling

The most widely used dynamic penetration test globally. It involves driving a standard split-barrel sampler into the ground at the bottom of a borehole using a specific hammer weight (63.5 kg or 140 lb) falling from a standard height (75 cm or 30 in) **Figure 6** and **Figure 7**.

- A borehole is drilled to the desired testing depth.
- The split-barrel sampler is attached to drilling rods and lowered to the bottom of the borehole.
- The hammer is dropped, and the number of blows required to drive the sampler for three consecutive 15 cm (6 in) increments is recorded.
- The sum of the blows for the *second and third* 15 cm penetrations is known as the **"N-value"** or "Standard Penetration Resistance." The first 15 cm is considered a "seating drive."




**Figure 6. SPT Activity and Soil Sample Documentation obtained from split-barrel sampler**

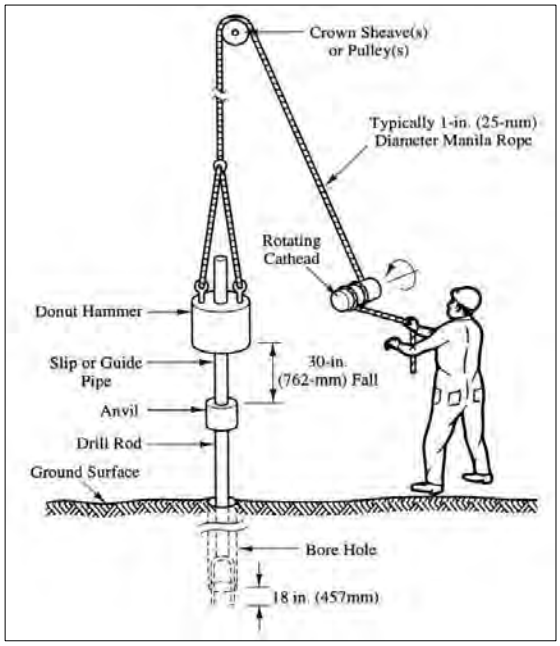



**Figure 7. Standard Penetration Test Ilustration**

An undisturbed soil sample is a soil sample collected in a way that aims to preserve its natural structure, density, moisture content, and in-situ stress conditions as much as possible. While no sample can be perfectly "undisturbed" (as the act of sampling itself causes some degree of stress relief and disturbance), the goal of UDS sampling is to minimize these changes so that the sample accurately represents the soil's properties in the field **Figure 8**.



**Figure 8. UDS Sampling Activity and Undisturbed Soil Sample Documentation**




**Figure 9. Disturbed Soil Sample Documentation**

# 3. SITE CONDITIONS

## 3.1. Regional Geology

Based on the Geological Map of the Bungku Quadrangle, Sulawesi Scale 1:250.000 (T.O. Simandjuntak, E.Rusmana, J.B. Supandjono, A.Kosawara, 1993) the work area is in Tokala Formation (TRjt), Ultramafic Complex (Ku), Tomata Formation and Alluvium. The following detail of those information is presented below **Figure 10**:

1. Alluvium (Qa)
   Alluvium refers to unconsolidated sediments (like sand, gravel, silt, and clay) It is characterized by its relatively young age (Quaternary period, recent geological past) and often well-sorted, stratified nature. Litology dominate with Mud,clay, granule and pebble

2. Tomata Formation (Tmpt)
   Alterning of sandstone, claystone, tuff and conglomerate with lignite intercalations. The presence of "quartz-rich conglomerates, sandstones, coaly mudstones and coals" is also mentioned, particularly for the Lower Pleistocene Tomata Formation.

3. Untramafic Complex (Ku)
   Ultramafic complexes form through various geological processes, primarily involving the partial melting of the Earth's mantle and subsequent emplacement or crystallization : Harzburgit, lherzolite, wehrlite, websterite, serpentinite, dunite, diabase and gabro

4. Tokala Formation (TRjt)
   Alterning of clastic limestone, lithic sandstone wake, shale, marl, and sandy clay with argillite intercalation. The Tolaka Formation primarily consists of **intercalated limestone and shale**.

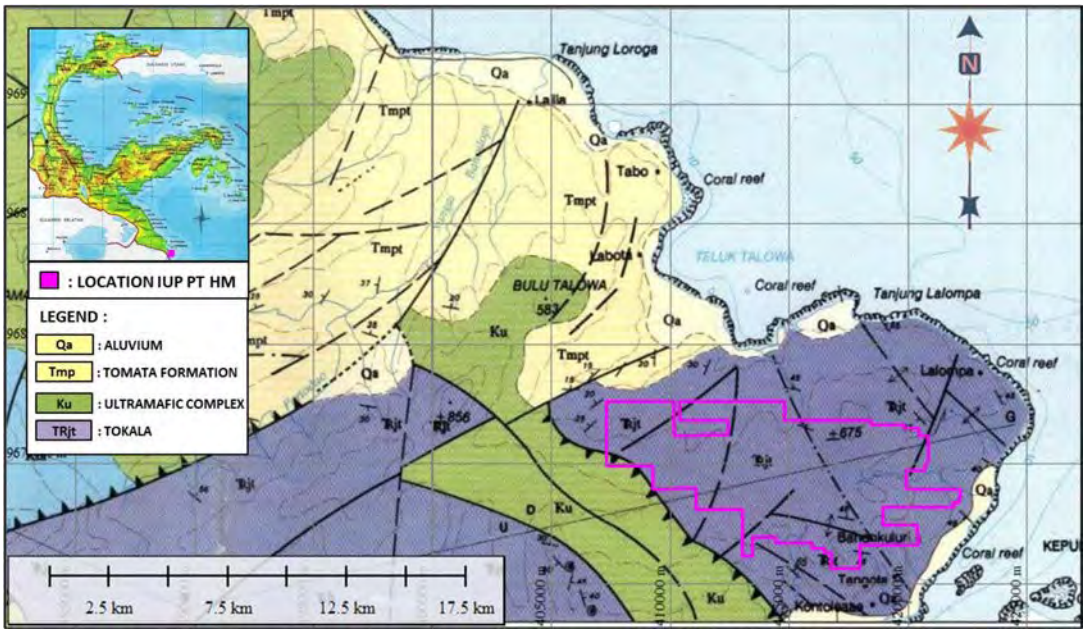



**Figure 10. Geological Map of PT Hengjaya Mineralindo (Geological Map of the Bungku Quadrangle, Sulawesi Scale 1:250.000 (T.O.Simandjuntak, E.Rusmana, J.B.Supandjono, A.Kosawara,1993)**

## 3.2. Geotechnical Condition

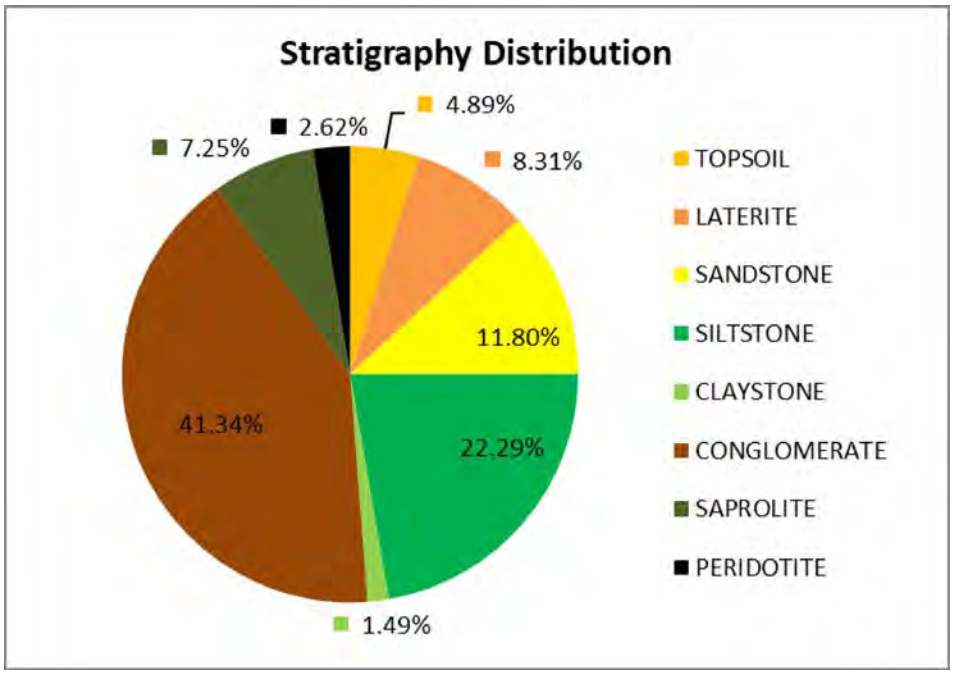
Geotechnical conditions described in the following section are the general description of the physical properties of soils and rocks based on observations to the core recovered taken from the boreholes.

### 3.2.1. Soil Type

The soil types at the project area were covered and dominated by silt, reddish brown to brown graded, slightly – low plasticity, from the ground surface to an approximate depth varying from 1 – 8.45 mBGL.

### 3.2.2. Rock Type

The rock layers that will form the slopes other than laterite-limonite and saprolite zone as mining material consist of Sandstone, Siltstone, Claystone, Conglomerate and were dominated by Conglomerate (41.34%) and Siltstone (22.29%). Rock distribution of each borehole can be illustrated on **Figure 11**.



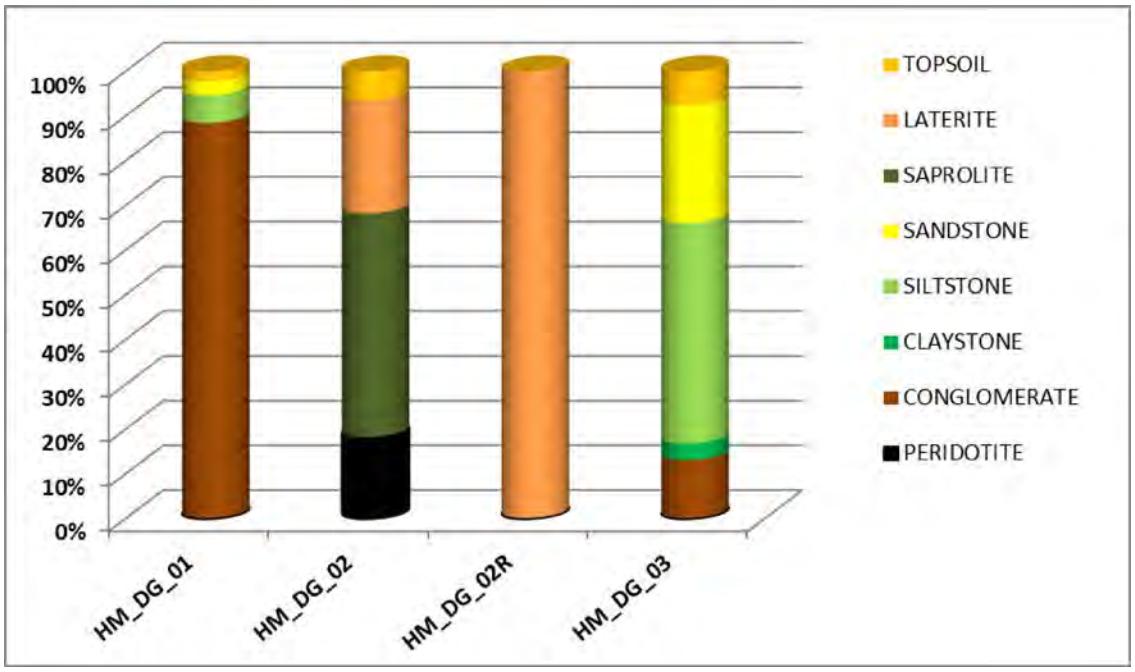
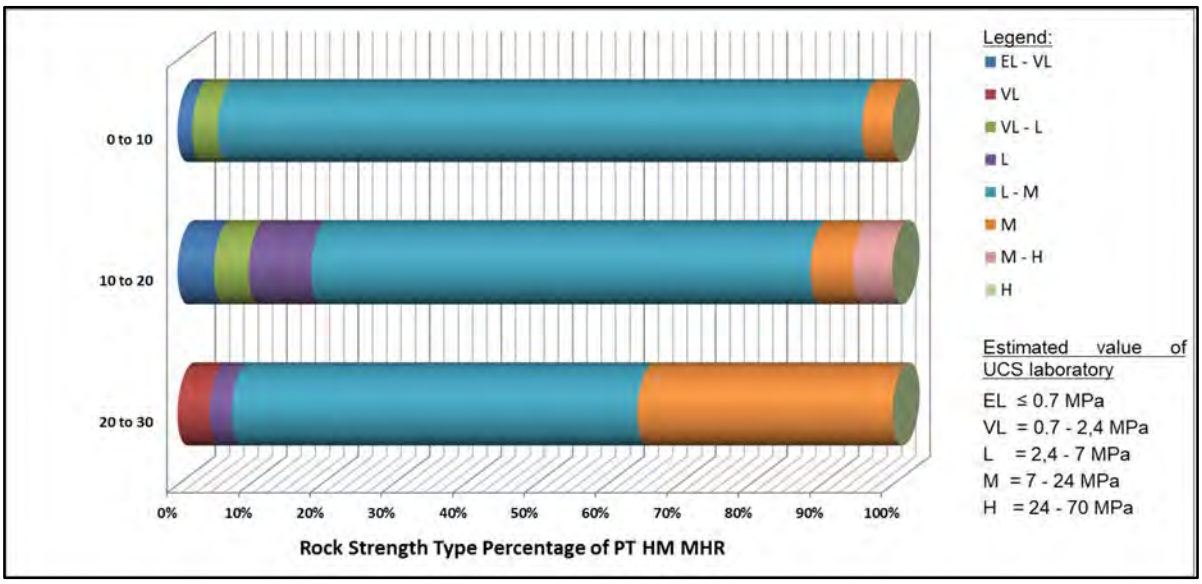



**Figure 11. Rock Type and Stratigraphy Distribution**

### 3.2.3. Rock Strength

The geotechnical borehole logging data analysis is shown in **Figure 12**; i.e. showing that most of the materials are visually classified to be medium strength.




Notes
EL : Extremely Low
VL : Very Low
L : Low
M : Medium
H : High
VH : Very High

**Figure 12. Inferred Rock Strength Classification**

### 3.2.4. Geological Strength Index (GSI)

The Geological Strength Index (GSI) is a system of rock-mass characterization that has been developed in engineering rock mechanics to meet the need for reliable input data, particularly those related to rock-mass properties required as input into numerical analysis or closed form solutions for designing tunnels, slopes or foundations in rocks.

The GSI estimation are determined directly on site during the drilling progress by visual assessment through the drilling core. The GSI distribution for each borehole is presented on **Figure 13**.

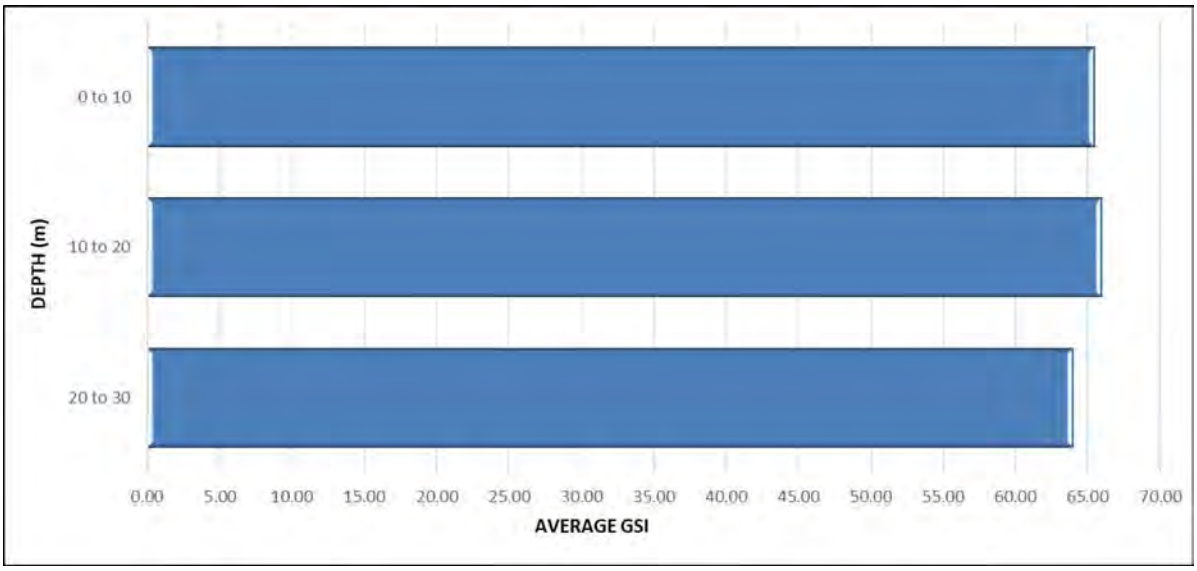



**Figure 13. Geological Strength Index (GSI) Estimation**

## 3.3. Hydrogeological Condition

Groundwater is one of the key elements in many geological and geotechnical factor conditioning soil and rock behaviour. Water is recharged to the groundwater system by percolation of water from precipitation and then flows to the stream through the groundwater system. Groundwater level will be varying depend on land conditions surrounding the borehole (e.g., land elevation, river, etc.).

### 3.3.1. Groundwater Level Monitoring

The groundwater level is measured from geotechnical boreholes available in the field. The purpose of this measurement is to obtain a description of the direction of groundwater distribution, whether it affects mining, main haul road or not. The results of groundwater level measurements are summarized in the below **Table 2**.



**Figure 14. Groundwater Level Monitoring measurement on complete drill hole.**

Groundwater measurements are carried out every morning before drilling activities begin on the second day of drilling until drilling is completed, plus H+2 if possible **Figure 14**.

**Table 2. Groundwater Level Monitoring**

| No | Date Monitoring | Borehole ID | Coordinates UTM | | Elevation | Vertical | Remarks |
|---|---|---|---|---|---|---|---|
| | | | Easting (mE) | Northing (mN) | (masl) | (mbgl) | |
| 1 | 04-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 1.60 | Depth drilled 2.00 m |
| 2 | 05-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 1.85 | Depth drilled 6.15 m |
| 3 | 07-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 2.48 | Depth drilled 12.67 m |
| 4 | 08-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 8.10 | Depth drilled 21.61 m |
| 5 | 09-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 4.10 | Depth drilled 28.11 m |
| 6 | 10-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 6.63 | EOH at depth 30.00 m |
| 7 | 11-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 4.39 | - |
| 8 | 12-Jun-25 | HM_DG_03 | 407356.139 | 9679127.088 | 63.151 | 6.10 | - |
| 9 | 13-Jun-25 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 2.10 | Depth drilled 5.50 m |
| 10 | 14-Jun-25 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 10.00 | Depth drilled 10.00 m waterloss |
| 11 | 15-Jun-25 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 17.79 | Depth drilled 18.00 m waterloss |
| 12 | 16-Jun-25 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 17.45 | Depth drilled 23.00 m |
| 13 | 17-Jun-25 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 17.15 | EOH at depth 30.00 |
| 14 | 18-Jun-25 | HM_DG_01 | 408604.523 | 9677277.934 | 414.963 | 16.85 | - |
| 15 | 19-Jun-25 | HM_DG_02 | 410672.182 | 9676108.574 | 460.446 | 9.37 | Depth drilled 9.50 m |
| 16 | 20-Jun-25 | HM_DG_02 | 410672.182 | 9676108.574 | 460.446 | - | Depth drilled 15.80 m Waterloss, stuck rods EOH at depth 16.15 |
| 17 | 20-Jun-25 | HM_DG_02R | 410672.182 | 9676108.574 | 460.446 | - | EOH at depth 3.50 m |
| 18 | 21-Jun-25 | HM_DG_02 | 410672.182 | 9676108.574 | 460.446 | 15.65 | |

# 4 CLOSURE

This Progress Factual Report based on our current understanding of the site. This Factual Report must be read in conjunction with the attached “Notes Relating to This Report” and any other attached explanatory notes and should be kept in its entirety without separation of individual pages or sections. **PT Abhipraya Nusa Engineering** cannot be held responsible for interpretations or conclusions from review by others of this report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this report. In preparing this report **PT Abhipraya Nusa Engineering** has necessarily relied upon information provided by the Client and/or their agents.

This Progress Factual Report is respectfully submitted to **PT Hengjaya Mineralindo**. If you have any questions or require additional information, please do not hesitate to contact us or at asr@ane.co.id

# APPENDIX A

## BOREHOLE LOGS

## HM_DG_01

# BOREHOLE : HM-DG-01

SHEET : 1 OF 4

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM18, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/12/2025 |
| COORDINATE | : 408604.523mE 9677277.934mN UTM 51S | FINISH DATE | : 06/16/2025 |
| SURFACE RL | : 414.963 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 7-24 M 25-70 H 75-240 EH | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 2.5 5 7.5 10 12.5 15 17.5 20 |
| | 0.0 | | 414.96 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 0.40 | 0 | 0 | | | | | | | | | | | | | |
| | 0.5 | 414.5 | 414.56 | | | | | | | SILT, yellowish to brown, medium to coarse, with fragmen mix gravel, coarse to every coarse | W-M | VS | | HW | | | | |
| | | | 0.62 | | | | | | | | | | | | | | | |
| | | | 414.34 | | | | | | | CORE LOSS | | | | | | | | |
| | 1.0 | 414.0 | | 20 | 0 | | | | | | | | | | | | | |
| | 1.5 | 413.5 | 1.50 | | | | | | | | | | | | | | | |
| | | | 1.60 | | | | | | | grades yellowish to brown to Grey, coarse grain | W-M | VS | | HW | | | | |
| | | | 413.36 | 20 | 0 | | | | | CORE LOSS | | | | | | | | |
| | 2.0 | 413.0 | 2.00 | | | | | | | | | | | | | | | |
| | | | 412.96 | | | | SPT-1, 2.00 m - 2.27 m 4,2/120,- | | | grades light Grey to cream | M | VSt-H | | MW | | | | |
| | | | 2.27 | 0 | 0 | | Rec.= 0.13 m | | | | | | | | | | | |
| | | | 412.69 | | | | | | | CONGLOMERATE, Brown to light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, medium to coarse grain; matrix : mixture with SS, SL, CLY, fine to coarse grain | | | | FR | 40-50 | | | |
| | 2.5 | 412.5 | | 75 | 67 | | | | | | | | | | | | | |
| | | | 2.82 | | | | | | | | | | | | | | | |
| | | | 412.14 | | | | | | | CORE LOSS | | | | | | | | |
| | 3.0 | 412.0 | | | | | | | | | | | | | | | | |
| | | | 3.25 | | | | | | | | | | | | | | | |
| | | | 411.71 | | | | | | | CONGLOMERATE, Brown to light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 5-80 mm; matrix : mixture with SS, SL, CLY, fine to coarse grain | | | | FR | 40-50 | | | |
| | 3.5 | 411.5 | | 75 | 70 | | | | | | | | | | | | | |
| | | | 4.00 | | | | | | | | | | | | | | | |
| | 4.0 | 411.0 | 410.96 | | | | SPT-2, 4.00 m - 4.00 m 5/0,-,- | | | mix claystone, siltstone, sandstone, quartz, 5-100 mm, coarse to very coarse grain; matrix : mix, fine to coarse grain | | | ⊗ | FR | 40-50 | | | |
| | | | | | | | 5/0,-,- ( N = - ( HB ) Rec.= 0.00 m DS : (4.00 m - 4.30 m) Rec.=0.30 m | | | | | | | | | | | | |
| | 4.5 | 410.5 | | 100 | 100 | | DS : (4.60 m - 5.00 m) Rec.=0.40 m | | | | | | | | | | 4.42: J : CA 50°, clean, stepped, rough | |
| | | | 5.00 | | | | | | | | | | | | | | | |
| | 5.0 | 410.0 | 409.96 | | | | | | | mix claystone, siltstone, sandstone, quartz, 5-50 mm, fine - coarse grain; matrix : mix, very fine to medium grain | | | | | | | | |
| | | | | 96 | 88 | | | | | | | | | | | | | |
| | 5.5 | 409.5 | 5.48 | | | | | | | | | | | | | | | |
| | | | 409.46 | | | | | | | CORE LOSS<br>mix claystone, siltstone, sandstone, quartz, 5-50 mm, fine to coarse grain; matrix : sandstone, siltstone, fine-medium grain | | | | FR | 35-45 | | | |
| | 6.0 | 409.0 | | 100 | 65 | | | | | | | | | | | | | |
| | | | 6.50 | | | | | | | | | | | | | | | |
| | 6.5 | 408.5 | 408.46 | | | | UCS/DS : (7.00 m - 7.55 m) Rec.=0.55 m | | | grades light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-20 mm, matrix : sandstone, siltstone, veryfine to medium grain | | | | | 60-70 | | | |
| | 7.0 | 408.0 | | 100 | 100 | | | | | | | | | | | | 7.00: J : infil, undulating, rough | |
| | | | 7.55 | | | | | | | | | | | | | | | |
| | 7.5 | 407.5 | 407.41 | | | | | | | grades light Brown to Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-20 mm, matrix : sandstone, siltstone, fine to medium grain | | | | | | | | |
| | | | | 100 | 100 | | | | | | | | | | | | | |
| | 8.0 | 407.0 | | | | | | | | | | | | | | | | |
| | 8.5 | 406.5 | | 89 | 85 | | | | | | | | | | | | | |
| | | | 8.89 | | | | | | | | | | | | | | | |
| | 9.0 | 406.0 | 9.00 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 405.96 | | | | | | | grades light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, siltstone, fine to medium grain | | | | FR | 60-70 | | | |
| | 9.5 | 405.5 | | 100 | 90 | | | | | | | | | | | | | |
| | 10.0 | 405.0 | | | | | | | | | | | | | | | | |

# BOREHOLE : HM-DG-01

SHEET : 2 OF 4

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM18, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/12/2025 |
| COORDINATE | : 408604.523mE 9677277.934mN UTM 51S | FINISH DATE | : 06/16/2025 |
| SURFACE RL | : 414.963 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 1.4 M 2.8 H 5.6 EH 11.2 | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 2.5 5.0 7.5 10.0 |
| | 10.0 | | | | | | | | | grades light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, siltstone, fine to medium grain | | | | FR | 40-50 | | | |
| | | | 10.45 | | | | | | | | | | | | | | | |
| | 10.5 | 404.5 | 404.51 | 45 | 22 | | | | | CORE LOSS | | | | | | | | |
| | | | 11.00 | | | | | | | | | | | | | | | |
| | 11.0 | 404.0 | 403.96 | | | | | | | mix claystone, siltstone, sandstone, quartz, 2-80 mm, matrix : sandstone, siltstone, fine to medium grain | | | | FR | 60-70 | | | |
| | 11.5 | 403.5 | | 100 | 100 | | | | | | | | | | | | | |
| | | 403.0 | 12.00 | | | | | | | | | | | | | | | |
| | 12.0 | | 402.96 | | | | UCS/DS : (12.42 m - 12.91 m) Rec.=0.49 m | | | grades light Grey to Cream, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, siltstone, fine to medium grain | | | | | | | | |
| | 12.5 | 402.5 | | 91 | 91 | | | | | | | | | | | | | |
| | | | 12.91 | | | | | | | | | | | | | | | |
| | 13.0 | 402.0 | 13.00 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 401.96 | | | | | | | grades light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, siltstone, fine to medium grain | | | | FR | 35-45 | | | |
| | | | 13.45 | | | | | | | | | | | | | | | |
| | 13.5 | 401.5 | 13.56 | 79 | 24 | | | | | SILTSTONE, yellowish Brown | | | | | | | | |
| | | | 401.40 | | | | | | | CONGLOMERATE, light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, siltstone, fine to medium grain | | | | | 60-70 | | | |
| | | | 13.79 | | | | | | | | | | | | | | | |
| | | | 401.17 | | | | | | | CORE LOSS | | | | | | | | |
| | 14.0 | 401.0 | 14.00 | | | | | | | | | | | | | | | |
| | | | 400.96 | | | | | | | mix claystone, siltstone, sandstone, quartz, 2-20 mm, matrix : sandstone, fine to medium grain | | | | FR | 60-70 | | | |
| | 14.5 | 400.5 | 14.55 | 86 | 74 | | | | | | | | | | | | | |
| | | | 400.41 | | | | | | | SILTSTONE, yellowish to reddish Brown, massive | | | | | 70-80 | | 14.55: C : CA 45° clean, stepped, rough | |
| | | | 14.86 | | | | | | | | | | | | | | | |
| | | | 400.10 | | | | | | | CORE LOSS | | | | | | | | |
| | 15.0 | 400.0 | 15.00 | | | | | | | | | | | | | | | |
| | | | 399.96 | | | | DS : (15.00 m - 15.29 m) Rec.=0.29 m | | | CONGLOMERATE, light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-20 mm, matrix : sandstone, fine to medium grain, Interlaminated with SILTSTONE, yellowish Brown, massive | | | | FR | 60-70 | | | |
| | | | | | | | DS : (15.29 m - 15.58 m) Rec.=0.29 m | | | | | | | | | | | |
| | 15.5 | 399.5 | | 91 | 83 | | | | | | | | | | | | | |
| | | | 15.91 | | | | | | | | | | | | | | | |
| | 16.0 | 399.0 | 16.00 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 398.96 | | | | DS : (16.00 m - 16.33 m) Rec.=0.33 m | | | mix claystone, siltstone, sandstone, quartz, 2-80 mm, matrix : sandstone, fine to medium grain, Interlaminated with SILTSTONE, yellowish Brown, massive | | | | FR | 60-70 | | | |
| | 16.5 | 398.5 | | 100 | 100 | | | | | | | | | | | | | |
| | | | 16.90 | | | | | | | | | | | | | | | |
| | 17.0 | 398.0 | 398.06 | | | | UCS/DS : (17.53 m - 18.00 m) Rec.=0.47 m | | | mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, fine to medium grain, Interlaminated with SILTSTONE, yellowish Brown, massive | | | | | | | | |
| | 17.5 | 397.5 | | 100 | 100 | | | | | | | | | | | | | |
| | | | 17.80 | | | | | | | | | | | | | | | |
| | | | 397.16 | | | | | | | SILTSTONE, yellowish to reddish Brown, massive | | | | | 70-80 | | 17.80: C : CA 30° bedding | |
| | 18.0 | 397.0 | 18.00 | | | | | | | | | | | | | | | |
| | | | 396.96 | | | | | | | CONGLOMERATE, light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, fine to medium grain, Interlaminated with SILTSTONE, yellowish-reddish Brown, massive depth @18.45 m - 18.50 m | | | | | 35-45 | | | |
| | 18.5 | 396.5 | | 91 | 76 | | | | | | | | | | | | | |
| | | | 18.91 | | | | | | | | | | | | | | | |
| | 19.0 | 396.0 | 19.00 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 395.96 | | | | | | | SILTSTONE, yellowish Brown, massive | | | | FR | 70-80 | | | |
| | | | 19.15 | | | | | | | | | | | | | | | |
| | | | 395.81 | | | | | | | CONGLOMERATE, light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, fine to medium grain, Interbed with SILTSTONE | | | | | 60-70 | | | |
| | 19.5 | 395.5 | | 100 | 85 | | | | | | | | | | | | | |
| | | | 19.70 | | | | | | | | | | | | | | | |
| | | | 395.26 | | | | | | | SILTSTONE, yellowish to reddish Brown, massive | | | | | 70-80 | | | |
| | 20.0 | 395.0 | 20.00 | | | | | | | | | | | | | | | |

# BOREHOLE : HM-DG-01

SHEET : 3 OF 4

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM18, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/12/2025 |
| COORDINATE | : 408604.523mE 9677277.934mN UTM 51S | FINISH DATE | : 06/16/2025 |
| SURFACE RL | : 414.963 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 2-4 M 4-10 H 10-20 EH 24to | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 5 10 15 20 25 |
| | 20.0 | | 394.96 | | | | | | | CONGLOMERATE, light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, fine to medium grain, Interbed with SILTSTONE, yellowish Brown | | | | FR | 35-45 | | | |
| | 20.5 | 394.5 | | 100 | 93 | | | | | | | | | | | | | |
| | 21.0 | 394.0 | 21.00 | | | | | | | | | | | | | | | |
| | | | 393.96 | | | | | | | mix claystone, siltstone, sandstone, quartz, 2-80 mm, matrix : sandstone, fine to medium grain | | | | | 60-70 | | | |
| | 21.5 | 393.5 | | 96 | 86 | | | | | | | | | | | | | |
| | 22.0 | 393.0 | 21.96 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 392.96 | | | | UCS/DS : (22.00 m - 22.50 m) Rec.=0.50 m | | | CONGLOMERATE, light Grey to Brown, fragment : mix claystone, siltstone, sandstone, quartz, 2-100 mm, matrix : sandstone, fine to medium grain | | | | FR | 60-70 | | | |
| | 22.5 | 392.5 | | 100 | 100 | | | | | | | | | | | | | |
| | 23.0 | 392.0 | 23.00 | | | | | | | | | | | | | | | |
| 17.45m | | | 391.96 | | | | SPT-1, 4.00 m - 4.00 m 5/0,-,- \| N = - ( HB ) Rec.= 0.00 m | | | grades light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-100 mm, matrix : sandstone, fine to medium grain | | | | ⊗ | | | | |
| | 23.5 | 391.5 | | 100 | 100 | | | | | | | | | | | | | |
| | 24.0 | 391.0 | 24.05 | | | | | | | | | | | | | | | |
| | | | 390.91 | | | | | | | mix claystone, siltstone, sandstone, quartz, 2-80 mm, matrix : sandstone, fine to medium grain | | | | | | | | |
| | 24.5 | 390.5 | | 76 | 56 | | | | | | | | | | | | | |
| | | | 24.77 | | | | | | | | | | | | | | | |
| | | | 390.19 | | | | | | | CORE LOSS | | | | | | | | |
| | 25.0 | 390.0 | 25.00 | | | | | | | | | | | | | | | |
| | | | 389.96 | | | | | | | CONGLOMERATE, light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-80 mm, matrix : sandstone, fine to medium grain, silty on top run, brown, massive | | | | FR | 60-70 | | | |
| | 25.5 | 389.5 | 25.55 | 83 | 111 | | | | | | | | | | | | | |
| | | | 389.41 | | | | | | | SANDSTONE, greyish Brown to Grey, fine to medium grain, well sorted | | | | | 70-80 | | | |
| | | | 25.75 | | | | | | | | | | | | | | | |
| | | | 389.21 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 25.90 | | | | | | | | | | | | | | | |
| | 26.0 | 389.0 | 389.06 | | | | | | | CONGLOMERATE, light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-100 mm, matrix : sandstone, fine to medium grain | | | | FR | 35-45 | | | |
| | 26.5 | 388.5 | | 100 | 89 | | | | | | | | | | | | | |
| | | | 26.65 | | | | | | | | | | | | | | | |
| | | | 388.31 | | | | | | | SANDSTONE, greyish Brown to Grey, fine to medium grain, well sorted | | | | | 70-80 | | 26.65: C : gradational with conglomerate | |
| | 27.0 | 388.0 | 27.00 | | | | | | | | | | | | | | | |
| | | | 387.96 | | | | | | | CONGLOMERATE, light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, fine to medium grain | | | | | 35-45 | | | |
| | | | 27.20 | | | | | | | | | | | | | | | |
| | | | 387.76 | | | | | | | SANDSTONE, greyish Brown to Grey, fine to medium grain, well graded, well sorted | | | | | 70-80 | | | |
| | | | 27.45 | | | | | | | | | | | | | | | |
| | 27.5 | 387.5 | 387.51 | 100 | 95 | | | | | CONGLOMERATE, light Grey, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : sandstone, fine to medium grain | | | | | 35-45 | | | |
| | 28.0 | 387.0 | 28.04 | | | | | | | | | | | | | | | |
| | | | 386.92 | | | | | | | grades light Grey to Cream, fragment : mix claystone, siltstone, sandstone, quartz, 2-200 mm, matrix : claystone, siltstone, sandstone | | | | | 60-70 | | | |
| | 28.5 | 386.5 | | 100 | 91 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | 28.69: I : infil with quartz, rough, undulating | |
| | 29.0 | 386.0 | 29.00 | | | | | | | | | | | | | | | |
| | | | 385.96 | | | | | | | SILTSTONE, yellowish to reddish Brown, massive | | | | | 70-80 | | | |
| | 29.5 | 385.5 | 29.55 | 100 | 100 | | | | | | | | | | | | | |
| | | | 385.41 | | | | | | | CONGLOMERATE, light Grey to Cream, fragment : mix claystone, siltstone, sandstone, quartz, 2-50 mm, matrix : claystone, siltstone, sandstone, fine to medium grain, sandy at bottom | | | | | 60-70 | | 29.55: C : gradational with conglomerate | |
| | 30.0 | 385.0 | 30.00 | | | | | | | | | | | | | | | |

# BOREHOLE : HM-DG-01

SHEET : 4 OF 4

ABHIPRAYA nusa engineering

| | |
|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL |
| PROJECT NO | : 03.002.04-25 |
| DRILLING | : PT DANMAR EXPLORINDO |
| LOCATION | : MHR-KM18, MOROWALI, CENTRAL SULAWESI |
| COORDINATE | : 408604.523mE 9677277.934mN UTM 51S |
| SURFACE RL | : 414.963 |
| INCLINATION | : -90 |
| LOGGED | : ASR |
| START DATE | : 06/12/2025 |
| FINISH DATE | : 06/16/2025 |
| CHECKED | : YH |
| DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 7 M 24 H 70 EH 240 | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 5 10 15 20 25 |
| | 30.0 | 384.5 | 384.96 | | | | | | | End of BOREHOLE at 30.00m depth | | | | | | | | |
| | 30.5 | 384.0 | | | | | | | | | | | | | | | | |
| | 31.0 | 383.5 | | | | | | | | | | | | | | | | |
| | 31.5 | 383.0 | | | | | | | | | | | | | | | | |
| | 32.0 | 382.5 | | | | | | | | | | | | | | | | |
| | 32.5 | 382.0 | | | | | | | | | | | | | | | | |
| | 33.0 | 381.5 | | | | | | | | | | | | | | | | |
| | 33.5 | 381.0 | | | | | | | | | | | | | | | | |
| | 34.0 | 380.5 | | | | | | | | | | | | | | | | |
| | 34.5 | 380.0 | | | | | | | | | | | | | | | | |
| | 35.0 | 379.5 | | | | | | | | | | | | | | | | |
| | 35.5 | 379.0 | | | | | | | | | | | | | | | | |
| | 36.0 | 378.5 | | | | | | | | | | | | | | | | |
| | 36.5 | 378.0 | | | | | | | | | | | | | | | | |
| | 37.0 | 377.5 | | | | | | | | | | | | | | | | |
| | 37.5 | 377.0 | | | | | | | | | | | | | | | | |
| | 38.0 | 376.5 | | | | | | | | | | | | | | | | |
| | 38.5 | 376.0 | | | | | | | | | | | | | | | | |
| | 39.0 | 375.5 | | | | | | | | | | | | | | | | |
| | 39.5 | 375.0 | | | | | | | | | | | | | | | | |
| | 40.0 | | | | | | | | | | | | | | | | | |

# APPENDIX A

## BOREHOLE LOGS

## HM_DG_02

## HM_DG_02R

# BOREHOLE : HM-DG-02

SHEET : 1 OF 2

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM15, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/18/2025 |
| COORDINATE | : 410672.182mE 9676108.574mN UTM 51S | FINISH DATE | : 06/20/2025 |
| SURFACE RL | : 460.446 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 VL 0.7 ~ 2.4 L 2.4 ~ 7.0 M 7.0 ~ 24.0 H 24.0 ~ 70.0 EH 70.0 ~ | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 |
| | 0.0 | | 460.45 | | | | | | | CORE LOSS | | | | | | | |
| | | | 0.40 | | | | | | | | | | | | | | |
| | 0.5 | 460.0 | 460.05 | 60 | 0 | | | | | TOP SOIL : LATERITE, low plasticity, reddish Brown to yellowish Brown, silt, fine, wet to moist, very-soft, organic matter trace apart | W-M | VS | | | | | 0.40: component : silty particle fine size, limonite zone at bottom |
| | | 459.5 | 1.00 | | | | | | | | | | | | | | |
| | 1.0 | | 459.45 | | | | | | | Silty LATERITE, low plasticity, reddish yelowish Brown, fine grain | | | | | | | |
| | 1.5 | 459.0 | | 100 | 0 | | | | | | | VS-S | | | | | |
| | 2.0 | 458.5 | | | | | SPT-1, 2.00 m - 2.38 m 1/380,- - \| N = 0 Rec.= 0.38 m | | | | M | VS | ⊗ | | | | |
| | | | | 0 | 0 | | | | | | | | | | | | |
| | | | 2.38 | | | | DS : (2.38m - 2.63m) Rec.= 0.25 m | | | | | | | | | | |
| | 2.5 | 458.0 | 458.07 | | | | | | | grades reddish Brown | | S | | | | | 2.38: well-graded |
| | | | 2.78 | 100 | 0 | | | | | | | | | | | | |
| | | | 457.67 | | | | | | | grades yellowish Brown | | S-F | | | | | |
| | 3.0 | 457.5 | | | | | | | | | | | | | | | 3.00: component : saprolite, 1-5mm, poorly graded at bottom, F |
| | | | 3.34 | | | | | | | | | S | | | | | |
| | 3.5 | 457.0 | 457.11 | 34 | 0 | | | | | CORE LOSS | | | | | | | |
| | | 456.5 | 4.00 | | | | | | | | | | | | | | |
| | 4.0 | | 456.45 | | | | SPT-2, 4.00 m - 4.45 m 2,3,5 \| N = 8 Rec.= 0.27 m | | | SAPROLITE, yellowish greenish Brown, fine to medium grain material, silty | | | ⊗ | RS-EW | | | 4.00: component : rounded-subrounded, poorly-graded, poorly-sorted |
| | | 456.0 | 4.45 | 0 | 0 | | | | | | | | | | | | |
| | 4.5 | | 456.00 | 0 | 0 | | UDS-1 : (4.50m - 5.00m) Rec.= 0.50 m | | | CORE LOSS | | | | | | | |
| | | 455.5 | 5.00 | | | | | | | | | | | | | | |
| | 5.0 | | 455.45 | | | | | | | grades greyish greenish Brown, fine to medium grain material, silty | | | | EW-HW | | | 5.00: component : rounded-subrounded, 1-5mm, poorly-graded, poorly-sorted |
| | | | 5.34 | | | | | | | | | | | | | | |
| | 5.5 | 455.0 | 455.11 | 34 | 0 | | | | | CORE LOSS | | | | | | | |
| | | 454.5 | 6.00 | | | | | | | | | | | | | | |
| | 6.0 | | 454.45 | | | | SPT-3, 6.00 m - 6.45 m 1/180,3/120,5/150 \| N = 8/270 Rec.= 0.45 m | | | grades yellowish greenish Brown, fine grain material | | | ⊗ | EW-HW | | | 6.00: component : subrounded-angular, 1-20mm, poorly-graded, poorly-sorted |
| | | | 6.45 | 0 | 0 | | | | | | | | | | | | |
| | 6.5 | 454.0 | 454.00 | | | | | | | grades yellowish Brown, fine to medium grain material, silty | | | | | | | 6.45: component : subrounded-subangular, 1-10mm, poorly-graded, poorly-sorted |
| | | | 6.65 | | | | | | | | | | | | | | |
| | | | 453.80 | 36 | 0 | | | | | CORE LOSS | | | | | | | |
| | | 453.5 | 7.00 | | | | | | | | | | | | | | |
| | 7.0 | | 453.45 | | | | | | | grades yellowish greenish Brown, fine to coarse grain, loose material | | | | EW-HW | | | 7.00: component : subrounded-angular, gravely, 2-20mm, poorly-graded, poorly-sorted |
| | | 453.0 | 7.50 | | | | | | | | | | | | | | |
| | 7.5 | | 452.95 | 50 | 0 | | | | | CORE LOSS | | | | | | | |
| | | 452.5 | 8.00 | | | | | | | | | | | | | | |
| | 8.0 | | 452.45 | | | | SPT-4, 8.00 m - 8.45 m 7,17,20 \| N = 37 Rec.= 0.23 m | | | grades Brown to greenish Grey, medium to coarse grain material | | | ⊗ | HW | | | 8.00: component : rounded-subangular, 2-20mm, well-graded, poorly-sorted |
| | | | 8.45 | 0 | 0 | | | | | | | | | | | | |
| | 8.5 | 452.0 | 452.00 | | | | | | | grades greenish to blackish Grey, medium to coarse grain, loose material | | | | | 25-35 | | 8.45: component : subrounded-angular, 2-20mm, poorly-graded, poorly-sorted |
| | | | 8.72 | | | | | | | | | | | | | | |
| | | | 451.73 | 26 | 0 | | | | | CORE LOSS | | | | | | | |
| | 9.0 | 451.5 | | | | | | | | | | | | | | | |
| | | | 9.50 | | | | | | | | | | | | | | |
| | 9.5 | 451.0 | 450.95 | | | | UDS-2 : (9.50m - 10.00m) Rec.= 0.00 m | | | no sample | | | | | | | |
| | | | | 0 | 0 | | | | | | | | | | | | |
| | 10.0 | 450.5 | 10.00 | | | | | | | | | | | | | | |

# BOREHOLE : HM-DG-02

SHEET : 2 OF 2

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM15, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/18/2025 |
| COORDINATE | : 410672.182mE 9676108.574mN UTM 51S | FINISH DATE | : 06/20/2025 |
| SURFACE RL | : 460.446 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | Field Material Description | | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 1-4 M 4-10 H 10-40 EH 40> | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 5 10 15 20 25 |
| | 10.0 | | 450.45 | | | | SPT-5, 10.00 m - 10.45 m 4,5,8 \| N = 13 Rec.= 0.31 m | | | grades greyish Brown to blackish Grey, medium to coarse grain material | | | ⊗ | HW | | | 10.00: component : rounded-subangular, 2-20mm, poorly-graded, poorly-sorted | |
| | | | | 0 | 0 | | | | | | | | | | | | | |
| | | | 10.45 | | | | | | | | | | | | | | | |
| | 10.5 | 450.0 | 450.00 | | | | | | | grades yellowish Brown to blackish Grey, medium to coarse grain, loose material | | | | | 45-55 | | 10.45: component : rounded-subrounded, 2-20mm, well-graded, poorly-sorted | |
| | | | | 100 | 100 | | | | | | | | | | | | | |
| | 11.0 | 449.5 | 11.00 | | | | | | | | | | | | | | | |
| | | | 11.10 | | | | | | | grades brownish Grey to greenish Black, medium to coarse grain, loose material | | | | | 25-35 | | 11.00: component : subrounded-subrangular, 1-20mm, poorly-graded, poorly-sorted | |
| | | | 449.35 | 20 | 0 | | | | | CORE LOSS | | | | | | | | |
| | 11.5 | 449.0 | | | | | | | | | | | | | | | | |
| | | | | 0 | 0 | | | | | | | | | | | | | |
| | 12.0 | 448.5 | 12.00 | | | | | | | | | | ⊗ | | | | | |
| | | | 448.45 | | | | SPT-6, 12.00 m - 12.45 m 5/170,2/650,- \| N = 2/650 Rec.= 0.00 m ( no-sampel ) | | | no-sample | | | | | | | | |
| | 12.5 | 448.0 | | 0 | 0 | | | | | | | | | | | | | |
| | | | 12.82 | | | | | | | | | | | | | | | |
| | 13.0 | 447.5 | 447.63 | | | | | | | grades brownish Grey to blackish Green, Black, medium to coarse grain, loose material | | | | HW | 25-35 | | 12.82: component : subrounded-subrangular, 2-30mm, poorly-graded, poorly-sorted | |
| | | | | 80 | 0 | | | | | | | | | | | | | |
| | | | 13.22 | | | | | | | | | | | | | | | |
| | | | 13.32 | | | | | | | CORE LOSS | | | | | | | | |
| | 13.5 | 447.0 | 447.13 | | | | | | | PERIDOTITE, brownish Grey to blackish Green, fragmen 2-30mm, gravely, subrounded to angular, masif | | | | FR | 25-35 | | 13.32: vein : Quartz, Pyroxene, 1-3mm, random spacing | |
| | | | | 65 | 34 | | | | | | | | | | | | | |
| | | | 13.76 | | | | | | | CORE LOSS | | | | | | | | |
| | 14.0 | 446.5 | 446.69 | | | | | | | | | | | | | | | |
| | | | 14.00 | | | | | | | | | | | | | | | |
| | | | 14.10 | 0 | 0 | | SPT-7, 14.00 m - 14.45 m 8/100,-,- \| N = >50 ( HB at 14.10m ) Rec.= 0.10 m | | | grades blackish Green, medium to coarse material, trace of quartz, pyroxene minerals | | | | ⊗FR | | | 14.10: vein : Quartz, Pyroxene, 1-5mm, random spacing | |
| | | | 446.35 | | | | | | | grades blackish Grey, subrounded to angular, massive | | | | | 25-35 | | | |
| | | | 14.40 | | | | | | | | | | | | | | | |
| | 14.5 | 446.0 | 446.05 | 50 | 0 | | | | | CORE LOSS | | | | | | | | |
| | | | 14.70 | | | | | | | | | | | | | | | |
| | | | 445.75 | | | | | | | grades blackish Grey, subrounded to angular, massive | | | | FR | 25-35 | | 14.70: vein : Quartz, Pyroxene, 0.5-10mm, random spacing | |
| | | | 14.96 | 52 | 20 | | | | | | | | | | | | | |
| | 15.0 | 445.5 | 445.49 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 15.20 | | | | | | | | | | | | | | | |
| | | | 445.25 | | | | | | | grades brownish to dark Grey, subrounded to angular, massive | | | | FR | 25-35 | | 15.20: vein : Quartz, Pyroxene, 0.5-3mm, random spacing | |
| | | | 15.43 | | | | | | | | | | | | | | | |
| | 15.5 | 445.0 | 445.02 | 38 | 0 | | | | | CORE LOSS | | | | | | | | |
| | | | 15.80 | | | | | | | | | | | | | | | |
| | | | 444.65 | | | | | | | grades brownish to dark Grey, subrounded to angular, massive | | | | FR | 25-35 | | 15.80: vein : Quartz, Pyroxene, 1-3mm, random spacing | |
| | 16.0 | 444.5 | | 100 | 29 | | | | | | | | | | | | | |
| Waterloss | | | 16.15 | | | | | | | | | | | | | | | |
| | | | 444.30 | | | | | | | End of BOREHOLE at 16.15m depth | | | | | | | | |
| | 16.5 | 444.0 | | | | | | | | | | | | | | | | |
| | 17.0 | 443.5 | | | | | | | | | | | | | | | | |
| | 17.5 | 443.0 | | | | | | | | | | | | | | | | |
| | 18.0 | 442.5 | | | | | | | | | | | | | | | | |
| | 18.5 | 442.0 | | | | | | | | | | | | | | | | |
| | 19.0 | 441.5 | | | | | | | | | | | | | | | | |
| | 19.5 | 441.0 | | | | | | | | | | | | | | | | |
| | 20.0 | 440.5 | | | | | | | | | | | | | | | | |

# BOREHOLE : HM-DG-02R

SHEET : 1 OF 1

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM15, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/20/2025 |
| COORDINATE | : 410672.182mE 9676108.574mN UTM 51S | FINISH DATE | : 06/20/2025 |
| SURFACE RL | : 460.446 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/08/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 7-24 M 25-70 H 71-240 EH | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 1-5 6-10 11-20 >20 |
| | 0.0 | 460.45 | | | | | | | | CORE LOSS | | | | | | | | |
| | 0.5 | 460.0 | 0.50 459.95 | | | | UDS-1 : (0.50m - 1.00m) Rec.= 0.50 m | | | Silty LATERITE, low plasticity, reddish to yelowish Brown, fine grain | | VS-S | | | | | 1.00: component : well-graded | |
| | 1.0 | 459.5 | | | | | | | | | | | | | | | | |
| | 1.5 | 459.0 | | | | | UDS-2 : (1.50m - 2.00m) Rec.= 0.50 m | | | | | | | | | | | |
| | 2.0 | 458.5 | 2.00 458.45 | | | | | | | grades yellowish Brown, fine grain, fine grain | M | | | | | | 2.00: component : well-graded | |
| | 2.5 | 458.0 | | | | | UDS-3 : (2.50m - 3.00m) Rec.= 0.45 m | | | | | S | | | | | | |
| | 3.0 | 457.5 | 3.00 457.45 | | | | | | | grades yellowish to greyish Brown | | | | | | | 3.00: component : saprolite, 1-5mm, poorly graded at bottom | |
| | 3.5 | 457.0 | 3.50 456.95 | | | | | | | End of BOREHOLE at 3.50m depth | | | | | | | | |
| | 4.0 | 456.5 | | | | | | | | | | | | | | | | |
| | 4.5 | 456.0 | | | | | | | | | | | | | | | | |
| | 5.0 | 455.5 | | | | | | | | | | | | | | | | |
| | 5.5 | 455.0 | | | | | | | | | | | | | | | | |
| | 6.0 | 454.5 | | | | | | | | | | | | | | | | |
| | 6.5 | 454.0 | | | | | | | | | | | | | | | | |
| | 7.0 | 453.5 | | | | | | | | | | | | | | | | |
| | 7.5 | 453.0 | | | | | | | | | | | | | | | | |
| | 8.0 | 452.5 | | | | | | | | | | | | | | | | |
| | 8.5 | 452.0 | | | | | | | | | | | | | | | | |
| | 9.0 | 451.5 | | | | | | | | | | | | | | | | |
| | 9.5 | 451.0 | | | | | | | | | | | | | | | | |
| | 10.0 | 450.5 | | | | | | | | | | | | | | | | |

# APPENDIX A

## BOREHOLE LOGS

## HM_DG_03

# BOREHOLE : HM-DG-03

SHEET : 1 OF 3

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM21, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/3/2025 |
| COORDINATE | : 407356.139mE 9679127.088mN UTM 51S | FINISH DATE | : 06/9/2025 |
| SURFACE RL | : 63.151 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/12/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) VL 0.7 L 7-24 M 24-70 H 70-240 EH | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 5 10 15 20 25 |
| | 0.0 | | 63.15 | | | | | | | CORE LOSS | | | | | | | | |
| | 0.5 | 63.0 | 0.60 | 0 | 0 | | | | | | | | | | | | | |
| | | 62.5 | 62.55 | | | | | | | GRAVEL, dark Grey to Brown, coarse grain, silty, wet, poorly graded | W | VL | | HW | | | | |
| | 1.0 | | 1.00 | 82 | 0 | | | | | | | | | | | | | |
| | | 62.0 | 62.15 | | | | | | | SILT, yellowish Brown, sandy apart, fine grain | W-M | VS-S | | | | | | |
| | 1.5 | | 1.50 | | | | | | | | | | | | | | | |
| | | 61.5 | 61.65 | 0 | 0 | | | | | CORE LOSS | | | | | | | | |
| | 2.0 | | 2.00 | | | | | | | | | | | | | | | |
| | | 61.0 | 61.15 | | | | SPT-1, 2.00 m - 2.45 m 9,12,22 \| N = 34 Rec.= 0.35 m | | | Sandy SILT, reddish to yellowish Brown, fine grain, with some gravel on top, VL | M | VSt-H | ⊗ | MW | | | | |
| | | | 2.45 | | | | | | | | | | | | | | | |
| | 2.5 | | 2.55 | | | | | | | CORE LOSS | | | | | | | | |
| | | 60.5 | 60.60 | 80 | 0 | | | | | becomes medium to coarse grain, with some gravel | M | S | | MW | | | | |
| | 3.0 | | 2.95 | | | | | | | | | | | | | | | |
| | | | 60.20 | 100 | 0 | | | | | SILT, brownish Grey, fine to medium | | | | | | | | |
| | | 60.0 | 3.15 | | | | | | | | | | | | | | | |
| | | | 60.00 | 92 | 30 | | | | | CLAYSTONE, Grey, massive, sandy | | | | FR | 50-60 | | | |
| | 3.5 | | 3.61 | | | | | | | | | | | | | | | |
| | | 59.5 | 59.50 | | | | | | | CORE LOSS | | | | FR | 70-80 | | | |
| | | | | | | | | | | SILTSTONE, greyish Brown, massive | | | | | | | | |
| | 4.0 | | | 70 | 10 | | | | | | | | | | | | | |
| | | 59.0 | 4.35 | | | | | | | | | | | | | | | |
| | | | 58.80 | | | | | | | CORE LOSS | | | | | | | | |
| | 4.5 | | 4.65 | | | | | | | | | | | | | | | |
| | | 58.5 | 58.50 | | | | | | | grades redish Brown to Grey, massive | | | | FR | 45-55 | | | |
| | | | | 100 | 0 | | | | | | | | | | | | | |
| | 5.0 | | 5.15 | | | | | | | | | | | | | | | |
| | | 58.0 | 58.00 | | | | DS : (5.15 m - 5.35 m) Rec.= 0.20 m | | | grades greyish Brown, massive | | | | | 70-80 | | | |
| | | | | 78 | 68 | | | | | | | | | | | | 5.35: J : CA 10°, infil with clay-sand, undulating, rough | |
| | 5.5 | | 5.54 | | | | | | | | | | | | | | | |
| | | | 5.65 | | | | | | | CORE LOSS | | | | | | | | |
| | | 57.5 | 57.50 | | | | DS : (5.65 m - 5.85 m) Rec.= 0.20 m | | | sandy at bottom, spacing random | | | | FR | 70-80 | | | |
| | | | | 90 | 80 | | DS : (5.85 m - 6.05 m) Rec.= 0.20 m | | | | | | | | | | | |
| | 6.0 | | 6.10 | | | | | | | | | | | | | | | |
| | | 57.0 | 57.00 | | | | UCS : (6.15 m - 6.65 m) Rec.= 0.50 m | | | CORE LOSS | | | | FR | 70-80 | | | |
| | | | | | | | | | | grades reddish Brown, massive, interlaminate with claystone, dark grey, sandstone, light Grey, fine to medium grain | | | | | | | | |
| | 6.5 | | | 100 | 100 | | | | | | | | | | | | | |
| | | 56.5 | | | | | | | | | | | | | | | | |
| | 7.0 | | | | | | | | | | | | | | | | | |
| | | 56.0 | | | | | | | | | | | | | | | | |
| | 7.5 | | | | | | | | | | | | | | | | | |
| | | 55.5 | | 85 | 85 | | | | | | | | | | | | | |
| | 8.0 | | 8.02 | | | | | | | | | | | | | | | |
| | | | 55.13 | | | | | | | CORE LOSS | | | | | | | | |
| | | 55.0 | 8.17 | | | | | | | | | | | | | | | |
| | | | 54.98 | | | | | | | CLAYSTONE, dark Grey, massive, interlaminate with Sandstone, light Grey, very fine grain; Siltstone, cream-Brown | | | | FR | 50-60 | | 8.26: J : CA 5°-10°, undulating, rough | |
| | | | | 100 | 40 | | | | | | | | | | | | | |
| | 8.5 | | 8.67 | | | | | | | | | | | | | | 8.50: J : CA 5°-10°, undulating, rough 8.58: J : CA 5°-10°, undulating, rough | |
| | | 54.5 | 54.48 | | | | DS : (8.67 m - 9.00 m) Rec.= 0.33 m | | | SILTSTONE, dark Brown to Grey, massive | | | | | 70-80 | | | |
| | | | | 78 | 66 | | | | | | | | | | | | | |
| | 9.0 | | 9.06 | | | | | | | | | | | | | | | |
| | | 54.0 | 9.17 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 53.98 | | | | | | | grades reddish Brown, massive | | | | FR | 70-80 | | | |
| | | | 9.33 | | | | | | | | | | | | | | | |
| | | | 9.41 | | | | | | | SANDSTONE, light Grey, massive, fine to medium grain, interbed with siltstone | | | | | 55-65 | | 9.33: C : interbed with siltstone CA 5°-15°, planar, undulating, rough | |
| | 9.5 | | 53.74 | | | | UCS/DS : (9.41 m - 9.73 m) Rec.= 0.32 m | | | SILTSTONE, reddish Brown, massive | | | | | 70-80 | | | |
| | | 53.5 | | 90 | 77 | | | | | | | | | | | | | |
| | 10.0 | | | | | | | | | | | | | | | | 9.77: C : interbed with siltstone CA 5°-15°, planar, undulating, rough | |

# BOREHOLE : HM-DG-03

SHEET : 2 OF 3

ABHIPRAYA nusa engineering

| | |
|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL |
| PROJECT NO | : 03.002.04-25 |
| DRILLING | : PT DANMAR EXPLORINDO |
| LOCATION | : MHR-KM21, MOROWALI, CENTRAL SULAWESI |
| COORDINATE | : 407356.139mE 9679127.088mN UTM 51S |
| SURFACE RL | : 63.151 |
| INCLINATION | : -90 |
| LOGGED | : ASR |
| START DATE | : 06/3/2025 |
| FINISH DATE | : 06/9/2025 |
| CHECKED | : YH |
| DATE | : 07/12/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 7-24 M 25-70 H 71-240 EH | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 2.5 5 7.5 10 12.5 15 17.5 20 |
| | 10.0 | | 10.07 | | | | | | | | | | | | | | | |
| | | 53.0 | 10.17 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 52.98 | | | | UCS/DS : (10.17 m - 10.43 m) Rec.= 0.26 m | | | SANDSTONE, light Grey, massive, fine to medium grain, interbed with siltstone, reddish Grey to Brown | | | | FR | 70-80 | | 10.30: C : interbed with siltstone, CA 24°, 5-150mm, random spacing<br>10.44: C : interbed with siltstone, CA 24°, 5-150mm, random spacing<br>10.57: J : CA 80° | |
| | 10.5 | | | | | | | | | | | | | | 35-45 | | | |
| | | 52.5 | | | | | | | | | | | | | | | | |
| | | | | 85 | 31 | | | | | | | | | | | | | |
| | 11.0 | | | | | | UCS : (11.07 m - 11.44 m) Rec.= 0.37 m | | | | | | | | | | | |
| | | 52.0 | 11.44 | | | | | | | | | | | | | | | |
| | | | 51.71 | | | | | | | CORE LOSS | | | | | | | | |
| | 11.5 | | 11.67 | | | | | | | | | | | | | | | |
| | | 51.5 | 51.48 | | | | UCS/DS : (11.67 m - 12.03 m) Rec.= 0.36 m | | | grades light Grey to brownish Grey, massive, fine to medium grain, interbed with siltstone, reddish Grey to Brown | | | | FR | 70-80 | | | |
| | 12.0 | | | | | | | | | | | | | | | | | |
| | | 51.0 | | 100 | 100 | | | | | | | | | | | | | |
| | 12.5 | | | | | | | | | | | | | | | | | |
| | | 50.5 | 12.67 | | | | | | | | | | | | | | | |
| | | | 12.77 | | | | | | | CORE LOSS | | | | | | | | |
| | | | 50.38 | | | | | | | grades light Grey, massive, very fine to fine grain, interbed with siltstone, reddish Brown; claystone, dark-grey | | | | FR | 70-80 | | | |
| | 13.0 | 50.0 | | 88 | 69 | | | | | | | | | | | | | |
| | 13.5 | | | | | | UCS/DS : (13.47 m - 13.97 m) Rec.= 0.50 m | | | | | | | | | | | |
| | | 49.5 | | | | | | | | | | | | | | | | |
| | 14.0 | | | 100 | 100 | | | | | | | | | | | | | |
| | | 49.0 | | | | | | | | | | | | | | | | |
| | 14.5 | | | | | | | | | | | | | | | | | |
| | | 48.5 | 14.67 | | | | | | | | | | | | | | | |
| | | | 48.48 | | | | UCS&DS : (14.67 m - 15.11 m) Rec.= 0.44 m | | | SILTSTONE, reddish Brown, massive, gradational with sandstone | | | | | | | | |
| | | | 14.87 | | | | | | | | | | | | | | | |
| | 15.0 | | 48.28 | | | | | | | SANDSTONE, light Grey, massive, fine to coarse grain, gradational with conglomerate | | | | | 50-60 | | 14.87: C : gradational with sandstone | |
| | | 48.0 | | 100 | 100 | | DS : (15.11 m - 15.40 m) Rec.= 0.29 m | | | | | | | | | | | |
| | 15.5 | | 15.50 | | | | DS : (15.40 m - 15.60 m) Rec.= 0.20 m | | | | | | | | | | | |
| | | | 47.65 | | | | | | | CONGLOMERATE, light to dark Grey, component : sandstone, siltstone, claystone, medium to coarse grain | | | | | 35-45 | | 15.50: C : gradational with conglomerate | |
| | | 47.5 | 15.72 | | | | | | | | | | | | | | | |
| | | | 47.43 | | | | | | | SILTSTONE, reddish Brown, massive, interlaminate with sandstone, light Grey, fine to medium grain | | | | | 70-80 | | 15.87: J : CA 60°, clean, undulating, rough | |
| | 16.0 | 47.0 | | 100 | 100 | | | | | | | | | | | | | |
| | 16.5 | | | | | | | | | | | | | | | | 16.49: J : CA 30°, clean, planar, smooth | |
| | | 46.5 | 16.67 | | | | | | | | | | | | | | | |
| | | | 46.48 | | | | | | | SANDSTONE, light Grey, massive, fine to medium, coarse grain @17.02 m and @17.25 m, interlaminated w/ siltstone, reddish brown, nodule apart | | | | | 50-60 | | | |
| | 17.0 | | | | | | | | | | | | | | | | | |
| | | 46.0 | | 100 | 100 | | UCS : (17.02 m - 17.51 m) Rec.= 0.49 m | | | | | | | | | | | 17.02: C : interlaminated, gradational contact with siltstone, 2-100 mm, random spacing<br>17.25: C : interlaminated, gradational contact with siltstone, 2-100 mm, random spacing |
| | 17.5 | | 17.51 | | | | | | | | | | | | | | | |
| | | | 45.64 | | | | | | | SILTSTONE, light Brown to Cream, massive, interlaminate with sandstone, light Grey, fine to medium grain; claystone, dark-Grey | | | | | 70-80 | | | |
| | | 45.5 | | | | | | | | | | | | | | | | |
| | 18.0 | | | | | | | | | | | | | | | | | |
| | | 45.0 | | 100 | 100 | | | | | | | | | | | | | |
| | 18.5 | | | | | | UCS/DS : (18.28 m - 18.73 m) Rec.= 0.45 m | | | | | | | | | | | |
| | | 44.5 | 18.73 | | | | | | | | | | | | | | | |
| | | | 44.42 | | | | | | | grades light Brown to Grey massive, interlaminate with sandstone, light Grey, fine to coarse grain; claystone, dark to Grey | | | | | | | | |
| | 19.0 | | | | | | | | | | | | | | | | | |
| | | 44.0 | | 100 | 100 | | | | | | | | | | | | | |
| | 19.5 | | | | | | | | | | | | | | | | | |
| | | | 19.61 | | | | | | | | | | | | | | | |
| | | 43.5 | 43.54 | | | | | | | grades reddish to light Brown, massive, interlaminate with sandstone, light Grey, fine to medium grain; claystone, dark-Grey | | | | | | | | |
| | 20.0 | | | | | | | | | | | | | | | | 19.91: J : CA 70°, clean, stepped, rough | |

# BOREHOLE : HM-DG-03

SHEET : 3 OF 3

ABHIPRAYA nusa engineering

| | | | |
|---|---|---|---|
| CLIENT | : PT. HENGJAYA MINERALINDO | | |
| PROJECT | : GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL | | |
| PROJECT NO | : 03.002.04-25 | | |
| DRILLING | : PT DANMAR EXPLORINDO | LOGGED | : ASR |
| LOCATION | : MHR-KM21, MOROWALI, CENTRAL SULAWESI | START DATE | : 06/3/2025 |
| COORDINATE | : 407356.139mE 9679127.088mN UTM 51S | FINISH DATE | : 06/9/2025 |
| SURFACE RL | : 63.151 | CHECKED | : YH |
| INCLINATION | : -90 | DATE | : 07/12/25 |

HENGJAYA MINERALINDO

| Drilling | | | | | | Sampling | | Field Material Description | | | | | | | | Defect Information | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WATER | DEPTH (metres) | RL (metres, ) | DEPTH RL | TCR (%) | RQD (SCR) (%) | RECOVERED/ SAMPLING | SAMPLE OR FIELD TEST | GRAPHIC LOG | USC Symbol | SOIL / ROCK MATERIAL DESCRIPTION | MOISTURE | CONSISTENCY DENSITY | SPT (N Value) ⊗ N Value 0 10 20 30 40 50 | WEATHERING | GSI | INFERRED STRENGTH (MPa) EL 0.7 L 1.4 M 2.8 H 5.6 EH 11.2 | DEFECT DESCRIPTION & Additional Observations | FRACTURE FREQUENCY (Defects per unit metre length) 0 2.5 5.0 7.5 10.0 |
| | 20.0 | | | | | | | | | | | | | | | | | |
| | 43.0 | | | 100 | 100 | | | | | SILTSTONE, light Brown to Cream, massive, interlaminate with sandstone, light Grey, fine to medium grain; claystone, dark-Grey | | | | FR | 70-80 | | 20.28: J : CA 50°, clean, planar, smooth | |
| | 20.5 | | 20.61 | | | | | | | | | | | | | | | |
| | 42.5 | 42.54 | | | | | | | | grades light Brown to Grey, massive, interlaminate with sandstone, light Grey, fine to medium grain; claystone, dark to Grey | | | | | 50-60 | | | |
| | 21.0 | | | 98 | 69 | | | | | | | | | | | | | |
| | 42.0 | | | | | | | | | | | | | | | | | |
| | 21.5 | | 21.59 | | | | | | | | | | | | | | | |
| | 41.5 | 41.54 | | | | | | | | CORE LOSS | | | | | | | | |
| | | | | | | | | | | SANDSTONE, light-dark Grey, massive, fine to medium, @21.81 m partly coarse grain , @22.30 m, siltstone at bottom, light Grey - Brown | | | | FR | 70-80 | | | |
| | 22.0 | | | 84 | 78 | | | | | | | | | | | | | |
| | 41.0 | | 22.37 | | | | | | | | | | | | | | 22.21: C : siltstone | |
| | | 40.78 | 22.51 | | | | | | | CORE LOSS | | | | | | | | |
| | 22.5 | 40.64 | | | | | UCS&DS : (22.51 m - 23.03 m) Rec.= 0.52 m | | | SILTSTONE, reddish Brown, massive, interlaminate with sandstone, light Grey, fine to medium grain; claystone, dark grey | | | | FR | 70-80 | | | |
| | 40.5 | | | | | | | | | | | | | | | | | |
| | 23.0 | | | 100 | 100 | | | | | | | | | | | | | |
| | 40.0 | | | | | | | | | | | | | | | | | |
| | 23.5 | | | | | | | | | | | | | | | | | |
| | 39.5 | | | | | | | | | | | | | | | | 23.75: C : gradational with sandstone | |
| | 24.0 | | | | | | | | | | | | | | | | | |
| | 39.0 | | | 100 | 100 | | | | | | | | | | | | | |
| | | | 24.36 | | | | | | | | | | | | | | | |
| | | 38.79 | | | | | | | | SANDSTONE, light Grey, medium to coarse grain at botom | | | | | 50-60 | | 24.36: C : gradational with sandstone | |
| | 24.5 | | 24.61 | | | | | | | | | | | | | | | |
| | 38.5 | 38.49 | | | | | | | | becomes fine to medium grain | | | | | 70-80 | | | |
| | | | | | | | | | | SILTSTONE, reddish Brown, massive, interlaminate with sandstone, light Grey, fine to medium grain; claystone, dark-grey | | | | | 70-80 | | | |
| | 25.0 | | | | | | | | | | | | | | | | | |
| | 38.0 | | 25.16 | 100 | 100 | | | | | | | | | | | | | |
| | | 37.99 | | | | | | | | CONGLOMERATE, Brown to Grey, component : mix claystone, siltstone, sandstone, quartz, 2-50 mm, medium to coarse grain | | | | | 40-50 | | | |
| | 25.5 | | 25.61 | | | | | | | | | | | | | | | |
| | 37.5 | 37.54 | | | | | | | | grades reddish Brown to Brown, component : mix claystone, siltstone, sandstone, quartz, 2-50 mm, medium to coarse grain | | | | | | | | |
| | 26.0 | | | | | | | | | | | | | | | | | |
| | 37.0 | | | 100 | 90 | | UCS&DS : (25.98 m - 26.53 m) Rec.= 0.55 m | | | | | | | | | | | |
| | 26.5 | | 26.61 | | | | | | | | | | | | | | | |
| | 36.5 | 36.54 | | | | | | | | grades light Brown to Grey, component : mix claystone, siltstone, sandstone, quartz, 2-20 mm, medium to coarse grain | | | | | 35-45 | | | |
| | 27.0 | | | | | | | | | | | | | | | | | |
| | 36.0 | | 27.23 | 62 | 32 | | | | | | | | | | | | | |
| | | 35.92 | | | | | | | | CORE LOSS | | | | | | | | |
| | 27.5 | | 27.61 | | | | | | | | | | | | | | | |
| | 35.5 | 35.54 | | | | | | | | CONGLOMERATE, light Brown to Grey, component : mix claystone, siltstone, sandstone, quartz, 2-20 mm, medium to coarse grain | | | | FR | 35-45 | | | |
| | | 27.89 | 35.26 | 56 | 48 | | | | | CORE LOSS | | | | | | | | |
| | 28.0 | | 28.11 | | | | | | | | | | | | | | | |
| | 35.0 | 35.04 | | | | | | | | grades reddish Brown to light Grey, component : mix claystone, siltstone, sandstone, quartz, 2-50 mm, medium to coarse grain | | | | FR | 35-45 | | | |
| | | 28.37 | 34.78 | | | | | | | CORE LOSS | | | | | | | | |
| | 28.5 | | | | | | | | | | | | | | | | | |
| | 34.5 | | | 26 | 20 | | | | | | | | | | | | | |
| | 29.0 | | 29.11 | | | | | | | | | | | | | | | |
| | 34.0 | 34.04 | | | | | | | | grades reddish Brown to dark-Grey, component : mix claystone, siltstone, sandstone, quartz, 2-50 mm, medium to coarse grain | | | | FR | 35-45 | | | |
| | 29.5 | | | | | | | | | | | | | | | | | |
| | | 29.68 | 33.47 | 57 | 15 | | | | | CORE LOSS | | | | | | | | |
| | 33.5 | | | | | | | | | EOH at depth 30.00 m | | | | | | | | |
| | 30.0 | | | | | | | | | | | | | | | | | |

# APPENDIX B

## COREBOX DOCUMENTATION

# COREBOX DOCUMENTATION - HM_DG_01




COREBOX-1 ( 0.00 m – 5.00 m )




COREBOX-2 ( 5.00 m – 10.00 m )




COREBOX-3 ( 10.00 m – 15.00 m )




COREBOX-4 ( 15.00 m – 20.00 m )




COREBOX-5 ( 20.00 m – 25.00 m )




COREBOX-6 ( 25.00 m – 30.00 m )

## COREBOX DOCUMENTATION - HM_DG_02




COREBOX-1 ( 0.00 m – 5.00 m )




COREBOX-2 ( 5.00 m – 10.00 m )




COREBOX-3 ( 10.00 m – 15.00 m )




COREBOX-4 ( 15.00 m – 16.15 m )

## COREBOX DOCUMENTATION - HM_DG_02R




COREBOX-1 ( 0.00 m – 3.50 m )

# COREBOX DOCUMENTATION - HM_DG_03




COREBOX-1 ( 0.00 m – 5.00 m )




COREBOX-2 ( 5.00 m – 10.00 m )




COREBOX-3 ( 10.00 m – 15.00 m )




COREBOX-4 ( 15.00 m – 20.00 m )




COREBOX-5 ( 20.00 m – 25.00 m )




COREBOX-6 ( 25.00 m – 30.00 m )

# APPENDIX C

## WORK COMPLETION REPORT AND
## LIST SAMPLES DELIVERED TO LABORATORIES
## ( SOIL AND ROCK )

ABHIPRAYA
nusa engineering

**No :** BA_03/ANE/GT-HM/001/07-25 Jakarta, 12 Juli 2025

**From** : PT Abhipraya Nusa Engineering
**To** : PT Hengjaya Mineralindo
**Perihal** : **Work Completion Report and Field Database "Geotechnical Investigation of MHR Properties Material"**
**Lampiran** : **3**

Pada hari ini, **Kamis** tanggal **12 Juli 2025** telah ditanda tangani Berita Acara mengenai Penyelesaian pekerjaan dan Penyerahan *Fieldwork Database* **"Geotechnical Investigation of Main Haul Road Properties Material" PT Hengjaya Mineralindo,** yang berlokasi di daerah Desa Tangofa dan Bete-Bete, Kecamatan Bungku Selatan, Kabupaten Morowali, Provinsi Sulawesi Tengah, dengan jumlah total **4** titik bor (*1 redrill*) dan total kedalaman **79.65** meter, dengan *summary* sebagai berikut :

1. *Total Full coring (include redrill)* : ***79.65** meter*
   - *Soil Coring* : *8.48 meter*
   - *Rock Coring* : *55.76 meter*
   - *Coreloss* : *15.41 meter*

2. *Total Sample Obtain and Shipping to Laboratory*
   - *Rock Core Samples ( UCS & DS )* : *31 Sampel*
   - *Rock Grab Samples ( limestone )* : *2 Sampel*
   - *Soil Samples ( SPT )* : *8 Sampel*
   - *Soil Sample ( DS )* : *1 Sampel*
   - *UDS Samples* : *4 Sampel*

Pekerjaan supervisi pengeboran geoteknik ini dilakukan pada tanggal ***01 Juni 2025*** sampai dengan ***21 Juni 2025***, dengan perincian sebagaimana terdapat pada halaman terlampir.

Demikian Berita Acara ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Jakarta, 12 Juli 2025
**PT Abhipraya Nusa Engineering**

**Andi Setia Rahardian**
PJO/Field Engineer

Tangofa , 12 Juli 2025
**PT Hengjaya Mineralindo**

PT. HENGJAYA MINERALINDO
(Muh. Ihram Reyhan R.)
Site Client Representative

ABHIPRAYA
nusa engineering

LAMPIRAN 1 :

BOREHOLE COMPLETION GEOTECHNICAL DRILLING
"GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL" PT HENGJAYA MINERALINDO

| LOCATION ID | NO | RIG ID | HOLE ID ACTUAL | DEPTH PLAN (m) | DEPTH TARGET (m) | DEPTH ACTUAL (m) | OPEN HOLE (m) | SOIL CORING (m) | ROCK CORING (m) | CORELOSS (m) | TOTAL RECOVERY | START DATE | FINISH DATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SITE TANGOFA | 1 | Rig 11 | HM_DG_03 | 30.00 | 30.00 | 30.00 | - | 1.95 | 23.84 | 4.21 | 85.97% | 03-Jun-25 | 09-Jun-25 | EOH |
| | 2 | | HM_DG_01 | 28.58 | 28.58 | 30.00 | - | 0.59 | 25.58 | 3.83 | 87.23% | 12-Jun-25 | 16-Jun-25 | EOH |
| | 3 | | HM_DG_02 | 32.58 | 32.58 | 16.15 | - | 2.94 | 6.34 | 6.87 | 57.46% | 18-Jun-25 | 20-Jun-25 | EOH, Instruction by client HM on Bedrock +2.00 m |
| | 4 | | HM_DG_02R | - | 5.00 | 3.50 | - | 3.00 | 0.00 | 0.50 | 85.71% | 20-Jun-25 | 20-Jun-25 | Redrill HM_DG_02, instruction by client HM, target UDS sample limonite obtain, EOH |
| TOTAL | | | | 91.16 | 96.16 | 79.65 | 0.00 | 8.48 | 55.76 | 15.41 | | | | |

| | |
|---|---|
| | : Total Meter Drilled EOH |
| | : Total Meter Drilled Soil Coring |
| | : Total Meter Drilled Rock Coring |
| | : Total Coreloss |

Jakarta, 12 Juli 2025
PT Abhipraya Nusa Engineering

Andi Satia Rahardian
PJO/Field Engineer

Tangofa, 12 Juli 2025
PT Hengjaya Mineralindo

for PT. HENGJAYA MINERALINDO

(Muh. Ihram Reyhan R.)
Site Client Representative

ABHIPRAYA
nusa engineering

LAMPIRAN 2 :

## WORK TIMELINE ACTUAL GEOTECHNICAL DRILLING
## "GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL" PT HENGJAYA MINERALINDO

| NO | DESCRIPTION | DURATION (Days) |
|---|---|---|
| A | MOBILIZATION AND DEMOBILIZATION | |
| 1 | Personnel Mobilization and Preparation | 2 |
| 2 | Personnel Demobilization | 2 |
| B | FIELD WORK | |
| 1 | Geotechnical drilling supervisor | 21 |
| | HM_DD_03 | 6 |
| | HM_DD_01 | 7 |
| | HM_DD_02 | 4 |
| | HM_DD_02R | 1 |
| 2 | Sample handing Batch 1 | 10 |
| | Sample shipping Batch 1 | 14 |
| 3 | Sample handling Batch 2 | 10 |
| | Sample shipping Batch 2 | 14 |
| 4 | Sample handling Batch 3 | 10 |
| | Sample shipping Batch 3 | 14 |
| C | LABORATORY WORK | |
| 1 | Geotechnical Laboratory Batch 1 | 30 |
| 2 | Geotechnical Laboratory Batch 2 | 30 |
| 3 | Geotechnical Laboratory Batch 3 | 30 |
| D | OFFICE WORK | |
| 1 | Reporting | |
| | Factual Report | 14 |




- Mob Demob
- Field Work / Drilling Progress
- Moving
- Continue Moving & Rig setup Preparation
- Standby / Idul Adha Day
- Finish & Rig down
- Sample handling
- Sample preparation by HM
- Shipping shipping
- Laboratory Work
- Office Work / Reporting

Jakarta, 12 Juli 2025
PT Abhipraya Nusa Engineering

Andi Sesa Rahardian
PJO/Field Engineer

Tangerang, 12 Juli 2025
PT Hengjaya Mineralindo

For
PT. HENGJAYA MINERALINDO
(Muh. Ihram Reyhan R.)
Site Client Representative

ABHIPRAYA
nusa engineering

LAMPIRAN 3 :

**SAMPLE OBTAIN AND SHIPPING TO LABORATORY**
**"GEOTECHNICAL INVESTIGATION OF MHR PROPERTIES MATERIAL" PT HENGJAYA MINERALINDO**

**ROCK SAMPLING GEOTECHNICAL DRILLING**
( TOTAL **31** CORE SAMPLES, **2** GRAB SAMPLES )

**ROCK CORE SAMPLES : HM_DG_03**

| NO. | HOLE ID | SAMPLE ID | DEPTH (m) | | THICKNESS (m) | RECOVERY (m) | LITOLOGY |
|---|---|---|---|---|---|---|---|
| | | | FROM | TO | | | |
| 1 | HM_DG_03 | UCS / DS | 5.15 | 5.35 | 0.20 | 0.20 | SILTSTONE |
| 2 | | UCS / DS | 5.65 | 5.85 | 0.20 | 0.20 | SILTSTONE |
| 3 | | UCS / DS | 5.85 | 6.05 | 0.20 | 0.20 | SILTSTONE |
| 4 | | UCS / DS | 6.15 | 6.65 | 0.50 | 0.50 | SILTSTONE |
| 5 | | UCS / DS | 8.67 | 9.00 | 0.33 | 0.33 | SILTSTONE |
| 6 | | UCS / DS | 9.41 | 9.73 | 0.32 | 0.32 | SILTSTONE |
| 7 | | UCS / DS | 10.17 | 10.43 | 0.26 | 0.26 | SANDSTONE-SILTSTONE |
| 8 | | UCS | 11.07 | 11.44 | 0.37 | 0.37 | SANDSTONE-SILTSTONE |
| 9 | | UCS/DS | 11.67 | 12.03 | 0.36 | 0.36 | SANDSTONE-SILTSTONE |
| 10 | | UCS | 13.47 | 13.97 | 0.50 | 0.50 | silty-SANDSTONE |
| 11 | | UCS & DS | 14.67 | 15.11 | 0.44 | 0.44 | SILTSTONE-CONGLOMERATE |
| 12 | | DS | 15.11 | 15.40 | 0.29 | 0.29 | CONGLOMERATE-SANDSTONE |
| 13 | | DS | 15.40 | 15.60 | 0.20 | 0.20 | CONGLOMERATE |
| 14 | | UCS | 17.02 | 17.51 | 0.49 | 0.49 | silty-SANDSTONE |
| 15 | | UCS / DS | 18.28 | 18.73 | 0.45 | 0.45 | SILTSTONE |
| 16 | | UCS & DS | 22.51 | 23.03 | 0.52 | 0.52 | SILTSTONE |
| 17 | | UCS & DS | 25.98 | 26.53 | 0.55 | 0.55 | CONGLOMERATE |

PT. HENGJAYA MINERALINDO

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**ROCK CORE SAMPLES : HM_DG_01**

| NO. | HOLE ID | SAMPLE ID | DEPTH (m) | | THICKNESS (m) | RECOVERY (m) | LITOLOGY |
|---|---|---|---|---|---|---|---|
| | | | FROM | TO | | | |
| 1 | HM_DG_01 | UCS/DS | 2.34 | 2.82 | 0.48 | 0.48 | CONGLOMERATE |
| 2 | | DS | 4.00 | 4.30 | 0.30 | 0.30 | CONGLOMERATE |
| 3 | | DS | 4.60 | 5.00 | 0.40 | 0.40 | CONGLOMERATE |
| 4 | | UCS/DS | 7.00 | 7.55 | 0.55 | 0.55 | CONGLOMERATE |
| 5 | | UCS/DS | 12.42 | 12.91 | 0.49 | 0.49 | CONGLOMERATE |
| 6 | | DS | 15.00 | 15.29 | 0.29 | 0.29 | CONGLOMERATE-SILTSTONE |
| 7 | | DS | 15.29 | 15.58 | 0.29 | 0.29 | CONGLOMERATE-SILTSTONE |
| 8 | | DS | 16.00 | 16.33 | 0.33 | 0.33 | CONGLOMERATE-SILTSTONE |
| 9 | | UCS/DS | 17.53 | 18.00 | 0.47 | 0.47 | CONGLOMERATE-SILTSTONE |
| 10 | | UCS/DS | 22.00 | 22.50 | 0.50 | 0.50 | CONGLOMERATE |
| 11 | | DS | 25.42 | 25.75 | 0.33 | 0.33 | CONGLOMERATE-SANDSTONE |
| 12 | | DS | 26.60 | 27.00 | 0.40 | 0.40 | CONGLOMERATE-SANDSTONE |
| 13 | | DS | 27.23 | 27.50 | 0.27 | 0.27 | CONGLOMERATE-SANDSTONE |
| 14 | | UCS/DS | 27.50 | 28.04 | 0.54 | 0.54 | CONGLOMERATE |

**ROCK GRAB SAMPLES : LIMESTONE**

| NO. | HOLE ID | SAMPLE ID | DEPTH (m) | | THICKNESS (m) | Dimention | LITOLOGY |
|---|---|---|---|---|---|---|---|
| | | | FROM | TO | | | |
| 1 | GRAB SAMPLE | UCS | 0.00 | 0.00 | 0.00 | about 25 x 25 | LIMESTONE |
| 2 | GRAB SAMPLE | DS | 0.00 | 0.00 | 0.00 | about 25 x 25 | LIMESTONE |

PT. HENGSAPA MINERALINDO

12/9 25

10/9 25

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nusa engineering

**SOIL SAMPLING GEOTECHNICAL DRILLING**
( TOTAL **8** SPT SAMPLES, **1** DS SAMPLES, **4** UDS SAMPLES )

**SOIL SAMPLES : SPT & UDS**

| NO. | HOLE ID | SAMPLE ID | DEPTH (m) | | THICKNESS (m) | RECOVERY (m) | LITOLOGY |
|---|---|---|---|---|---|---|---|
| | | | FROM | TO | | | |
| 1 | HM_DG_03 | SPT-1 | 2.00 | 2.45 | 0.45 | 0.35 | |
| 2 | HM_DG_01 | SPT-1 | 2.00 | 2.27 | 0.27 | 0.13 | |
| 3 | | SPT-2 | 4.00 | 4.00 | 0.00 | 0.00 | no sampel |
| 4 | HM_DG_02 | SPT-1 | 2.00 | 2.38 | 0.38 | 0.38 | |
| 5 | | DS | 2.38 | 2.63 | 0.25 | 0.25 | |
| 6 | | SPT-2 | 4.00 | 4.45 | 0.45 | 0.27 | |
| 7 | | UDS-1 | 4.50 | 5.00 | 0.50 | 0.50 | |
| 8 | | SPT-3 | 6.00 | 6.45 | 0.45 | 0.45 | |
| 9 | | SPT-4 | 8.00 | 8.45 | 0.45 | 0.23 | |
| 10 | | SPT-5 | 10.00 | 10.45 | 0.45 | 0.31 | |
| 11 | | SPT-6 | 12.00 | 12.82 | 0.82 | 0.00 | no sampel |
| 12 | | SPT-7 | 14.00 | 14.10 | 0.10 | 0.10 | |
| 13 | HM_DG_02R | UDS-1 | 0.50 | 1.00 | 0.50 | 0.50 | |
| 14 | | UDS-2 | 1.50 | 2.00 | 0.50 | 0.50 | |
| 15 | | UDS-3 | 2.50 | 3.00 | 0.50 | 0.45 | |

PT. HENGJAYA MINERALINDO
12/2 25

# APPENDIX D

## LABORATORIUM RESULT

## ( SOIL )

pt. pratama widya engineering
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GEOTECH
**Widya Griya Headquarter Jakarta**
Jl. Kelapa Buaran PLN No. 92A-D, Cikokol, Tangerang - 15117, Indonesia
Ph. (62-21) 557 82407/18 Fax. (62-21) 557 01567
Email : headoffice@pratamawidya.engineering.com
**Integrated Office Batam**
Komp. Century Park Blok D2-D3, Bengkong Sadai, Batam Centre - 29461, Indonesia
Ph. (+62-778) 451035 Fax. (+62-778) 451036
Website : www.pratamawidyaengineering.com
Soil/Rock Investigation (Onshore & Offshore) | Piezocone CPTu | Topo & Bathymetric Survey | Geological Survey | Geophysical Survey | Pumping Test

Tangerang, 17 September 2025

Kepada :
**PT. Abhipraya Nusa Engineering**
Jl. Barkah No.27 RT.003/RW.005 Ciganjur Kec. Jagakarsa, Kota Administrati Jakarta Selatan, Daerah Khusus Ibukota, Jakarta-12630

Up : Bpk. Yudi
Hp : +62 812-2363-171

Reff : DN.023-PWE-IX-2025
Subyek : Laporan Laboratorium Proyek Investigasi Geoteknik PT Hengjaya Mineralindo
Kepada Yth,

Bersama ini kami sampaikan Laporan Laboratorium Proyek Investigasi Geoteknik Properti Material *Main Haul Road* PT Hengjaya Mineralindo yang berlokasi di Site Tangofa, Morowali, Sulawesi Tengah. Intiperkasa dengan jumlah pengujian seperti tabel dibawah ini :

| No. | Name of Testing | Standard | Jumlah Test (Sampel) |
|---|---|---|---|
| **1** | **Index Properties** | | |
| A | Water Content Test | ASTM. D2216 | 13 |
| B | Unit Weight Test | | 13 |
| C | Specific Grafity Test | ASTM. D1188 | 13 |
| D | Atterberg Limits Test | ASTM. D4318 | 5 |
| E | Shrinkage | ASTM. D4318 | 5 |
| F | Grain size Test & Hydrometer Test | ASTM. D422 | 13 |
| G | Sample Preparation | | 13 |
| **2** | **Engineering Properties** | | |
| A | Unconfined Compression Test | ASTM. D2166 | 4 |
| B | Triaxial UU Test | ASTM D2850 | 3 |
| C | Direct Shear Test | ASTM. D3080 | 5 |
| D | Consolidation Test | ASTM. D2435 | 3 |

Kami sangat menghargai kesempatan untuk mengerjakan proyek ini dan jangan ragu untuk menghubungi kami jika Anda memiliki pertanyaan mengenai laporan ini atau jika kami dapat membantu lebih lanjut.

Terima kasih atas perhatian dan kerjasamanya yang baik.

Salam,
**PT. PRATAMA WIDYA ENGINEERING**

pratama widya engineering.pt

**Heriyanto**

pt. pratama widya engineering
LABORATORIUM MEKANIKA TANAH & BATUAN
GEOTECH

# ORDER TEST

No.PO/Contract :
Client : PT. ABHIPRAYA NUSA ENGINEERING
Project : Geotechnical Investigation Of Main Haul Road Properties Material
Location : Morowali Regency - Central Sulawesi Province

Batch : 1
Total Sample : 13
Date of Received : 15 Juli 2025
Reciept ID : AM-34/25

| No | Sample Code | Boring No | Depth | | Length Sample (cm) | Sample Description | Sample Type | Kind of Test | | | | | | | | | | | | | | | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Index Properties | | | | | | | Engineering Properties | | | | | | | | |
| | | | | | | | | Soil | | | | | | | Soil | | | | | | | | |
| | | | | | | | | | | | | | | | Triaxial | | | | | | | | |
| | | | From | To | | | | Water Content | Unit Weight | Spesific Gravity | Attenberg Limit | Shrinking Limit | Sieve Analysis | | Unconsolidated Undrained | Consolidated Undrained | Consolidated Drained | Direct Shear | Unconfined | Consolidation | Swelling Test | Permeability | |
| | | | | | | | | Wn | g m | Gs | Att | Ws | GZ | Hyd | UU | CU | CD | DS | UC | CC | SW | K | |
| 1 | ABH34/25-1 | HM_DG_01 | 2.00 | 2.27 | | Sandy Gravel | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material *Sandy gravel*, tidak bisa uji ATT |
| 2 | ABH34/25-2 | HM_DG_02 | 2.00 | 2.38 | | Clayey Silt | SPT | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | |
| 3 | ABH34/25-3 | | 2.38 | 2.63 | | Silty Clay | DS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | 1 | 1 | 1 | | | Kondisi *disturbed sample* (ds), Hanya diuji UC dan DS |
| 4 | ABH34/25-4 | | 4.00 | 4.45 | | Gravelly Sand | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material *gravelly sand*, tidak bisa uji ATT |
| 5 | ABH34/25-5 | | 4.50 | 5.00 | | Gravelly Sand | UDS | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | 1 | 1 | 1 | | | Material *gravelly sand* , tidak bisa diuji ATT, UU, UC, CC |
| 6 | ABH34/25-6 | | 6.00 | 6.45 | | Sandy Gravel | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material *Sandy gravel*, tidak bisa uji ATT |
| 7 | ABH34/25-7 | | 8.00 | 8.45 | | Sandy Gravel | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material *Sandy gravel*, tidak bisa uji ATT |
| 8 | ABH34/25-8 | | 10.00 | 10.45 | | Gravelly Sand | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material *gravelly sand*, tidak bisa uji ATT |
| 9 | ABH34/25-9 | | 14.00 | 14.10 | | Sandy Gravel | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material *Sandy gravel*, tidak bisa uji ATT |
| 10 | ABH34/25-10 | HM_DG_02 R | 0.50 | 1.00 | | Silty Clay | UDS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 1 | 1 | 1 | | | |
| 11 | ABH34/25-11 | | 1.50 | 2.00 | | Silty Clay | UDS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 1 | 1 | 1 | | | |
| 12 | ABH34/25-12 | | 2.50 | 3.00 | | Gravelly Silt | UDS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 1 | 1 | 1 | | | |
| 13 | ABH34/25-13 | HM_DG_03 | 2.00 | 2.45 | | Gravely Sand | SPT | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | | | | Material dominan *gravelly Sand*, tidak bisa uji ATT |
| Total Sample Requests | | | | | | | | 13 | 13 | 13 | 13 | 5 | 13 | 13 | 4 | | | 5 | 5 | 5 | | | |
| Total Sample Test Conducted | | | | | | | | 13 | 13 | 13 | 5 | 5 | 13 | 13 | 3 | | | 5 | 4 | 3 | | | |
| Total Untestable Sample | | | | | | | | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 1 | | | 0 | 1 | 2 | | | |

Note :

1. *Srinkage* dilakukan pada 5 sampel materil *cohesive*
2. Pengujian Pada HM_DG_02 karena material berupa *non cohesive* tidak dapat dilakukan pengujian TX UU dan UC yang kami ganti dengan *Direct Shear* untuk pengujian *engineering properties*
3. Pengujian Konsolidasi pada sampel HM_DG_02 kedalaman 2.38 - 2.63, sample merupakan *disturbed sample* yang tidak direkomendasikan untuk dilakukan pengujian sesuai dengan SNI
4. Pengujian Konsolidasi pada sample HM_DG_02 kedalaman 4.5 - 5.0, hasil pengujian *grain size* berupa *gravelly sand*, dimana material ini tidak memungkinkan untuk dilakukan pengujian

# LAMPIRAN A

# SUMMARY OF LABORATORY TEST

GEOTECH

pt. pratama widya engineering
LABORATORIUM MEKANIKA TANAH & BATUAN
GEOTECH
Jl.Kelapa Buaran PLN No.92 A-D Cikokol, Tangerang 15117
Phone : (+6221) 55782407 & 55782418

# SERTIFIKAT HASIL UJI

Nomor :008-LPWE-I-07-2025 Revisi :00

No.PO/Contract :
Pemohon Uji : PT. HENGJAYA MINERALINDO

Tgl Diterima : 17 Juli ' 2025
Tgl Pengujian : 18 Juli s/d 29 Juli ' 2025

**PROJECT** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL**
**LOCATION** : **MOROWALI REGENCY - CENTRAL SULAWESI**

## SUMMARY OF SOIL SAMPLE TEST RESULT

| Test | Method | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Code | | ABH34/25-1 | ABH34/25-2 | ABH34/25-3 | ABH34/25-4 | ABH34/25-5 | ABH34/25-6 | ABH34/25-7 |
| | | Bore Hole No. | | HM_DG_01 | HM_DG_02 | | | | | |
| | | Sample Depth | in m | 2.00 - 2.27 ( S ) | 2.00 - 2.38 ( S ) | 2.38 - 2.63 ( C ) | 4.00 - 4.45 ( S ) | 4.50 - 5.00 ( U ) | 6.00 - 6.45 ( S ) | 8.00 - 8.45 ( S ) |
| Gradation | SNI 3423-2008 | Gravel | in % | 61.00 | | 5.00 | 33.00 | 46.00 | 64.00 | 57.00 |
| | | Sand | in % | 28.00 | 7.00 | 21.00 | 51.00 | 53.00 | 34.00 | 36.00 |
| | | Silt | in % | 10.00 | 81.00 | 27.00 | 16.00 | 1.00 | 2.00 | 7.00 |
| | | Clay | in % | 1.00 | 12.00 | 47.00 | - | - | - | - |
| Atterberg | SNI 1967:2008 | * Liquid Limit | in % | - | 71.00 | 38.50 | - | - | - | - |
| | SNI 1966:2008 | * Plastic Limit | in % | - | 36.32 | 32.30 | - | - | - | - |
| | SNI 1966:2008 | * Plasticity index | in % | - | 34.68 | 6.20 | - | - | - | - |
| | | Soil Type | in % | - | ML | CH | - | - | - | - |
| | SNI 3422:2008 | Shrinkage Limit | | - | 48.50 | 26.66 | - | - | - | - |
| | SNI 1964:2008 | * Specific Grafity | | 2.701 | 2.702 | 2.630 | 2.696 | 2.646 | 2.693 | 2.705 |
| | SNI 03-3637-1994 | * Dry Density | in t/m³ | - | - | 1.145 | - | 1.089 | - | - |
| | | Coefficient of Permeability | in cm/sec | - | - | - | - | | - | - |
| Natural State | SNI 1965:2019 | * Water Content | in % | 17.65 | 57.49 | 53.30 | 39.69 | 41.47 | 57.79 | 64.00 |
| | SNI 03-3637-1994 | * Wet Density | in t/m³ | - | - | 1.755 | - | 1.54 | - | - |
| | | Void Ratio | | - | - | 1.297 | - | 1.429 | - | - |
| | | Porosity | in % | - | - | 0.565 | - | 0.588 | - | - |
| | | Degree of Saturation | in % | - | - | 100.00 | - | 76.78 | - | - |
| Point Load | ASTM D5731 | Estimed Compressive Strength | in Mpa | - | - | - | - | - | - | - |
| Unconfined / UCS | SNI 03-3638-2012 | Compressive Strength | in kg/cm² | - | - | 0.675 | - | - | - | - |
| | | Remolded | in kg/cm² | - | - | 0.501 | - | - | - | - |
| | | Sensitivity | | - | - | 1.348 | - | - | - | - |
| | | Young's Modulus | in kg/cm² | - | - | - | - | - | - | - |
| | | Poison's Ratio | | - | - | - | - | - | - | - |
| Triaxial CU | SNI 03-2455-200x | Cohesion | in kg/cm² | - | - | - | - | - | - | - |
| | | Cohesion Eff. | in kg/cm² | - | - | - | - | - | - | - |
| | | Angle of internal friction | in ° | - | - | - | - | - | - | - |
| | | Angle of internal friction eff. | in ° | - | - | - | - | - | - | - |
| Triaxial UU | SNI 4813-2015 | Cohesion | in kg/cm² | - | - | - | - | - | - | - |
| | | Angle of internal friction | in ° | - | - | - | - | - | - | - |
| Direct Shear | SNI 3420:2008 | Cohesion | in kg/cm² | - | - | 0.18 | - | 0.41 | - | - |
| | | Angle of internal friction | in ° | - | - | 27 | - | 46 | - | - |
| Consolidation | SNI 2812-2011 | Coeff. of consolidation | in cm/sec | - | - | - | - | - | - | - |
| | | Compression index (Cc lab) | | - | - | - | - | - | - | - |
| | | Compression index (Cc Field) | | - | - | - | - | - | - | - |
| | | Recompression Index Cr | | - | - | - | - | - | - | - |
| | | Overburden pressure P0 | in kg/cm² | - | - | - | - | - | - | - |
| | | Preloading Pc | in kg/cm² | - | - | - | - | - | - | - |

Remarks : U : Thin Wall Sample
C : Core Sample
S : SPT Sample

* = Parameter dalam proses akreditasi KAN
** = Hasil pengujian Lab Subkontrak
***= Penyangkalan (*disclaimer*)

*LPWE.FRM.AM.21 I Version :2.1*

Tangerang,
**Kepala Laboratorium**

( Rumandani Wulan, S.T )

pt. pratama widya engineering
LABORATORIUM MEKANIKA TANAH & BATUAN
GEOTECH
Jl.Kelapa Buaran PLN No.92 A-D Cikokol, Tangerang 15117
Phone : (+6221) 55782407 & 55782418

# SERTIFIKAT HASIL UJI

Nomor :007-LPWE-I-07-2025 Revisi :00

No.PO/Contract :
Pemohon Uji : PT. HENGJAYA MINERALINDO

Tgl Diterima : 17 Juli ' 2025
Tgl Pengujian : 18 Juli s/d 29 Juli ' 2025

**PROJECT** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL**
**LOCATION** : **MOROWALI REGENCY - CENTRAL SULAWESI**

## SUMMARY OF SOIL SAMPLE TEST RESULT

| Test | Method | | | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|
| | | Sample Code | | ABH34/25-8 | ABH34/25-9 | ABH34/25-10 | ABH34/25-11 | ABH34/25-12 | ABH34/25-13 |
| | | Bore Hole No. | | HM_DG_02 | | HM_DG_02 R | | | HM_DG_03 |
| | | Sample Depth | in m | 10.00 - 10.45 ( S ) | 14.00 - 14.10 ( S ) | 0.50 - 1.00 ( U ) | 1.50 - 2.00 ( U ) | 2.50 - 3.00 ( U ) | 2.00 - 2.45 ( S ) |
| Gradation | SNI 3423-2008 | Gravel | in % | 47.00 | 68.00 | 1.00 | 7.00 | 3.00 | 44.00 |
| | | Sand | in % | 50.00 | 31.00 | 7.00 | 8.00 | 12.00 | 46.00 |
| | | Silt | in % | 3.00 | 1.00 | 43.00 | 44.00 | 45.00 | 10.00 |
| | | Clay | in % | - | - | 49.00 | 41.00 | 40.00 | - |
| Atterberg | SNI 1967:2008 | * Liquid Limit | in % | - | - | 64.50 | 68.50 | 74.00 | - |
| | SNI 1966:2008 | * Plastic Limit | in % | - | - | 27.31 | 27.50 | 30.90 | - |
| | SNI 1966:2008 | * Plasticity index | in % | - | - | 37.19 | 41.00 | 43.10 | - |
| | | Soil Type | in % | - | - | CH | CH | CH | - |
| | SNI 3422:2008 | Shrinkage Limit | | - | - | 41.48 | 44.77 | 61.66 | - |
| | SNI 1964:2008 | * Specific Grafity | | 2.706 | 2.699 | 2.626 | 2.635 | 2.649 | 2.700 |
| | SNI 03-3637-1994 | * Dry Density | in t/m³ | - | - | 1.194 | 1.182 | 0.970 | - |
| | | Coefficient of Permeability | in cm/sec | - | - | - | - | - | - |
| Natural State | SNI 1965:2019 | * Water Content | in % | 41.88 | 20.16 | 51.31 | 57.41 | 62.98 | 17.66 |
| | SNI 03-3637-1994 | * Wet Density | in t/m³ | - | - | 1.807 | 1.861 | 1.581 | - |
| | | Void Ratio | | - | - | 1.199 | 1.229 | 1.731 | - |
| | | Porosity | in % | - | - | 0.545 | 0.551 | 0.634 | - |
| | | Degree of Saturation | in % | - | - | 100.00 | 100.00 | 96.39 | - |
| Point Load | ASTM D5731 | Estimed Compressive Strength | in Mpa | - | - | - | - | - | - |
| Unconfined / UCS | SNI 03-3638-2012 | Compressive Strength | in kg/cm² | - | - | - | - | - | - |
| | | Remolded | in kg/cm² | - | - | 0.371 | 0.505 | 0.319 | - |
| | | Sensitivity | | - | - | - | - | - | - |
| | | Young's Modulus | in kg/cm² | - | - | - | - | - | - |
| | | Poison's Ratio | | - | - | - | - | - | - |
| Triaxial CU | SNI 03-2455-200x | Cohesion | in kg/cm² | - | - | - | - | - | - |
| | | Cohesion Eff. | in kg/cm² | - | - | - | - | - | - |
| | | Angle of internal friction | in ° | - | - | - | - | - | - |
| | | Angle of internal friction eff. | in ° | - | - | - | - | - | - |
| Triaxial UU | SNI 4813-2015 | Cohesion | in kg/cm² | - | - | 0.23 | 0.28 | 0.13 | - |
| | | Angle of internal friction | in ° | - | - | 12.00 | 12.90 | 10.5 | - |
| Direct Shear | SNI 3420:2008 | Cohesion | in kg/cm² | - | - | 0.19 | 0.27 | 0.19 | - |
| | | Angle of internal friction | in ° | - | - | 25 | 20 | 26 | - |
| Consolidation | SNI 2812-2011 | Coeff. of consolidation | in cm/sec | - | - | 1.62.E-02 | 2.05.E-02 | 1.77.E-02 | - |
| | | Compression index (Cc lab) | | - | - | 0.294 | 0.398 | 0.661 | - |
| | | Compression index (Cc Field) | | - | - | 0.306 | 0.442 | 0.747 | - |
| | | Recompression Index Cr | | - | - | 0.003 | 0.010 | 0.033 | - |
| | | Overburden pressure P0 | in kg/cm² | - | - | 0.092 | 0.255 | 0.373 | - |
| | | Preloading Pc | in kg/cm² | - | - | 2.500 | 2.700 | 3.000 | - |

Remarks : U : Thin Wall Sample
C : Core Sample
S : SPT Sample

* = Parameter dalam proses akreditasi KAN
** = Hasil pengujian Lab Subkontrak
***= Penyangkalan (*disclaimer*)

*LPWE.FRM.AM.21 / Version :2.1*

Tangerang,
**Kepala Laboratorium**

( Rumandani Wulan, S.T )

# LAMPIRAN B

# SRINGKANGE LIMIT,
# WATER CONTENT & UNIT WEIGHT

GEOTECH

# SHRINKAGE LIMIT TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**Project** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL**
**Location** : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE**
**Date** : 20 August ' 2025
**Tested By** : Sigit

| BORING NO | DEPTH | Sample Code | Cont no. | weight of container | Wt of wet soil+ cont | Wt of dry soil + cont | Wt of dry soil | Volume wet soil | Volume dry soil | | Water content | Shrinkage Ratio ( R ) | Shrinkage limit % (S) | Average (S) % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | *W* | *Vo* | | | | |
| HM_DG_02 | 2.00 - 2.38 | ABH34/25-2 | C-11 | 61.92 | 131.04 | 101.33 | 39.41 | 39.25 | 379.86 | 28.14 | 75.39 | 1.40 | 47.19 | **48.50** |
| | | | C-12 | 61.99 | 129.05 | 99.95 | 37.96 | 39.25 | 392.24 | 29.05 | 76.66 | 1.31 | 49.80 | |
| | 2.38 - 2.63 | ABH34/25-3 | C-13 | 60.88 | 113.10 | 92.24 | 31.36 | 39.25 | 360.22 | 26.68 | 66.52 | 1.18 | 26.44 | **25.66** |
| | | | C-14 | 62.10 | 115.49 | 95.10 | 33.00 | 39.25 | 365.45 | 27.07 | 61.79 | 1.22 | 24.88 | |
| HM_DG_02 R | 0.50 - 1.00 | ABH34/25-10 | C-15 | 62.30 | 133.27 | 102.75 | 40.45 | 39.25 | 349.36 | 25.88 | 75.45 | 1.56 | 42.39 | **41.48** |
| | | | C-16 | 59.75 | 127.56 | 98.28 | 38.53 | 39.25 | 345.63 | 25.60 | 75.99 | 1.50 | 40.57 | |
| | 1.50 - 2.00 | ABH34/25-11 | C-17 | 61.87 | 130.97 | 101.54 | 39.67 | 39.25 | 374.13 | 27.71 | 74.19 | 1.43 | 45.11 | **44.77** |
| | | | C-21 | 61.99 | 128.55 | 99.35 | 37.36 | 39.25 | 359.76 | 26.65 | 78.16 | 1.40 | 44.43 | |
| | 2.50 - 3.00 | ABH34/25-12 | C-22 | 61.66 | 124.42 | 96.11 | 34.45 | 39.25 | 432.72 | 32.05 | 82.18 | 1.07 | 61.29 | **61.66** |
| | | | C-30 | 60.72 | 123.06 | 95.06 | 34.34 | 39.25 | 439.47 | 32.55 | 81.54 | 1.05 | 62.04 | |

Remarks

$Vo = W / \gamma hg$

*Vo* = volume of dry soil — $cm^3$
*W* = weight of spilled mercury — gram
*γhg* = density of mercury (13,5) — $gr/cm^3$

# WATER CONTENT & UNIT WEIGHT

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**Project** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL**
**Location** : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE**
**Date of test** : July ' 2025

**Tested by** : Hani
**Computed by** : Ricko
**Checked by** : Wulan

| WATER CONTENT | | | | | | | | | | | | UNIT WEIGHT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No.** | **Bore Hole** | **Depth ( m )** | | **Sample type** | **Soil Description** | **Cont. no.** | **Weight of Container + Wet Soil ( gr )** | **Weight of Container + Dry Soil ( gr )** | **Weight of Container ( gr )** | **Water Content ( % )** | **Average Water Content ( % )** | **Weight Wet Sample** | **Volume of Mould ( cm3 )** | **Unit Weight ( gr/cm$^{3}$ )** | **Pocket Penetrometer ( kg/cm$^{2}$ )** |
| | | **From** | **To** | | | | | | | | | | | | |
| ABH34/25-1 | HM_DG_01 | 2.00 | 2.27 | SPT | Silty Gravel, Dark Brown | 12 | 49.82 | 43.77 | 10.63 | 18.26 | **17.65** | - | - | - | - |
| | | | | | | 183 | 49.75 | 44.07 | 10.75 | 17.05 | | | | | |
| ABH34/25-2 | HM_DG_02 | 2.00 | 2.38 | SPT | Silt, Reddish Brown | 284 | 52.30 | 36.69 | 10.79 | 60.27 | **57.49** | - | - | - | - |
| | | | | | | 33 | 52.51 | 37.73 | 10.71 | 54.70 | | | | | |
| ABH34/25-3 | | 2.38 | 2.63 | DS | Clay, Light Brown | 119 | 42.32 | 30.54 | 10.52 | 58.84 | **53.30** | 68.89 | 39.25 | **1.755** | **2.00** |
| | | | | | | 224 | 42.96 | 32.53 | 10.69 | 47.76 | | | | | |
| ABH34/25-4 | | 4.00 | 4.45 | SPT | Silty Gravel, Reddish Brown | 9 | 48.97 | 38.11 | 10.67 | 39.58 | **39.69** | - | - | - | - |
| | | | | | | 184 | 50.82 | 39.31 | 10.39 | 39.80 | | | | | |
| ABH34/25-5 | | 4.50 | 5.00 | UDS | Silty Gravel, Reddish Brown | 14 | 72.66 | 54.07 | 10.77 | 42.93 | **41.47** | 61.84 | 39.25 | **1.576** | **Gravel** |
| | | | | | | 10 | 72.46 | 54.78 | 10.58 | 40.00 | | | | | |
| ABH34/25-6 | | 6.00 | 6.45 | SPT | Silty Gravel, Dark Brown | 23 | 39.11 | 28.61 | 10.55 | 58.14 | **57.79** | - | - | - | - |
| | | | | | | 99 | 40.84 | 29.88 | 10.80 | 57.44 | | | | | |
| ABH34/25-7 | | 8.00 | 8.45 | SPT | Silty Gravel, Dark Brown | 22 | 49.39 | 34.01 | 10.77 | 66.18 | **64.00** | - | - | - | - |
| | | | | | | 1 | 49.61 | 34.68 | 10.53 | 61.82 | | | | | |
| ABH34/25-8 | | 10.00 | 10.45 | SPT | Silty Gravel, Dark Grey | 143 | 44.35 | 34.37 | 10.57 | 41.93 | **41.88** | - | - | - | - |
| | | | | | | 90 | 44.57 | 34.63 | 10.87 | 41.84 | | | | | |
| ABH34/25-9 | | 14.00 | 14.10 | SPT | Silty Gravel, Reddish Brown | 162 | 49.26 | 42.53 | 10.72 | 21.16 | **20.16** | - | - | - | - |
| | | | | | | 221 | 49.46 | 43.22 | 10.67 | 19.17 | | | | | |

# WATER CONTENT & UNIT WEIGHT

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**Project** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL**
**Location** : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE**
**Date of test** : July ' 2025

**Tested by** : Hani
**Computed by** : Ricko
**Checked by** : Wulan

| WATER CONTENT | | | | | | | | | | | | UNIT WEIGHT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No.** | **Bore Hole** | **Depth ( m )** | | **Sample type** | **Soil Description** | **Cont. no.** | **Weight of Container + Wet Soil ( gr )** | **Weight of Container + Dry Soil ( gr )** | **Weight of Container ( gr )** | **Water Content ( % )** | **Average Water Content ( % )** | **Weight Wet Sample** | **Volume of Mould ( cm3 )** | **Unit Weight ( gr/cm$^3$ )** | **Pocket Penetrometer ( kg/cm$^2$ )** |
| | | **From** | **To** | | | | | | | | | | | | |
| ABH34/25-10 | HM_DG_02 R | 0.50 | 1.00 | UDS | Clay, Reddish Brown | 285 | 46.12 | 34.04 | 10.57 | 51.47 | **51.31** | 70.92 | 39.25 | **1.807** | **1.00** |
| | | | | | | 31 | 46.85 | 34.65 | 10.80 | 51.15 | | | | | |
| ABH34/25-11 | | 1.50 | 2.00 | UDS | Clay, Brown | 52 | 40.78 | 29.72 | 10.86 | 58.64 | **57.41** | 73.04 | 39.25 | **1.861** | **1.25** |
| | | | | | | 151 | 42.43 | 31.06 | 10.82 | 56.18 | | | | | |
| ABH34/25-12 | | 2.50 | 3.00 | UDS | Gravelly Clay, Brown | 126 | 45.03 | 32.06 | 10.72 | 60.78 | **62.98** | 62.05 | 39.25 | **1.581** | **1.00** |
| | | | | | | 99 | 45.63 | 31.76 | 10.48 | 65.18 | | | | | |
| ABH34/25-13 | HM_DG_03 | 2.00 | 2.45 | SPT | Gravelly Sand, Light Brown | 107 | 45.81 | 40.45 | 10.67 | 18.00 | **17.66** | - | - | - | - |
| | | | | | | 257 | 45.92 | 40.75 | 10.90 | 17.32 | | | | | |
| | | | | | | | | | | | | | | | |
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# LAMPIRAN C

# SPECIFIC GRAVITY TEST

GEOTECH

# SPESIFIC GRAVITY

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**PROJECT** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PRPOERTIES MATERIAL**
**LOCATION** : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE**
**Date** : **July ' 2025**
**Tested by** : **Hani**
**Computed by** : **Ricko**
**Checked by** : **Wulan**

| NO | ABH34/25-1 | ABH34/25-2 | ABH34/25-3 | ABH34/25-4 | ABH34/25-5 | ABH34/25-6 | ABH34/25-7 | ABH34/25-8 | ABH34/25-9 |
|---|---|---|---|---|---|---|---|---|---|
| BOR NO | **HM_DG-01** | **HM_DG-02** | | | | | | | |
| DEPTH | **2.00 - 2.27** | **2.00 - 2.38** | **2.38 - 2.63** | **4.00 - 4.45** | **4.50 - 5.00** | **6.00 - 6.45** | **8.00 - 8.45** | **10.00 - 10.45** | **14.00 - 14.10** |
| PICNOMETER NO. | P.01 | P.02 | P.04 | P.05 | P.06 | P.07 | P.08 | P.09 | P.10 |
| Weight of PICNOMETER + Sample ( W1) | 56.8382 | 49.7125 | 57.9452 | 59.3469 | 55.6462 | 58.7011 | 61.3661 | 57.7183 | 59.7152 |
| Weight of PICNOMETER( W2) | 41.6397 | 34.518 | 42.7532 | 44.1534 | 40.4488 | 43.5098 | 46.1691 | 42.5218 | 44.5218 |
| Weight of Sample WT = ( W1 - W2 ) | 15.1985 | 15.1945 | 15.192 | 15.1935 | 15.1974 | 15.1913 | 15.197 | 15.1965 | 15.1934 |
| Weight of PICNOMETER + Water | 97.0502 | 93.2503 | 95.2045 | 96.1241 | 97.7968 | 97.0754 | 96.5591 | 94.8879 | 98.9934 |
| Wt of Picnometer + water + Sample ( W3 ) | 106.6244 | 102.8229 | 103.62977 | 105.68198 | 107.2512 | 106.627 | 106.1391 | 104.4689 | 108.5582 |
| Temperature T1 , 0°C | 32° | 32° | 32° | 32° | 32° | 32° | 32° | 32° | 32° |
| Weight of Picnometer + Water at T X $^0$ C (W4) | 97.0531 | 93.2522 | 94.204 | 96.1245 | 97.7965 | 97.0759 | 96.5595 | 94.8883 | 98.9936 |
| W5 = W1 - W2 + W4 ( WS ) | 112.2516 | 108.4467 | 109.3960 | 111.3180 | 112.9939 | 112.2672 | 111.7565 | 110.0848 | 114.1870 |
| Volume of sample = ( W5 - W3 ) | 5.6272 | 5.6238 | 5.7662 | 5.6360 | 5.7427 | 5.6402 | 5.6174 | 5.6159 | 5.6288 |
| Specific Gravity ( K WT / ( W5 - W3 )) | 2.701 | 2.702 | 2.635 | 2.696 | 2.646 | 2.693 | 2.705 | 2.706 | 2.699 |
| Average Specific Gravity | | | | | | | | | |

Remarks

# SPESIFIC GRAVITY

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**PROJECT** : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PRPOERTIES MATERIAL**
**LOCATION** : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE**
**Date** : **July ' 2025**
**Tested by** : **Hani**
**Computed by** : **Ricko**
**Checked by** : **Wulan**

| NO | ABH34/25-10 | ABH34/25-11 | ABH34/25-12 | ABH34/25-13 |
|---|---|---|---|---|
| BOR NO | **HM_DG_02 R** | | | **HM_DG_03** |
| DEPTH | **0.50 - 1.00** | **1.50 - 2.00** | **2.50 - 3.00** | **2.00 - 2.45** |
| PICNOMETER NO. | P.11 | P.12 | P.13 | P.14 |
| Weight of PICNOMETER + Sample ( W1) | 58.2504 | 50.9100 | 61.6924 | 59.7247 |
| Weight of PICNOMETER( W2) | 43.0542 | 35.7177 | 46.493 | 44.5294 |
| Weight of Sample WT = ( W1 - W2 ) | 15.1962 | 15.1923 | 15.1994 | 15.1953 |
| Weight of PICNOMETER + Water | 97.7435 | 92.6433 | 97.6444 | 96.3036 |
| Wt of Picnometer + water + Sample ( W3 ) | 107.1524 | 102.0633 | 107.1062 | 105.8712 |
| Temperature T1 , 0°C | 32° | 32° | 32° | 32° |
| Weight of Picnometer + Water at T X $^{0}$ C (W4) | 97.7436 | 92.6485 | 97.6449 | 96.3039 |
| W5 = W1 - W2 + W4 ( WS ) | 112.9398 | 107.8408 | 112.8443 | 111.4992 |
| Volume of sample = ( W5 - W3 ) | 5.7874 | 5.7775 | 5.7381 | 5.6280 |
| Specific Gravity ( K WT / ( W5 - W3 )) | 2.626 | 2.630 | 2.649 | 2.700 |
| Average Specific Gravity | | | | |

Remarks

# LAMPIRAN D

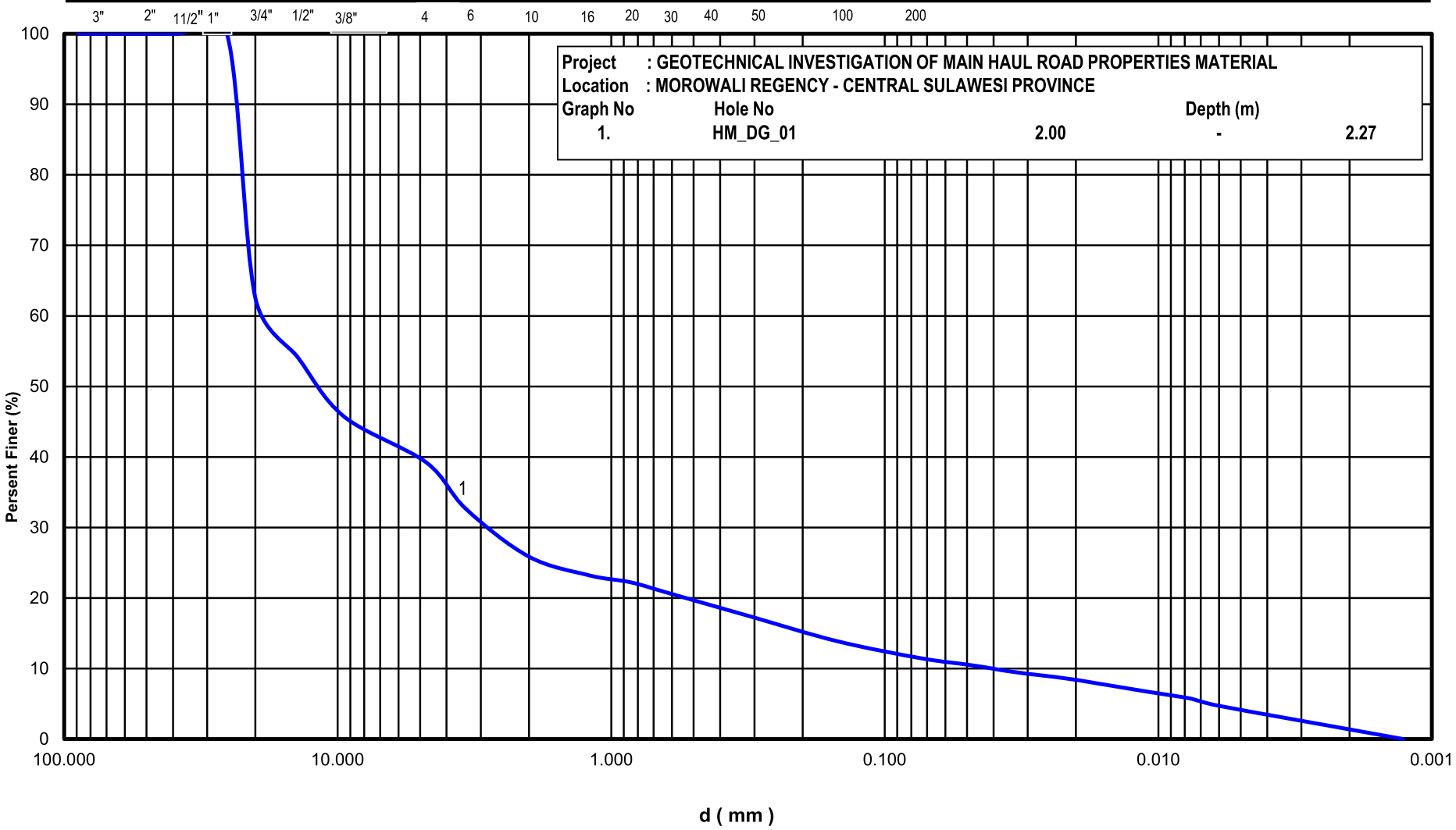
# GRAINSIZE DISTRIBUTION CURVE

GEOTECH

# GRAINSIZE DISTRIBUTION CURVE

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

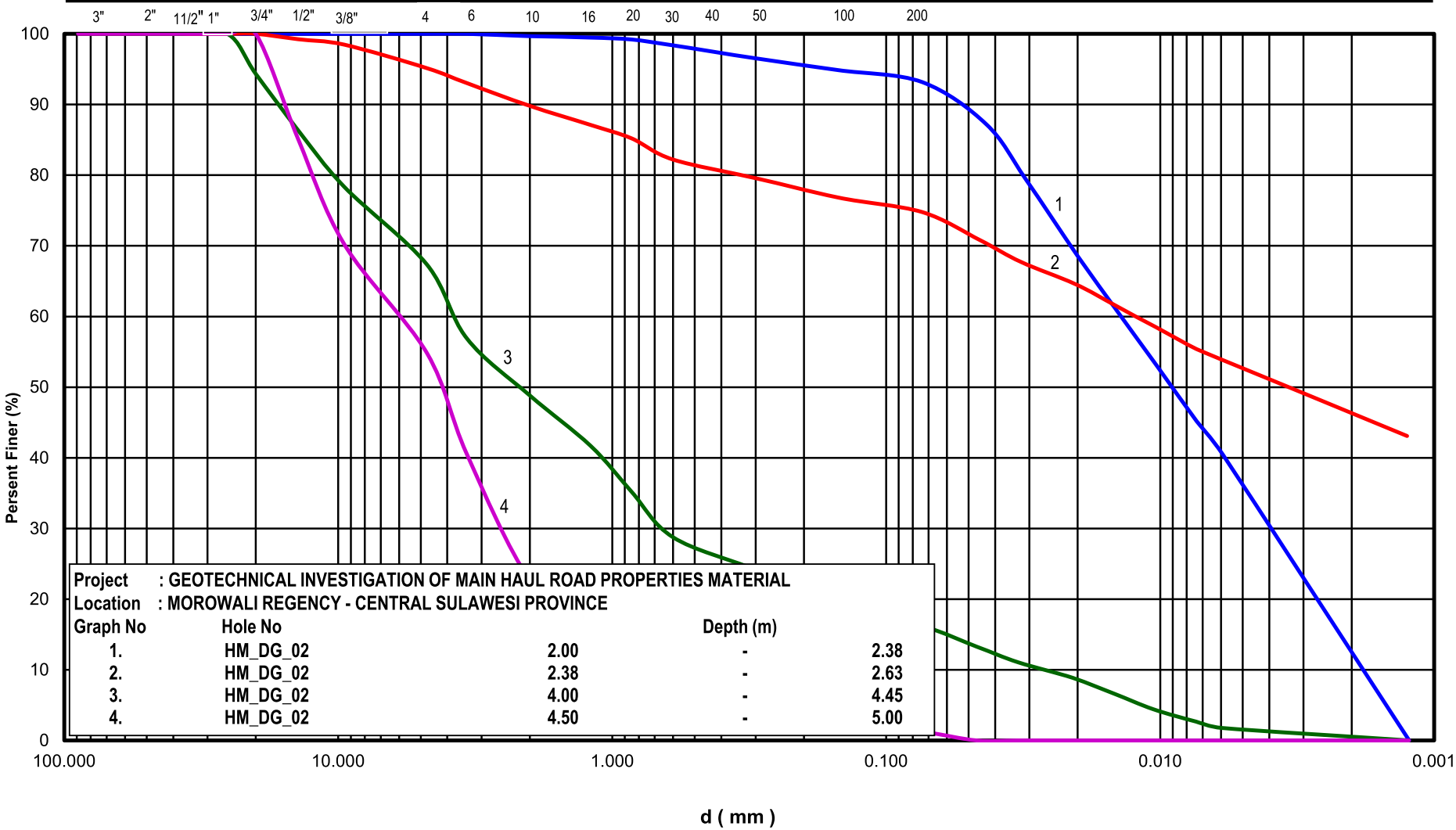
| GRAVEL | | SAND | | | SILT FRACTION | CLAY FRACTION |
|---|---|---|---|---|---|---|
| C | F | C | M | F | | |



# GRAINSIZE DISTRIBUTION CURVE

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GEOTECH

| GRAVEL | | SAND | | | SILT FRACTION | CLAY FRACTION |
|---|---|---|---|---|---|---|
| C | F | C | M | F | | |



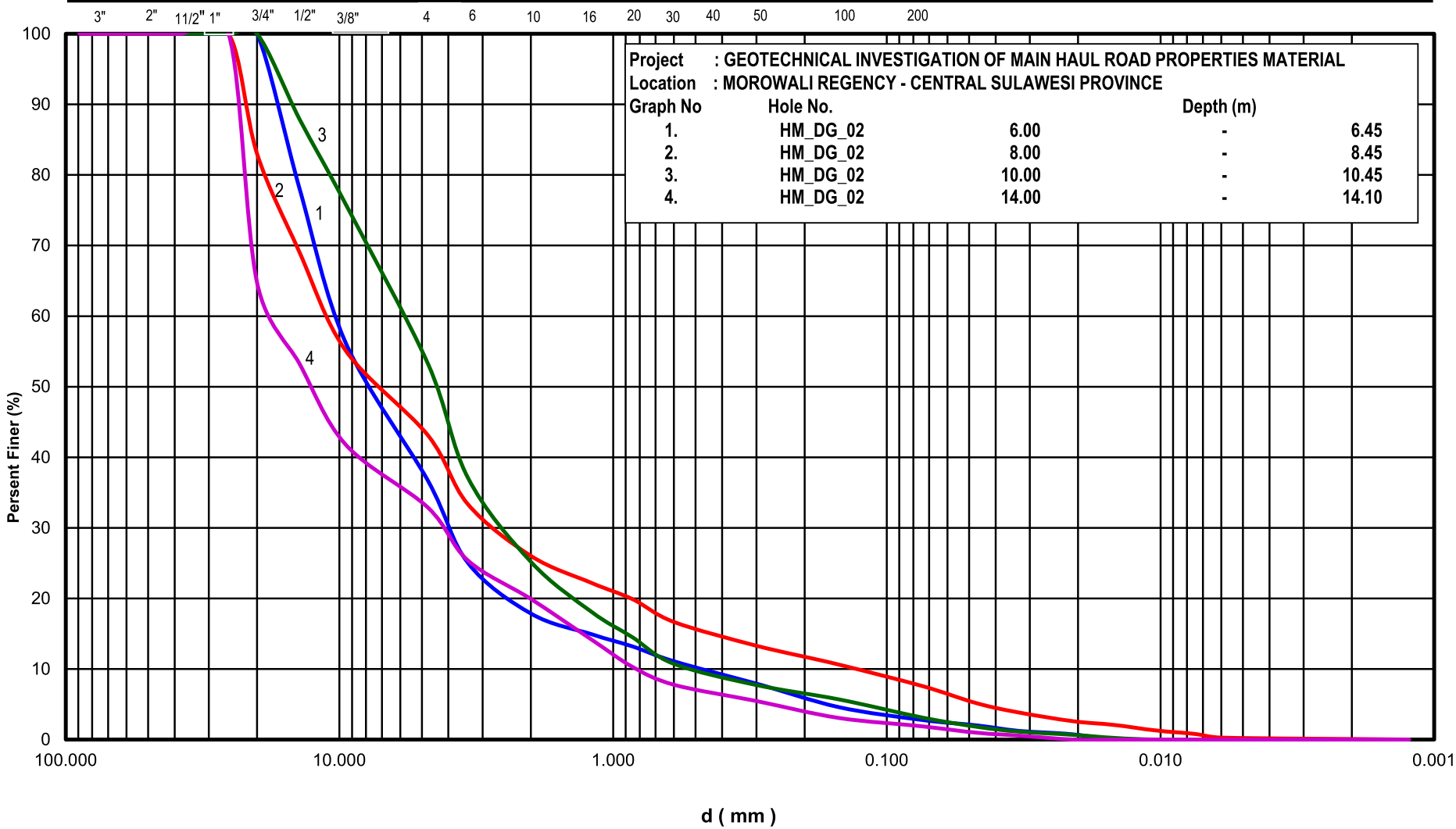

Project : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL
Location : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE

| Graph No | Hole No | Depth (m) | | |
|---|---|---|---|---|
| 1. | HM_DG_02 | 2.00 | - | 2.38 |
| 2. | HM_DG_02 | 2.38 | - | 2.63 |
| 3. | HM_DG_02 | 4.00 | - | 4.45 |
| 4. | HM_DG_02 | 4.50 | - | 5.00 |

# GRAINSIZE DISTRIBUTION CURVE

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| GRAVEL | | SAND | | | SILT FRACTION | CLAY FRACTION |
|---|---|---|---|---|---|---|
| C | F | C | M | F | | |



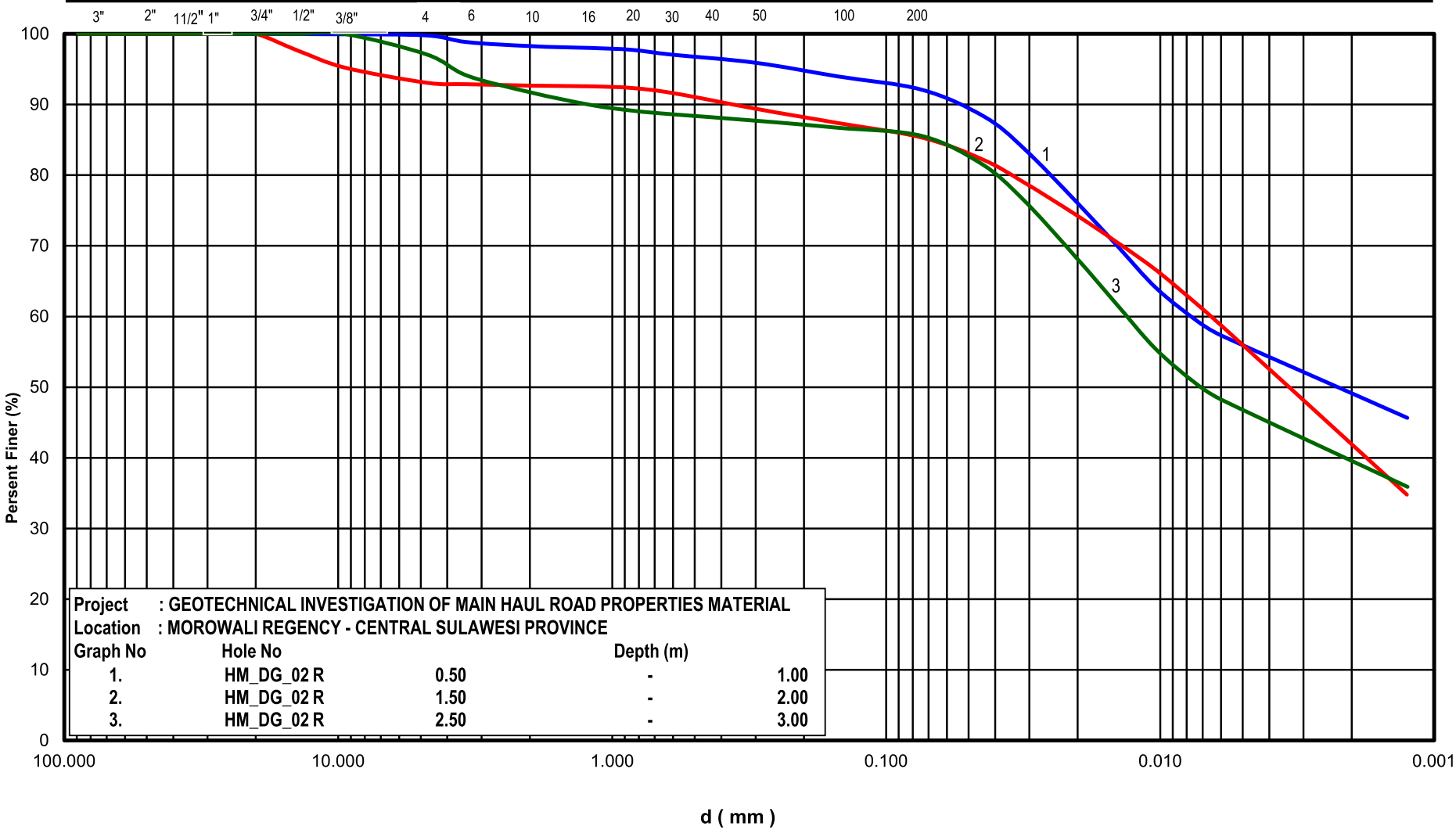

Project : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL
Location : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE

| Graph No | Hole No. | Depth (m) | | |
|---|---|---|---|---|
| 1. | HM_DG_02 | 6.00 | - | 6.45 |
| 2. | HM_DG_02 | 8.00 | - | 8.45 |
| 3. | HM_DG_02 | 10.00 | - | 10.45 |
| 4. | HM_DG_02 | 14.00 | - | 14.10 |

# GRAINSIZE DISTRIBUTION CURVE

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| GRAVEL | | SAND | | | SILT FRACTION | CLAY FRACTION |
|---|---|---|---|---|---|---|
| C | F | C | M | F | | |

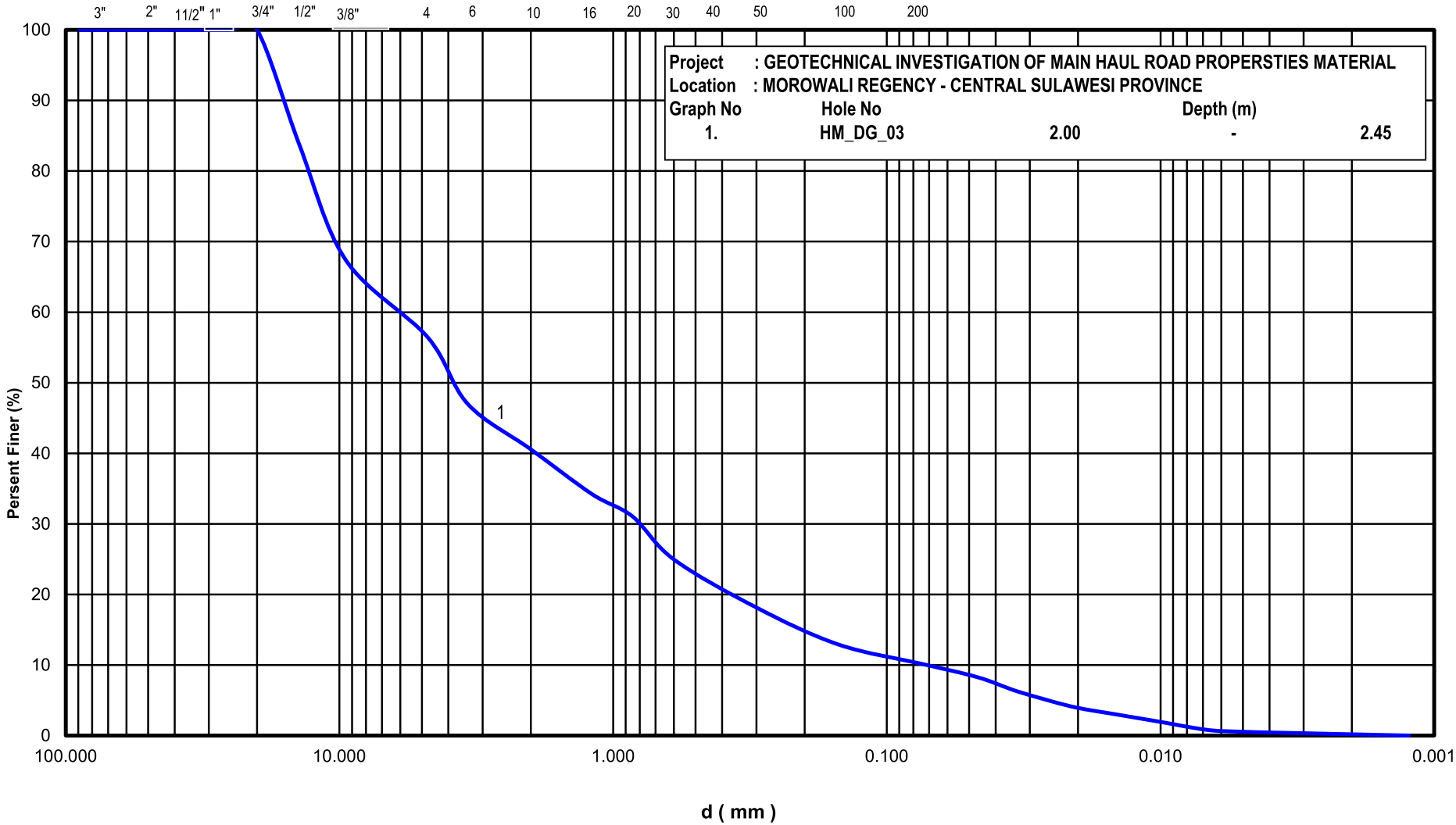



| | | | | |
|---|---|---|---|---|
| Project | : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL | | | |
| Location | : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE | | | |
| Graph No | Hole No | Depth (m) | | |
| 1. | HM_DG_02 R | 0.50 | - | 1.00 |
| 2. | HM_DG_02 R | 1.50 | - | 2.00 |
| 3. | HM_DG_02 R | 2.50 | - | 3.00 |

# GRAINSIZE DISTRIBUTION CURVE

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| GRAVEL | | SAND | | | SILT FRACTION | CLAY FRACTION |
|---|---|---|---|---|---|---|
| C | F | C | M | F | | |




Project : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERSTIES MATERIAL
Location : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE

| Graph No | Hole No | Depth (m) | | |
|---|---|---|---|---|
| 1. | HM_DG_03 | 2.00 | - | 2.45 |

# LAMPIRAN E

# PLASTICITY CHART

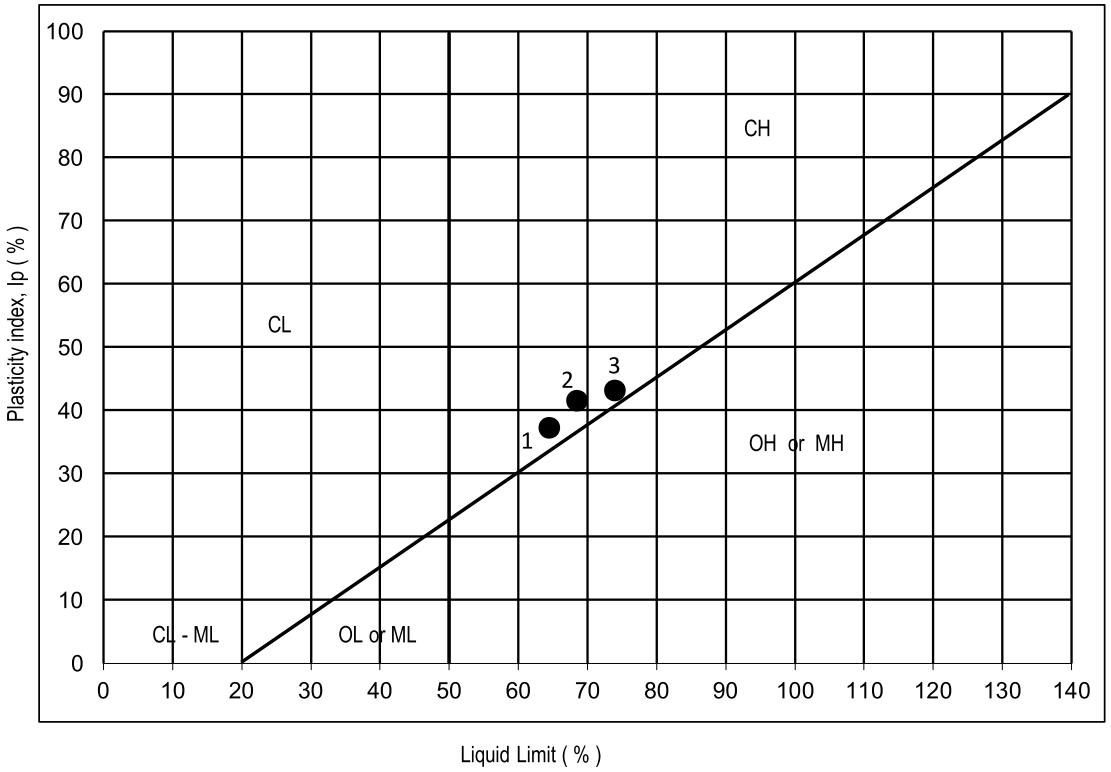
GEOTECH

# PLASTICITY CHART

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**PROJECT** : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL
**LOCATION** : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE
**DATE** : July ' 2025

**TESTED BY** : Alvin
**COMPUTED BY** : Ricko
**CHECKED BY** : Wulan




**REMARKS**

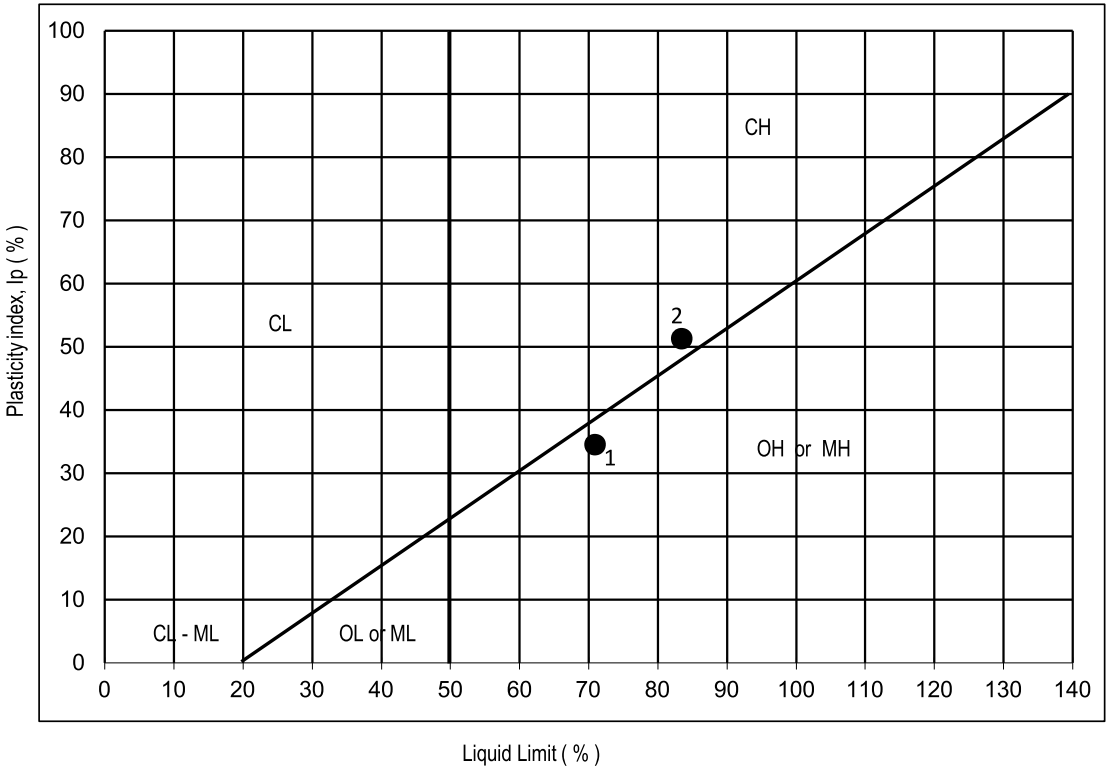
| No | SAMPEL KODE | BORE HOLE | DEPTH ( m ) | CLASS |
|---|---|---|---|---|
| 1 | ABH34/25-10 | HM_DG_02 R | 0.50 - 1.00 | CH |
| 2 | ABH34/25-11 | HM_DG_02 R | 1.50 - 2.00 | CH |
| 3 | ABH34/25-12 | HM_DG_02 R | 2.50 - 3.00 | CH |

# PLASTICITY CHART

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

**PROJECT** : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL
**LOCATION** : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE
**DATE** : July ' 2025

**TESTED BY** : Alvin
**COMPUTED BY** : Ricko
**CHECKED BY** : Wulan




**REMARKS**

| No | SAMPEL KODE | BORE HOLE | DEPTH ( m ) | CLASS |
|---|---|---|---|---|
| 1 | ABH34/25-2 | HM_DG_02 | 2.00 - 2.38 | MH |
| 2 | ABH34/25-3 | HM_DG_02 | 2.38 - 2.63 | CH |

# LAMPIRAN F

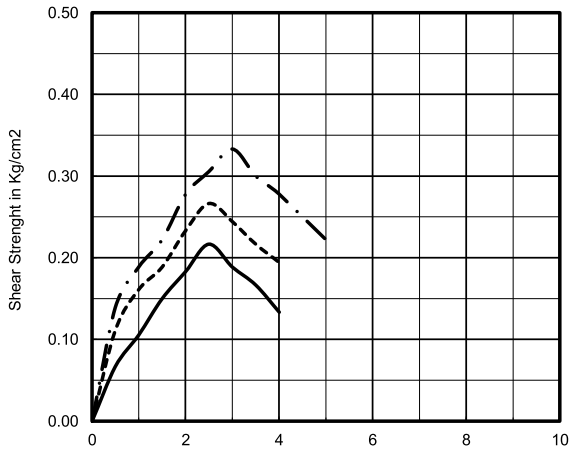
# DIRECT SHEAR TEST
# (DS)

GEOTECH

# DIRECT SHEAR TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

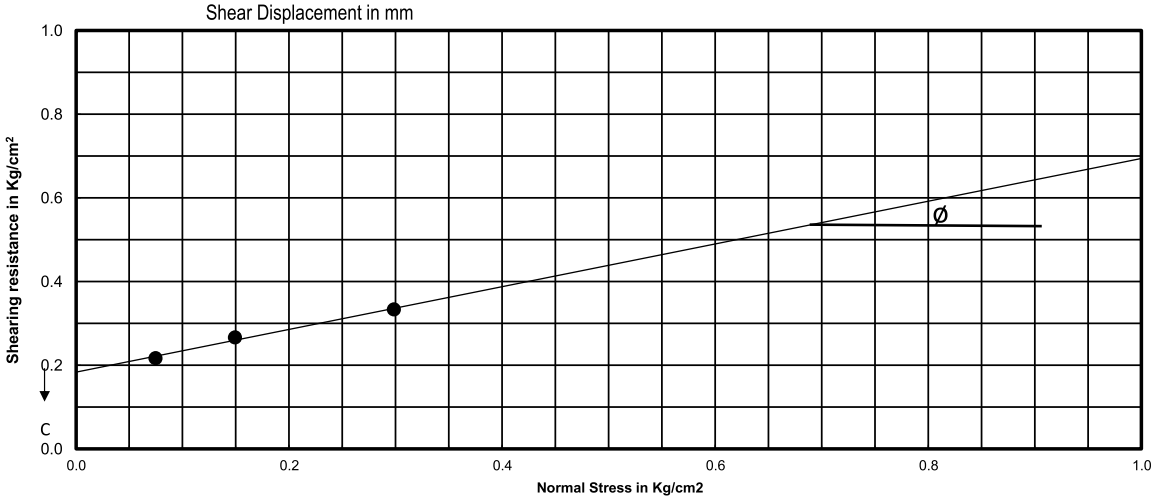
| | | | | | |
|---|---|---|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Sigit |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Rk |
| **Drilling No.** | : | HM_DG_02 | **Checked by** | : | Ars |
| **Depth** | : | 2.38 - 2.63 | **Sample ID** | : | ABH34/25-3 |
| **Soil Type** | : | Clay, Brown | **Date** | : | Aug-25 |




| Maximum Shearing Resistence (kg/cm2) | | | |
|---|---|---|---|
| A | B | C | D |
| 0.217 | 0.267 | | 0.333 |

| | | | |
|---|---|---|---|
| Callibration | : | 0.1676 | kg/div |
| Area | : | 30.175 | cm2 |
| High | : | 2 | cm |

| Angel of Internal Friction | Degree | Cohesion | $Kg/cm^2$ |
|---|---|---|---|
| Ø | 27 | C | 0.18 |




Normal stress in kg/cm2

| | | |
|---|---|---|
| A | = | 0.075 |
| B | = | 0.149 |
| C | = | |
| D | = | 0.298 |

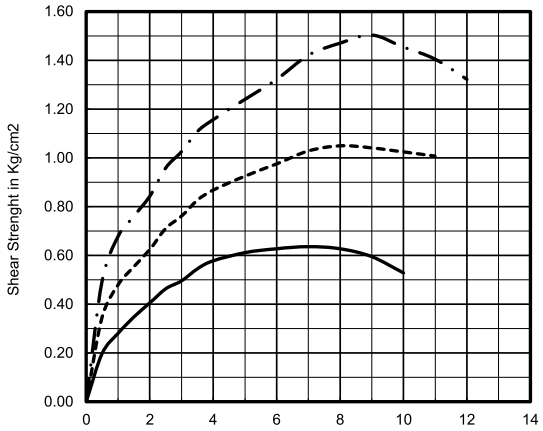
Unit Weight in t/m3

| | | |
|---|---|---|
| A | = | 1.627 |
| B | = | 1.627 |
| C | = | |
| D | = | 1.631 |

# DIRECT SHEAR TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

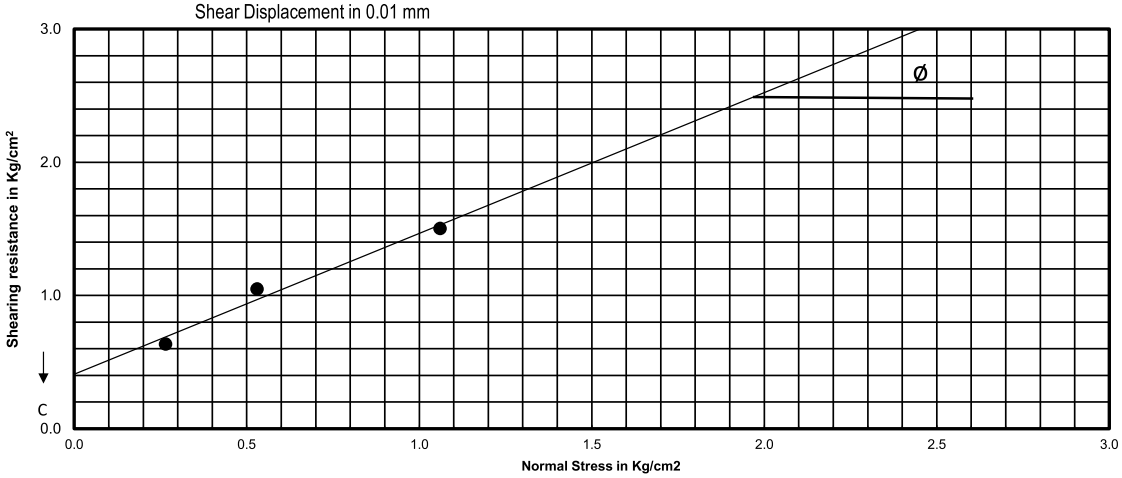
| | | | | | |
|---|---|---|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Ricko |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Ricko |
| **Drilling No.** | : | HM_DG_02 | **Checked by** | : | Wulan |
| **Depth** | : | 4.50 - 5.00 | **Sample ID** | : | ABH34/25-5 |
| **Soil Type** | : | Silty Grave l, Reddish Brown | **Date** | : | July ' 2025 |




| Maximum Shearing Resistence (kg/cm2) | | | |
|---|---|---|---|
| A | B | C | D |
| 0.636 | 1.049 | | 1.503 |

| | | | |
|---|---|---|---|
| Callibration | : | 0.4985 | kg/div |
| Area | : | 30.1754 | cm2 |
| High | : | 2 | cm |

| Angel of Internal Friction | Degree | Cohesion | Kg/cm$^2$ |
|---|---|---|---|
| Ø | 46 | C | 0.41 |




Normal stress in kg/cm2

| | | |
|---|---|---|
| A | = | 0.265 |
| B | = | 0.530 |
| C | = | |
| D | = | 1.060 |

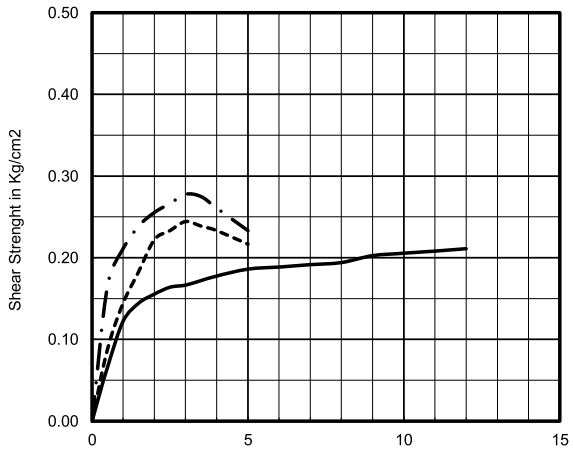
Unit Weight in t/m3

| | | |
|---|---|---|
| A | = | 1.561 |
| B | = | 1.568 |
| C | = | |
| D | = | 1.575 |

# DIRECT SHEAR TEST

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GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| | | | | | |
|---|---|---|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Sigit |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Aris |
| **Drilling No.** | : | HM_DG_02R | **Checked by** | : | Heri |
| **Depth** | : | 0.50 - 1.00 | **Sample ID** | : | ABH34/25-10 |
| **Soil Type** | : | Clay, Reddish Brown ( *Remoulded condition sample* ) | **Date** | : | Aug-25 |




| Maximum Shearing Resistence (kg/cm2) | | | |
|---|---|---|---|
| A | B | C | D |
| 0.211 | 0.244 | | 0.278 |

| | | | |
|---|---|---|---|
| Callibration | : | 0.1676 | kg/div |
| Area | : | 30.175 | cm2 |
| High | : | 2 | cm |

| Angel of Internal Friction | Degree | Cohesion | $Kg/cm^2$ |
|---|---|---|---|
| Ø | 25 | C | 0.19 |




Normal stress in kg/cm2

| | | |
|---|---|---|
| A | = | 0.045 |
| B | = | 0.090 |
| C | = | |
| D | = | 0.180 |

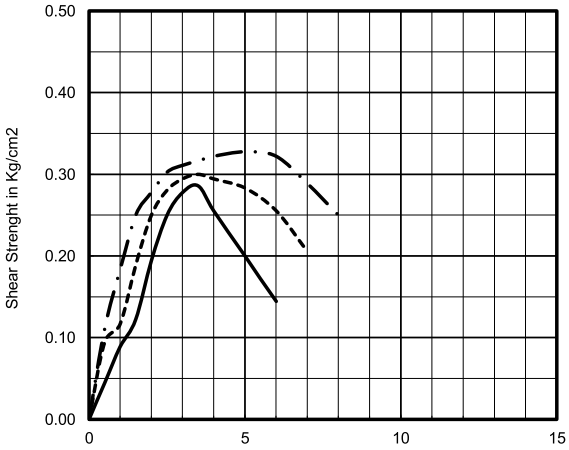
Unit Weight in t/m3

| | | |
|---|---|---|
| A | = | 1.797 |
| B | = | 1.797 |
| C | = | |
| D | = | 1.798 |

# DIRECT SHEAR TEST

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GEOTECH

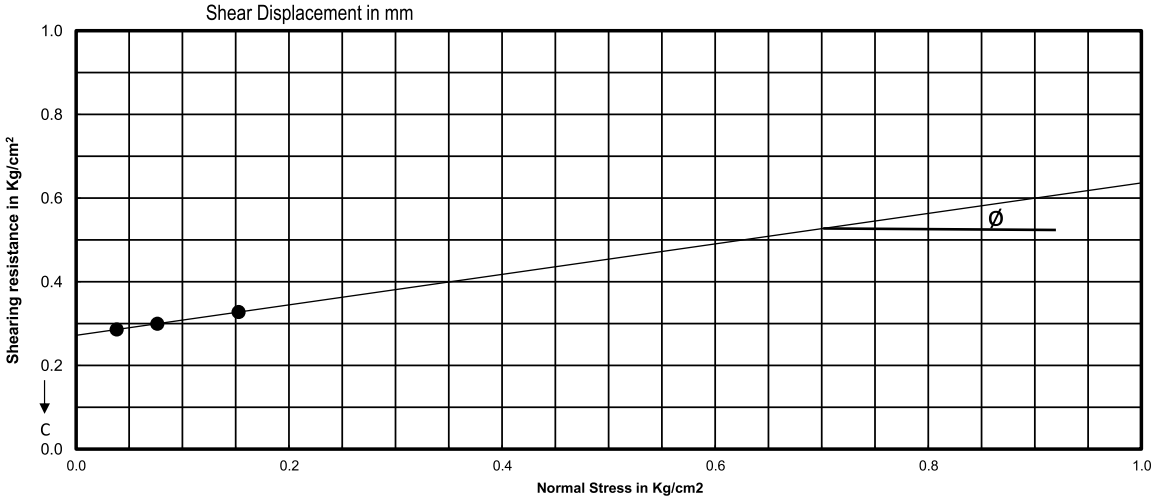
| | | | | | |
|---|---|---|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Sigit |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Aris |
| **Drilling No.** | : | HM_DG_02R | **Checked by** | : | Heri |
| **Depth** | : | 1.50 - 2.00 | **Sample ID** | : | ABH34/25-11 |
| **Soil Type** | : | Clay, Brown ( *Remoulded condition sample* ) | **Date** | : | Aug-25 |




| Maximum Shearing Resistence (kg/cm2) | | | |
|---|---|---|---|
| A | B | C | D |
| 0.286 | 0.300 | | 0.328 |

| | | | |
|---|---|---|---|
| Callibration | : | 0.1676 | kg/div |
| Area | : | 30.175 | cm2 |
| High | : | 2 | cm |

| Angel of Internal Friction | Degree | Cohesion | Kg/cm$^2$ |
|---|---|---|---|
| Ø | 20 | C | 0.27 |




Normal stress in kg/cm2

| | | |
|---|---|---|
| A | = | 0.038 |
| B | = | 0.076 |
| C | = | |
| D | = | 0.152 |

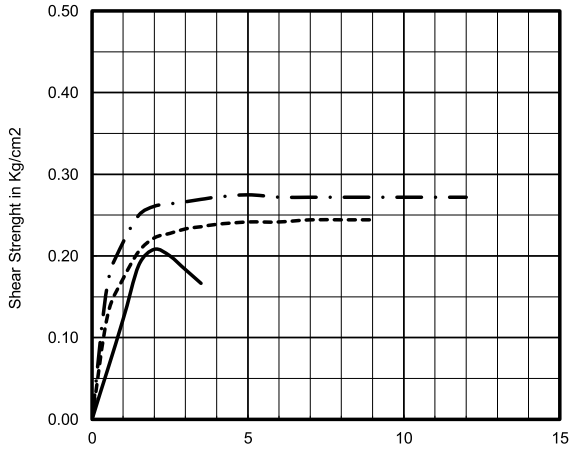
Unit Weight in t/m3

| | | |
|---|---|---|
| A | = | 1.775 |
| B | = | 1.520 |
| C | = | |
| D | = | 1.522 |

# DIRECT SHEAR TEST

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GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

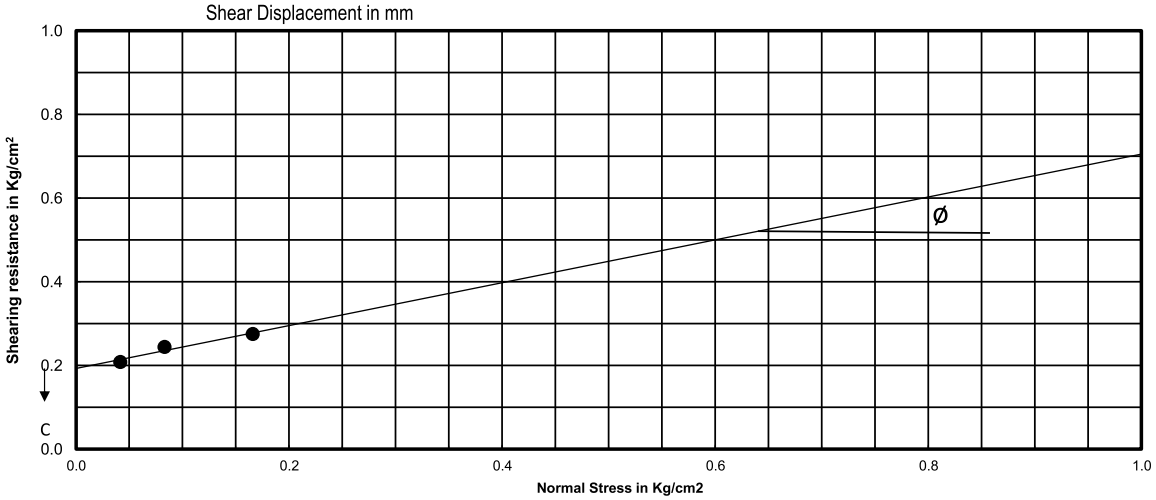
| | | | | | |
|---|---|---|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Sigit |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Aris |
| **Drilling No.** | : | HM_DG_02R | **Checked by** | : | Heri |
| **Depth** | : | 2.50 - 3.00 | **Sample ID** | : | ABH34/25-12 |
| **Soil Type** | : | Gravelly Clay, Brown ( *Remoulded condition sample* ) | **Date** | : | Aug-25 |




| Maximum Shearing Resistence (kg/cm2) | | | |
|---|---|---|---|
| A | B | C | D |
| 0.208 | 0.244 | | 0.275 |

| | | | |
|---|---|---|---|
| Callibration | : | 0.1676 | kg/div |
| Area | : | 30.175 | cm2 |
| High | : | 2 | cm |

| Angel of Internal Friction | Degree | Cohesion | Kg/cm$^2$ |
|---|---|---|---|
| Ø | 26 | C | 0.19 |




Normal stress in kg/cm2

| | | |
|---|---|---|
| A | = | 0.041 |
| B | = | 0.083 |
| C | = | |
| D | = | 0.166 |

Unit Weight in t/m3

| | | |
|---|---|---|
| A | = | 1.514 |
| B | = | 1.520 |
| C | = | |
| D | = | 1.522 |

# LAMPIRAN G

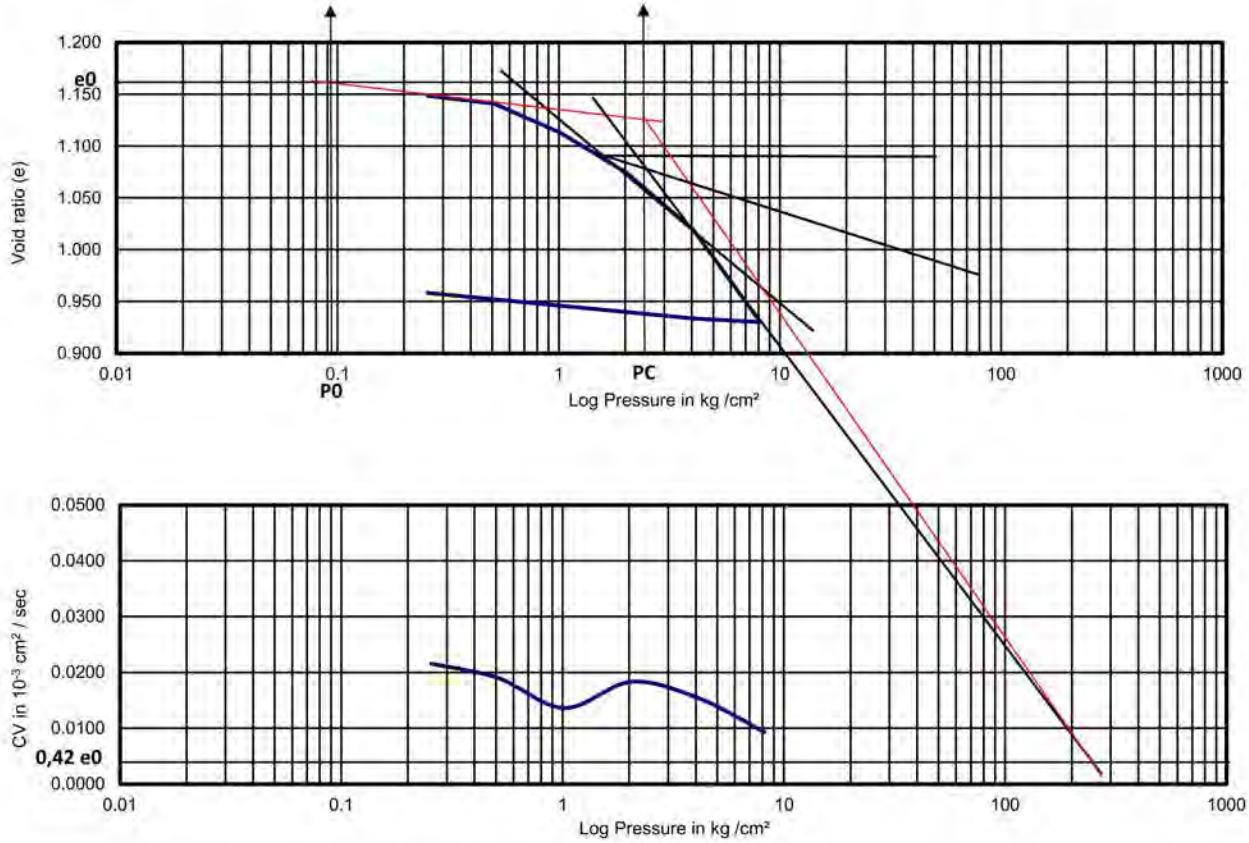
# CONSOLIDATION TEST
# (CC)

GEOTECH

# CONSOLIDATION TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES

| | | | | | |
|---|---|---|---|---|---|
| Project | : GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL | | Sample Height | : 2.00 | cm |
| Location | : MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE | | Sample Dia | : 5.00 | cm |
| Boring/Point No | : HM_DG_02 R | | Sample Area | : 19.63 | $cm^2$ |
| Depth m | : 0.50 - 1.00 | | Tested by | : Marshall | |
| Test Start | : July ' 2025 | | Checked by | : Wulan | |



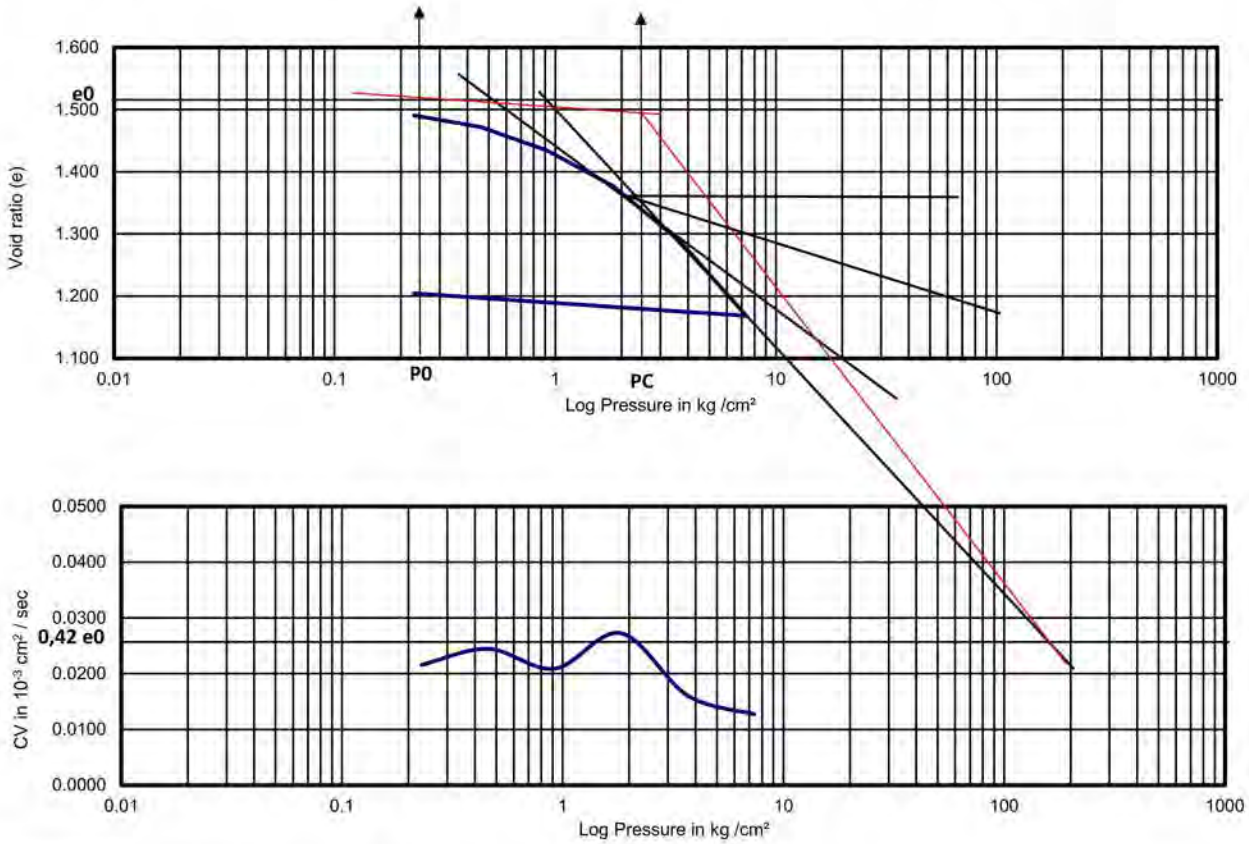

| | | Initial | Final |
|---|---|---|---|
| Water Content | % | 48.75 | 48.75 |
| Wet Density | $gr/cm^2$ | 1.837 | 1.995 |
| Dry density | $gr/cm^3$ | 1.235 | 1.341 |
| Specific Grafity | | 2.626 | |
| Void Ratio | | 1.126 | 0.958 |
| Porosity | | 0.530 | 0.489 |
| Degree of saturation | % | 100.00 | 100.00 |

| | | |
|---|---|---|
| Recompression Index Cr | 0.003 | |
| Overburden pressure P0 | 0.092 | kg/cm2 |
| Preloading Pc | 2.500 | kg/cm2 |
| Insitu Void Ratio e0 | 1.161 | |
| Compression Index Cc Field | 0.306 | |
| Compression Index Cc Lab | 0.294 | |
| Coefficient of Consolidation Cv | 1.62E-02 | $cm^2/sec$ |

# CONSOLIDATION TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES

| | | | | | |
|---|---|---|---|---|---|
| Project | : | GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL | Sample Height | : 2.00 | cm |
| Location | : | MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE | Sample Dia | : 5.00 | cm |
| Boring/Point No | : | HM_DG_02R | Sample Area | : 19.63 | $cm^2$ |
| Depth m | : | 1.50 - 2.00 | Tested by | : Marshall | |
| Test Start | : | July ' 2025 | Checked by | : Wulan | |



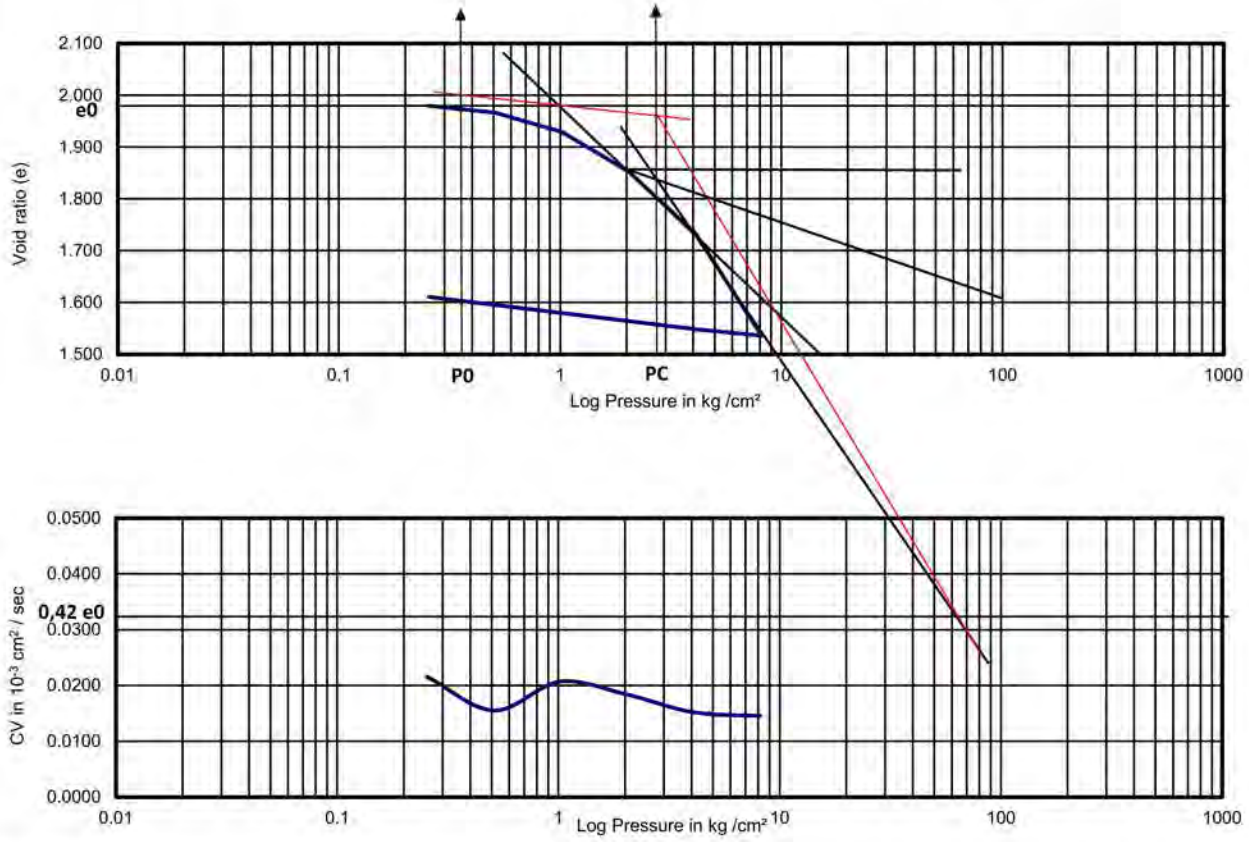

| | | Initial | Final |
|---|---|---|---|
| Water Content | % | 58.44 | 58.44 |
| Wet Density | $gr/cm^2$ | 1.701 | 1.894 |
| Dry density | $gr/cm^3$ | 1.073 | 1.195 |
| Specific Grafity | | 2.635 | |
| Void Ratio | | 1.455 | 1.204 |
| Porosity | | 0.593 | 0.546 |
| Degree of saturation | % | 100.00 | 100.00 |

| | | |
|---|---|---|
| Recompression Index Cr | 0.010 | |
| Overburden pressure P0 | 0.255 | kg/cm2 |
| Preloading Pc | 2.550 | kg/cm2 |
| Insitu Void Ratio e0 | 1.512 | |
| Compression Index Cc Field | 0.448 | |
| Compression Index Cc Lab | 0.398 | |
| Coefficient of Consolidation Cv | 2.05E-02 | $cm^2/sec$ |

# CONSOLIDATION TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES

| | | | | | |
|---|---|---|---|---|---|
| Project | : | GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL | Sample Height | : 2.00 | cm |
| Location | : | MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE | Sample Dia | : 5.00 | cm |
| Boring/Point No | : | HM_DG_02R | Sample Area | : 19.63 | $cm^2$ |
| Depth m | : | 2.50 - 3.00 | Tested by | : Marshall | |
| Test Start | : | July ' 2025 | Checked by | : Wulan | |




| | | Initial | Final |
|---|---|---|---|
| Water Content | % | 67.10 | 67.10 |
| Wet Density | $gr/cm^2$ | 1.490 | 1.696 |
| Dry density | $gr/cm^3$ | 0.892 | 1.015 |
| Specific Grafity | | 2.649 | |
| Void Ratio | | 1.970 | 1.610 |
| Porosity | | 0.663 | 0.617 |
| Degree of saturation | % | 90.23 | 100.00 |

| | | |
|---|---|---|
| Recompression Index Cr | 0.033 | |
| Overburden pressure P0 | 0.373 | kg/cm2 |
| Preloading Pc | 2.800 | kg/cm2 |
| Insitu Void Ratio e0 | 1.992 | |
| Compression Index Cc Field | 0.731 | |
| Compression Index Cc Lab | 0.661 | |
| Coefficient of Consolidation Cv | 1.77E-02 | $cm^2$/sec |

# LAMPIRAN H

# UNCONFINED COMPRESSION TEST (UCT)

GEOTECH

# UNCONFINED COMPRESSION TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| | | |
|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** |
| **Drilling No.** | : | **HM_DG_02** |
| **Depth (m)** | : | **2.38 - 2.63** |
| **Sampel Code** | : | **ABH34/25-3** |
| **Tested by** | : | **Riko** |
| **Computed by** | : | **Riko** |
| **Checked by** | : | **Wulan** |
| **Date of test** | : | **July ' 2025** |

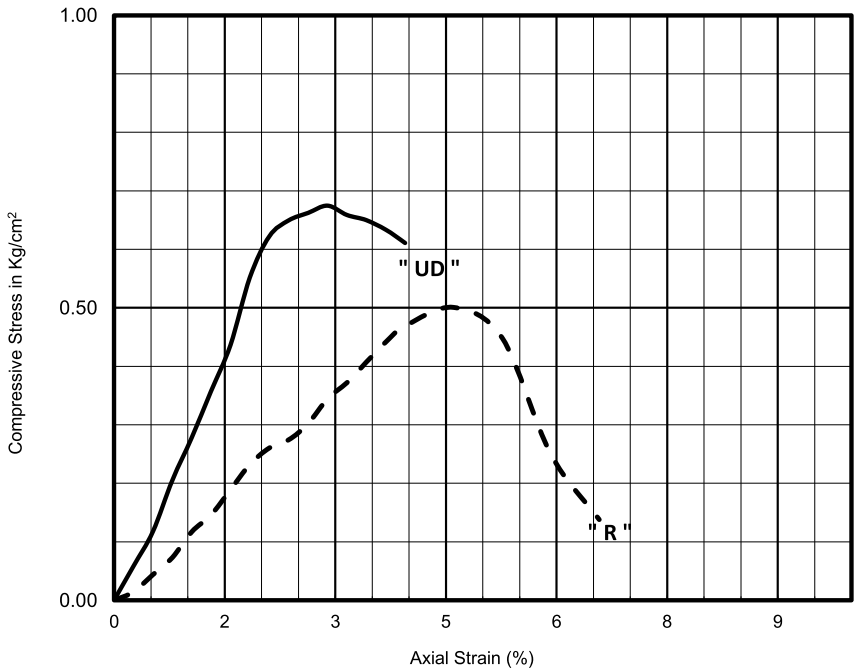
| SAMPLE CONDITION | | " U.D. " | " R " |
|---|---|---|---|
| Water content | % | 63.85 | 62.89 |
| Wet density | gr/cm3 | 1.556 | 1.547 |
| Dry density | gr/cm3 | 0.950 | 0.950 |
| Specific Gravity | | 2.635 | |
| Void ratio | | 1.775 | 1.775 |
| Saturation | % | 87.40 | 84.85 |
| Unc. Comp. Strength | $Kg/cm^2$ | 0.675 | 0.501 |
| Sensitivity | | 1.348 | |
| Specimen diameter | mm | 38 | |
| Specimen height | mm | 76 | |

**Sensitivity**

| | | | | |
|---|---|---|---|---|
| | < | 2 | : | Insensitive |
| 2 | - | 4 | : | Moderately sensitive |
| 4 | - | 8 | : | Sensitive |
| 8 | - | 16 | : | Very sensitive |
| 16 | - | 32 | : | Slightly quick |
| 32 | - | 64 | : | Medium quick |
| | > | 64 | : | Quick |

**Consistency in $Kg/cm^2$**

| | | | | |
|---|---|---|---|---|
| | < | 0.2 | : | Very soft |
| 0.25 | - | 0.50 | : | Soft |
| 0.50 | - | 1.00 | : | Medium |
| 1.00 | - | 2.00 | : | Stiff |
| 2.00 | - | 4.00 | : | Very stiff |
| | > | 4.00 | : | Hard |




Failure Sketch :

" Undisturbed "



" Remolded "



# UNCONFINED COMPRESSION TEST

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GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| | | |
|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** |
| **Drilling No.** | : | **HM_DG_02R** |
| **Depth (m)** | : | **0.50 - 1.00** |
| **Sampel Code** | : | **ABH34/25-10** |
| **Tested by** | : | **Eko** |
| **Computed by** | : | **Ars** |
| **Checked by** | : | **Heri** |
| **Date of test** | : | **Aug' 2025** |

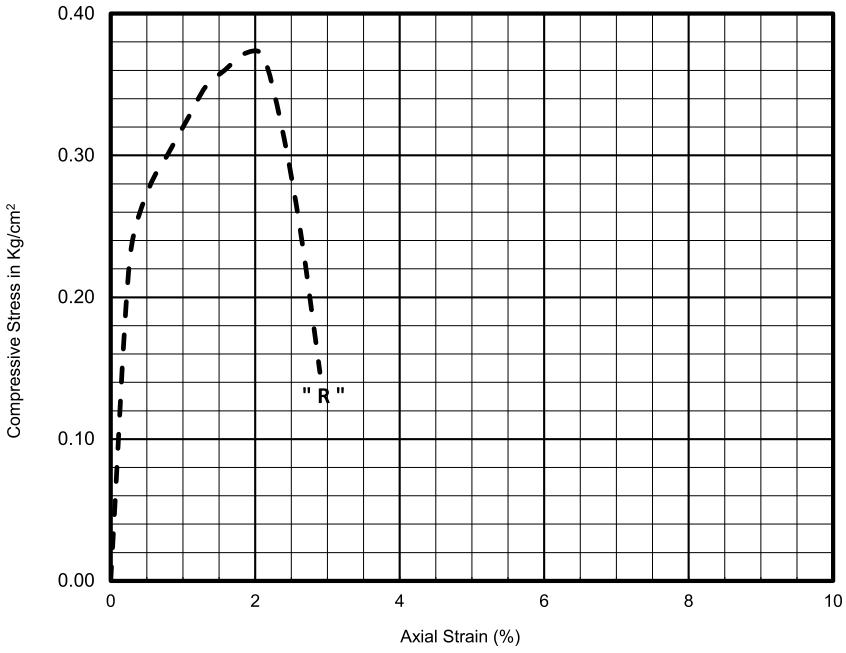
| SAMPLE CONDITION | | " U.D. " | " R " |
|---|---|---|---|
| Water content | % | | 57.10 |
| Wet density | gr/cm3 | | 1.814 |
| Dry density | gr/cm3 | | 1.154 |
| Specific Gravity | | 2.626 | |
| Void ratio | | | 1.275 |
| Saturation | % | | 100.00 |
| Unc. Comp. Strength | $Kg/cm^2$ | | 0.371 |
| Sensitivity | | | |
| Specimen diameter | mm | 38 | |
| Specimen height | mm | 76 | |

**Sensitivity**

| | | | | |
|---|---|---|---|---|
| | < | 2 | : | Insensitive |
| 2 | - | 4 | : | Moderately sensitive |
| 4 | - | 8 | : | Sensitive |
| 8 | - | 16 | : | Very sensitive |
| 16 | - | 32 | : | Slightly quick |
| 32 | - | 64 | : | Medium quick |
| | > | 64 | : | Quick |

**Consistency in $Kg/cm^2$**

| | | | | |
|---|---|---|---|---|
| | < | 0.2 | : | Very soft |
| 0.25 | - | 0.50 | : | Soft |
| 0.50 | - | 1.00 | : | Medium |
| 1.00 | - | 2.00 | : | Stiff |
| 2.00 | - | 4.00 | : | Very stiff |
| | > | 4.00 | : | Hard |




Failure Sketch :

" Undisturbed "



" Remolded "



# UNCONFINED COMPRESSION TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| | | |
|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** |
| **Drilling No.** | : | **HM_DG_02R** |
| **Depth (m)** | : | **1.50 - 2.00** |
| **Sampel Code** | : | **ABH34/25-11** |
| **Tested by** | : | **Eko** |
| **Computed by** | : | **Ars** |
| **Checked by** | : | **Heri** |
| **Date of test** | : | **Aug' 2025** |

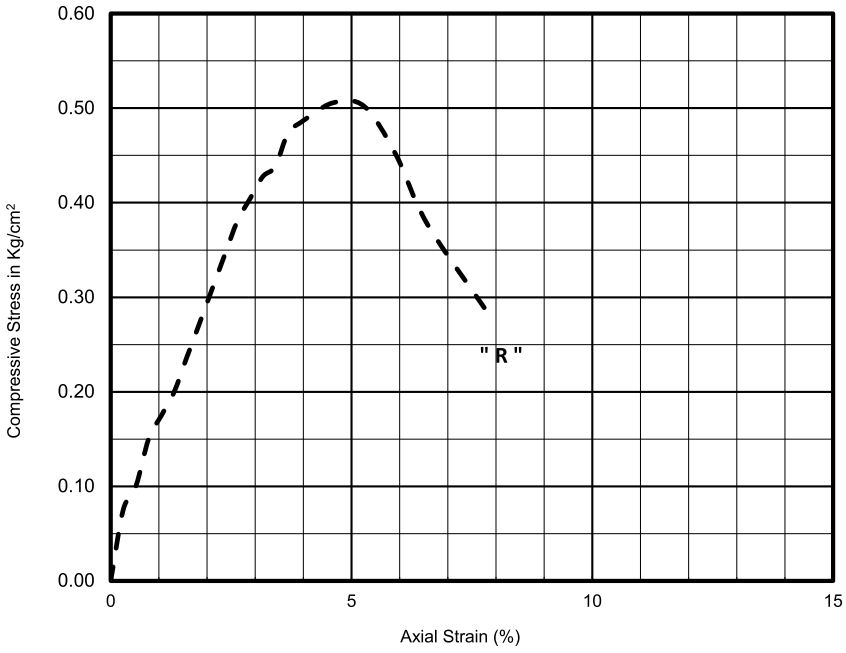
| SAMPLE CONDITION | | " U.D. " | " R " |
|---|---|---|---|
| Water content | % | | 68.32 |
| Wet density | gr/cm3 | | 1.875 |
| Dry density | gr/cm3 | | 1.114 |
| Specific Gravity | | 2.635 | |
| Void ratio | | | 1.365 |
| Saturation | % | | 100.00 |
| Unc. Comp. Strength | $Kg/cm^2$ | | 0.505 |
| Sensitivity | | | |
| Specimen diameter | mm | 38 | |
| Specimen height | mm | 76 | |

**Sensitivity**

| | | | | |
|---|---|---|---|---|
| | < | 2 | : | Insensitive |
| 2 | - | 4 | : | Moderately sensitive |
| 4 | - | 8 | : | Sensitive |
| 8 | - | 16 | : | Very sensitive |
| 16 | - | 32 | : | Slightly quick |
| 32 | - | 64 | : | Medium quick |
| | > | 64 | : | Quick |

**Consistency in $Kg/cm^2$**

| | | | | |
|---|---|---|---|---|
| | < | 0.2 | : | Very soft |
| 0.25 | - | 0.50 | : | Soft |
| 0.50 | - | 1.00 | : | Medium |
| 1.00 | - | 2.00 | : | Stiff |
| 2.00 | - | 4.00 | : | Very stiff |
| | > | 4.00 | : | Hard |




Failure Sketch :

" Undisturbed "



" Remolded "



# UNCONFINED COMPRESSION TEST

pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES
GEOTECH

| | | |
|---|---|---|
| **Project** | : | **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** |
| **Location** | : | **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** |
| **Drilling No.** | : | **HM_DG_02R** |
| **Depth (m)** | : | **2.50 - 3.00** |
| **Sampel Code** | : | **ABH34/25-12** |
| **Tested by** | : | **Eko** |
| **Computed by** | : | **Ars** |
| **Checked by** | : | **Heri** |
| **Date of test** | : | **Aug' 2025** |

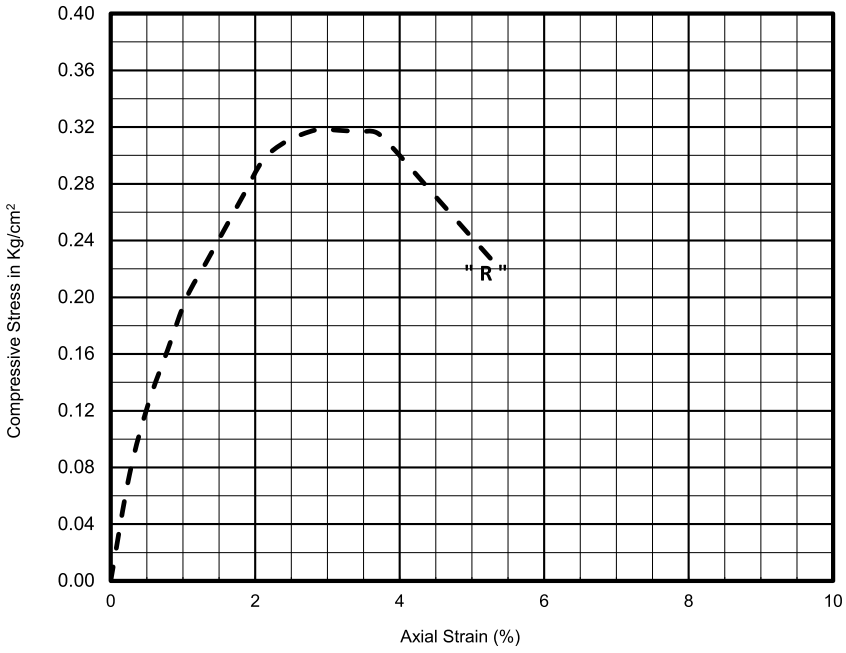
| SAMPLE CONDITION | | " U.D. " | " R " |
|---|---|---|---|
| Water content | % | | 86.29 |
| Wet density | gr/cm3 | | 1.593 |
| Dry density | gr/cm3 | | 0.855 |
| Specific Gravity | | 2.649 | |
| Void ratio | | | 2.097 |
| Saturation | % | | 100.00 |
| Unc. Comp. Strength | $Kg/cm^2$ | | 0.319 |
| Sensitivity | | | |
| Specimen diameter | mm | 38 | |
| Specimen height | mm | 76 | |

**Sensitivity**

| | | | | |
|---|---|---|---|---|
| | < | 2 | : | Insensitive |
| 2 | - | 4 | : | Moderately sensitive |
| 4 | - | 8 | : | Sensitive |
| 8 | - | 16 | : | Very sensitive |
| 16 | - | 32 | : | Slightly quick |
| 32 | - | 64 | : | Medium quick |
| | > | 64 | : | Quick |

**Consistency in $Kg/cm^2$**

| | | | | |
|---|---|---|---|---|
| | < | 0.2 | : | Very soft |
| 0.25 | - | 0.50 | : | Soft |
| 0.50 | - | 1.00 | : | Medium |
| 1.00 | - | 2.00 | : | Stiff |
| 2.00 | - | 4.00 | : | Very stiff |
| | > | 4.00 | : | Hard |




Failure Sketch :

" Undisturbed "



" Remolded "



# LAMPIRAN I

# TRIAXIAL UNCONSOLIDATED UNDRAINED (TX UU)

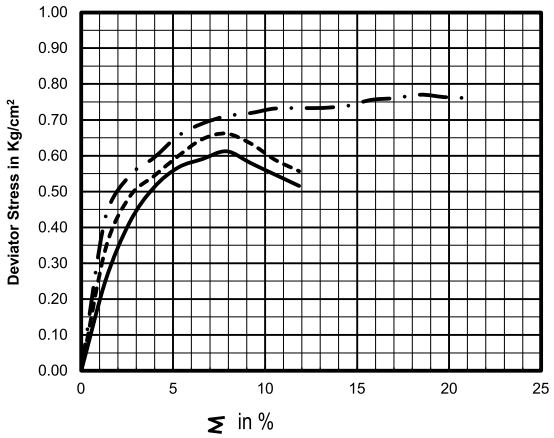
GEOTECH

# TRIAXIAL COMPRESSION TEST ( UU )

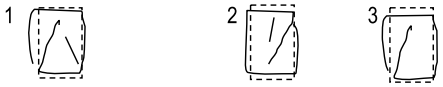
pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES

| | | | | | |
|---|---|---|---|---|---|
| **Project** | : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Aris |
| **Location** | : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Aris |
| **Drilling No.** | : HM_DG_02 R | **Checked by** | : | Wulan |
| **Depth (m)** | : 0.50 - 1.00 | **Date** | : | July ' 2025 |
| **Soil Type** | : Clay , Reddish Brown | **Sample Code** | : | ABH34/25-10 |

| No | WN | $\gamma$ t/m3 | $\gamma_d$ t/m3 | GS | e | Sr. % | $\sigma$ 3 Kg/cm$^2$ | $\sigma_1$ Kg/cm$^2$ | Curve Symbol |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 42.39 | 1.850 | 1.299 | 2.626 | 1.022 | 100.00 | 0.10 | 0.713 | ——— |
| 2 | 41.71 | 1.773 | 1.251 | | 1.098 | 99.72 | 0.20 | 0.862 | - - - - |
| 3 | 40.98 | 1.697 | 1.204 | | 1.181 | 91.10 | 0.40 | 1.171 | — · — |

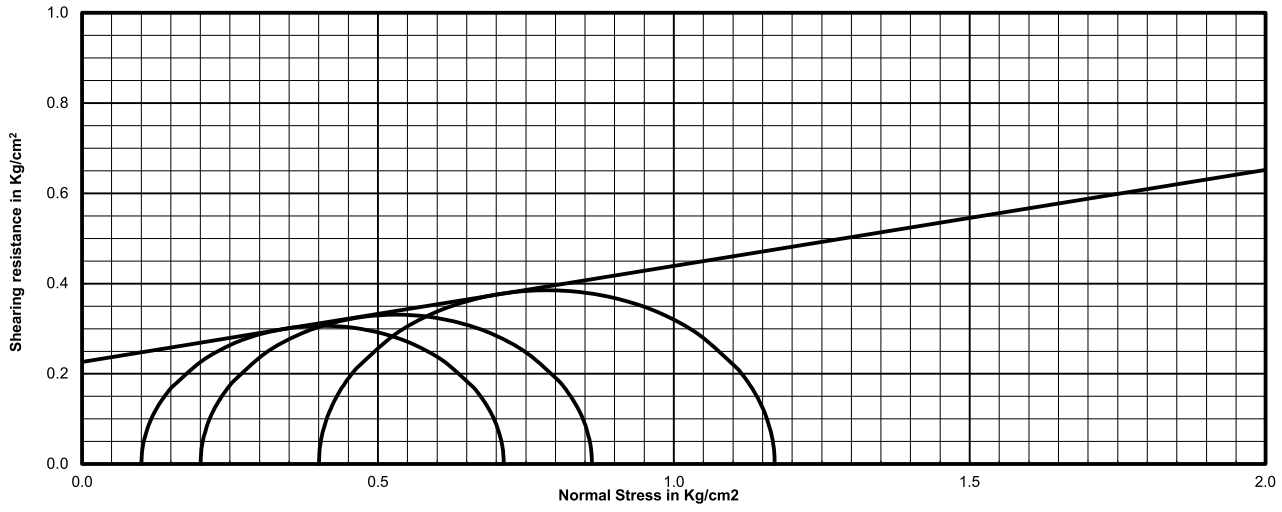



Failure Sketch :




Test Type : UU

| Angel of Internal Friction | Degree | Cohesion | Kg/cm$^2$ |
|---|---|---|---|
| Ø | 12.0 | C | 0.23 |

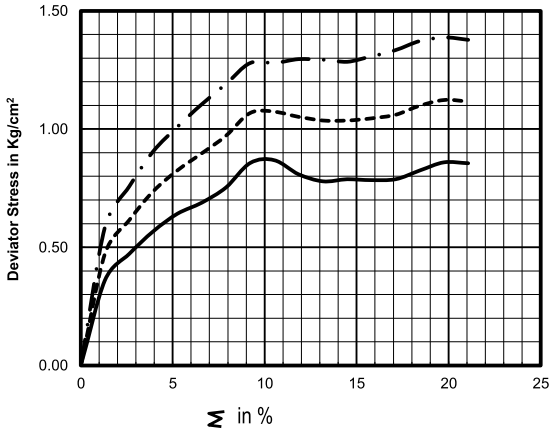


# TRIAXIAL COMPRESSION TEST ( UU )

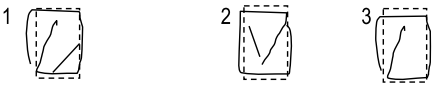
pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES

| | | | | | |
|---|---|---|---|---|---|
| **Project** | : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Eko |
| **Location** | : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Ars |
| **Drilling No.** | : HM_DG_02 R | **Checked by** | : | Heri |
| **Depth (m)** | : 1.50 - 2.00 | **Date** | : | 26-Aug-25 |
| **Soil Type** | : Clay , Reddish Brown ( *Remoulded condition sample* ) | **Sample Code** | : | ABH34/25-11 |

| No | WN | γ t/m3 | γd t/m3 | GS | e | Sr. % | σ 3 Kg/cm² | σt Kg/cm² | Curve Symbol |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 43.39 | 1.818 | 1.268 | 2.635 | 1.079 | 100.00 | 0.30 | 1.169 | ——— |
| 2 | 43.02 | 1.815 | 1.269 | | 1.077 | 100.00 | 0.60 | 1.724 | - - - - |
| 3 | 42.66 | 1.812 | 1.270 | | 1.075 | 100.00 | 1.20 | 2.588 | — · — |

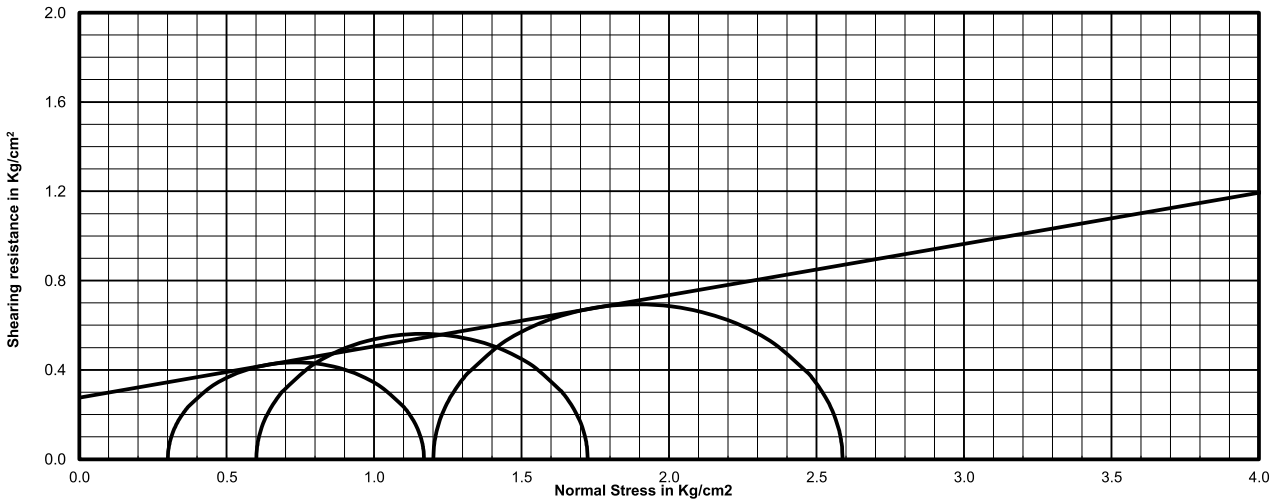



Failure Sketch :




Test Type : UU

| Angel of Internal Friction | Degree | Cohesion | Kg/cm² |
|---|---|---|---|
| Ø | 12.9 | C | 0.28 |

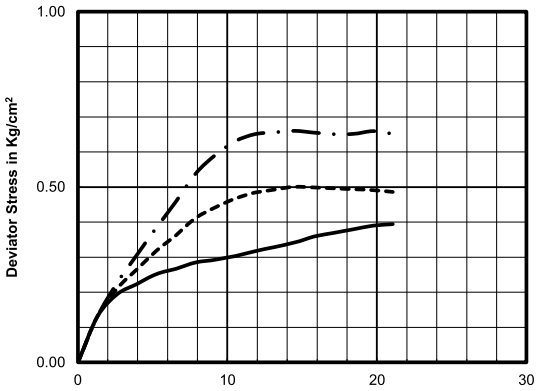


# TRIAXIAL COMPRESSION TEST ( UU )

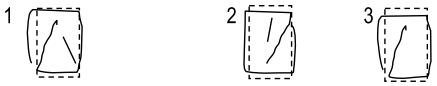
pt. pratama widya engineering
GEOTECHNICAL ENGINEERING SERVICES

| | | | | | |
|---|---|---|---|---|---|
| **Project** | : **GEOTECHNICAL INVESTIGATION OF MAIN HAUL ROAD PROPERTIES MATERIAL** | **Tested by** | : | Eko |
| **Location** | : **MOROWALI REGENCY - CENTRAL SULAWESI PROVINCE** | **Computed by** | : | Ricko |
| **Drilling No.** | : HM_DG_02 R | **Checked by** | : | Wulan |
| **Depth (m)** | : 2.50 - 3.00 | **Date** | : | July ' 2025 |
| **Soil Type** | : Clay, Reddish Brown | **Sample Code** | : | ABH34/25-12 |

| No | WN | ɣ t/m3 | ɣd t/m3 | GS | e | Sr. % | σ 3 Kg/cm² | σt Kg/cm² | Curve Symbol |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 50.71 | 1.723 | 1.143 | 2.609 | 1.283 | 100.00 | 0.20 | 0.594 | ——— |
| 2 | 51.15 | 1.705 | 1.128 | | 1.313 | 100.00 | 0.40 | 0.901 | - - - - |
| 3 | 51.61 | 1.688 | 1.113 | | 1.344 | 100.00 | 0.80 | 1.460 | — · — |

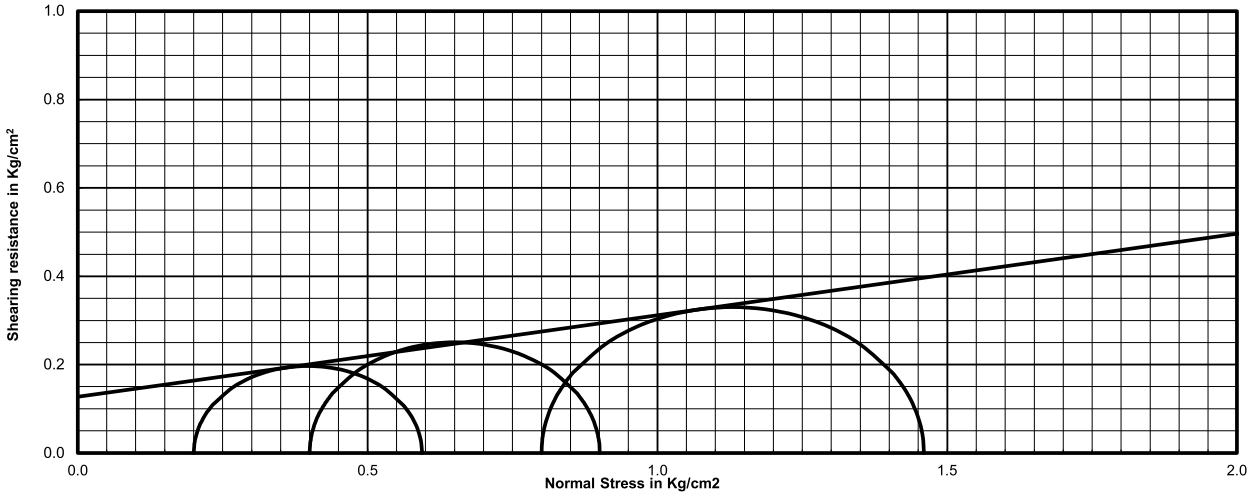



Failure Sketch :




Test Type : UU

| Angel of Internal Friction | Degree | Cohesion | Kg/cm² |
|---|---|---|---|
| Ø | 10.5 | C | 0.13 |



# LAMPIRAN J

# DOKUMENTASI SOIL TEST

GEOTECH

pt. pratama widya engineering
GEOTECH

**Project : Geotechnical Investigation of Main Haul Properties Material**

**Location : Morowali Regency**

| Appendix | Work | DOCUMENTATION | Page | Total Pages |
|---|---|---|---|---|
| | Laboratory Test | | 1 | 5 |

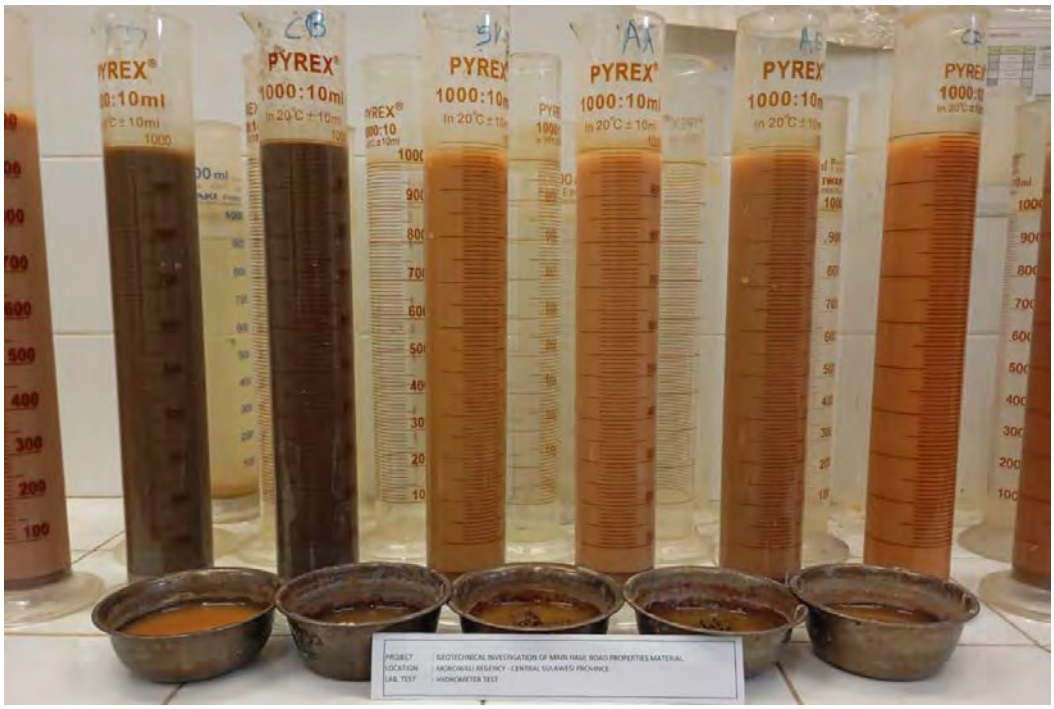
**Description : Grain Size Test & Atteberg Limit Test**





| pt. pratama widya engineering GEOTECH | Project : Geotechnical Investigation of Main Haul Properties Material<br>Location : Morowali Regency | | | |
|---|---|---|---|---|
| Appendix | Work | DOCUMENTATION | Page | Total Pages |
| | Laboratory Test | | 2 | 5 |

**Description : Hydrometer Test & Spesific Gravity**






| pt. pratama widya engineering GEOTECH | Project : Geotechnical Investigation of Main Haul Properties Material<br>Location : Morowali Regency | | | |
|---|---|---|---|---|
| Appendix | Work | DOCUMENTATION | Page | Total Pages |
| | Laboratory Test | | 3 | 5 |

**Description : Water Content & Srinkage Test**






| pt. pratama widya engineering GEOTECH | Project : Geotechnical Investigation of Main Haul Properties Material<br>Location : Morowali Regency | | | |
|---|---|---|---|---|
| Appendix | Work | **DOCUMENTATION** | Page | Total Pages |
| | Laboratory Test | | 4 | 5 |

**Description : Direct Shear & Unconfined Compression Test**





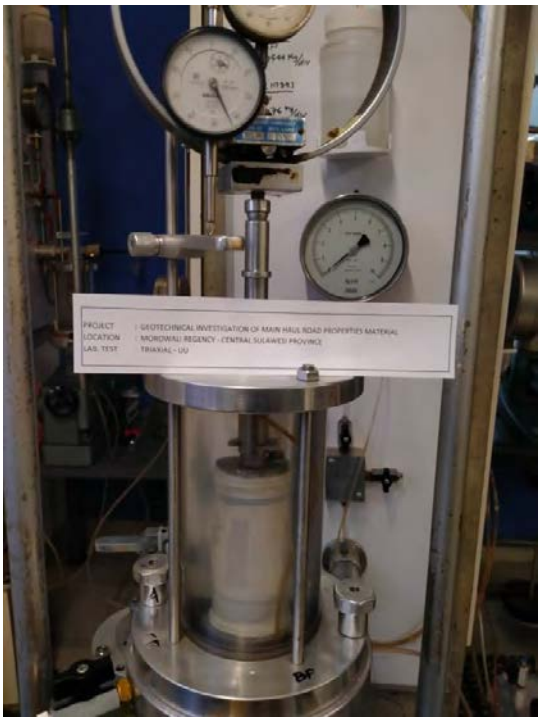




| pt. pratama widya engineering GEOTECH | Project : Geotechnical Investigation of Main Haul Properties Material<br>Location : Morowali Regency | | | |
|---|---|---|---|---|
| Appendix | Work | DOCUMENTATION | Page | Total Pages |
| | Laboratory Test | | 5 | 5 |

**Description : Consolidation & Triaxial UU**





# APPENDIX E

## LABORATORIUM RESULT

## ( ROCK )

GEOLAND QUATTRO TECHNOLAB
Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung, Jawa Barat 40225
082115618130 geolandquattro@geolandtechnolab.com https://geolandtechnolab.com/

KAN Komite Akreditasi Nasional LP-2060-IDN

# LAPORAN HASIL UJI

## MEKANIKAL DAN FISIK BATUAN

TESTING REPORT OF

ROCK PHYSICAL AND MECHANICAL PROPERTIES

**No. Laporan** : GQT-061/VII/2025
Report No.

**Pelanggan** : **PT. ANE HENGJAYA MINERALINDO**
Customer

**Alamat** : Jl. Barkah No. 27, RT 03 / RW 05 Ciganjur, Jagakarsa, Jakarta Selatan
Address

**Nama Proyek** : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province

**AGUSTUS 2025**

# DAFTAR ISI LAPORAN

LIST OF REPORT CONTENTS


| No | Item | Halaman | Metode Standar |
|---|---|---|---|
| 1 | Daftar Sample / List of Sample | 1 | |
| 2 | Physical Properties (PP) | 1 | ISRM 2007 |
| 3 | Uniaxial Compressive Strength (UCS) | 15 | ISRM 2007 |
| 4 | Direct Shear (DS) | 18 | ISRM 2007 |
| 5 | Ultrasonic Velocity (UV) | - | ISRM 2015 |
| 6 | Point Load Index (PLI) | - | ISRM 2007 |
| 7 | Brazilian/Tensile Test (BZ) | - | ISRM 2007 |
| 8 | Slake Durability (SD) | - | SNI 3406-2019 |
| 9 | Permeability Test (PER) | - | ASTM D4644-16, IDT |
| 10 | Lampiran | - | - |
| **Jumlah halaman** | | **35** | |

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung
Jawa Barat 40225
Tlp/WA : 082115618130
E-mail: geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

Pelanggan (Customer) : **PT. ANE HENGJAYA MINERALINDO**
Alamat (Address) : Jl. Barkah No. 27, RT 03 / RW 05 Ciganjur, Jagakarsa, Jakarta Selatan
Proyek/lokasi (Project) : Geotechical Investigation Of Main Haul Road Properties Material
PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province
No Laporan (Report Number) : GQT-061/VII/2025

**DAFTAR SAMPEL**

| No | Kode Sampel | Kedalaman (m) | Panjang | Litologi | PP | UCS | DS | UV | PLI | BZ | SLAKE | PER | Notice |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | HM_DG_03 DS | 5.85 - 6.05 | 0.20 | SILTSTONE | 1 | | 1 | | | | | | |
| 2 | HM_DG_03 UCS & DS | 6.15 - 6.65 | 0.50 | SILTSTONE | 1 | 1 | 1 | | | | | | |
| 3 | HM_DG_03 UCS | 8.67 - 9.00 | 0.33 | SILTSTONE | 1 | 1 | | | | | | | |
| 4 | HM_DG_03 DS | 9.41 - 9.73 | 0.32 | SILTSTONE | 1 | | 1 | | | | | | |
| 5 | HM_DG_03 DS | 11.67 - 12.03 | 0.36 | SANDSTONE-SILTSTONE | 1 | | 1 | | | | | | |
| 6 | HM_DG_03 DS | 13.47 - 13.97 | 0.50 | Silty-SANDSTONE | 1 | 1 | | | | | | | |
| 7 | HM_DG_03 UCS & DS | 14.67 - 15.11 | 0.44 | SILTSTONE-CONGLOMERATE | 1 | 1 | 1 | | | | | | |
| 8 | HM_DG_03 DS | 15.11 - 15.40 | 0.29 | CONGLOMERATE-SANDSTONE | 1 | | 1 | | | | | | |
| 9 | HM_DG_03 UCS | 17.02 - 17.51 | 0.49 | Silty-SANDSTONE | 1 | 1 | | | | | | | |
| 10 | HM_DG_03 DS | 18.28 - 18.73 | 0.45 | SILTSTONE | 1 | | 1 | | | | | | |
| 11 | HM_DG_03 UCS & DS | 22.51 - 23.03 | 0.52 | SILTSTONE | 1 | 1 | 1 | | | | | | |
| 12 | HM_DG_03 UCS & DS | 25.98 - 26.53 | 0.55 | CONGLOMERATE | 1 | 1 | 1 | | | | | | |
| 13 | HM_DG_01 UCS | 2.34 - 2.82 | 0.48 | CONGLOMERATE | 1 | 1 | | | | | | | |
| 14 | HM_DG_01 DS | 4.60 - 5.00 | 0.40 | CONGLOMERATE | 1 | | 1 | | | | | | |
| 15 | HM_DG_01 UCS & DS | 7.00 - 7.55 | 0.55 | CONGLOMERATE | 1 | 1 | 1 | | | | | | |
| 16 | HM_DG_01 UCS & DS | 12.42 - 12.91 | 0.49 | CONGLOMERATE | 1 | 1 | 1 | | | | | | |
| 17 | HM_DG_01 DS | 15.00 - 15.29 | 0.29 | CONGLOMERATE-SILTSTONE | 1 | | 1 | | | | | | |
| 18 | HM_DG_01 UCS | 17.53 - 18.00 | 0.47 | CONGLOMERATE-SILTSTONE | 1 | 1 | | | | | | | |
| 19 | HM_DG_01 UCS & DS | 22.00 - 22.50 | 0.50 | CONGLOMERATE | 1 | 1 | 1 | | | | | | |
| 20 | HM_DG_01 DS | 26.60 - 27.00 | 0.40 | CONGLOMERATE-SANDSTONE | 1 | | 1 | | | | | | |
| 21 | HM_DG_01 UCS | 27.50 - 28.04 | 0.54 | CONGLOMERATE | 1 | 1 | | | | | | | |
| 22 | GRAB SAMPLE UCS | 0.00 - 0.00 | 0.00 | LIMESTONE | 1 | 1 | | | | | | | |
| 23 | GRAB SAMPLE DS | 0.00 - 0.00 | 0.00 | LIMESTONE | 1 | | 1 | | | | | | |
| **Total** | | | | | **23** | **14** | **16** | **0** | **0** | **0** | **0** | **0** | |

Bandung, 21 Juli 2025

**Purwanto ST.**
**Kepala Laboratorium**
*(Head of Laboratory)*

# PHYSICAL PROPERTIES

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung
Jawa Barat 40225
Tlp/WA : 082115618130
E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

## LAPORAN HASIL UJI

*(REPORT OF ANALYSIS)*

**No : GQT-061/VII/2025**

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 21 Juli 2025 |
| Proyek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 30 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Nana |

### UJI SIFAT FISIK

*(Physical Properties Test)*

| No | Kode Sampel | Kedalaman | Litologi | $\rho_n$ (gr/cm$^3$) | $\rho_d$ (gr/cm$^3$) | $\rho_s$ (gr/cm$^3$) | W % | S % | n % | e |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | HM_DG_03 DS | 5.85 - 6.05 | SILTSTONE | 2.21 | 1.94 | 2.22 | 13.52 | 93.92 | 27.99 | 0.39 |
| 2 | HM_DG_03 UCS & DS | 6.15 - 6.65 | SILTSTONE | 2.32 | 2.11 | 2.33 | 9.96 | 92.51 | 22.67 | 0.29 |
| 3 | HM_DG_03 UCS | 8.67 - 9.00 | SILTSTONE | 2.18 | 1.88 | 2.20 | 16.48 | 94.94 | 32.55 | 0.48 |
| 4 | HM_DG_03 DS | 9.41 - 9.73 | SILTSTONE | 2.24 | 1.98 | 2.26 | 13.01 | 93.25 | 27.68 | 0.38 |
| 5 | HM_DG_03 DS | 11.67 - 12.03 | SANDSTONE-SILTSTONE | 2.24 | 2.01 | 2.26 | 11.73 | 91.83 | 25.62 | 0.34 |
| 6 | HM_DG_03 DS | 13.47 - 13.97 | Silty-SANDSTONE | 2.21 | 1.95 | 2.23 | 13.23 | 92.09 | 28.05 | 0.39 |
| 7 | HM_DG_03 UCS & DS | 14.67 - 15.11 | SILTSTONE-CONGLOMERATE | 2.16 | 1.85 | 2.18 | 16.58 | 94.38 | 32.53 | 0.48 |
| 8 | HM_DG_03 DS | 15.11 - 15.40 | CONGLOMERATE-SANDSTONE | 2.29 | 2.09 | 2.31 | 9.39 | 90.18 | 21.81 | 0.28 |
| 9 | HM_DG_03 UCS | 17.02 - 17.51 | Silty-SANDSTONE | 2.24 | 2.03 | 2.26 | 10.63 | 91.65 | 23.53 | 0.31 |
| 10 | HM_DG_03 DS | 18.28 - 18.73 | SILTSTONE | 2.14 | 1.87 | 2.17 | 14.62 | 92.17 | 29.64 | 0.42 |
| 11 | HM_DG_03 UCS & DS | 22.51 - 23.03 | SILTSTONE | 2.21 | 1.97 | 2.24 | 12.06 | 89.26 | 26.61 | 0.36 |
| 12 | HM_DG_03 UCS & DS | 25.98 - 26.53 | CONGLOMERATE | 2.43 | 2.27 | 2.46 | 7.09 | 84.60 | 19.04 | 0.24 |
| 13 | HM_DG_01 UCS | 2.34 - 2.82 | CONGLOMERATE | 2.54 | 2.47 | 2.56 | 2.86 | 79.72 | 8.88 | 0.10 |
| 14 | HM_DG_01 DS | 4.60 - 5.00 | CONGLOMERATE | 2.40 | 2.24 | 2.41 | 7.28 | 93.32 | 17.47 | 0.21 |
| 15 | HM_DG_01 UCS & DS | 7.00 - 7.55 | CONGLOMERATE | 2.31 | 2.11 | 2.32 | 9.20 | 93.22 | 20.86 | 0.26 |
| 16 | HM_DG_01 UCS & DS | 12.42 - 12.91 | CONGLOMERATE | 2.50 | 2.39 | 2.51 | 4.73 | 91.67 | 12.31 | 0.14 |
| 17 | HM_DG_01 DS | 15.00 - 15.29 | CONGLOMERATE-SILTSTONE | 2.61 | 2.60 | 2.64 | 0.65 | 41.59 | 4.08 | 0.04 |
| 18 | HM_DG_01 UCS | 17.53 - 18.00 | CONGLOMERATE-SILTSTONE | 2.57 | 2.51 | 2.59 | 2.16 | 72.58 | 7.46 | 0.08 |
| 19 | HM_DG_01 UCS & DS | 22.00 - 22.50 | CONGLOMERATE | 2.61 | 2.56 | 2.62 | 1.77 | 81.15 | 5.59 | 0.06 |
| 20 | HM_DG_01 DS | 26.60 - 27.00 | CONGLOMERATE-SANDSTONE | 2.57 | 2.52 | 2.59 | 1.94 | 72.22 | 6.76 | 0.07 |
| 21 | HM_DG_01 UCS | 27.50 - 28.04 | CONGLOMERATE | 2.61 | 2.56 | 2.62 | 1.93 | 83.75 | 5.88 | 0.06 |
| 22 | GRAB SAMPLE UCS | 0.00 - 0.00 | LIMESTONE | 2.62 | 2.60 | 2.64 | 0.95 | 63.37 | 3.90 | 0.04 |
| 23 | GRAB SAMPLE DS | 0.00 - 0.00 | LIMESTONE | 2.59 | 2.58 | 2.61 | 0.58 | 49.48 | 3.00 | 0.03 |

$\rho_n$ = Natural Density
$\rho_d$ = Dry Density
$\rho_s$ = Saturated Density
w = Natural Water Content
S = Degree of Saturation
n = Porosity
e = Void Ratio

Keterangan :

1. Hasil pengujian HANYA valid untuk sampel yang diuji dengan kode, kedalaman, dan litologi yang tertera pada tabel di atas.
2. Laboratorium memberikan batas maksimal 30 hari sejak tanggal penyerahan laporan pengujian bagi pelanggan untuk mengajukan keluhan terkait hasil pengujian.

Bandung, 30 Juli 2025

**Purwanto ST.**
**Kepala Laboratorium**
*(Head of Laboratory)*

# UNIAXIAL COMPRESSIVE STRENGTH

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

## LAPORAN HASIL UJI

*(REPORT OF ANALYSIS)*

**No : GQT-061/VII/2025**

| | | | | | |
|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : | Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : | 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

### UJI KUAT TEKAN

*(Uniaxial Compressive Strength Test)*

| No | Kode Sampel | Kedalaman | Litologi | $\sigma_c$ (MPa) | E (MPa) | υ | UCS Koreksi (MPa) |
|---|---|---|---|---|---|---|---|
| 1 | HM_DG_03 UCS & DS | 6.15 - 6.65 | SILTSTONE | 7.24 | 2,142.95 | 0.28 | 7.25 |
| 2 | HM_DG_03 UCS | 8.67 - 9.00 | SILTSTONE | 6.40 | 2,516.83 | 0.27 | 6.40 |
| 3 | HM_DG_03 DS | 13.47 - 13.97 | Silty-SANDSTONE | 5.28 | 2,293.29 | 0.27 | 5.30 |
| 4 | HM_DG_03 UCS & DS | 14.67 - 15.11 | SILTSTONE-CONGLOMERATE | 5.30 | 3,004.40 | 0.25 | 5.27 |
| 5 | HM_DG_03 UCS | 17.02 - 17.51 | Silty-SANDSTONE | 3.86 | 1,779.50 | 0.27 | 3.84 |
| 6 | HM_DG_03 UCS & DS | 22.51 - 23.03 | SILTSTONE | 8.23 | 3,522.02 | 0.27 | 8.28 |
| 7 | HM_DG_03 UCS & DS | 25.98 - 26.53 | CONGLOMERATE | 0.95 | 311.35 | 0.25 | 0.94 |
| 8 | HM_DG_01 UCS | 2.34 - 2.82 | CONGLOMERATE | 21.08 | 14,979.32 | 0.27 | 20.91 |
| 9 | HM_DG_01 UCS & DS | 7.00 - 7.55 | CONGLOMERATE | 16.82 | 7,659.43 | 0.26 | 16.80 |
| 10 | HM_DG_01 UCS & DS | 12.42 - 12.91 | CONGLOMERATE | 30.60 | 17,533.44 | 0.26 | 30.57 |
| 11 | HM_DG_01 UCS | 17.53 - 18.00 | CONGLOMERATE-SILTSTONE | 28.01 | 11,485.62 | 0.27 | 27.91 |
| 12 | HM_DG_01 UCS & DS | 22.00 - 22.50 | CONGLOMERATE | 14.41 | 5,039.76 | 0.25 | 14.29 |
| 13 | HM_DG_01 UCS | 27.50 - 28.04 | CONGLOMERATE | 20.39 | 9,927.15 | 0.24 | 20.29 |

$\sigma_c$ = Compressive Strength
E = Young's Modulus
υ = Poisson's Ratio

Keterangan :

1. Hasil pengujian HANYA valid untuk sampel yang diuji dengan kode, kedalaman, dan litologi yang tertera pada tabel di atas.
2. Laboratorium memberikan batas maksimal 30 hari sejak tanggal penyerahan laporan pengujian bagi pelanggan untuk mengajukan keluhan terkait hasil pengujian.
3. UCS Koreksi adalah nilai $\sigma_c$ dikalikan dengan faktor koreksi karena keterbatasan panjang sampel.

Bandung, 30 Juli 2025

**Purwanto ST.**
**Kepala Laboratorium**
*(Head of Laboratory)*

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

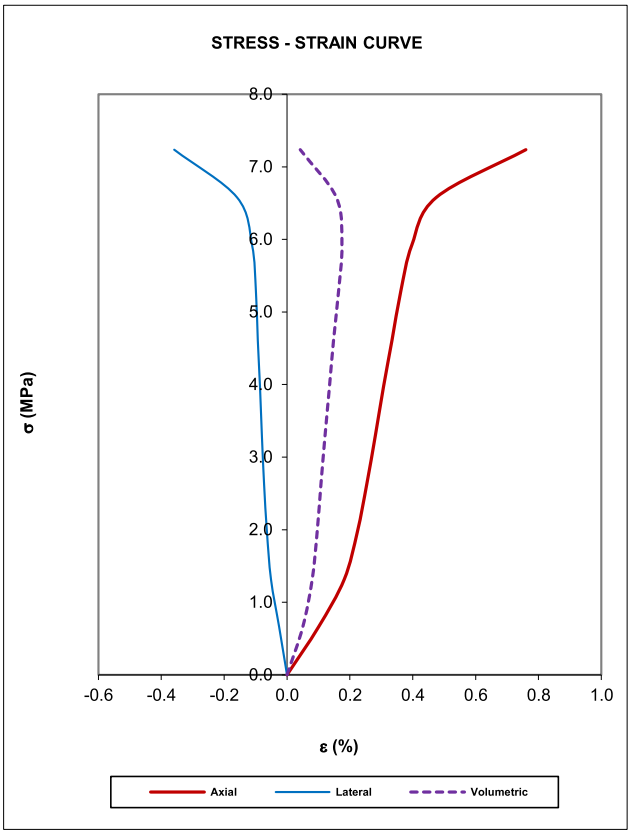
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_03 UCS & DS | Diameter *(Diameter)* | : 59.63 mm |
| Kedalaman *(Depth)* | : 6.15 - 6.65 | Panjang *(Length)* | : 120.80 mm |
| Litologi *(Lithology)* | : SILTSTONE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.66 | -15 | 12 | -0.025 | 0.100 | 0.050 |
| 3 | 1.32 | -30 | 22 | -0.051 | 0.182 | 0.080 |
| 4 | 1.97 | -38 | 27 | -0.064 | 0.224 | 0.096 |
| 5 | 2.63 | -44 | 31 | -0.073 | 0.254 | 0.108 |
| 6 | 3.30 | -48 | 34 | -0.080 | 0.281 | 0.121 |
| 7 | 3.97 | -51 | 37 | -0.086 | 0.307 | 0.135 |
| 8 | 4.61 | -55 | 40 | -0.093 | 0.334 | 0.148 |
| 9 | 5.29 | -59 | 44 | -0.099 | 0.362 | 0.164 |
| 10 | 5.92 | -66 | 48 | -0.111 | 0.397 | 0.175 |
| 11 | 6.58 | -95 | 57 | -0.159 | 0.475 | 0.157 |
| 12 | 7.24 | -214 | 92 | -0.359 | 0.760 | 0.042 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 7.24 |
| E (MPa) | 2,142.95 |
| υ | 0.28 |



# GEOLAND QUATTRO TECHNOLAB

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Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

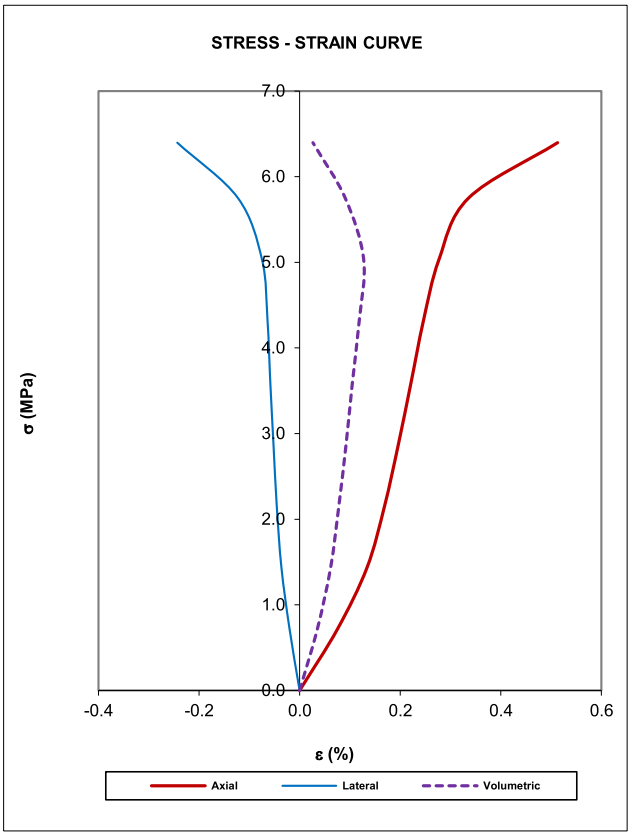
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_03 UCS | Diameter *(Diameter)* | : 59.53 mm |
| Kedalaman *(Depth)* | : 8.67 - 9.00 | Panjang *(Length)* | : 119.23 mm |
| Litologi *(Lithology)* | : SILTSTONE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.72 | -12 | 9 | -0.020 | 0.075 | 0.035 |
| 3 | 1.44 | -22 | 16 | -0.036 | 0.134 | 0.062 |
| 4 | 2.16 | -27 | 20 | -0.046 | 0.169 | 0.078 |
| 5 | 2.88 | -31 | 23 | -0.052 | 0.196 | 0.092 |
| 6 | 3.59 | -35 | 26 | -0.058 | 0.222 | 0.105 |
| 7 | 4.31 | -38 | 29 | -0.064 | 0.246 | 0.118 |
| 8 | 5.03 | -45 | 33 | -0.075 | 0.277 | 0.127 |
| 9 | 5.75 | -73 | 40 | -0.123 | 0.336 | 0.091 |
| 10 | 6.40 | -145 | 61 | -0.243 | 0.513 | 0.026 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 6.40 |
| E (MPa) | 2,516.83 |
| υ | 0.27 |



# GEOLAND QUATTRO TECHNOLAB

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Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | | | |
|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : | Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : | 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

## UJI KUAT TEKAN

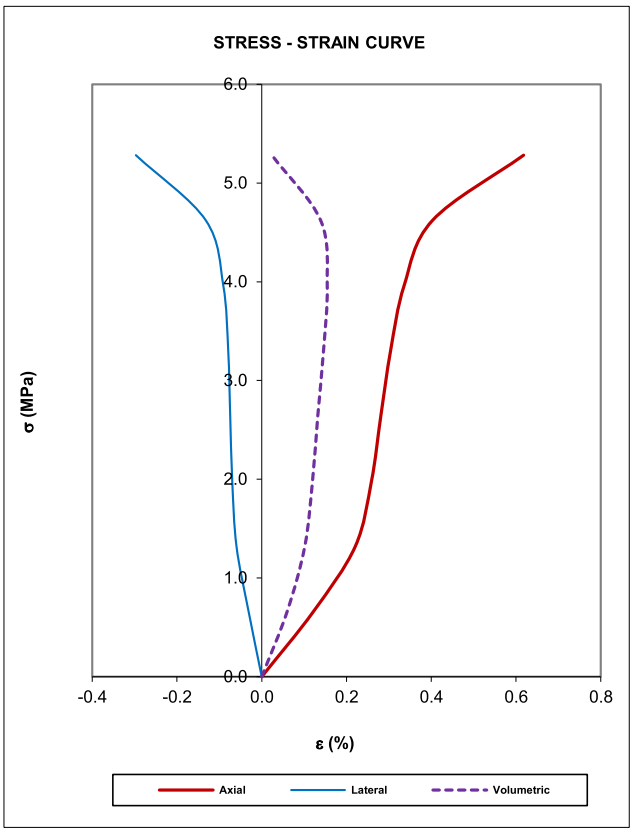
*(Uniaxial Compressive Strength Test)*

| | | | | | |
|---|---|---|---|---|---|
| Kode Sampel *(Sample Code)* | : | HM_DG_03 DS | Diameter *(Diameter)* | : 59.13 | mm |
| Kedalaman *(Depth)* | : | 13.47 - 13.97 | Panjang *(Length)* | : 122.27 | mm |
| Litologi *(Lithology)* | : | Silty-SANDSTONE | | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.66 | -18 | 15 | -0.031 | 0.122 | 0.060 |
| 3 | 1.32 | -35 | 27 | -0.060 | 0.221 | 0.102 |
| 4 | 1.98 | -41 | 32 | -0.070 | 0.259 | 0.120 |
| 5 | 2.64 | -44 | 34 | -0.074 | 0.281 | 0.132 |
| 6 | 3.30 | -47 | 37 | -0.079 | 0.304 | 0.146 |
| 7 | 3.96 | -54 | 41 | -0.091 | 0.336 | 0.155 |
| 8 | 4.62 | -78 | 49 | -0.132 | 0.403 | 0.139 |
| 9 | 5.28 | -176 | 76 | -0.297 | 0.618 | 0.024 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 5.28 |
| E (MPa) | 2,293.29 |
| υ | 0.27 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
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| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

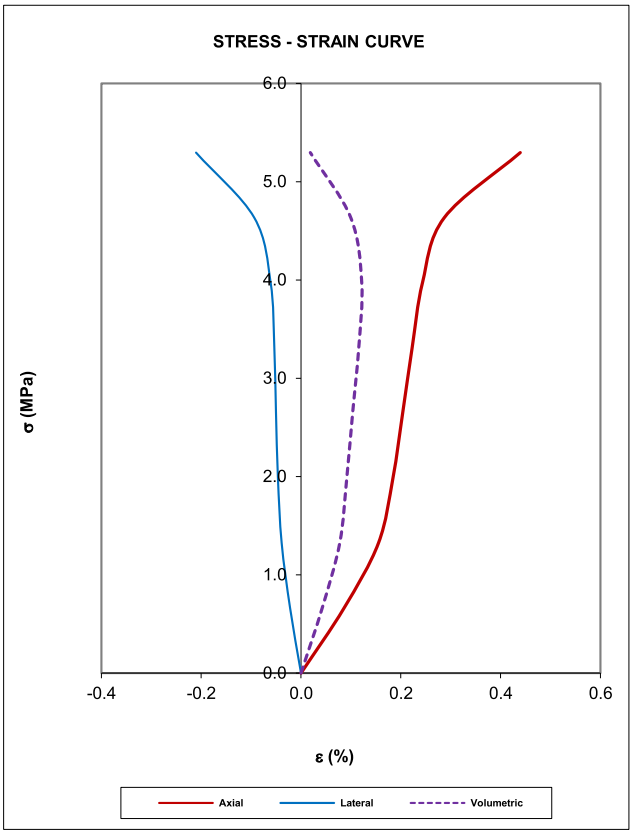
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_03 UCS & DS | Diameter *(Diameter)* | : 60.27 mm |
| Kedalaman *(Depth)* | : 14.67 - 15.11 | Panjang *(Length)* | : 115.93 mm |
| Litologi *(Lithology)* | : SILTSTONE-CONGLOMERATE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.66 | -13 | 10 | -0.022 | 0.086 | 0.042 |
| 3 | 1.32 | -23 | 18 | -0.039 | 0.155 | 0.078 |
| 4 | 1.99 | -28 | 21 | -0.046 | 0.184 | 0.092 |
| 5 | 2.66 | -30 | 24 | -0.050 | 0.204 | 0.104 |
| 6 | 3.31 | -32 | 26 | -0.054 | 0.223 | 0.116 |
| 7 | 3.97 | -37 | 28 | -0.061 | 0.243 | 0.122 |
| 8 | 4.63 | -56 | 33 | -0.094 | 0.287 | 0.100 |
| 9 | 5.30 | -127 | 51 | -0.210 | 0.439 | 0.019 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 5.30 |
| E (MPa) | 3,004.40 |
| υ | 0.25 |



# GEOLAND QUATTRO TECHNOLAB

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| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

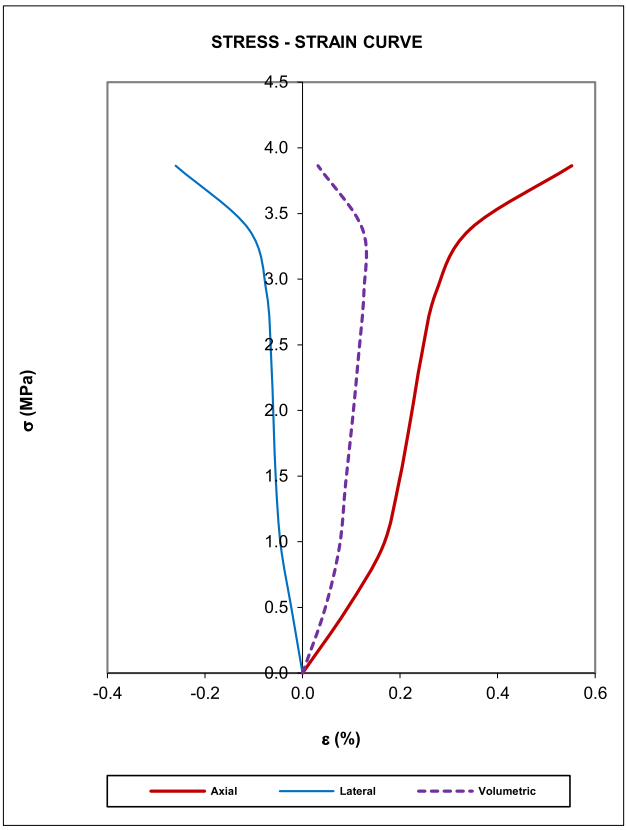
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_03 UCS | Diameter *(Diameter)* | : 60.77 mm |
| Kedalaman *(Depth)* | : 17.02 - 17.51 | Panjang *(Length)* | : 115.27 mm |
| Litologi *(Lithology)* | : Silty-SANDSTONE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.48 | -14 | 10 | -0.022 | 0.090 | 0.046 |
| 3 | 0.97 | -27 | 19 | -0.045 | 0.165 | 0.076 |
| 4 | 1.45 | -33 | 23 | -0.055 | 0.198 | 0.089 |
| 5 | 1.93 | -36 | 26 | -0.060 | 0.222 | 0.103 |
| 6 | 2.41 | -39 | 28 | -0.065 | 0.244 | 0.115 |
| 7 | 2.90 | -45 | 32 | -0.074 | 0.273 | 0.126 |
| 8 | 3.38 | -67 | 40 | -0.110 | 0.344 | 0.123 |
| 9 | 3.86 | -158 | 64 | -0.260 | 0.552 | 0.032 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 3.86 |
| E (MPa) | 1,779.50 |
| υ | 0.27 |



# GEOLAND QUATTRO TECHNOLAB

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KAN Komite Akreditasi Nasional LP-2060-IDN

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|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 23 Juli 2025 |
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| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

## UJI KUAT TEKAN

*(Uniaxial Compressive Strength Test)*

| | | | | | | |
|---|---|---|---|---|---|---|
| Kode Sampel *(Sample Code)* | : | HM_DG_03 UCS & DS | Diameter *(Diameter)* | : | 58.87 | mm |
| Kedalaman *(Depth)* | : | 22.51 - 23.03 | Panjang *(Length)* | : | 123.43 | mm |
| Litologi *(Lithology)* | : | SILTSTONE | | | | |

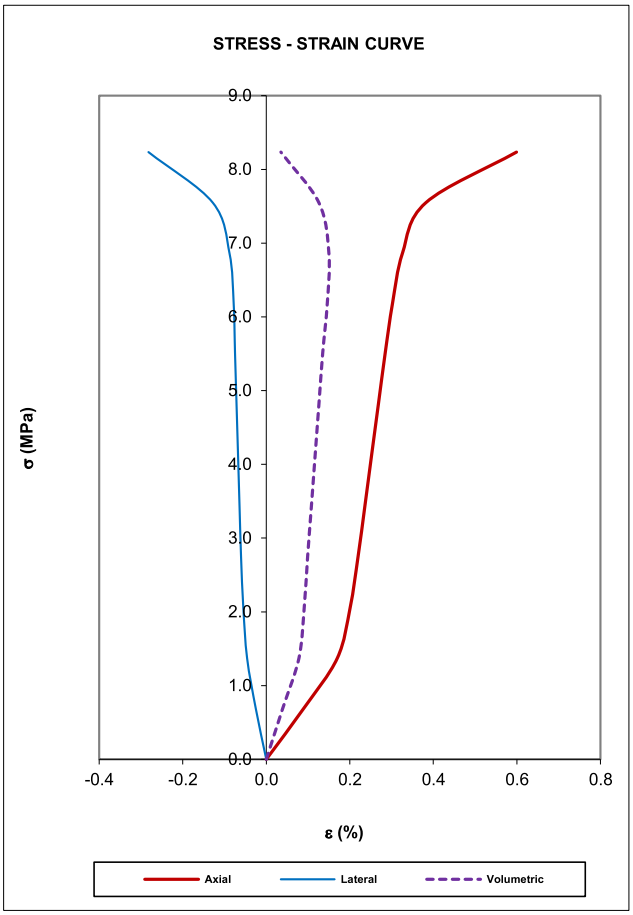
| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.69 | -15 | 11 | -0.025 | 0.089 | 0.039 |
| 3 | 1.37 | -27 | 21 | -0.046 | 0.170 | 0.078 |
| 4 | 2.06 | -32 | 25 | -0.055 | 0.201 | 0.091 |
| 5 | 2.75 | -36 | 27 | -0.060 | 0.220 | 0.099 |
| 6 | 3.43 | -38 | 29 | -0.064 | 0.236 | 0.108 |
| 7 | 4.13 | -40 | 31 | -0.068 | 0.252 | 0.117 |
| 8 | 4.82 | -42 | 33 | -0.071 | 0.269 | 0.126 |
| 9 | 5.51 | -44 | 35 | -0.075 | 0.285 | 0.135 |
| 10 | 6.18 | -46 | 37 | -0.078 | 0.302 | 0.146 |
| 11 | 6.86 | -52 | 40 | -0.088 | 0.326 | 0.150 |
| 12 | 7.55 | -75 | 47 | -0.128 | 0.382 | 0.126 |
| 13 | 8.23 | -166 | 74 | -0.282 | 0.599 | 0.035 |

$\sigma_c$ = Compressive Strength

Δ = Deformation

ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 8.23 |
| E (MPa) | 3,522.02 |
| υ | 0.27 |



# GEOLAND QUATTRO TECHNOLAB

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| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

## UJI KUAT TEKAN

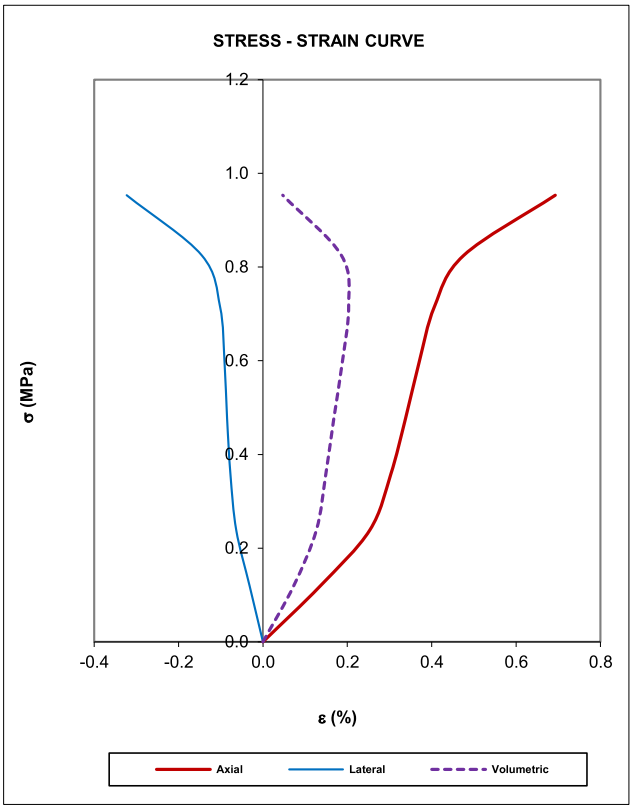
*(Uniaxial Compressive Strength Test)*

| | | | | | |
|---|---|---|---|---|---|
| Kode Sampel *(Sample Code)* | : | HM_DG_03 UCS & DS | Diameter *(Diameter)* | : 61.17 | mm |
| Kedalaman *(Depth)* | : | 25.98 - 26.53 | Panjang *(Length)* | : 105.83 | mm |
| Litologi *(Lithology)* | : | CONGLOMERATE | | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 0.12 | -19 | 14 | -0.032 | 0.136 | 0.073 |
| 3 | 0.24 | -39 | 27 | -0.063 | 0.253 | 0.127 |
| 4 | 0.36 | -47 | 32 | -0.077 | 0.303 | 0.149 |
| 5 | 0.48 | -52 | 36 | -0.085 | 0.338 | 0.168 |
| 6 | 0.60 | -56 | 39 | -0.091 | 0.370 | 0.188 |
| 7 | 0.72 | -62 | 43 | -0.102 | 0.406 | 0.203 |
| 8 | 0.83 | -89 | 50 | -0.145 | 0.476 | 0.186 |
| 9 | 0.95 | -198 | 73 | -0.323 | 0.693 | 0.047 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 0.95 |
| E (MPa) | 311.35 |
| υ | 0.25 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

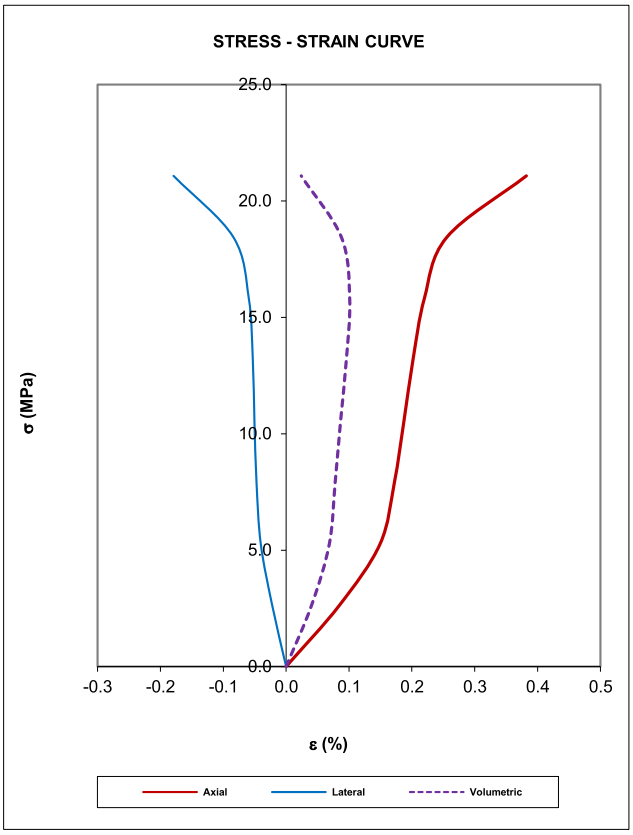
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_01 UCS | Diameter *(Diameter)* | : 60.57 mm |
| Kedalaman *(Depth)* | : 2.34 - 2.82 | Panjang *(Length)* | : 113.70 mm |
| Litologi *(Lithology)* | : CONGLOMERATE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 2.63 | -13 | 10 | -0.022 | 0.085 | 0.040 |
| 3 | 5.27 | -24 | 17 | -0.040 | 0.150 | 0.069 |
| 4 | 7.90 | -29 | 20 | -0.047 | 0.172 | 0.078 |
| 5 | 10.54 | -31 | 21 | -0.050 | 0.187 | 0.087 |
| 6 | 13.17 | -32 | 23 | -0.053 | 0.202 | 0.096 |
| 7 | 15.81 | -36 | 25 | -0.059 | 0.220 | 0.101 |
| 8 | 18.44 | -51 | 29 | -0.084 | 0.256 | 0.088 |
| 9 | 21.08 | -108 | 43 | -0.179 | 0.382 | 0.024 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 21.08 |
| E (MPa) | 14,979.32 |
| υ | 0.27 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | | | |
|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : | Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : | 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

## UJI KUAT TEKAN

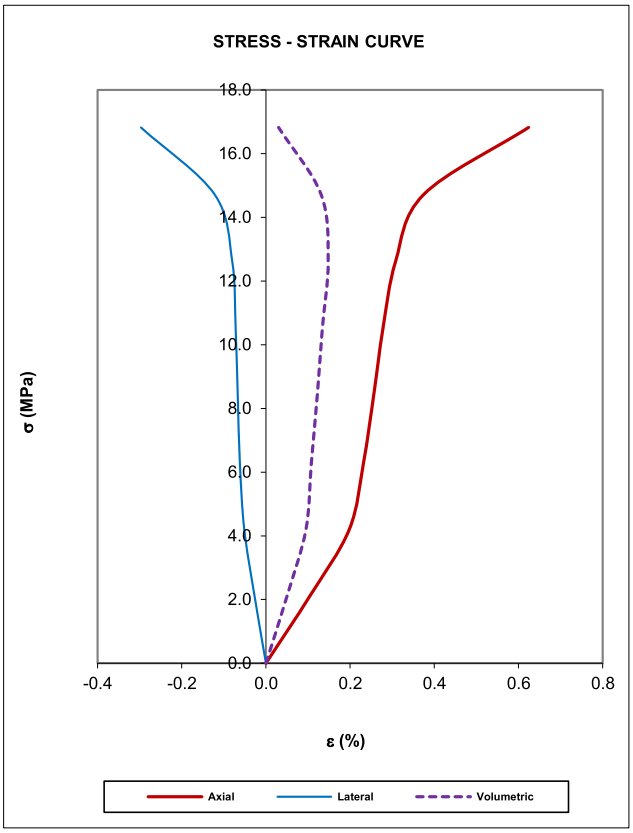
*(Uniaxial Compressive Strength Test)*

| | | | | | |
|---|---|---|---|---|---|
| Kode Sampel *(Sample Code)* | : | HM_DG_01 UCS & DS | Diameter *(Diameter)* | : 61.10 | mm |
| Kedalaman *(Depth)* | : | 7.00 - 7.55 | Panjang *(Length)* | : 121.10 | mm |
| Litologi *(Lithology)* | : | CONGLOMERATE | | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 2.10 | -16 | 13 | -0.027 | 0.104 | 0.050 |
| 3 | 4.21 | -31 | 24 | -0.052 | 0.198 | 0.095 |
| 4 | 6.31 | -38 | 28 | -0.062 | 0.232 | 0.108 |
| 5 | 8.41 | -41 | 31 | -0.067 | 0.256 | 0.122 |
| 6 | 10.51 | -44 | 34 | -0.072 | 0.278 | 0.134 |
| 7 | 12.62 | -49 | 37 | -0.080 | 0.308 | 0.148 |
| 8 | 14.72 | -75 | 45 | -0.122 | 0.375 | 0.131 |
| 9 | 16.82 | -181 | 76 | -0.297 | 0.624 | 0.030 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 16.82 |
| E (MPa) | 7,659.43 |
| υ | 0.26 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

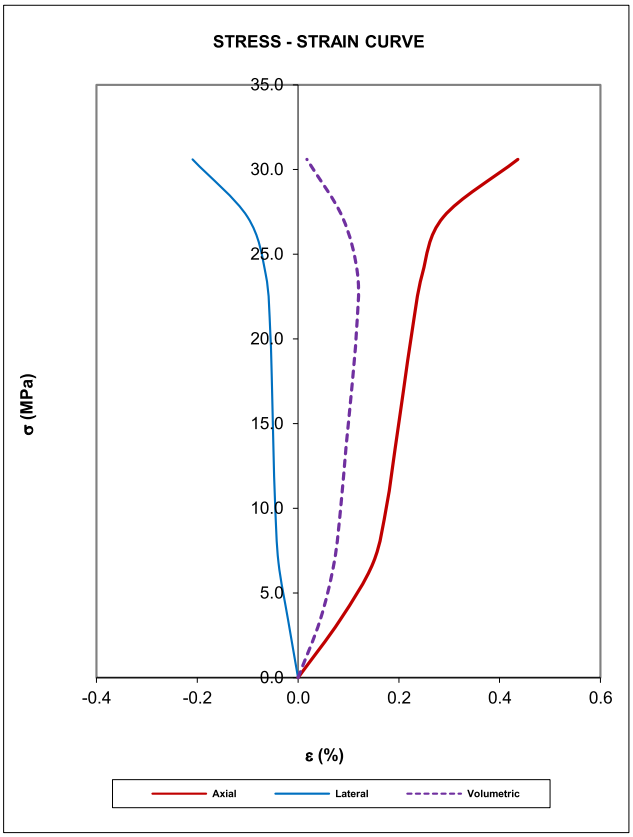
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_01 UCS & DS | Diameter *(Diameter)* | : 60.83 mm |
| Kedalaman *(Depth)* | : 12.42 - 12.91 | Panjang *(Length)* | : 120.53 mm |
| Litologi *(Lithology)* | : CONGLOMERATE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 3.40 | -12 | 10 | -0.020 | 0.083 | 0.044 |
| 3 | 6.80 | -24 | 18 | -0.039 | 0.149 | 0.072 |
| 4 | 10.17 | -28 | 21 | -0.045 | 0.176 | 0.085 |
| 5 | 13.60 | -30 | 23 | -0.049 | 0.193 | 0.095 |
| 6 | 16.97 | -31 | 25 | -0.052 | 0.209 | 0.106 |
| 7 | 20.40 | -34 | 27 | -0.055 | 0.226 | 0.116 |
| 8 | 23.80 | -39 | 30 | -0.064 | 0.246 | 0.118 |
| 9 | 27.20 | -61 | 35 | -0.100 | 0.289 | 0.088 |
| 10 | 30.60 | -127 | 53 | -0.209 | 0.436 | 0.018 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 30.60 |
| E (MPa) | 17,533.44 |
| υ | 0.26 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | | | |
|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : | Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : | 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

## UJI KUAT TEKAN

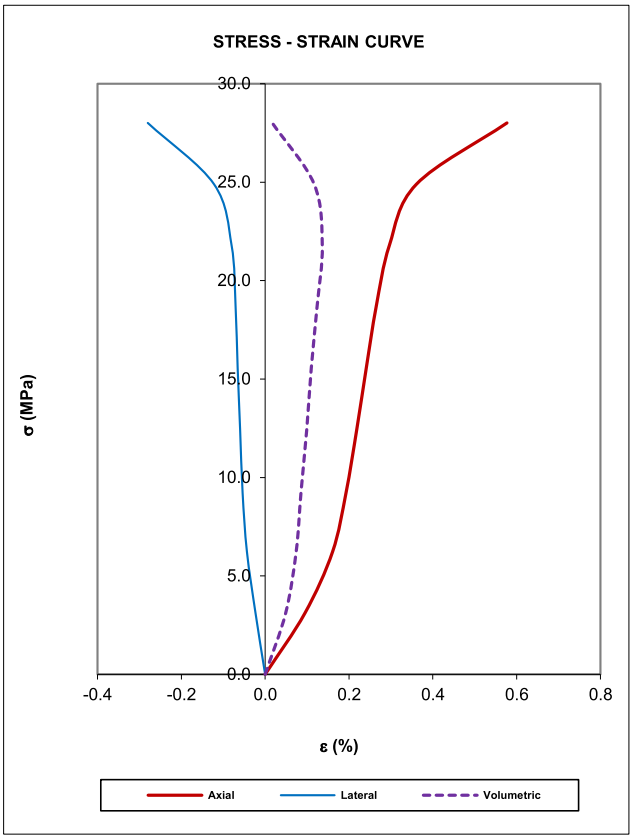
*(Uniaxial Compressive Strength Test)*

| | | | | | |
|---|---|---|---|---|---|
| Kode Sampel *(Sample Code)* | : | HM_DG_01 UCS | Diameter *(Diameter)* | : 60.73 | mm |
| Kedalaman *(Depth)* | : | 17.53 - 18.00 | Panjang *(Length)* | : 118.10 | mm |
| Litologi *(Lithology)* | : | CONGLOMERATE-SILTSTONE | | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 3.11 | -14 | 11 | -0.023 | 0.095 | 0.049 |
| 3 | 6.22 | -26 | 19 | -0.043 | 0.161 | 0.074 |
| 4 | 9.23 | -33 | 23 | -0.054 | 0.193 | 0.086 |
| 5 | 12.45 | -36 | 26 | -0.060 | 0.219 | 0.099 |
| 6 | 15.56 | -40 | 28 | -0.066 | 0.241 | 0.110 |
| 7 | 18.67 | -43 | 31 | -0.071 | 0.265 | 0.124 |
| 8 | 21.78 | -49 | 35 | -0.080 | 0.296 | 0.136 |
| 9 | 24.90 | -74 | 43 | -0.122 | 0.361 | 0.117 |
| 10 | 28.01 | -170 | 68 | -0.280 | 0.577 | 0.017 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 28.01 |
| E (MPa) | 11,485.62 |
| υ | 0.27 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | | | |
|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : | Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : | 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

## UJI KUAT TEKAN

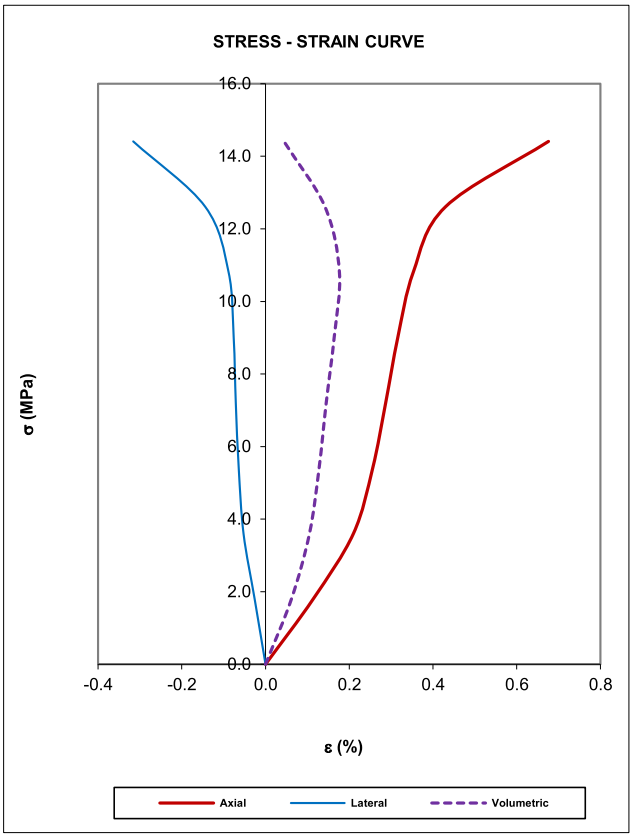
*(Uniaxial Compressive Strength Test)*

| | | | | | |
|---|---|---|---|---|---|
| Kode Sampel *(Sample Code)* | : | HM_DG_01 UCS & DS | Diameter *(Diameter)* | : 60.93 | mm |
| Kedalaman *(Depth)* | : | 22.00 - 22.50 | Panjang *(Length)* | : 114.27 | mm |
| Litologi *(Lithology)* | : | CONGLOMERATE | | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 1.80 | -16 | 13 | -0.026 | 0.114 | 0.062 |
| 3 | 3.60 | -32 | 24 | -0.053 | 0.210 | 0.105 |
| 4 | 5.40 | -39 | 29 | -0.064 | 0.256 | 0.128 |
| 5 | 7.21 | -43 | 33 | -0.071 | 0.287 | 0.145 |
| 6 | 9.01 | -46 | 36 | -0.076 | 0.316 | 0.164 |
| 7 | 10.81 | -54 | 40 | -0.088 | 0.353 | 0.177 |
| 8 | 12.61 | -88 | 49 | -0.144 | 0.430 | 0.142 |
| 9 | 14.41 | -193 | 77 | -0.316 | 0.676 | 0.044 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 14.41 |
| E (MPa) | 5,039.76 |
| υ | 0.25 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 23 Juli 2025 |
| Projek/lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : 29 Juli 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji Oleh *(Tested by)* | : Robby,Riki,Nana |

## UJI KUAT TEKAN

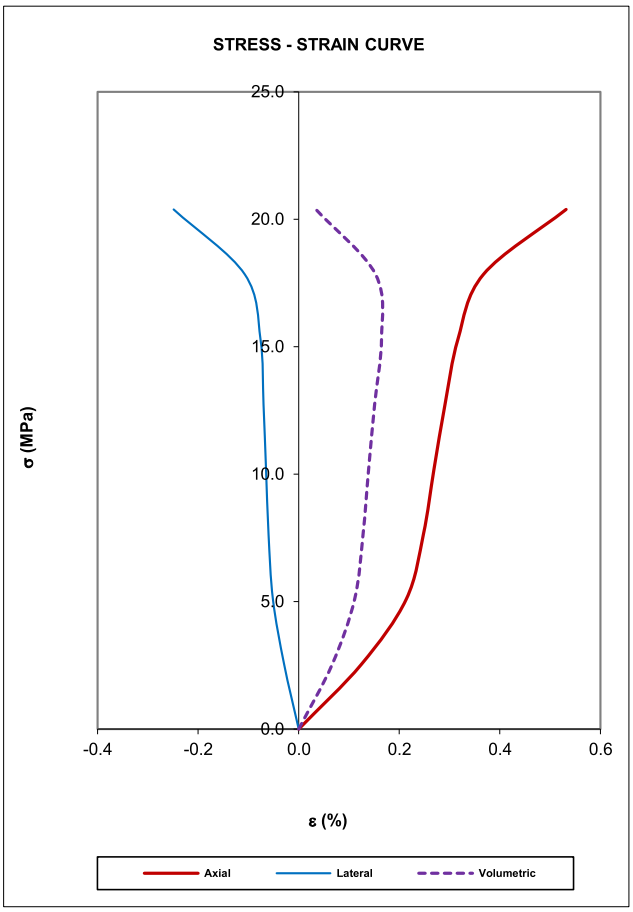
*(Uniaxial Compressive Strength Test)*

| | | | |
|---|---|---|---|
| Kode Sampel *(Sample Code)* | : HM_DG_01 UCS | Diameter *(Diameter)* | : 60.67 mm |
| Kedalaman *(Depth)* | : 27.50 - 28.04 | Panjang *(Length)* | : 116.87 mm |
| Litologi *(Lithology)* | : CONGLOMERATE | | |

| No | $\sigma_c$ (MPa) | Δ Lateral (µm) | Δ Axial (10µm) | ε Lateral % | ε Axial % | ε Volumetric % |
|---|---|---|---|---|---|---|
| 1 | 0.00 | 0 | 0 | 0.000 | 0.000 | 0.000 |
| 2 | 2.55 | -18 | 15 | -0.029 | 0.125 | 0.067 |
| 3 | 5.10 | -31 | 25 | -0.051 | 0.214 | 0.111 |
| 4 | 7.64 | -36 | 29 | -0.060 | 0.248 | 0.128 |
| 5 | 10.19 | -39 | 31 | -0.065 | 0.269 | 0.139 |
| 6 | 12.74 | -42 | 34 | -0.070 | 0.291 | 0.151 |
| 7 | 15.29 | -46 | 37 | -0.076 | 0.317 | 0.165 |
| 8 | 17.84 | -65 | 43 | -0.107 | 0.367 | 0.153 |
| 9 | 20.39 | -151 | 62 | -0.249 | 0.532 | 0.034 |

$\sigma_c$ = Compressive Strength
Δ = Deformation
ε = Strain

| | |
|---|---|
| $\sigma_c$ (MPa) | 20.39 |
| E (MPa) | 9,927.15 |
| υ | 0.24 |



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

## LAPORAN HASIL UJI

*(REPORT OF ANALYSIS)*

**No : GQT-061/VII/2025**

| | | | | | |
|---|---|---|---|---|---|
| Pelanggan *(Customer)* | : | **PT. ANE HENGJAYA MINERALINDO** | Tanggal Terima *(Date of Received)* | : | 16 Juli 2025 |
| Alamat *(Address)* | : | Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : | 29 Juli 2025 |
| Projek/lokasi *(Project/location)* | : | Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analysis)* | : | 31 Juli 2025 |
| Metode Standar *(Standard Method)* | : | ISRM 2007 | Diuji Oleh *(Tested by)* | : | Robby,Riki,Nana |

### UJI KUAT TEKAN

*(Uniaxial Compressive Strength Test)*

| No | Kode Sampel | Kedalaman | Litologi | F (kN) | Panjang (mm) | Lebar (mm) | Tinggi (mm) | $\sigma_c$ (MPa) |
|---|---|---|---|---|---|---|---|---|
| 1 | GRAB SAMPLE UCS | 0.00 - 0.00 | Limestone | 60.30 | 65.63 | 64.73 | 124.65 | 14.19 |

$\sigma_c$ = Compressive Strength

Keterangan :

1. Hasil pengujian HANYA valid untuk sampel yang diuji dengan kode, kedalaman, dan litologi yang tertera pada tabel di atas.
2. Laboratorium memberikan batas maksimal 30 hari sejak tanggal penyerahan laporan pengujian bagi pelanggan untuk mengajukan keluhan terkait hasil pengujian.

Bandung, 31 Juli 2025

**Purwanto ST.**

**Kepala Laboratorium**

*(Head of Laboratory)*

# DIRECT SHEAR

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

## LAPORAN HASIL UJI

*(REPORT OF ANALYSIS)*

**No : GQT-061/VII/2025**

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

### Uji Geser Langsung

*(Direct Shear Test)*

| No | Kode Sampel | Kedalaman (m) | Litologi | $\sigma_n$ (MPa) | τ (MPa) | | Cohesion (MPa) | | Internal Friction Angle (°) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak | Residual | Peak | Residual | Peak | Residual |
| 1 | HM_DG_03 DS/DS-01 | 5.85 - 6.05 | SILTSTONE | 0.077 | 0.469 | 0.423 | 0.424 | 0.392 | 30.06 | 22.53 |
| | HM_DG_03 DS/DS-02 | | | 0.139 | 0.502 | 0.451 | | | | |
| | HM_DG_03 DS/DS-03 | | | 0.205 | 0.543 | 0.476 | | | | |
| 2 | HM_DG_03 UCS & DS/DS-01 | 6.15 - 6.65 | SILTSTONE | 0.071 | 0.690 | 0.464 | 0.653 | 0.431 | 27.78 | 23.95 |
| | HM_DG_03 UCS & DS/DS-02 | | | 0.141 | 0.730 | 0.492 | | | | |
| | HM_DG_03 UCS & DS/DS-03 | | | 0.211 | 0.763 | 0.526 | | | | |
| 3 | HM_DG_03 DS/DS-01 | 9.41 - 9.73 | SILTSTONE | 0.071 | 0.635 | 0.462 | 0.587 | 0.429 | 33.98 | 24.57 |
| | HM_DG_03 DS/DS-02 | | | 0.141 | 0.683 | 0.494 | | | | |
| | HM_DG_03 DS/DS-03 | | | 0.211 | 0.730 | 0.526 | | | | |
| 4 | HM_DG_03 DS/DS-01 | 11.67 - 12.03 | SANDSTONE-SILTSTONE | 0.075 | 0.525 | 0.223 | 0.467 | 0.176 | 37.61 | 31.65 |
| | HM_DG_03 DS/DS-02 | | | 0.145 | 0.578 | 0.265 | | | | |
| | HM_DG_03 DS/DS-03 | | | 0.212 | 0.631 | 0.308 | | | | |
| 5 | HM_DG_03 UCS & DS/DS-01 | 14.67 - 15.11 | SILTSTONE-CONGLOMERATE | 0.067 | 0.433 | 0.301 | 0.403 | 0.275 | 23.77 | 21.79 |
| | HM_DG_03 UCS & DS/DS-02 | | | 0.132 | 0.460 | 0.330 | | | | |
| | HM_DG_03 UCS & DS/DS-03 | | | 0.196 | 0.490 | 0.352 | | | | |
| 6 | HM_DG_03 DS/DS-01 | 15.11 - 15.40 | CONGLOMERATE-SANDSTONE | 0.068 | 0.440 | 0.271 | 0.387 | 0.220 | 38.23 | 37.03 |
| | HM_DG_03 DS/DS-02 | | | 0.135 | 0.496 | 0.322 | | | | |
| | HM_DG_03 DS/DS-03 | | | 0.204 | 0.547 | 0.373 | | | | |
| 7 | HM_DG_03 DS/DS-01 | 18.28 - 18.73 | SILTSTONE | 0.066 | 0.705 | 0.431 | 0.668 | 0.400 | 29.18 | 26.08 |
| | HM_DG_03 DS/DS-02 | | | 0.140 | 0.747 | 0.470 | | | | |
| | HM_DG_03 DS/DS-03 | | | 0.208 | 0.784 | 0.500 | | | | |
| 8 | HM_DG_03 UCS & DS/DS-01 | 22.51 - 23.03 | SILTSTONE | 0.064 | 0.744 | 0.418 | 0.711 | 0.376 | 28.71 | 25.32 |
| | HM_DG_03 UCS & DS/DS-02 | | | 0.140 | 0.792 | 0.419 | | | | |
| | HM_DG_03 UCS & DS/DS-03 | | | 0.209 | 0.823 | 0.488 | | | | |
| 9 | HM_DG_03 UCS & DS/DS-01 | 25.98 - 26.53 | CONGLOMERATE | 0.067 | 0.631 | 0.336 | 0.572 | 0.287 | 41.49 | 35.33 |
| | HM_DG_03 UCS & DS/DS-02 | | | 0.135 | 0.691 | 0.382 | | | | |
| | HM_DG_03 UCS & DS/DS-03 | | | 0.198 | 0.747 | 0.429 | | | | |
| 10 | HM_DG_01 DS/DS-01 | 4.60 - 5.00 | CONGLOMERATE | 0.282 | 3.056 | 1.339 | 2.798 | 1.102 | 42.79 | 39.56 |
| | HM_DG_01 DS/DS-02 | | | 0.651 | 3.406 | 1.628 | | | | |
| | HM_DG_01 DS/DS-03 | | | 0.883 | 3.612 | 1.839 | | | | |

Keterangan :

1. Hasil pengujian HANYA valid untuk sampel yang diuji dengan kode, kedalaman, dan litologi yang tertera pada tabel di atas.
2. Laboratorium memberikan batas maksimal 30 hari sejak tanggal penyerahan laporan pengujian bagi pelanggan untuk mengajukan keluhan terkait hasil pengujian.

Bandung, 01 Agustus 2025

**Purwanto ST.**

**Kepala Laboratorium**

*(Head of Laboratory)*

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

## LAPORAN HASIL UJI

*(REPORT OF ANALYSIS)*

**No : GQT-061/VII/2025**

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

### Uji Geser Langsung

*(Direct Shear Test)*

| No | Kode Sampel | Kedalaman (m) | Litologi | $\sigma_n$ (MPa) | τ (MPa) | | Cohesion (MPa) | | Internal Friction Angle (°) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peak | Residual | Peak | Residual | Peak | Residual |
| 11 | HM_DG_01 UCS & DS/DS-01 | 7.00 - 7.55 | CONGLOMERATE | 0.353 | 2.812 | 1.359 | 2.488 | 1.064 | 43.03 | 38.65 |
| | HM_DG_01 UCS & DS/DS-02 | | | 0.662 | 3.114 | 1.573 | | | | |
| | HM_DG_01 UCS & DS/DS-03 | | | 1.127 | 3.537 | 1.974 | | | | |
| 12 | HM_DG_01 UCS & DS/DS-01 | 12.42 - 12.91 | CONGLOMERATE | 0.400 | 3.280 | 1.498 | 2.939 | 1.184 | 40.33 | 37.64 |
| | HM_DG_01 UCS & DS/DS-02 | | | 0.659 | 3.497 | 1.682 | | | | |
| | HM_DG_01 UCS & DS/DS-03 | | | 0.908 | 3.711 | 1.890 | | | | |
| 13 | HM_DG_01 DS/DS-01 | 15.00 - 15.29 | CONGLOMERATE-SILTSTONE | 0.332 | 3.833 | 0.989 | 3.593 | 0.782 | 35.93 | 32.17 |
| | HM_DG_01 DS/DS-02 | | | 0.701 | 4.103 | 1.225 | | | | |
| | HM_DG_01 DS/DS-03 | | | 1.109 | 4.396 | 1.479 | | | | |
| 14 | HM_DG_01 UCS & DS/DS-01 | 22.00 - 22.50 | CONGLOMERATE | 0.335 | 3.638 | 2.112 | 3.400 | 1.863 | 36.20 | 35.61 |
| | HM_DG_01 UCS & DS/DS-02 | | | 0.728 | 3.949 | 2.364 | | | | |
| | HM_DG_01 UCS & DS/DS-03 | | | 1.010 | 4.129 | 2.598 | | | | |
| 15 | HM_DG_01 DS/DS-01 | 26.60 - 27.00 | CONGLOMERATE-SANDSTONE | 0.411 | 3.712 | 1.852 | 3.394 | 1.549 | 38.25 | 35.09 |
| | HM_DG_01 DS/DS-02 | | | 0.666 | 3.927 | 1.997 | | | | |
| | HM_DG_01 DS/DS-03 | | | 1.200 | 4.337 | 2.398 | | | | |
| 16 | GRAB SAMPLE DS/DS-01 | - | LIMESTONE | 0.361 | 4.432 | 1.262 | 4.127 | 1.010 | 40.05 | 33.79 |
| | GRAB SAMPLE DS/DS-02 | | | 0.743 | 4.746 | 1.485 | | | | |
| | GRAB SAMPLE DS/DS-03 | | | 1.025 | 4.991 | 1.710 | | | | |

Keterangan :

1. Hasil pengujian HANYA valid untuk sampel yang diuji dengan kode, kedalaman, dan litologi yang tertera pada tabel di atas.
2. Laboratorium memberikan batas maksimal 30 hari sejak tanggal penyerahan laporan pengujian bagi pelanggan untuk mengajukan keluhan terkait hasil pengujian.

Bandung, 05 Agustus 2025

**Purwanto ST.**

**Kepala Laboratorium**

*(Head of Laboratory)*

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 DS
Kedalaman (m) : 5.85 - 6.05
Litologi : SILTSTONE

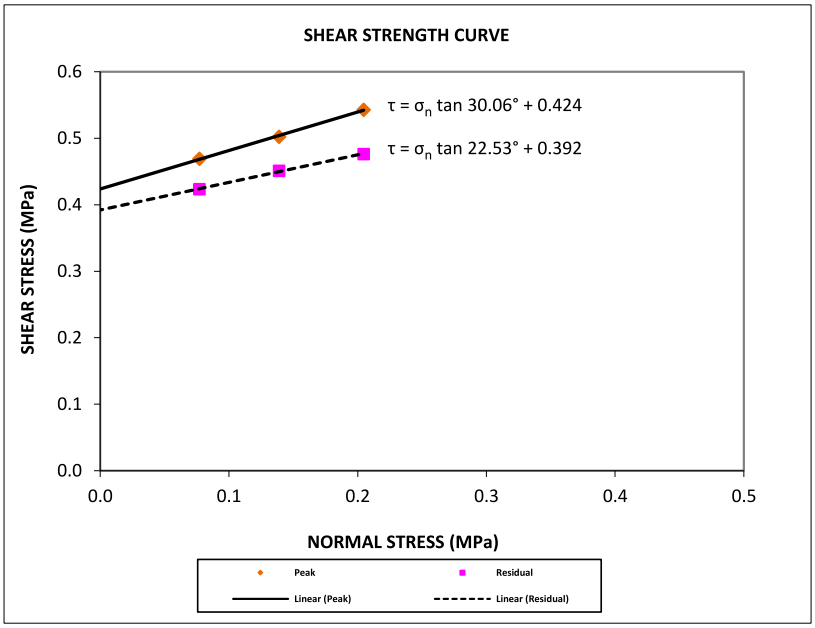
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2598.90 | 0.20 | 1.219 | 1.100 | 0.077 | 0.469 | 0.423 |
| 2 | 2878.82 | 0.40 | 1.446 | 1.298 | 0.139 | 0.502 | 0.451 |
| 3 | 2931.90 | 0.60 | 1.592 | 1.397 | 0.205 | 0.543 | 0.476 |

**Peak**

Cohesion (MPa) : 0.424
Internal Friction Angle (o) : 30.06

**Residual**

Cohesion (MPa) : 0.392
Internal Friction Angle (o) : 22.53



# GEOLAND QUATTRO TECHNOLAB

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E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 UCS & DS
Kedalaman (m) : 6.15 - 6.65
Litologi : SILTSTONE

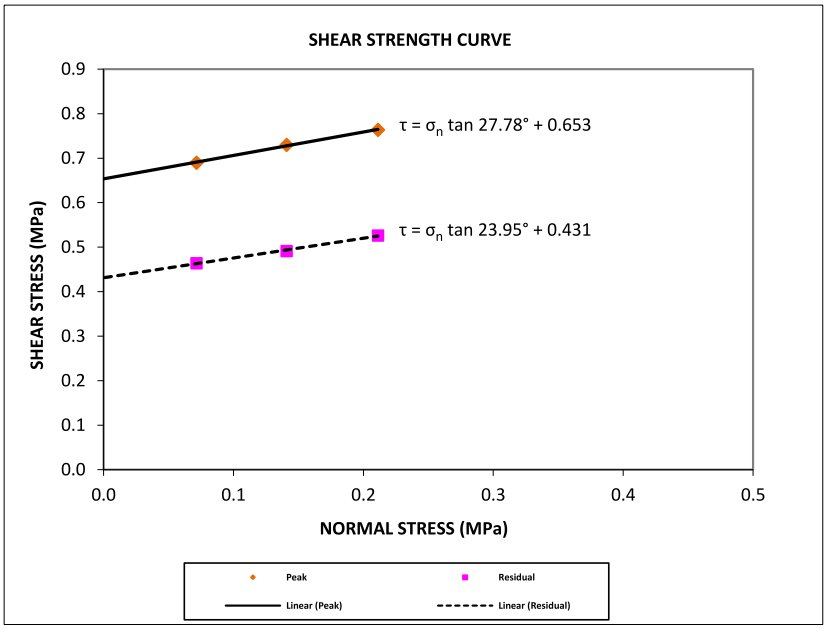
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2797.90 | 0.20 | 1.930 | 1.298 | 0.071 | 0.690 | 0.464 |
| 2 | 2840.94 | 0.40 | 2.074 | 1.397 | 0.141 | 0.730 | 0.492 |
| 3 | 2840.98 | 0.60 | 2.169 | 1.495 | 0.211 | 0.763 | 0.526 |

**Peak**

Cohesion (MPa) : 0.653
Internal Friction Angle (o) : 27.78

**Residual**

Cohesion (MPa) : 0.431
Internal Friction Angle (o) : 23.95



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E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 DS
Kedalaman (m) : 9.41 - 9.73
Litologi : SILTSTONE

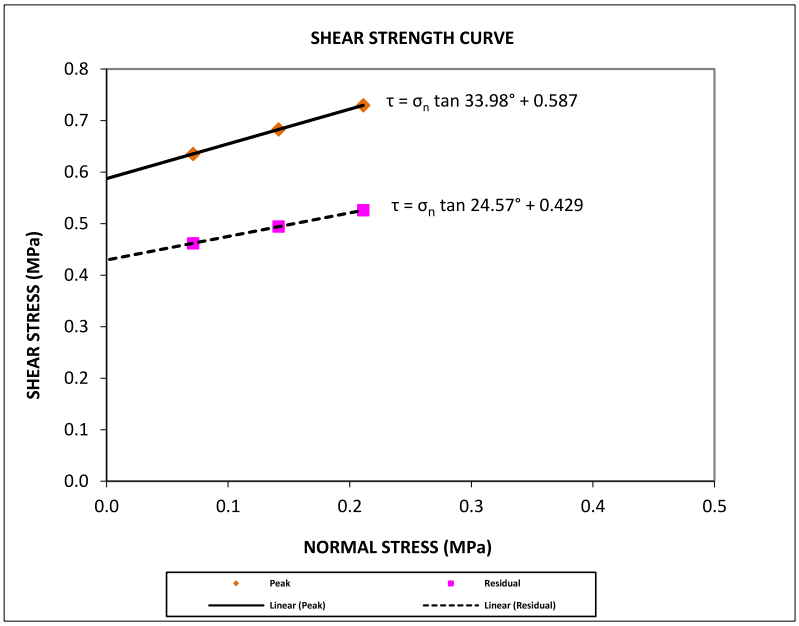
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2811.47 | 0.20 | 1.786 | 1.298 | 0.071 | 0.635 | 0.462 |
| 2 | 2826.87 | 0.40 | 1.930 | 1.397 | 0.141 | 0.683 | 0.494 |
| 3 | 2842.61 | 0.60 | 2.074 | 1.495 | 0.211 | 0.730 | 0.526 |

**Peak**

Cohesion (MPa) : 0.587
Internal Friction Angle (o) : 33.98

**Residual**

Cohesion (MPa) : 0.429
Internal Friction Angle (o) : 24.57



# GEOLAND QUATTRO TECHNOLAB

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KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 DS
Kedalaman (m) : 11.67 - 12.03
Litologi : SANDSTONE-SILTSTONE

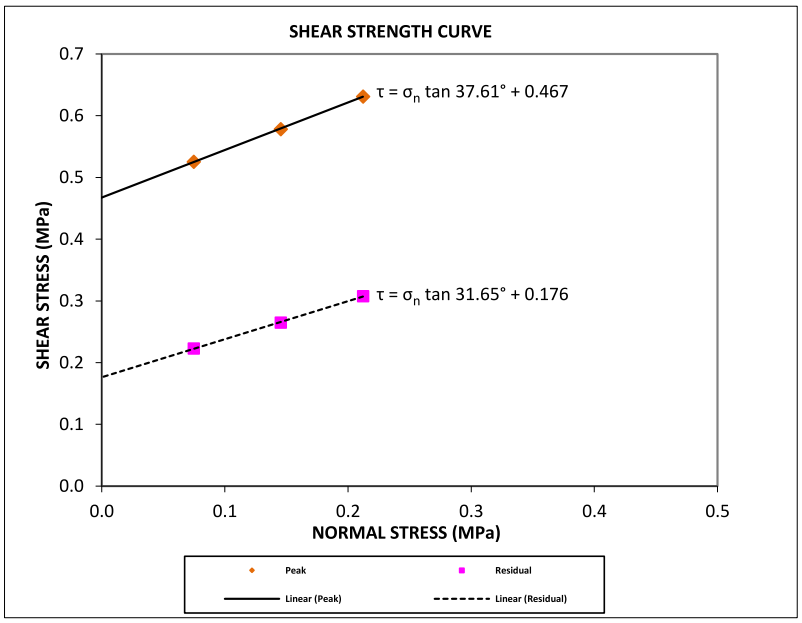
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2676.85 | 0.20 | 1.407 | 0.597 | 0.075 | 0.525 | 0.223 |
| 2 | 2752.18 | 0.40 | 1.592 | 0.729 | 0.145 | 0.578 | 0.265 |
| 3 | 2828.98 | 0.60 | 1.786 | 0.870 | 0.212 | 0.631 | 0.308 |

**Peak**

Cohesion (MPa) : 0.467
Internal Friction Angle (o) : 37.61

**Residual**

Cohesion (MPa) : 0.176
Internal Friction Angle (o) : 31.65



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 UCS & DS
Kedalaman (m) : 14.67 - 15.11
Litologi : SILTSTONE-CONGLOMERATE

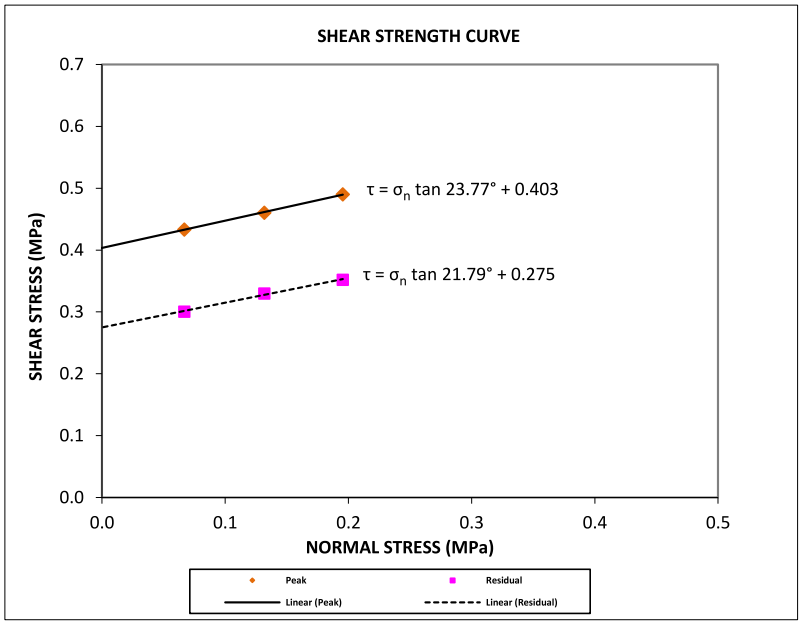
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2995.22 | 0.20 | 1.298 | 0.900 | 0.067 | 0.433 | 0.301 |
| 2 | 3034.50 | 0.40 | 1.397 | 1.001 | 0.132 | 0.460 | 0.330 |
| 3 | 3068.98 | 0.60 | 1.504 | 1.080 | 0.196 | 0.490 | 0.352 |

**Peak**

Cohesion (MPa) : 0.403
Internal Friction Angle (o) : 23.77

**Residual**

Cohesion (MPa) : 0.275
Internal Friction Angle (o) : 21.79



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

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E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 DS
Kedalaman (m) : 15.11 - 15.40
Litologi : CONGLOMERATE-SANDSTONE

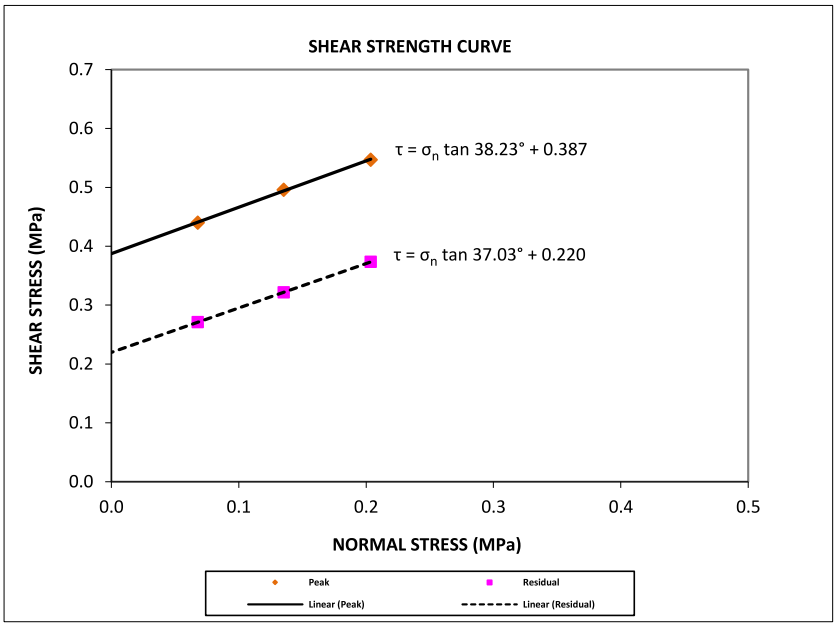
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2951.46 | 0.20 | 1.298 | 0.800 | 0.068 | 0.440 | 0.271 |
| 2 | 2956.20 | 0.40 | 1.465 | 0.951 | 0.135 | 0.496 | 0.322 |
| 3 | 2946.50 | 0.60 | 1.612 | 1.100 | 0.204 | 0.547 | 0.373 |

**Peak**

Cohesion (MPa) : 0.387
Internal Friction Angle (o) : 38.23

**Residual**

Cohesion (MPa) : 0.220
Internal Friction Angle (o) : 37.03



# GEOLAND QUATTRO TECHNOLAB

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Jawa Barat 40225

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E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 DS
Kedalaman (m) : 18.28 - 18.73
Litologi : SILTSTONE

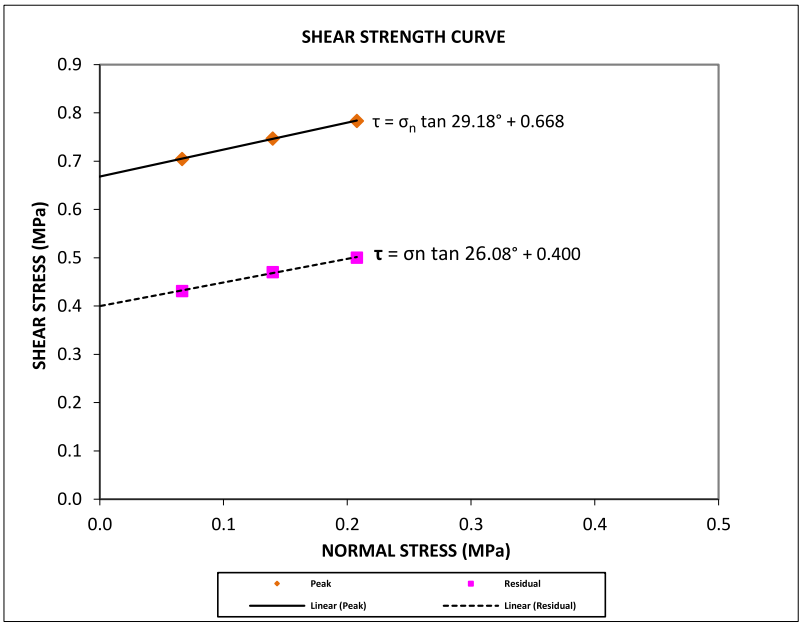
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 3009.63 | 0.20 | 2.121 | 1.298 | 0.066 | 0.705 | 0.431 |
| 2 | 2864.80 | 0.40 | 2.141 | 1.348 | 0.140 | 0.747 | 0.470 |
| 3 | 2888.75 | 0.60 | 2.264 | 1.446 | 0.208 | 0.784 | 0.500 |

**Peak**

Cohesion (MPa) : 0.668
Internal Friction Angle (o) : 29.18

**Residual**

Cohesion (MPa) : 0.400
Internal Friction Angle (o) : 26.08



# GEOLAND QUATTRO TECHNOLAB

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E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 UCS & DS
Kedalaman (m) : 22.51 - 23.03
Litologi : SILTSTONE

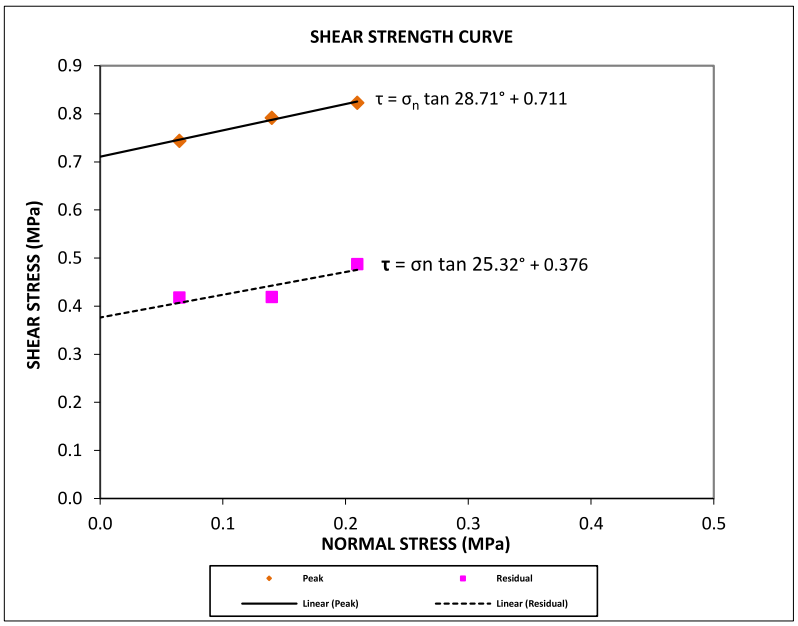
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 3106.48 | 0.20 | 2.311 | 1.298 | 0.064 | 0.744 | 0.418 |
| 2 | 2860.01 | 0.40 | 2.264 | 1.200 | 0.140 | 0.792 | 0.419 |
| 3 | 2864.81 | 0.60 | 2.359 | 1.397 | 0.209 | 0.823 | 0.488 |

**Peak**

Cohesion (MPa) : 0.711
Internal Friction Angle (o) : 28.71

**Residual**

Cohesion (MPa) : 0.376
Internal Friction Angle (o) : 25.32



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_03 UCS & DS
Kedalaman (m) : 25.98 - 26.53
Litologi : CONGLOMERATE

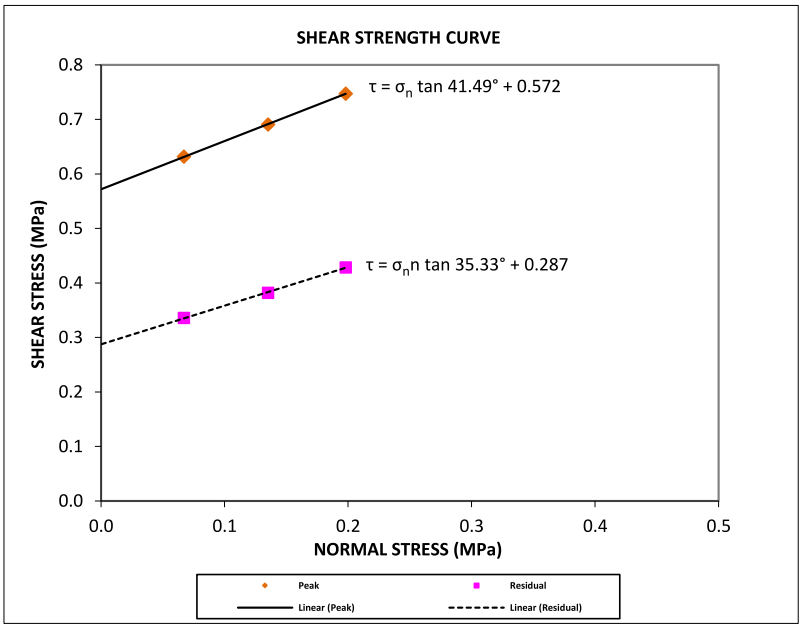
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 2980.63 | 0.20 | 1.882 | 1.001 | 0.067 | 0.631 | 0.336 |
| 2 | 2961.04 | 0.40 | 2.045 | 1.130 | 0.135 | 0.691 | 0.382 |
| 3 | 3029.50 | 0.60 | 2.264 | 1.298 | 0.198 | 0.747 | 0.429 |

**Peak**

Cohesion (MPa) : 0.572
Internal Friction Angle (o) : 41.49

**Residual**

Cohesion (MPa) : 0.287
Internal Friction Angle (o) : 35.33



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 28-29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 01 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_01 DS
Kedalaman (m) : 4.60 - 5.00
Litologi : CONGLOMERATE

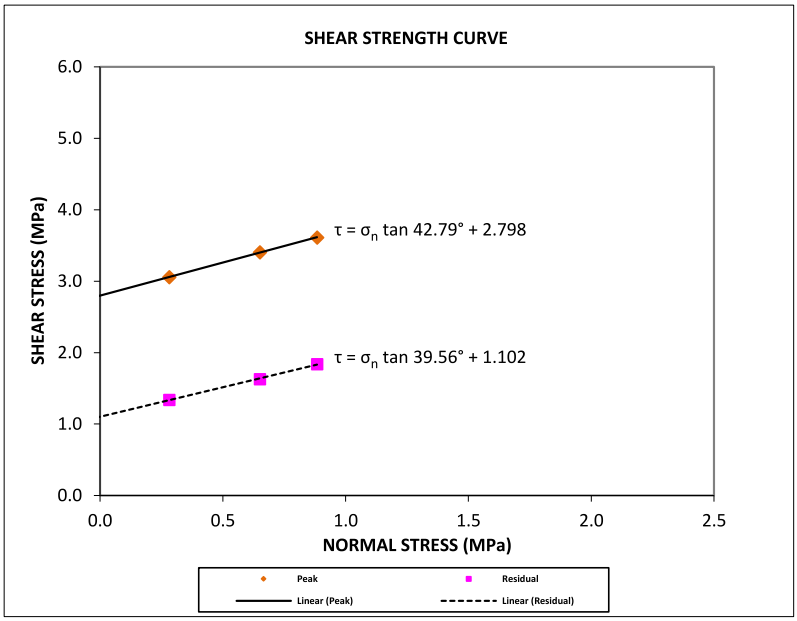
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 709.67 | 0.20 | 2.169 | 0.951 | 0.282 | 3.056 | 1.339 |
| 2 | 614.48 | 0.40 | 2.093 | 1.001 | 0.651 | 3.406 | 1.628 |
| 3 | 679.14 | 0.60 | 2.453 | 1.249 | 0.883 | 3.612 | 1.839 |

**Peak**

Cohesion (MPa) : 2.798
Internal Friction Angle (o) : 42.79

**Residual**

Cohesion (MPa) : 1.102
Internal Friction Angle (o) : 39.56



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_01 UCS & DS
Kedalaman (m) : 7.00 - 7.55
Litologi : CONGLOMERATE

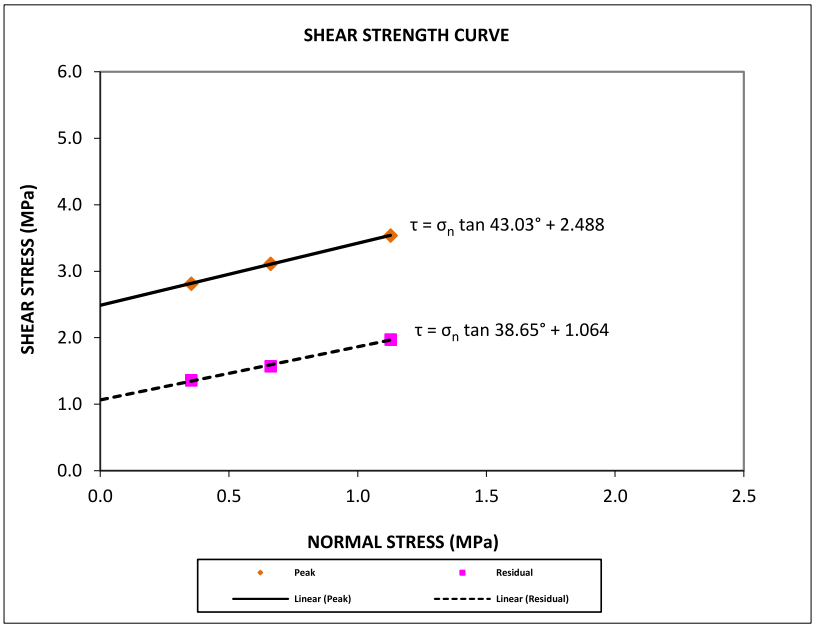
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 566.12 | 0.20 | 1.592 | 0.769 | 0.353 | 2.812 | 1.359 |
| 2 | 604.43 | 0.40 | 1.882 | 0.951 | 0.662 | 3.114 | 1.573 |
| 3 | 532.20 | 0.60 | 1.882 | 1.051 | 1.127 | 3.537 | 1.974 |

**Peak**

Cohesion (MPa) : 2.488
Internal Friction Angle (o) : 43.03

**Residual**

Cohesion (MPa) : 1.064
Internal Friction Angle (o) : 38.65



# GEOLAND QUATTRO TECHNOLAB

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E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
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| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_01 UCS & DS
Kedalaman (m) : 12.42 - 12.91
Litologi : CONGLOMERATE

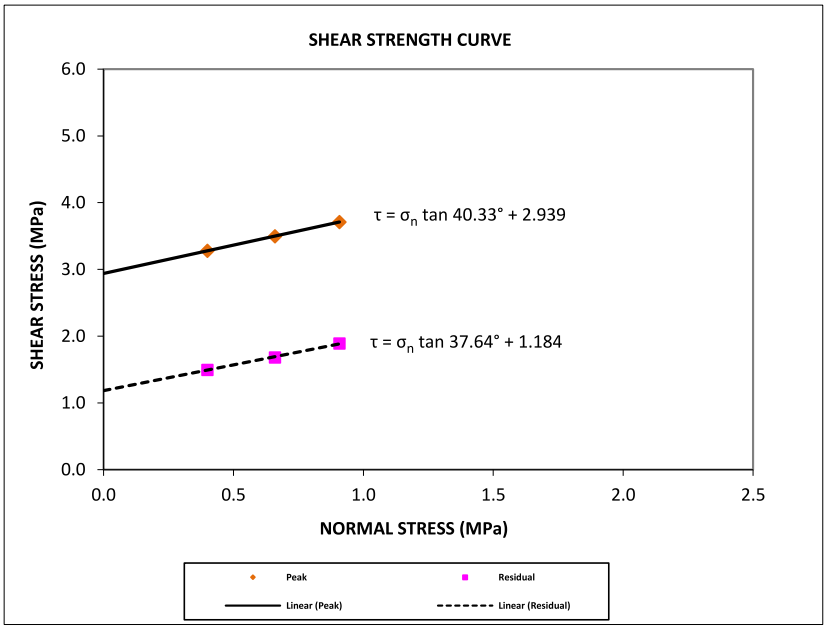
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 500.19 | 0.20 | 1.641 | 0.749 | 0.400 | 3.280 | 1.498 |
| 2 | 606.70 | 0.40 | 2.121 | 1.021 | 0.659 | 3.497 | 1.682 |
| 3 | 660.96 | 0.60 | 2.453 | 1.249 | 0.908 | 3.711 | 1.890 |

**Peak**

Cohesion (MPa) : 2.939
Internal Friction Angle (o) : 40.33

**Residual**

Cohesion (MPa) : 1.184
Internal Friction Angle (o) : 37.64



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_01 DS
Kedalaman (m) : 15.00 - 15.29
Litologi : CONGLOMERATE-SILTSTONE

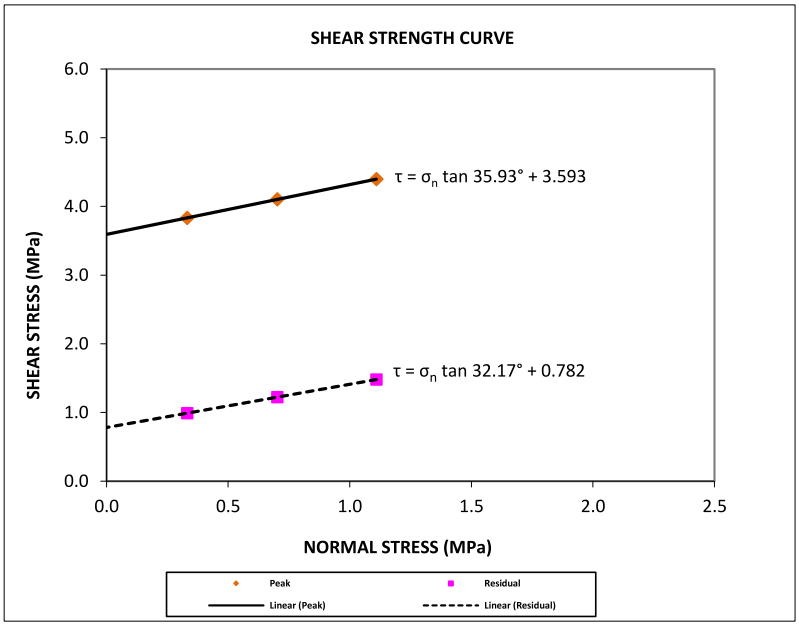
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 603.09 | 0.20 | 2.311 | 0.597 | 0.332 | 3.833 | 0.989 |
| 2 | 570.22 | 0.40 | 2.340 | 0.698 | 0.701 | 4.103 | 1.225 |
| 3 | 540.82 | 0.60 | 2.378 | 0.800 | 1.109 | 4.396 | 1.479 |

**Peak**

Cohesion (MPa) : 3.593
Internal Friction Angle (o) : 35.93

**Residual**

Cohesion (MPa) : 0.782
Internal Friction Angle (o) : 32.17



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_01 UCS & DS
Kedalaman (m) : 22.00 - 22.50
Litologi : CONGLOMERATE

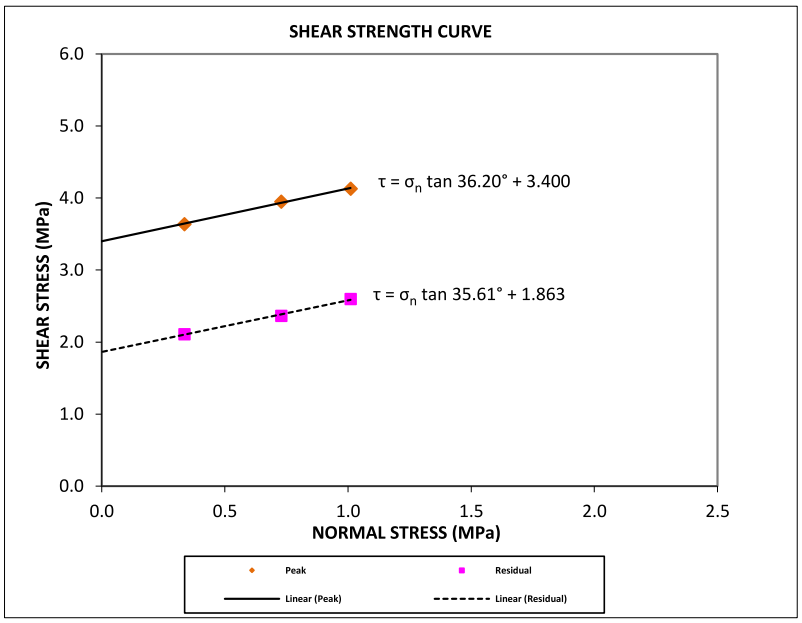
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 596.16 | 0.20 | 2.169 | 1.259 | 0.335 | 3.638 | 2.112 |
| 2 | 549.21 | 0.40 | 2.169 | 1.298 | 0.728 | 3.949 | 2.364 |
| 3 | 594.05 | 0.60 | 2.453 | 1.543 | 1.010 | 4.129 | 2.598 |

**Peak**

Cohesion (MPa) : 3.400
Internal Friction Angle (o) : 36.20

**Residual**

Cohesion (MPa) : 1.863
Internal Friction Angle (o) : 35.61



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : HM_DG_01 DS
Kedalaman (m) : 26.60 - 27.00
Litologi : CONGLOMERATE-SANDSTONE

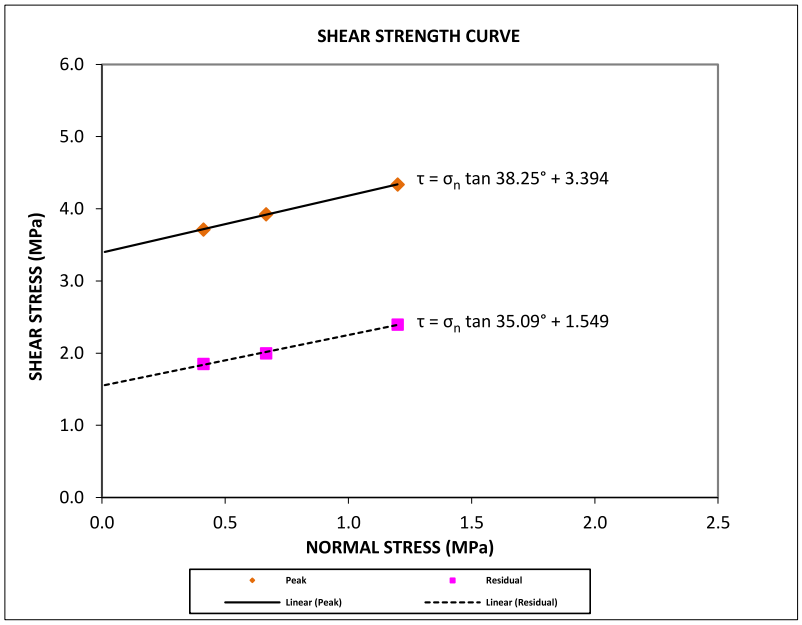
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 486.30 | 0.20 | 1.805 | 0.900 | 0.411 | 3.712 | 1.852 |
| 2 | 600.61 | 0.40 | 2.359 | 1.200 | 0.666 | 3.927 | 1.997 |
| 3 | 500.19 | 0.60 | 2.169 | 1.200 | 1.200 | 4.337 | 2.398 |

**Peak**

Cohesion (MPa) : 3.394
Internal Friction Angle (o) : 38.25

**Residual**

Cohesion (MPa) : 1.549
Internal Friction Angle (o) : 35.09



# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung

Jawa Barat 40225

Tlp/WA : 082115618130

E-mail : geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

| | | | |
|---|---|---|---|
| Pelanggan *(Customer)* | : **PT. ANE HENGJAYA MINERALINDO** | Tanggal Diterima *(Date of Received)* | : 16 Juli 2025 |
| Alamat *(Address)* | : Jl. Barkah No. 27, RT 03/ RW 05 Ciganjur, Jagakarsa, Jakarta Selatan | Tanggal Pengujian *(Date of Test)* | : 29 Juli 2025 |
| Proyek/Lokasi *(Project/Location)* | : Geotechical Investigation Of Main Haul Road Properties Material PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province | Tanggal Analisis *(Date of Analisis)* | : 05 Agustus 2025 |
| Metode Standar *(Standard Method)* | : ISRM 2007 | Diuji oleh *(Tested by)* | : Robby,Riki,Nana |

## Uji Geser Langsung

*(Direct Shear Test)*

Kode sampel : GRAB SAMPLE DS
Kedalaman (m) : -
Litologi : LIMESTONE

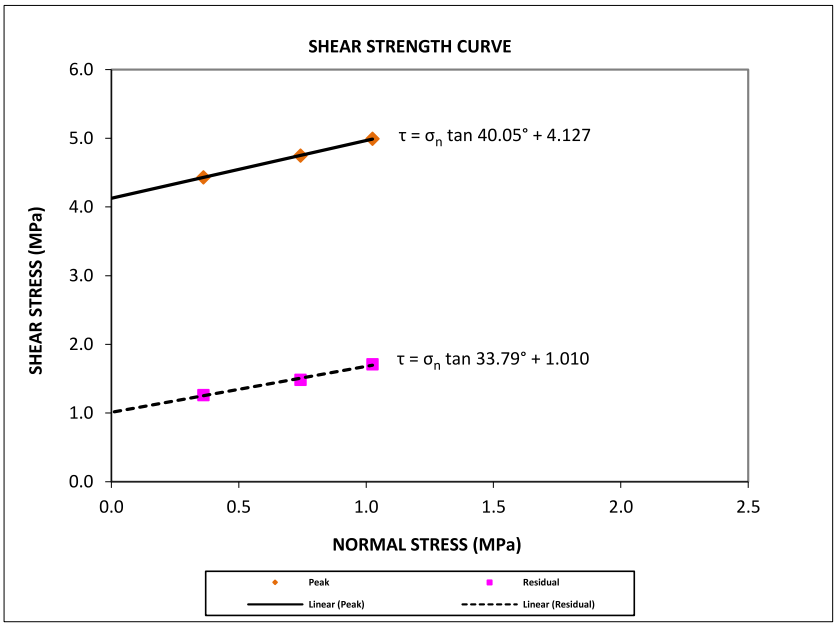
| No | Area ($mm^2$) | $F_{normal}$ (kN) | $F_{shear}$ (kN) | | $\sigma_{normal}$ (MPa) | τ (MPa) | |
|---|---|---|---|---|---|---|---|
| | | | Peak | Residual | | Peak | Residual |
| 1 | 553.43 | 0.20 | 2.453 | 0.698 | 0.361 | 4.432 | 1.262 |
| 2 | 538.65 | 0.40 | 2.557 | 0.800 | 0.743 | 4.746 | 1.485 |
| 3 | 585.28 | 0.60 | 2.921 | 1.001 | 1.025 | 4.991 | 1.710 |

**Peak**

Cohesion (MPa) : 4.127
Internal Friction Angle (o) : 40.05

**Residual**

Cohesion (MPa) : 1.010
Internal Friction Angle (o) : 33.79



# APPENDIX E

## DOCUMENTATION
## LABORATORIUM RESULT
## ( ROCK )

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung
Jawa Barat 40225
Tlp/WA : 082115618130
E-mail: geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

**Geotechical Investigation Of Main Haul Road Properties Material**
**PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province**
GQT-061/VII/2025

**UJI SIFAT FISIK**
*(Physical Properties Test)*

**Before Test**



**After Test**



| NO | KODE SAMPEL | KEDALAMAN |
|---|---|---|
| 1 | HM_DG_03 DS | 5.85 - 6.05 |
| 2 | HM_DG_03 UCS & DS | 6.15 - 6.65 |
| 3 | HM_DG_03 UCS | 8.67 - 9.00 |
| 4 | HM_DG_03 DS | 9.41 - 9.73 |
| 5 | HM_DG_03 DS | 11.67 - 12.03 |
| 6 | HM_DG_03 DS | 13.47 - 13.97 |
| 7 | HM_DG_03 UCS & DS | 14.67 - 15.11 |
| 8 | HM_DG_03 DS | 15.11 - 15.4 |
| 9 | HM_DG_03 UCS | 17.02 - 17.51 |
| 10 | HM_DG_03 DS | 18.28 - 18.73 |

| NO | KODE SAMPEL | KEDALAMAN |
|---|---|---|
| 11 | HM_DG_03 UCS & DS | 22.51 - 23.03 |
| 12 | HM_DG_03 UCS & DS | 25.98 - 26.53 |
| 13 | HM_DG_01 UCS | 2.34 - 2.82 |
| 14 | HM_DG_01 DS | 4.60 - 5.00 |
| 15 | HM_DG_01 UCS & DS | 7.00 - 7.55 |
| 16 | HM_DG_01 UCS & DS | 12.42 - 12.91 |
| 17 | HM_DG_01 DS | 15.00 - 15.29 |
| 18 | HM_DG_01 UCS | 17.53 - 18.00 |
| 19 | HM_DG_01 UCS & DS | 22.00 - 22.50 |
| 20 | HM_DG_01 DS | 26.60 - 27.00 |

| NO | KODE SAMPEL | KEDALAMAN |
|---|---|---|
| 21 | HM_DG_01 UCS | 27.50 - 28.04 |
| 22 | GRAB SAMPLE UCS | 0.00 - 0.00 |
| 23 | GRAB SAMPLE DS | 0.00 - 0.00 |

# GEOLAND QUATTRO TECHNOLAB

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E-mail: geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

**Geotechical Investigation Of Main Haul Road Properties Material**
**PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province**

GQT-061/VII/2025

**UJI KUAT TEKAN**

*(Uniaxial Compressive Strength Test)*

| HM_DG_03 UCS & DS | |
|---|---|
| 6.15 - 6.65 | SILTSTONE |
|  |  |
| Before Test | After Test |

| HM_DG_03 UCS | |
|---|---|
| 8.67 - 9.00 | SILTSTONE |
|  |  |
| Before Test | After Test |

| HM_DG_03 DS | |
|---|---|
| 13.47 - 13.97 | silty-SANDSTONE |
|  |  |
| Before Test | After Test |

| HM_DG_03 UCS & DS | |
|---|---|
| 14.67 - 15.11 | SILTSTONE-CONGLOMERATE |
|  |  |
| Before Test | After Test |

| HM_DG_03 UCS | |
|---|---|
| 17.02 - 17.51 | silty-SANDSTONE |
|  |  |
| Before Test | After Test |

| HM_DG_03 UCS & DS | |
|---|---|
| 22.51 - 23.03 | SILTSTONE |
|  |  |
| Before Test | After Test |

# GEOLAND QUATTRO TECHNOLAB

Komplek Indahco No. 22 Jl. Nata Endah, Kec. Margahayu, Kab. Bandung
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Tlp/WA : 082115618130
E-mail: geolandquattro@geolandtechnolab.com


KAN Komite Akreditasi Nasional LP-2060-IDN

**Geotechical Investigation Of Main Haul Road Properties Material**
**PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province**

GQT-061/VII/2025

**UJI KUAT TEKAN**

*(Uniaxial Compressive Strength Test)*

| HM_DG_03 UCS & DS | |
|---|---|
| 25.98 - 26.53 | CONGLOMERATE |
|  |  |
| Before Test | After Test |

| HM_DG_01 UCS | |
|---|---|
| 2.34 - 2.82 | CONGLOMERATE |
|  |  |
| Before Test | After Test |

| HM_DG_01 UCS & DS | |
|---|---|
| 7.00 - 7.55 | CONGLOMERATE |
|  |  |
| Before Test | After Test |

| HM_DG_01 UCS & DS | |
|---|---|
| 12.42 - 12.91 | CONGLOMERATE |
|  |  |
| Before Test | After Test |

| HM_DG_01 UCS | |
|---|---|
| 17.53 - 18.00 | CONGLOMERATE-SILTSTONE |
|  |  |
| Before Test | After Test |

| HM_DG_01 UCS & DS | |
|---|---|
| 22.00 - 22.50 | CONGLOMERATE |
|  |  |
| Before Test | After Test |

# GEOLAND QUATTRO TECHNOLAB

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KAN Komite Akreditasi Nasional LP-2060-IDN

**Geotechical Investigation Of Main Haul Road Properties Material**
**PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province**

GQT-061/VII/2025

**UJI KUAT TEKAN**

*(Uniaxial Compressive Strength Test)*

| HM_DG_01 UCS | |
|---|---|
| 27.50 - 28.04 | CONGLOMERATE |
|  |  |
| Before Test | After Test |

| GRAB SAMPLE UCS | |
|---|---|
| 0.00 - 0.00 | LIMESTONE |
|  |  |
| Before Test | After Test |

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GQT-061/VII/2025

**Uji Geser Langsung**
*(Direct Shear Test)*

| HM_DG_03 DS | |
|---|---|
| 5.85 - 6.05 | SILTSTONE |
|   |   |
| Before Test | After Test |

| HM_DG_03 UCS & DS | |
|---|---|
| 6.15 - 6.65 | SILTSTONE |
|   |   |
| Before Test | After Test |

| HM_DG_03 DS | |
|---|---|
| 9.41 - 9.73 | SILTSTONE |
|   |   |
| Before Test | After Test |

# GEOLAND QUATTRO TECHNOLAB

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GQT-061/VII/2025

**Uji Geser Langsung**
*(Direct Shear Test)*

| HM_DG_03 DS | |
|---|---|
| **11.67 - 12.03** | **SANDSTONE-SILTSTONE** |
|   |   |
| **Before Test** | **After Test** |

| HM_DG_03 UCS & DS | |
|---|---|
| **14.67 - 15.11** | **SILTSTONE-CONGLOMERATE** |
|   |   |
| **Before Test** | **After Test** |

| HM_DG_03 DS | |
|---|---|
| **15.11 - 15.4** | **CONGLOMERATE-SANDSTONE** |
|   |   |
| **Before Test** | **After Test** |

# GEOLAND QUATTRO TECHNOLAB

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GQT-061/VII/2025

**Uji Geser Langsung**
*(Direct Shear Test)*

| HM_DG_03 DS | |
|---|---|
| **18.28 - 18.73** | **SILTSTONE** |
|  |  |
| **Before Test** | **After Test** |

| HM_DG_03 UCS & DS | |
|---|---|
| **22.51 - 23.03** | **SILTSTONE** |
|  |  |
| **Before Test** | **After Test** |

| HM_DG_03 UCS & DS | |
|---|---|
| **25.98 - 26.53** | **CONGLOMERATE** |
|  |  |
| **Before Test** | **After Test** |

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GQT-061/VII/2025

**Uji Geser Langsung**
*(Direct Shear Test)*

| HM_DG_01 DS | |
|---|---|
| **4.60 - 5.00** | **CONGLOMERATE** |
|   |   |
| **Before Test** | **After Test** |

| HM_DG_01 UCS & DS | |
|---|---|
| **7.00 - 7.55** | **CONGLOMERATE** |
|   |   |
| **Before Test** | **After Test** |

| HM_DG_01 UCS & DS | |
|---|---|
| **12.42 - 12.91** | **CONGLOMERATE** |
|   |   |
| **Before Test** | **After Test** |

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GQT-061/VII/2025

**Uji Geser Langsung**
*(Direct Shear Test)*

| HM_DG_01 DS | |
|---|---|
| **15.00 - 15.29** | **CONGLOMERATE-SILTSTONE** |
|   |   |
| **Before Test** | **After Test** |

| HM_DG_01 UCS & DS | |
|---|---|
| **22.00 - 22.50** | **CONGLOMERATE** |
|   |   |
| **Before Test** | **After Test** |

| HM_DG_01 DS | |
|---|---|
| **26.60 - 27.00** | **CONGLOMERATE-SANDSTONE** |
|   |   |
| **Before Test** | **After Test** |

# GEOLAND QUATTRO TECHNOLAB

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**PT Hengjaya Mineralindo, Site Tangofa, Morowali Regency, Central Sulawesi Province**
GQT-061/VII/2025

**Uji Geser Langsung**
*(Direct Shear Test)*

| GRAB SAMPLE DS | |
|---|---|
| **0.00 - 0.00** | **LIMESTONE** |
|   |   |
| **Before Test** | **After Test** |

ABHIPRAYA
nusa engineering

DRAFT FINAL REPORT

# STUDI HIDROLOGI, HIDROGEOLOGI, DAN GEOTEKNIK
# PT HENGJAYA MINERALINDO

## Bungku Pesisir, Kab. Morowali
## Provinsi Sulawesi Tengah


PT.LAPI ITB

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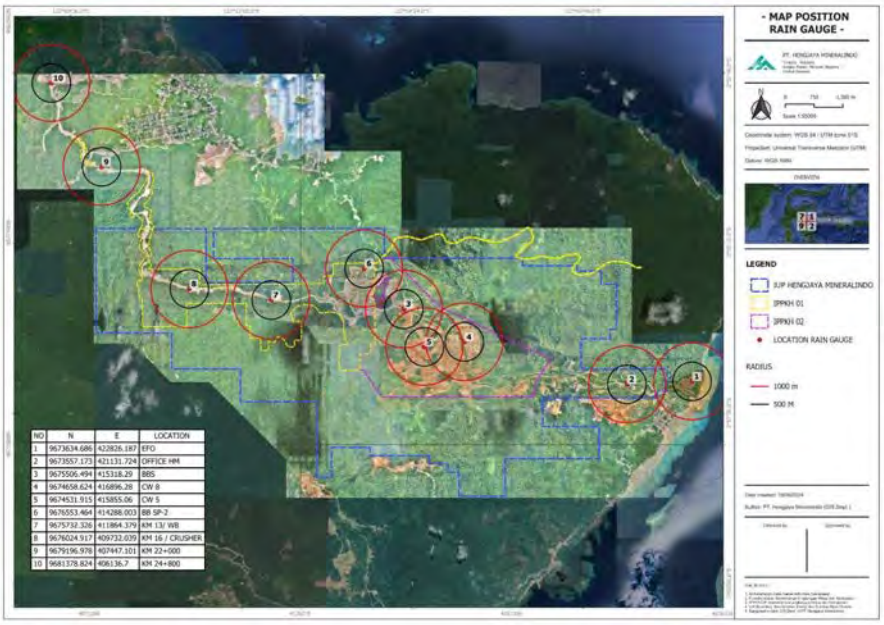
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# I. JENIS, JUMLAH & SEBARAN DATA

## I.1 Data Klimatologi

Kondisi klimatologi pada lokasi studi ditinjau dari data pencatatan curah hujan yang dimiliki oleh PT HM. Data pencatatan hujan didapatkan dari 8 stasiun klimatologi yang dimiliki oleh PT HM dengan sebaran lokasi ditunjukkan pada **Gambar I-1** dengan ketersediaan dan tipe data diperlihatkan pada **Tabel I-1**. Data yang tersedia berupa data hujan harian dengan rentang ketersediaan data bervariasi dari masing-masing stasiun. Pencatatan data terpanjang yaitu 5 tahun tercatat dari May-2019 hingga May-2024 terdapat pada lokasi Bete-Bete Pit dan Jetty Area sedangkan pada stasiun lainnya memiliki pencatatan data yang pendek (<3 tahun).



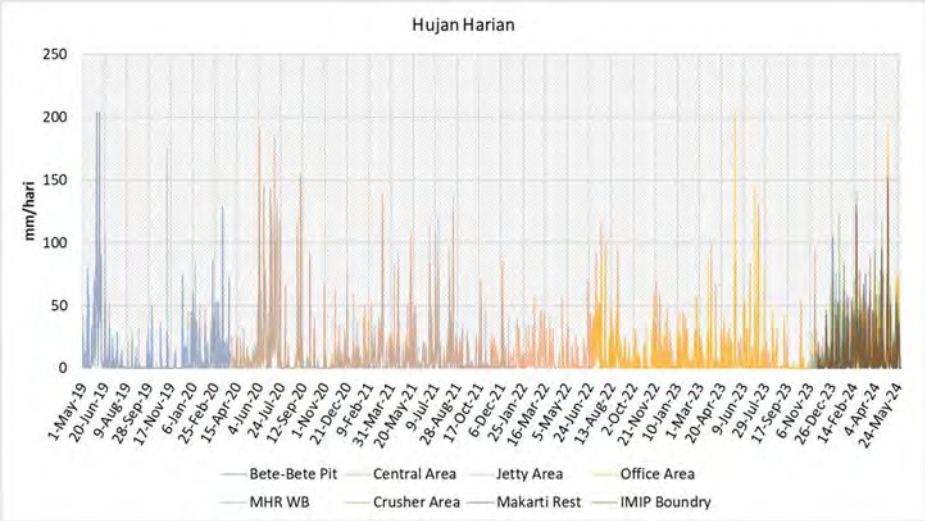

Gambar I-1 Lokasi sebaran data stasiun hujan PT HM

Tabel I-1 Koordinat stasiun dan tipe ketersediaan data hujan

| No | Stasiun Hujan | Koordinat | | Ketersidaan Data | |
|---|---|---|---|---|---|
| | | N | E | Tipe Data | Rentang Waktu |
| 1 | EFO/Jetty Area | 9673635 | 422826 | Harian | May'2019 – May'2024 |
| 2 | Office HM/Office Area | 9673557 | 421132 | Harian | July'2022 - May'2024 |

| No | Stasiun Hujan | Koordinat | | Ketersidaan Data | |
|---|---|---|---|---|---|
| | | N | E | Tipe Data | Rentang Waktu |
| 3 | BBS | 9675506 | 415318 | Tidak Tersedia | - |
| 4 | CW 8 | 9674659 | 416896 | Tidak Tersedia | - |
| 5 | CW 5/CZ21/Central Area | 9674532 | 415855 | Harian | Apr'2021 – May'2024 |
| 6 | BB SP-2/Bete-Bete Pit | 9676553 | 414288 | Harian | May'2019 – May'2024 |
| 7 | KM 13/MHR WB | 8675732 | 411864 | Harian | Nov'2023 - May'2024 |
| 8 | KM 16/Crusher Area | 9676025 | 409732 | Harian | Nov'2023 - May'2024 |
| 9 | KM 22+000/Makarti rest | 9679197 | 407447 | Harian | Nov'2023 - May'2024 |
| 10 | KM 24+800/IMIP Boundary | 9681379 | 406137 | Harian | Nov'2023 - May'2024 |

Ketersedian data hujan harian pada masing-masing stasiun ditampilkan dalam bentuk grafik pada **Gambar I-2** dengan rangkuman data hujan bulanan ditampilkan dalam bentuk tabel pada **Tabel I-2**. Selanjutnya kondisi klimatologi secara umum ditinjau dari rata-rata pencatatan curah hujan pada semua stasiun dengan periode pencatatan curah hujan yang lengkap selama 1 tahun yaitu di rentang tahun 2020 – 2023. Data rata-rata curah hujan bulanan dari semua stasiun ditunjukkan pada **Tabel I-3** dengan representasi grafis ditunjukan dengan grafik pada **Gambar I-3**. Berdasarkan data, rata-rata curah hujan harian pada lokasi studi yaitu sekitar 15 mm/hari dengan rata-rata curah hujan bulanan sebesar 304 mm/bulan serta rata-rata curah hujan tahunan sebesar 3651 mm/tahun sehingga termasuk kedalam kategori curah hujan yang tinggi (300-500 mm/bulan). Rata-rata curah tertinggi pada umumnya terjadi pada Juni-Juli sedangkan terendah pada akhir dan awal bulan setiap tahunnya. Berdasarkan pola curah hujan dari BMKG **(Gambar I-4**) diketahui tipe pola curah hujan pada lokasi studi merupakan tipe lokal. Pola ini memiliki distribusi hujan bulanan berkebalikan dari pola monsun. Pola lokal dicirikan oleh bentuk pola hujan unimodial (satu puncak hujan), tetapi waktunya berlawanan dengan tipe hujan monsun.




Gambar I-2 Grafik hujan harian masing-masing stasiun

Tabel I-2 Rangkuman data curah hujan bulanan masing-masing stasiun

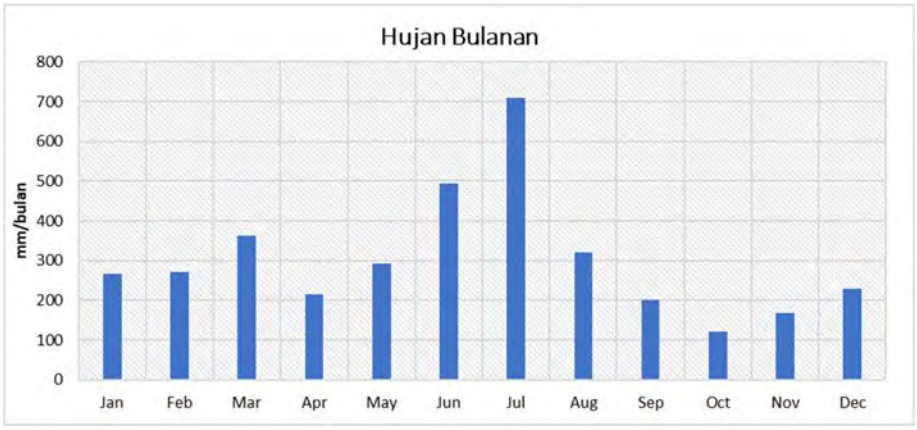
| Stasiun | Tahun | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bete-Bete Pit/ BB SP-2 | 2019 | nd | nd | nd | nd | 547 | 1165 | 165 | 45 | 52 | 112 | 69 | 182 |
| | 2020 | 366 | 364 | 490 | *nd* | 183 | 1250 | 1300 | 279 | 519 | 122 | 159 | 230 |
| | 2021 | 191 | 215 | 330 | 530 | 427 | 239 | 435 | 421 | 169 | 152 | 248 | 362 |
| | 2022 | 229 | 305 | 451 | 229 | 210 | 380 | 776 | 538 | 133 | 256 | 257 | 185 |
| | 2023 | 246 | 209 | 274 | 199 | 388 | 334 | 380 | 128 | 65 | 131 | 179 | 155 |
| Central Area/ CZ21/CW 5 | 2020 | *nd* | *nd* | *nd* | 120 | 149 | 1006 | 1118 | 251 | 374 | 127 | 131 | 244 |
| | 2021 | 228 | 249 | 446 | 312 | 460 | 220 | 385 | 485 | 189 | 133 | 152 | 237 |
| | 2022 | 230 | 238 | 401 | 168 | 164 | 291 | 749 | 398 | 123 | 149 | 311 | 338 |
| | 2023 | 303 | 243 | 277 | 203 | 399 | 329 | 401 | 176 | 68 | 88 | 146 | 120 |
| Jetty Area/EFO | 2019 | nd | nd | nd | nd | 290 | 1189 | 132 | 75 | 79 | 46 | 212 | 86 |
| | 2020 | 412 | 401 | 338 | 156 | 223 | 1020 | 1030 | 183 | 378 | 67 | 57 | 252 |
| | 2021 | 199 | 191 | 334 | 241 | 398 | 277 | 494 | 517 | 187 | 112 | 102 | 201 |
| | 2022 | 137 | 253 | 222 | 141 | 99 | 261 | 707 | 340 | 149 | 136 | 187 | 168 |
| | 2023 | 287 | 205 | 318 | 158 | 400 | 336 | 687 | 169 | 55 | 47 | 141 | 92 |
| Office Area/ | 2020 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |

| Stasiun | Tahun | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Office HM | 2021 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2022 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | 700 | 363 | 147 | 140 | 222 | 197 |
| | 2023 | 253 | 212 | 347 | 161 | 415 | 321 | 597 | 172 | 63 | 51 | 113 | 95 |
| MHR WB Area/ KM 13/WB | 2020 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2021 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2022 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2023 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | 128 | 182 |
| Crusher Area/ KM 16 | 2020 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2021 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2022 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2023 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | 30 | 247 |
| Makarti Rest/ KM 22+000 | 2020 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2021 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2022 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2023 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | 12 | 291 |
| IMIP Boundry/ KM 24+800 | 2020 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2021 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2022 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* |
| | 2023 | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | *nd* | 28 | 288 |

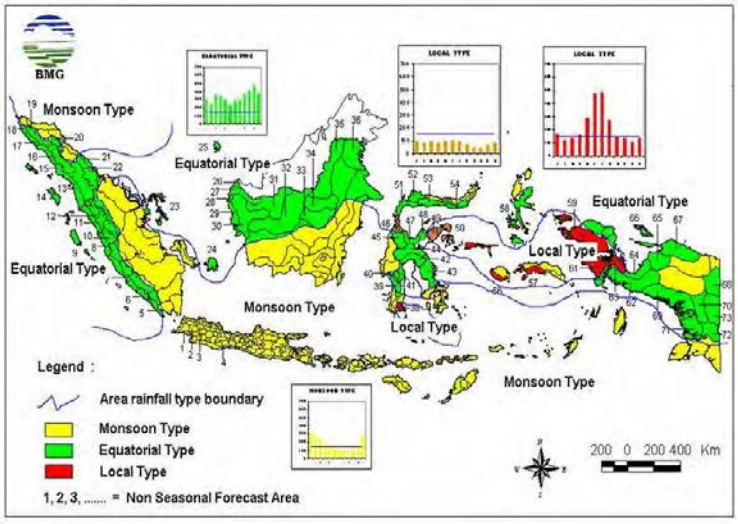
***Catatan**: nd (no data)*

Tabel I-3 Rata-rata curah hujan bulanan dan tahunan dari semua stasiun

| Tahun | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2020 | 389 | 382 | 414 | 138 | 185 | 1092 | 1149 | 237 | 424 | 105 | 116 | 242 | 4872 |
| 2021 | 206 | 218 | 370 | 361 | 429 | 245 | 438 | 474 | 182 | 132 | 167 | 266 | 3488 |
| 2022 | 199 | 270 | 358 | 179 | 158 | 311 | 733 | 410 | 138 | 170 | 244 | 222 | 3390 |
| 2023 | 272 | 217 | 304 | 180 | 400 | 330 | 516 | 161 | 63 | 79 | 147 | 184 | 2854 |
| **Rata-rata** | **266** | **272** | **361** | **214** | **293** | **494** | **709** | **321** | **201** | **122** | **168** | **229** | **3651** |




Gambar I-3 Grafik rata-rata hujan bulanan




Gambar I-4 Pola Curah hujan BMKG

Selanjutnya, dari data curah hujan yang diperoleh digunakan untuk mengetahui tipe iklim pada lokasi studi. Tipe iklim yang digunakan yaitu mengacu pada klasifikasi Schmidt & Ferguson (**Tabel I-5**) yang menghitung perbandingan antara jumlah bulan kering dan bulan basah. Klasifikasi bulan kering dan bulan basah didasarkan pada kriteria yang diklasifikasikan oleh Mohr **(Tabel I-4**).

Berdasarkan data curah hujan bulanan yang tersedia, tidak memiliki nilai dibawah 60 mm/bulan (kering), lebih besar dari 100 mm/bulan (basah), yaitu 96% dan diantaranya (lembab), yaitu 4%. Berdasarkan klasifikasi Schmidt dan Ferguson (1951), daerah studi memiliki nilai Q sebesar <14.30% sehingga termasuk kedalam tipe iklim A dengan kondisi iklim termasuk kedalam daerah sangat basah dengan vegetasi hutan hujan tropis.

Tabel I-4 Kriteria Bulan Basah dan Bulan Kering (Mohr)

| Tipe Bulan | Kering *(DM)* | Lembap (HM) | Basah (WM) |
|---|---|---|---|
| Curah Hujan Bulanan | < 60 mm/bulan | 60 – 100 mm/bulan | > 100 mm/bulan |

Tabel I-5 Klasifikasi Iklim menurut Schmidt dan Ferguson, 1951

| Tipe Iklim | Nilai Q (%) | Kondisi Iklim dan Vegetasi |
|---|---|---|
| A | < 14.3 | Daerah sangat basah, hutan hujan tropis |
| B | 14.3 – 33.3 | Daerah basah, hutan hujan tropis |
| C | 33.3 – 60.0 | Daerah agak basah, meranggas saat musim kering |
| D | 60.0 – 100.0 | Daerah sedang, hutan musiman |
| E | 100.0 – 167.0 | Daerah agak kering, hutan savana |
| F | 167.0 – 300.0 | Daerah kering, hutan savana |
| G | 300.0 – 700.0 | Daerah sangat kering, padang rumput |
| H | > 700.0 | Daerah amat sangat kering , padang rumput |

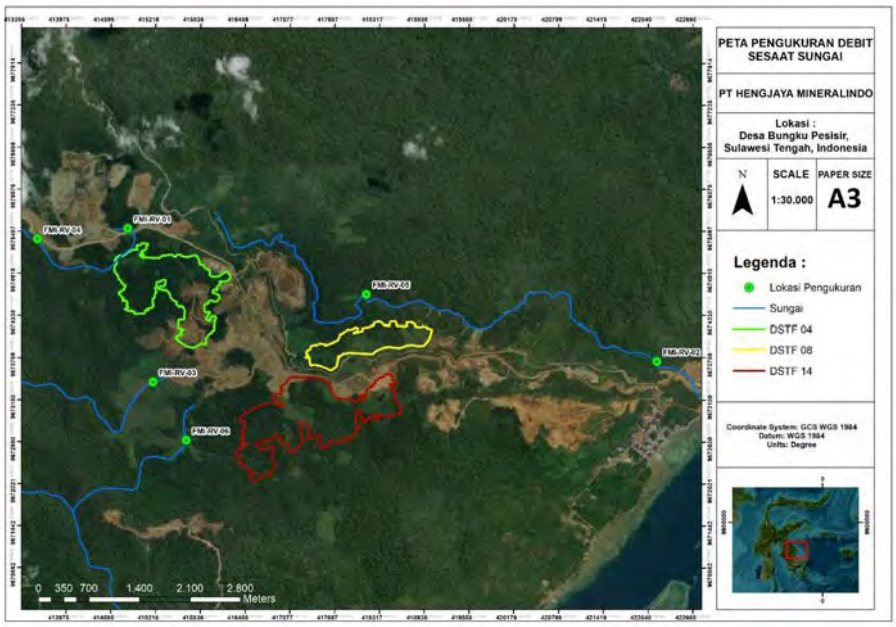
## I.2 Data Investigasi Lapangan

### I.2.1 Debit Sesaat Sungai

Pengukuran debit sesaat dilakukan pada area aliran permukaan (sungai dan anak sungai) yang berada di sekitar rencana lokasi DSTF. Berdasarkan pemetaan lapangan, terdapat aliran air utama yang berada di sebelah utara dan barat dari rencana lokasi DSTF dengan debit sesaat terukur sebesar 12 hingga 4001 L/s yang diperlihatkan pada Tabel I-6 dengan sebaran lokasi pengukuran diperlihatkan pada Gambar I-5.

Tabel I-6 Data pengukuran debit sesaat sungai

| Tanggal | ID Lokasi | Koordinat (GPS) | | Elevasi | Lebar | Dalam (maks) | Debit |
|---|---|---|---|---|---|---|---|
| | | Timur | Utara | m | m | m | L/s |
| 19/7/2024 | RV-01 | 414830 | 9675535 | 446 | 2 | 0,15 | 89 |
| 19/7/2024 | RV-02 | 442164 | 9673711 | 46 | 13 | 0,8 | 4001 |
| 22/7/2025 | RV-03 | 415182 | 9673424 | 319 | 2,5 | 0,46 | 468 |
| 2/8/2024 | RV-04 | 413581 | 9675385 | 393 | 2,7 | 0,35 | 212 |
| 14/8/2024 | RV-05 | 418136 | 9674628 | 271 | 6,7 | 0,67 | 571 |
| 29/8/2024 | RV-06 | 415638 | 9672621 | 310 | 1,0 | 0,27 | 12 |




Gambar I-5 Lokasi pengukuran debit sesaat sungai

### I.2.2 Kedalaman Muka Air Tanah

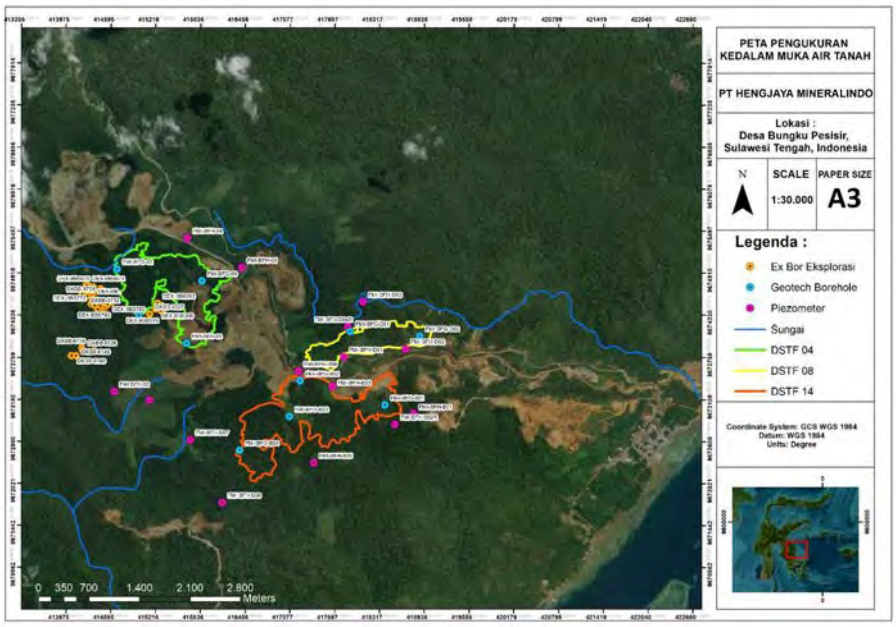
Pengukuran kedalaman muka airtanah dilakukan pada lokasi sumur pantau yang telah dikonstruksi, ex. Lubang bor geoteknik dan ex. Lubang bor eksplorasi dengan data diperlihatkan pada **Tabel I-7** dan sebaran lokasi pengukuran diperlihatkan pada **Gambar I-6**. Kedalaman muka airtanah pada lokasi area DSTF sekitarnya cukup dangkal dengan rentang nilai dari 3 hingga 42 meter atau pada elevasi 291 hingga 545 masl.

Tabel I-7 Data pengukuran kedalaman muka airtanah

| No. | Tanggal | Kode | Koordinat | | Elevasi | Dalam Muka Airtanah | Elevasi Muka Airtanah | Keterangan |
|---|---|---|---|---|---|---|---|---|
| | | | X | Y | Z | mbgs | masl | |
| 1 | 18/7/2024 | FMI-BFH-01 | 415134 | 9673168 | 306 | 11,1 | 294,9 | Sumur Pantau |
| 2 | 21/7/2024 | FMI-BFH-02 | 414644 | 9673289 | 309 | 17,13 | 291,87 | Sumur Pantau |
| 3 | 30/7/2024 | FMI-BFH-03 | 414480 | 9674398 | 396 | 17,22 | 378,78 | Sumur Pantau |
| 4 | 17/7/2024 | FMI-BFH-04 | 415658 | 9675398 | 428 | 4,16 | 423,84 | Sumur Pantau |
| 5 | 18/7/2024 | FMI-BFH-05 | 416413 | 9674993 | 406 | 19,65 | 386,35 | Sumur Pantau |
| 6 | 10/9/2024 | FMI-BFH-B01 | 418794 | 9672989 | 503 | 20,99 | 482,01 | Sumur Pantau |
| 7 | 23/9/2024 | FMI-BFH-B02R | 418536 | 9672836 | 400 | 12,1 | 387,9 | Sumur Pantau |
| 8 | 11/9/2024 | FMI-BFH-B03 | 417669 | 9673361 | 380 | 28,04 | 351,96 | Sumur Pantau |
| 9 | 5/8/2024 | FMI-BFH-B04 | 417195 | 9673569 | 355 | 41,97 | 313,03 | Sumur Pantau |
| 10 | 25/8/2024 | FMI-BFH-B05 | 417409 | 9672305 | 456 | 22,45 | 433,55 | Sumur Pantau |
| 11 | 29/8/2024 | FMI-BFH-B06 | 416145 | 9671755 | 348 | 9,27 | 338,73 | Sumur Pantau |
| 12 | 2/9/2024 | FMI-BFH-B07 | 415698 | 9672624 | 315 | 5,32 | 309,68 | Sumur Pantau |
| 13 | 7/8/2024 | FMI-BFH-D01 | 417828 | 9673766 | 372 | 15,49 | 356,51 | Sumur Pantau |
| 14 | 21/8/2024 | FMI-BFH-D02 | 418682 | 9673879 | 387 | 20,79 | 366,21 | Sumur Pantau |
| 15 | 25/8/2024 | FMI-BFH-D03 | 418091 | 9674518 | 313 | 18,97 | 294,03 | Sumur Pantau |
| 16 | 18/9/2024 | FMI-BFH-D04R | 417880 | 9674175 | 342 | 25,45 | 316,55 | Sumur Pantau |
| 17 | 12/07/24 | FMI-BFG-01 | 414987 | 9674332 | 464 | 21,47 | 442,53 | Ex. Bor Geoteknik |
| 18 | 20/07/2024 | FMI-BFG-02 | 414685 | 9674970 | 439 | 10,11 | 428,89 | Ex. Bor Geoteknik |
| 19 | 07/07/24 | FMI-BFG-03 | 415648 | 9673954 | 417 | 14,34 | 402,66 | Ex. Bor Geoteknik |
| 20 | 06/07/24 | FMI-BFG-04 | 415859 | 9674807 | 434 | 5 | 429 | Ex. Bor Geoteknik |
| 21 | 10/9/2024 | FMI-BFG-B01 | 418397 | 9673103 | 459 | 19,1 | 439,9 | Ex. Bor Geoteknik |
| 22 | 7/6/2024 | FMI-BFG-B04 | 416384 | 9672477 | 400 | 5,37 | 394,63 | Ex. Bor Geoteknik |
| 23 | 25/8/2024 | FMI-BFG-D01 | 417911 | 9674119 | 350 | 24 | 326 | Ex. Bor Geoteknik |
| 24 | 11/8/2024 | FMI-BFG-D02 | 418879 | 9674057 | 368 | 25,36 | 342,64 | Ex. Bor Geoteknik |

| No. | Tanggal | Kode | Koordinat | | Elevasi | Dalam Muka Airtanah | Elevasi Muka Airtanah | Keterangan |
|---|---|---|---|---|---|---|---|---|
| | | | X | Y | Z | mbgs | masl | |
| 25 | 24/7/2025 | DEX-BB6130 | 414365 | 9673856 | 309 | 6,44 | 302,56 | Ex. Bor Eksplorasi |
| 26 | 24/7/2025 | DEX-BB6140 | 414337 | 9673840 | 317 | 14,91 | 302,09 | Ex. Bor Eksplorasi |
| 27 | 24/7/2025 | DEX-BB6139 | 414306 | 9673833 | 353 | 11,42 | 341,58 | Ex. Bor Eksplorasi |
| 28 | 24/7/2025 | DEX-BB6138 | 414281 | 9673833 | 351 | 18 | 333 | Ex. Bor Eksplorasi |
| 29 | 24/7/2025 | DEX-BB5698 | 414224 | 9674662 | 418 | 13,94 | 404,06 | Ex. Bor Eksplorasi |
| 30 | 24/7/2025 | DEX-BB5717 | 414200 | 9674615 | 430 | 6,64 | 423,36 | Ex. Bor Eksplorasi |
| 31 | 24/7/2025 | DEX-BB5682 | 414246 | 974719 | 424 | 9,21 | 414,79 | Ex. Bor Eksplorasi |
| 32 | 24/7/2025 | DEX-BB5673 | 414252 | 9674748 | 429 | 29,14 | 399,86 | Ex. Bor Eksplorasi |
| 33 | 25/7/2025 | DEX-BB5781 | 414603 | 9674500 | 423 | 12,82 | 410,18 | Ex. Bor Eksplorasi |
| 34 | 25/7/2025 | DEX-BB5696 | 414452 | 9674697 | 475 | 35,2 | 439,8 | Ex. Bor Eksplorasi |
| 35 | 25/7/2025 | DEX-BB5705 | 414426 | 9674671 | 464 | 16,7 | 447,3 | Ex. Bor Eksplorasi |
| 36 | 25/7/2025 | DEX-BB5704 | 414400 | 9674670 | 459 | 33,13 | 425,87 | Ex. Bor Eksplorasi |
| 37 | 25/7/2025 | DEX-BB5703 | 414376 | 9674671 | 454 | 12,89 | 441,11 | Ex. Bor Eksplorasi |
| 38 | 25/7/2025 | DEX-BB5685 | 414351 | 9674721 | 453 | 28,1 | 424,9 | Ex. Bor Eksplorasi |
| 39 | 25/7/2025 | DEX-BB5675 | 414292 | 9674741 | 448 | 14,7 | 433,3 | Ex. Bor Eksplorasi |
| 40 | 25/7/2025 | DEX-BB5683 | 414267 | 9674714 | 443 | 12,63 | 430,37 | Ex. Bor Eksplorasi |
| 41 | 25/7/2025 | DEX-BB5674 | 414265 | 9674742 | 439 | 13,45 | 425,55 | Ex. Bor Eksplorasi |
| 42 | 26/7/2024 | DEX-BB5781 | 414566 | 9674489 | 441 | 12,82 | 428,18 | Ex. Bor Eksplorasi |
| 43 | 26/7/2024 | DEX-BB5769 | 414583 | 9674510 | 457 | 7,74 | 449,26 | Ex. Bor Eksplorasi |
| 44 | 26/7/2024 | DEX-BB5801 | 414475 | 9674436 | 411 | 7,18 | 403,82 | Ex. Bor Eksplorasi |
| 45 | 26/7/2024 | DEX-BB5790 | 414462 | 9674457 | 416 | 20,74 | 395,26 | Ex. Bor Eksplorasi |
| 46 | 26/7/2024 | DEX-BB5789 | 414442 | 9674467 | 406 | 25,32 | 380,68 | Ex. Bor Eksplorasi |
| 47 | 26/7/2024 | DEX-BB5775 | 414398 | 9674490 | 413 | 32,1 | 380,9 | Ex. Bor Eksplorasi |
| 48 | 26/7/2024 | DEX-BB5762 | 414422 | 9674522 | 413 | 32,7 | 380,3 | Ex. Bor Eksplorasi |
| 49 | 26/7/2024 | DEX-BB5748 | 414424 | 9674539 | 436 | 16,17 | 419,83 | Ex. Bor Eksplorasi |
| 50 | 26/7/2024 | DEX-BB5747 | 414403 | 9674539 | 422 | 20,14 | 401,86 | Ex. Bor Eksplorasi |
| 51 | 26/7/2024 | DEX-BB5720 | 414345 | 9674611 | 432 | 16,27 | 415,73 | Ex. Bor Eksplorasi |
| 52 | 26/7/2024 | DEX-BB.. | 414343 | 9674564 | 433 | 20,13 | 412,87 | Ex. Bor Eksplorasi |
| 53 | 26/7/2024 | DEX-BB5759 | 414337 | 9674510 | 411 | 20 | 391 | Ex. Bor Eksplorasi |
| 54 | 26/7/2024 | DEX-BB5772 | 414325 | 9674493 | 416 | 4,59 | 411,41 | Ex. Bor Eksplorasi |
| 55 | 26/7/2024 | DEX-BB5786 | 414369 | 9674467 | 411 | 10,8 | 400,2 | Ex. Bor Eksplorasi |
| 56 | 26/7/2024 | DEX-BB5807 | 414415 | 9674414 | 405 | 32,17 | 372,83 | Ex. Bor Eksplorasi |

| No. | Tanggal | Kode | Koordinat | | Elevasi | Dalam Muka Airtanah | Elevasi Muka Airtanah | Keterangan |
|---|---|---|---|---|---|---|---|---|
| | | | X | Y | Z | mbgs | masl | |
| 57 | 29/7/2025 | DEX-BB6302 | 415258 | 9674434 | 477 | 16,98 | 460,02 | Ex. Bor Eksplorasi |
| 58 | 29/7/2025 | DEX-BB6303 | 415274 | 9674438 | 487 | 29,66 | 457,34 | Ex. Bor Eksplorasi |
| 59 | 29/7/2025 | DEX-BB6309 | 415322 | 9674422 | 540 | 14,8 | 525,2 | Ex. Bor Eksplorasi |
| 60 | 29/7/2025 | DEX-BB6299 | 415296 | 9674472 | 548 | 3 | 545 | Ex. Bor Eksplorasi |
| 61 | 29/7/2025 | DEX-BB6293 | 415243 | 9674498 | 556 | 25,17 | 530,83 | Ex. Bor Eksplorasi |
| 62 | 29/7/2025 | DEX-BB6316 | 415320 | 9674397 | 540 | 22,6 | 517,4 | Ex. Bor Eksplorasi |
| 63 | 29/7/2025 | DEX-BB6315 | 415293 | 9674396 | 453 | 17,7 | 435,3 | Ex. Bor Eksplorasi |
| 64 | 29/7/2025 | DEX-BB6306 | 415220 | 9674421 | 538 | 14,22 | 523,78 | Ex. Bor Eksplorasi |
| 65 | 3/8/2024 | DEX-BB5753 | 414566 | 9674542 | 456 | 30,3 | 425,7 | Ex. Bor Eksplorasi |
| 66 | 3/8/2024 | DEX-BB5821 | 414508 | 9674368 | 425 | 16,74 | 408,26 | Ex. Bor Eksplorasi |
| 67 | 3/8/2024 | DEX-BB5822 | 414513 | 9674364 | 418 | 21,15 | 396,85 | Ex. Bor Eksplorasi |
| 68 | 3/8/2024 | DEX-BB5816 | 414493 | 9674381 | 413 | 16,78 | 396,22 | Ex. Bor Eksplorasi |
| 69 | 3/8/2024 | DEX-BB5810 | 414498 | 9674418 | 412 | 20,64 | 391,36 | Ex. Bor Eksplorasi |
| 70 | 3/8/2024 | DEX-BB5803 | 414517 | 9674447 | 418 | 26,12 | 391,88 | Ex. Bor Eksplorasi |
| 71 | 3/8/2024 | DEX-BB5792 | 414515 | 9674467 | 425 | 23 | 402 | Ex. Bor Eksplorasi |
| 72 | 3/8/2024 | DEX-BB5793 | 414550 | 9674470 | 425 | 14,7 | 410,3 | Ex. Bor Eksplorasi |
| 73 | 3/8/2024 | DEX-BB5780 | 414549 | 9674483 | 427 | 10,92 | 416,08 | Ex. Bor Eksplorasi |
| 74 | 20/8/2024 | DXBB-6146 | 414052 | 9673782 | 321 | 13,89 | 307,11 | Ex. Bor Eksplorasi |
| 75 | 20/8/2024 | DXBB-6149 | 414114 | 9673784 | 332 | 13,35 | 318,65 | Ex. Bor Eksplorasi |
| 76 | 20/8/2024 | DXBB-5732 | 414243 | 9674582 | 435 | 10,7 | 424,3 | Ex. Bor Eksplorasi |
| 77 | 20/8/2024 | DXBB-6327 | 415136 | 9674350 | 473 | 26,2 | 446,8 | Ex. Bor Eksplorasi |
| 78 | 20/8/2024 | *DXBB-6116* | 414196 | 9673888 | 345 | 13,37 | 331,63 | Ex. Bor Eksplorasi |
| 79 | 20/8/2024 | *DXBB-6126* | 414204 | 9673861 | 354 | 22,15 | 331,85 | Ex. Bor Eksplorasi |
| 80 | 20/8/2024 | *DXBB-5725* | 414274 | 9674594 | 431 | 19,1 | 411,9 | Ex. Bor Eksplorasi |



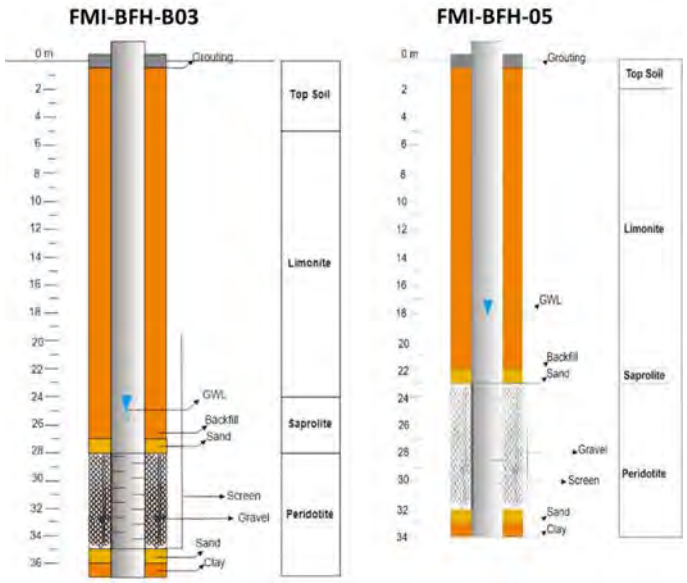

Gambar I-6 Sebaran lokasi pengukuran kedalaman muka airtanah

### I.2.3 Instalasi Sumur Pantai (Piezometer) dan Pengukuran Parameter Hidrolik Batuan

Pengeboran hidrogeologi dan konstruksi sumur uji dilakukan untuk mendapatkan data nilai parameter hidrolik batuan. Konduktivitas hidrolik batuan didapatkan dengan melakukan uji akifer berupa slug test (*falling head)* pada akifer target yang telah ditentukan berdasarkan data kondisi batuan hasil pemboran dan posisi muka airtanah. Posisi akifer pada umumnya berupa batuan *fracture rock* (yang tersusun dari litologi saprolit dan peridotite. Selain pada sumur yang terkonstruksi, pengujian juga dilakukan pada open hole (tanpa *screen*) dari lubang ex. bor geoteknik. Sebaran lokasi pengujian konduktivitas hidrolik lapangan pada area di sekitar rencana DSTF diperlihatkan pada Gambar I-9.

Sumur pantau di konstruksi pada area sekitar DSTF selain untuk pengujian parameter hidrolik batuan, juga digunakan sebagai titik pantau pengamatan kondisi muka airtanah baik kualitas dan kuantitas. Sebelum di konstruksi, lubang bor terlebih dahulu dilakukan *flushing* (menyemprotkan air dengan tekanan tertentu) yang bertujuan untuk membersihkan lubang bor dari sisa lumpur atau bahan lain yang mungkin masih ada. Setelah dibersihkan, lalu lubang dibiarkan beberapa

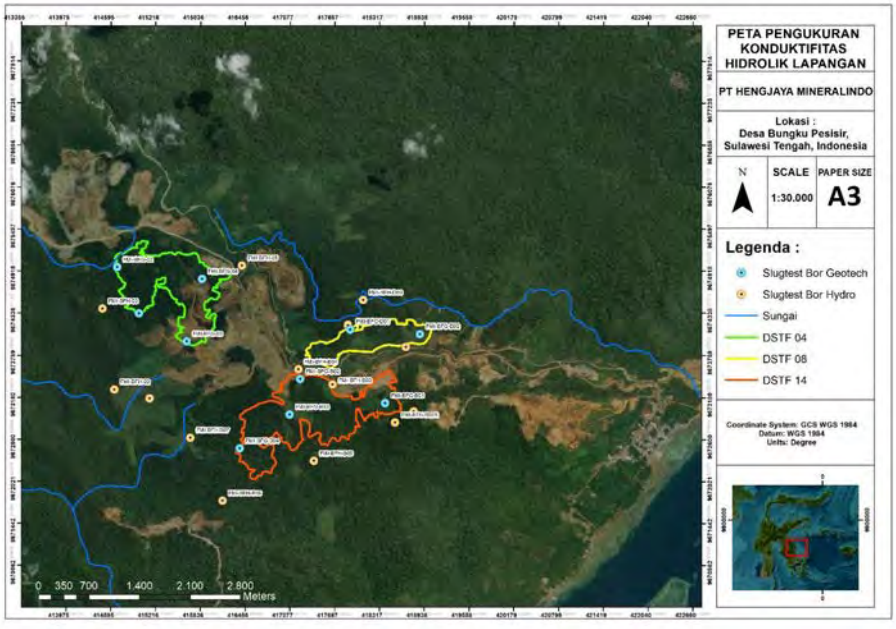
saat hingga muka airtanah stabil. Kedalaman muka airtanah stabil merupakan indikasi batas posisi akifer yang potensial. Pada umumnya, posisi muka airtanah berada pada batuan *fracture rock* dengan kedalaman yang cukup dangkal dari 4,91 hingga 41 meter. Material yang digunakan untuk konstruksi sumur beragam yang terdiri dari filter (material gravel) yang dipasang di sepanjang zona *screen,* pasir sedang sampai kasar ditempatkan di bagian atas atau bawah dari target lapisan (*screen*) dengan ketebalan ±2 m untuk memisahkan filter dari material kedap, sedangkan sisanya pada area *blank pipe* dipasang material kedap air berupa clay/bentonite. Tipikal desain konstruksi sumur pantau air tanah hasil pekerjaan lapangan dapat dilihat pada Gambar I-7.




Gambar I-7 Tipikal desain sumur pantau (*piezometer*)



Gambar I-8 Kondisi batuan yang berpotensi zona akifer (*fracture rock*)

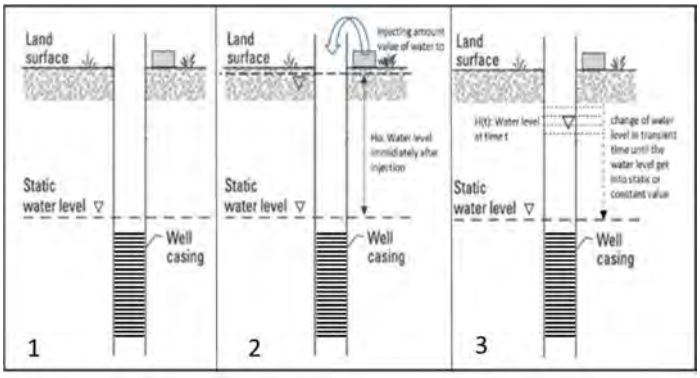



Gambar I-9 Sebaran lokasi pengukuran konduktivitas hidrolik batuan

*Slug test* (dalam Bouwer dan Rice (1976)) diterapkan untuk menentukan konduktivitas hidrolik dari tes sumur tunggal menggunakan metode *falling head*. Dalam metode ini, permukaan air tanah statis di dalam sumur diukur sebelum pengujian. Sejumlah air kemudian dimasukkan ke dalam sumur. Pengukuran level air dilakukan secara berkala oleh menggunakan *water level*

*logger* dan setiap perubahan muka airtanah dicatat sampai muka airtanah mencapai nilai statis/konstan. Ilustrasi uji *slug test* menggunakan metode *falling head* dapat dilihat pada **Gambar I-10**. Metode pengujian *slug test* mengacu pada ASTM No. D-4044. Data hasil *slug test* kemudian diproses untuk mendapatkan parameter konduktivitas hidrolik akifer menggunakan beberapa metode (misal Bouwer Rice, Hvorslev, dan Model KGS). Data nilai konduktivitas hidrolik batuan dari uji tersebut diperlihatkan pada **Tabel I-8** dengan nilai terukur dari 7,65 x $10^{-10}$ hingga 9,04 x $10^{-06}$ m/s dengan rata-rata 1,45 x $10^{-06}$ m/s. Semakin besar nilai konduktivitas hidrolik batuan, merepresentasikan kondisi akifer yang semakin potensial yang pada umumnya ditandai dengan semakin berkembangnya *zona fracture* pada area tersebut, namun semakin kecil nilai konduktivitas hidroliknya menandakan batuan fracture yang tidak begitu berkembang (cenderung *massive*) dan zona tersebut tidak berpotensi sebagai tempat penyimpanan air (akifer tidak potensial).

Selain pengujian di lapangan, juga dilakukan uji laboratorium pada sampel *core* hasil pemboran yang mewakili litologi tertentu. Data hasil uji nilai konduktivitas hidrolik batuan pada masing-masing litologi ditunjukkan pada Tabel I-9 dengan rata-rata nilai konduktivitas pada *soil* yaitu 1,31 x $10^{-06}$ m/s, limonit yaitu 3,45 x $10^{-06}$, saprolit 1,39 x $10^{-06}$ dan bedrock 3,01 x $10^{-11}$ m/s.




Gambar I-10 Pengukuran Lapangan Sederhana *Slug Test* Menggunakan Metode *Falling Head*

Tabel I-8 Nilai konduktivitas hidrolik lapangan hasil uji *slug test* (*falling head*)

| No. | Well Code | Uji ke- | Dalam Airtanah | Screen | | Panjang Screen | Konduktivitas Hidrolik | Note |
|---|---|---|---|---|---|---|---|---|
| | | | m | from | to | m | m/s | |
| 1 | FMI-BFH-01 | Test 1 | 11,52 | 26,00 | 34,00 | 8,00 | 4,01E-09 | Bor Hidro |
| 2 | FMI-BFH-02 | Test 1 | 17,52 | 11,50 | 28,00 | 16,50 | 3,62E-07 | Bor Hidro |
| 3 | FMI-BFH-03 | Test 1 | 14,3 | 9 | 21 | 12 | 9,77E-08 | Bor Hidro |
| | | Test 2 | | | | | 7,95E-08 | |
| 4 | FMI-BFH-04 | Test 1 | 4,91 | 11,00 | 23,00 | 12 | 2,61E-06 | Bor Hidro |

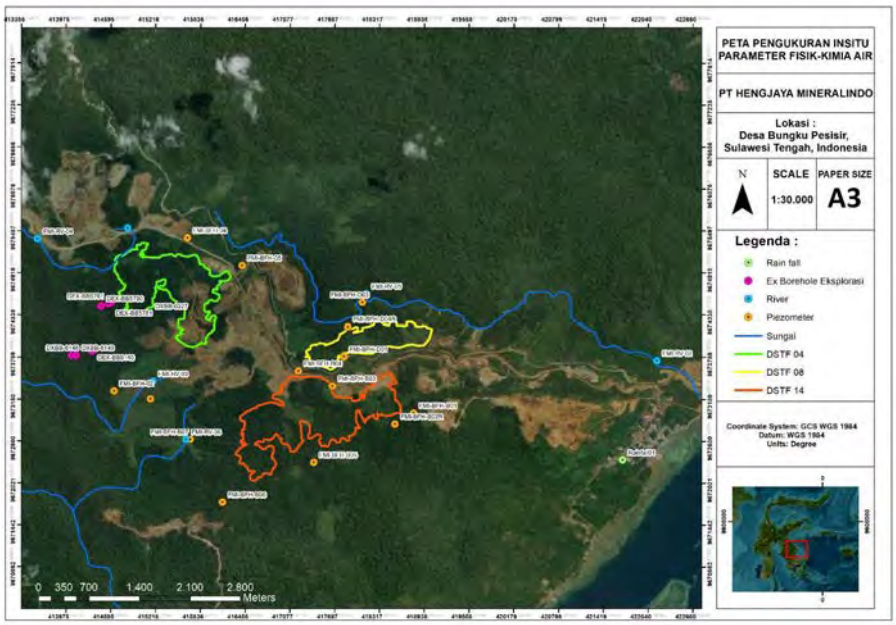
| No. | Well Code | Uji ke- | Dalam Airtanah | Screen | | Panjang Screen | Konduktivitas Hidrolik | Note |
|---|---|---|---|---|---|---|---|---|
| | | | m | from | to | m | m/s | |
| 5 | FMI-BFH-05 | Test 1 | 16,5 | 23 | 32 | 9 | 2,22E-06 | Bor Hidro |
| | | Test 2 | | | | | 2,54E-06 | |
| 6 | FMI-BFH-B01 | Test 1 | 14,66 | 15,00 | 19,00 | 4,00 | 3,09E-06 | Bor Hidro |
| 7 | FMI-BFH-B03 | Test 1 | 24,7 | 28,00 | 35,00 | 7,00 | 4,75E-07 | Bor Hidro |
| 8 | FMI-BFH-B04 | Test 1 | 41 | 19,00 | 49,00 | 30,00 | 7,65E-10 | Bor Hidro |
| 9 | FMI-BFH-B05 | Test 1 | 22,75 | 9,00 | 29,00 | 20,00 | 1,16E-07 | Bor Hidro |
| 10 | FMI-BFH-B06 | Test 1 | 7,45 | 5,00 | 20,00 | 15,00 | 5,47E-07 | Bor Hidro |
| 11 | FMI-BFH-B07 | Test 1 | 4,98 | 6 | 15 | 9 | 1,54E-06 | Bor Hidro |
| | | Test 2 | | | | | 7,55E-07 | |
| 12 | FMI-BFH-D01 | Test 1 | 15,79 | 7,00 | 21,00 | 14 | 2,89E-09 | Bor Hidro |
| | | Test 2 | | | | | 1,06E-07 | |
| 13 | FMI-BFH-D02 | Test 1 | 21,54 | 18,00 | 34,00 | 16,00 | 7,27E-08 | Bor Hidro |
| 14 | FMI-BFH-D03 | Test 1 | 19,43 | 7,00 | 37,00 | 30 | 3,45E-07 | Bor Hidro |
| | | Test 2 | | | | | 2,99E-07 | |
| 15 | FMI-BFH-D04R | Test 1 | 25,45 | 30,00 | 38,00 | 8,00 | 5,10E-07 | Bor Hidro |
| 16 | FMI-BFG-01 | Test 1 | 21,47 | *Open Hole* | | | 9,04E-06 | Bor Geotek |
| 17 | FMI-BFG-02 | Test 1 | 10,11 | *Open Hole* | | | 1,33E-08 | Bor Geotek |
| 18 | FMI-BFG-03 | Test 1 | 14,34 | *Open Hole* | | | 7,16E-08 | Bor Geotek |
| 19 | FMI-BFG-04 | Test 1 | 5 | *Open Hole* | | | 8,41E-07 | Bor Geotek |
| 20 | FMI-BFG-B01 | Test 1 | 19,1 | *Open Hole* | | | 1,10E-06 | Bor Geotek |
| 21 | FMI-BFG-B04 | Test 1 | 5,37 | *Open Hole* | | | 2,47E-07 | Bor Geotek |
| 22 | FMI-BFG-D01 | Test 1 | 24 | *Open Hole* | | | 8,11E-06 | Bor Geotek |
| 23 | FMI-BFG-D02 | Test 1 | 25,36 | *Open Hole* | | | 1,35E-07 | Bor Geotek |

Tabel I-9 Nilai konduktivitas hidrolik dari uji sampel core di laboratorium

| No | Kode Sampel | Deskripsi | K (m/s) |
|---|---|---|---|
| 1 | DS-03-FMI-BFH-04 | Saprolit | $6{,}63 \times 10^{-07}$ |
| 2 | UDS-01-FMI-BFG-04 | Topsoil (unconsolidated) | $6{,}02 \times 10^{-07}$ |
| 3 | DS-04-FMI-BFH-03 | Peridotite (Bedrock) | $2{,}36 \times 10^{-11}$ |
| 4 | DS-05-FMI-BFH-01 | Peridotite (Bedrock) | $5{,}01 \times 10^{-11}$ |
| 5 | DS-05-FMI-BFG-01 | Peridotite (Bedrock) | $1{,}67 \times 10^{-11}$ |
| 6 | DS-01-FMI-BFG-04 | Limonit | $7{,}96 \times 10^{-07}$ |
| 7 | DS-4-FMI-BFG-B02 | Saprolit | $3{,}43 \times 10^{-07}$ |
| 8 | DS-1-FMI-BFG-D01 | Saprolit | $5{,}09 \times 10^{-07}$ |
| 9 | DS-1-FMI-BFG-B02 | Limonit | $2{,}99 \times 10^{-07}$ |
| 10 | DS-7-FMI-BFG-B01 | Peridotite, bedrock | $8{,}49 \times 10^{-11}$ |
| 11 | DS-2-FMI-BFG-B03 | Peridotite, bedrock | $8{,}85 \times 10^{-11}$ |
| 12 | UDS-1-FMI-BFG-01 | Top Soil | $8{,}48 \times 10^{-07}$ |

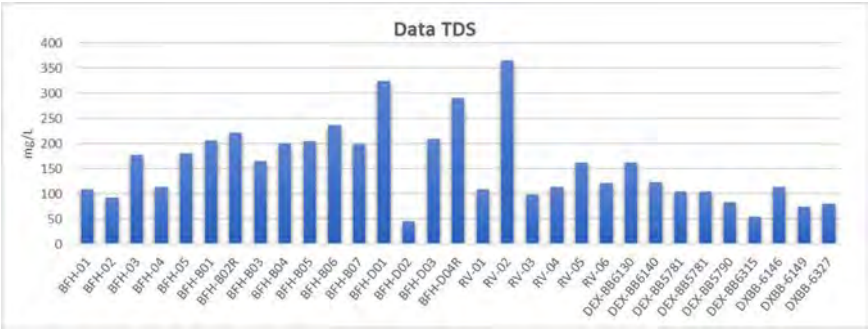
### I.2.4 Parameter Insitu Fisik dan Kimia Air

Pengukuran parameter fisik-kimia insitu lapangan dilakukan pada airtanah dan air permukaan di sekitar lokasi rencana DSTF dengan sebaran lokasi pengukuran diperlihatkan pada **Gambar I-11**. Pengukuran pada airtanah meliputi airtanah pada sumur pantau dan sumur ex. lubang bor eksplorasi sedangkan pada air permukaan meliputi air sungai. Pengukuran parameter in-situ fisik dan kimia yang dilakukan meliputi suhu (temperatur), derajat keasaman (pH), Total Padatan Terlarut / *Total Dissolved Solid* (TDS), Daya Hantar Listrik (DHL) / *Electrical Conductivity* (EC) dan oksigen terlarut / *Dissolved Oxygen* (DO) dengan data hasil pengukuran diperlihatkan pada **Tabel I-10** dan **Gambar I-12** merupakan grafik nilai pH dan TDS terukur pada airtanah dan sungai. Berdasarkan hasil pengukuran, suhu termasuk dalam katerogi normal berada pada rentang 22 $^{o}$C hingga 30,1 $^{o}$C, pH berada dalam kategori sedikit asam hingga netral 3,54 – 7,8, TDS, EC, Salinity mengindikasikan konsentrasi pada rentang air tawar (*fresh water*) yaitu TDS sebesar 46,1 mg/L hingga 365 mg/L, EC sebesar 69 µS hingga 547 µS, Salinity sebesar <0,01 hingga 0,03 % dan parameter lainnya berupa DO berada pada konsentrasi 1,0 mg/L hingga 2,9 mg/L.




Gambar I-11 Sebaran lokasi pengukuran parameter in situ sifat fisik-kimia air




Gambar I-12 Grafik data konsentrasi pH dan TDS pada Airtanah dan Sungai

Tabel I-10 Data pengukuran in-situ parameter fisik-kimia air

| No. | Tanggal | Kode Lokasi | Koordinat | | Elevasi | T | pH | TDS | EC | Salinity | DO | ORP | Catatan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Easting* | *Northing* | m | °C | | mg/L | µS | % | mg/L | mV | |
| 1 | 18/7/2024 | FMI-BFH-01 | 415146 | 9673182 | 314 | 26,3 | 7,68 | 109,5 | 183 | 0,01 | 1,5 | 190 | Sumur Pantau |
| 2 | 21/7/2024 | FMI-BFH-02 | 414642 | 9673293 | 324 | 26,8 | 6,9 | 93,5 | 151 | 0,01 | 1,2 | 168 | Sumur Pantau |
| 3 | 30/7/2024 | FMI-BFH-03 | 414480 | 964398 | 396 | 24,9 | 7,14 | 177 | 268 | 0,01 | 1,1 | 129 | Sumur Pantau |
| 4 | 17/7/2024 | FMI-BFH-04 | 415658 | 9675398 | 428 | 25,7 | 7,43 | 114,3 | 189 | 0,01 | 1,9 | 167 | Sumur Pantau |
| 5 | 18/7/2024 | FMI-BFH-05 | 416414 | 9675017 | 437 | 25,3 | 7,16 | 180 | 269 | 0,01 | 1,9 | 191 | Sumur Pantau |
| 6 | 10/9/2024 | FMI-BFH-B01 | 418794 | 9672989 | 503 | 29 | 7,2 | 206 | 298 | 0,02 | 1,2 | 35 | Sumur Pantau |
| 7 | 28/09/2024 | FMI-BFH-B02R | 418536 | 9672836 | 400 | 27 | 7,46 | 221 | 334 | 0,02 | 1,4 | na | Sumur Pantau |
| 8 | 11/9/2024 | FMI-BFH-B03 | 417669 | 9673361 | 380 | 26 | 6,3 | 165 | 248 | 0,01 | 1,3 | 175 | Sumur Pantau |
| 9 | 5/8/2024 | FMI-BFH-B04 | 417195 | 9673569 | 355 | 26,3 | 7,01 | 201 | 301 | 0,02 | 2,5 | 166 | Sumur Pantau |
| 10 | 25/8/2024 | FMI-BFH-B05 | 417409 | 9672305 | 313 | 25,9 | 7,43 | 205 | 305 | 0,02 | 1,8 | 152 | Sumur Pantau |
| 11 | 29/8/2024 | FMI-BFH-B06 | 416145 | 9671755 | 348 | 25,6 | 7,24 | 237 | 353 | 0,02 | 1,2 | 143 | Sumur Pantau |
| 12 | 2/9/2024 | FMI-BFH-B07 | 415698 | 9672624 | 315 | 25,6 | 7,23 | 199 | 298 | 0,02 | 1,1 | 144 | Sumur Pantau |
| 13 | 7/8/2024 | FMI-BFH-D01 | 417828 | 9673766 | 372 | 25,6 | 7,35 | 324 | 488 | 0,01 | 2,3 | 158 | Sumur Pantau |
| 14 | 21/8/2024 | FMI-BFH-D02 | 418685 | 9673889 | 383 | 27,1 | 5,21 | 46,1 | 69 | <0.01 | 1,5 | 190 | Sumur Pantau |
| 15 | 25/8/2024 | FMI-BFH-D03 | 418083 | 9674511 | 456 | 25,8 | 7,29 | 209 | 314 | 0,02 | 2,1 | 152 | Sumur Pantau |
| 16 | 28/09/2024 | FMI-BFH-D04R | 417880 | 9674175 | 342 | 26,5 | 7,34 | 292 | 437 | 0,02 | 1,5 | na | Sumur Pantau |
| 17 | 19/7/2024 | FMI-RV-01 | 414830 | 9675535 | 446 | 25,8 | 7,04 | 110,1 | 182 | 0,01 | 1,7 | 185 | Sungai |
| 18 | 19/7/2024 | FMI-RV-02 | 422164 | 9673711 | 46 | 25,4 | 7,5 | 365 | 547 | 0,03 | 2,9 | 183 | Sungai |
| 19 | 22/7/2024 | FMI-RV-03 | 415182 | 9673424 | 319 | 28,6 | 7,79 | 99,1 | 155 | 0,01 | 2,3 | 127 | Sungai |
| 20 | 2/8/2024 | FMI-RV-04 | 413581 | 9675385 | 393 | 24,9 | 7,61 | 113,7 | 179 | 0,01 | 2,3 | 119 | Sungai |
| 21 | 14/8/2024 | FMI-RV-05 | 418136 | 9674628 | 271 | 26,9 | 7,8 | 163 | 243 | 0,01 | 1,2 | 137 | Sungai |
| 22 | 29/8/2024 | FMI-RV-06 | 415638 | 9672621 | 310 | 25,1 | 7,11 | 121,4 | 191 | 0,01 | 1,2 | 154 | Sungai |
| 23 | 24/7/2024 | DEX-BB6130 | 414365 | 9673856 | 309 | 27 | 7,15 | 162 | 246 | 0,01 | 2,4 | 178 | *Ex. Exploration Borehole* |
| 24 | 24/7/2024 | DEX-BB6140 | 414337 | 9673840 | 317 | 25,8 | 7,02 | 122,5 | 199 | 0,01 | 2,3 | 183 | *Ex. Exploration Borehole* |
| 25 | 25/7/2024 | DEX-BB5781 | 414603 | 9674500 | 423 | 25,3 | 6,62 | 104,2 | 166 | <0,01 | 1,9 | 211 | *Ex. Exploration Borehole* |
| 26 | 26/7/2024 | DEX-BB5781 | 414566 | 9674489 | 441 | 25,3 | 6,62 | 104,2 | 166 | <0,01 | 1,9 | 211 | *Ex. Exploration Borehole* |

| No. | Tanggal | Kode Lokasi | Koordinat | | Elevasi | T | pH | TDS | EC | Salinity | DO | ORP | Catatan |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Easting* | *Northing* | m | °C | | mg/L | µS | % | mg/L | mV | |
| 27 | 26/7/2024 | DEX-BB5790 | 414462 | 9674457 | 416 | 26,4 | 6,69 | 83,9 | 129 | 0,01 | 2,3 | 158 | *Ex. Exploration Borehole* |
| 28 | 29/7/2024 | DEX-BB6315 | 415293 | 9674396 | 453 | 24,8 | 5,98 | 55,5 | 83 | <0,01 | 1,5 | 186 | *Ex. Exploration Borehole* |
| 29 | 20/8/2024 | DXBB-6146 | 414052 | 9673782 | 321 | 25,7 | 6,87 | 114 | 182 | 0,01 | 1 | 104 | *Ex. Exploration Borehole* |
| 30 | 20/8/2024 | DXBB-6149 | 414114 | 9673784 | 332 | 25,5 | 6,42 | 74,4 | 114 | 0,01 | 1,3 | 163 | *Ex. Exploration Borehole* |
| 31 | 20/8/2024 | DXBB-6327 | 415136 | 9674350 | 473 | 25,5 | 6,45 | 81,2 | 126 | 0,01 | 1,3 | 176 | *Ex. Exploration Borehole* |
| 32 | 06/9/2024 | Rainfall | 421690 | 9672341 | 13 | 27 | 3,54 | 34,4 | 51,9 | <0,01 | 1,1 | na | *Air Hujan* |

Note : na (*not available*)

# II. GEOLOGI

## II.1 Geologi Regional

### II.1.1 Topografi dan Geomorfologi

Peta geologi regional yang digunakan dalam laporan ini adalah Peta Geologi Lembar Bungku, Sulawesi (Simandjuntak dkk., 1993). Morfologi di daerah Lembar Bungku dapat dibagi menjadi lima satuan, yaitu:

a. Dataran rendah
   Morfologi dataran rendah umumnya mempunyai ketinggian 0 – 50 mdpl
b. Dataran menengah
   Morfologi dataran menengah menempati daerah sekitar Desa Tokolimbu dan Tosea, memiliki ketinggian 50 – 100 mdpl
c. Perbukitan menggelombang
   Morfologi perbukitan menggelombang memiliki ketinggian 100 – 400 mdpl
d. Karst
   Morfologi karst memiliki ketinggian 400 – 800 mdpl yang dicirikan oleh adanya perbukitan kasar, sungai bawah tanah, maupun dolina
e. Pegunungan
f. Morfologi pegunungan memiliki ketinggian lebih dari 800 mdpl.

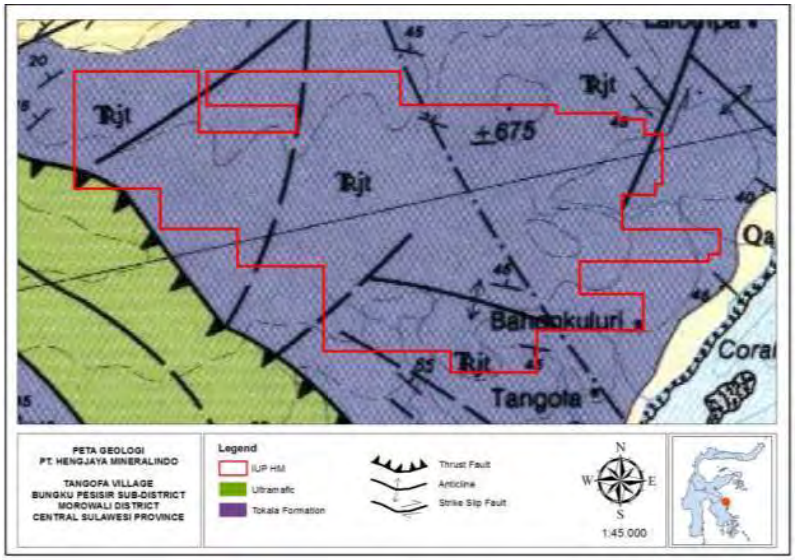
Pola Aliran Sungai umumnya meranting. Beberapa sungai memiliki pola hampir sejajar, yaitu Sungai Bahudopi, Sungai Bahumahoni, dan Sungai Wosu.

### II.1.2 Lithologi

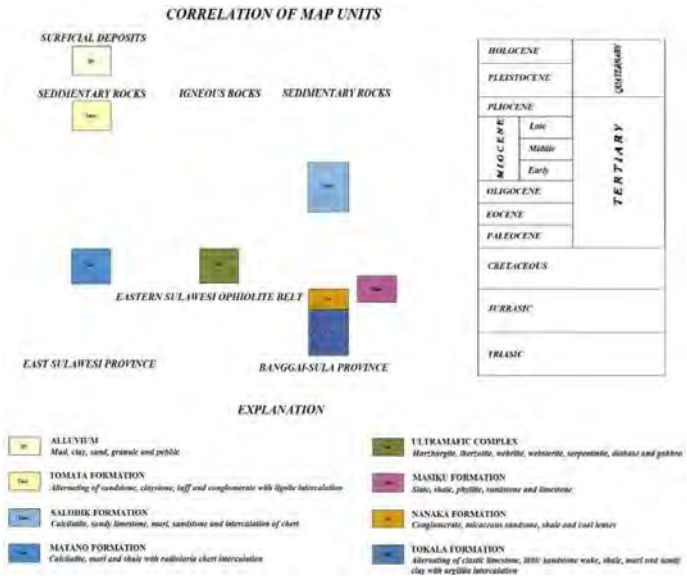
Satuan batuan di Peta Geologi Lembar Bungku (Simandjuntak dkk., 1993)Gambar II-1 Peta Geologi Regional Lembar Bungku, Sulawesi (Simandjuntak dkk., 1993) Yang Telah Ditambahkan Dengan Batas IUP **(Gambar II-1)** dapat dikelompokkan dalam dua mandala geologi, yaitu Mandala Banggai-Sula dan Mandala Sulawesi Timur (Sukamto, 1975). Pembagian stratigrafinya berturut-turut dari muda ke tua adalah sebagai berikut **(Gambar II-2**):

1. Aluvium (Qa) : lumpur, lempung, pasir, kerikil, serta kerakal.
2. Formasi Tomata (Tmpt) : perselingan batupasir konglomerat, batulempung, tufa dengan sisipan lignit.
3. Formasi Salodik (Tems) : kalsilutit, batugamping pasiran, napal, batupasir juga rijang.
4. Formasi Matano (Km) : kalsilutit, napal, serpih dan rijang. Kalsilutit, berbutir halus, berwarna kelabu, padat-keras, lapisannya baik, tebal lapisan berkisar antara 10 – 15 cm.
5. Kompleks Ultramafik (Ku) : harzburgit, lherzolit, wehrlit, websterit, serpentinit, dunit, diabas dan batuan gabro.
6. Formasi Masiku (JKm) : batusabak, serpih, flit, batupasir, batugamping dengan buncak rijang. Batusabak, berwarna kelabu sampai coklat kehitaman, berlapis baik, padat.
7. Formasi Nanaka (Jn) : konglomerat, batupasir mikaan, serpih dan lensa batubara.

8. Formasi Tokala (TRJt) : perselingan batugamping klastika, batu pasir sela, wake, serpih, napal, lempung pasiran dengan sisipan argilit.



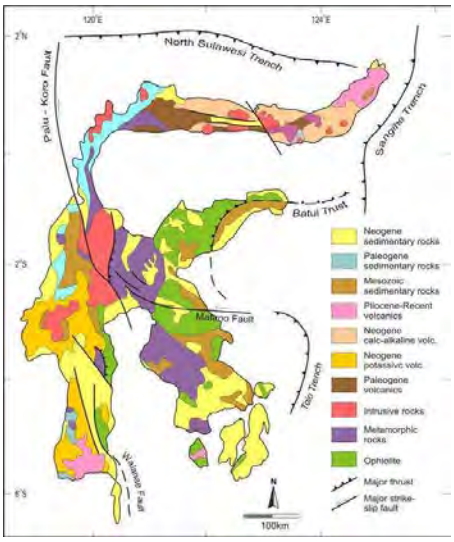

Gambar II-1 Peta Geologi Regional Lembar Bungku, Sulawesi (Simandjuntak dkk., 1993) Yang Telah Ditambahkan Dengan Batas IUP




Gambar II-2 Korelasi Unit Stratigrafi Pada Peta Geologi Lembar Bungku (Simandjuntak dkk., 1993)

### II.1.3 Struktur Geologi

Sulawesi secara tektonik merupakan wilayah yang disusun oleh benturan dua massa kerak benua, yaitu Sundaland yang menyusun Sulawesi Barat dan Australoid yang menyusun sebagian Sulawesi sebelah timur (Banggai-Sula) dan tenggara (Buton) (**Gambar II-3**). Terjepit di tengahnya adalah kerak samudera yang kini menjadi ofiolit dan terangkat ke permukaan melalui mekanisme obduksi. Ofiolit yang naik ke permukaan tersebut menjadi sumber batuan utama penghasil mineral logam dasar nikel dan besi.




Gambar II-3 Peta Geologi Sulawesi (Van Leeuwen dkk., 2011).

Pada periode 70 – 15 juta tahun yag lalu (Ma), hanya ada Sulawesi Barat yang masih menjadi bagian Sundaland dan tambahan massa kerak Bumi di sebelah timurnya. Sulawesi Barat kala itu adalah sebuah busur kepulauan/busur magmatik-vulkanik hasil subduksi kerak samudera terhadapnya yang menghasilkan beberapa periode magmatik dan volkanik di Sulawesi bagian barat. Perubahan-perubahan tektonik seperti pembukaan Selat Makassar, pembukaan Teluk Bone, pembukaan Teluk Tomini/Cekungan Gorontalo, subduksi Laut Sulawesi pada 50 – 15 Ma menyebabkan perubahan arah/polaritas busur magmatik dan subduksi Sulawesi dari cembung ke arah samudera menjadi agak lurus.

Pada periode 15 – 5 Ma, Sulawesi mengalami collision dan docking dua mikrokontinen Australia ke arah Sulawesi dari sebelah tenggara (mikrokontinen Buton-Tukangbesi) dan dari sebelah timur (mikrokontinen Banggai-Sula). Pada periode ini diperkirakan terjadi pembalikan utama arah/polaritas busur-busur Sulawesi dari semula cembung ke arah samudera menjadi cekung ke arah samudera (ke arah timur pada kala ini).

Pembalikan polaritas busur-busur Sulawesi ini secara frontal adalah akibat benturan mikrokontinen d Banggai-Sula yang membenturnya di titik pusat Sulawesi. Yang mengakibatkan rotasi. Lengan Tenggara berotasi melawan arah jarum jam sehingga membuka melebarkan Teluk Bone di sebelah baratnya, Lengan Utara berotasi searah jarum jam sehingga menutup Cekungan Gorontalo.

Periode 5 – 0 Ma adalah finalisasi pembalikan busur-busur Sulawesi dan periode tectonic escape di Sulawesi. Setelah benturan Buton-Tukangbesi dan benturan Banggai-Sula, terjadilah tectonic escape berupa sesar-sesar mendatar besar yang meretakkan dan menggeser-geser Sulawesi. Sesar-sesar ini mengarah ke timur umumnya, yaitu ke arah free

oceanic edge saat itu. Sesar-sesar mendatar besar Palu-Koro, Matano, Lawanopo, Kolaka, dan Balantak terjadi melalui mekanisme post-collision tectonic escape.

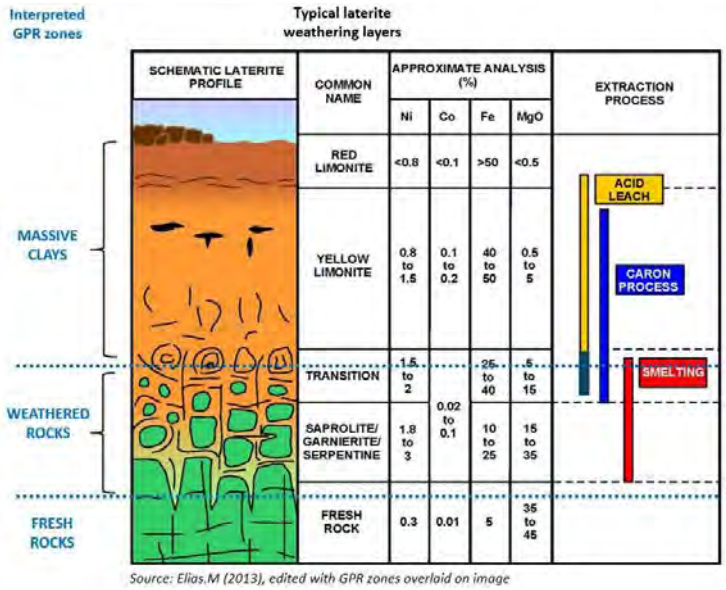
### II.1.4 Alterasi

Batuan ultramafik seperti peridotit, dunit, dan serpentinit yang mengalami pelapukan akan menghasilkan tanah laterit yang merupakan sumber dari pembentukan endapan bijih nikel atau endapan nikel laterit. Faktor cuaca menyebabkan perubahan komposisi batuan dan melarutkan unsur-unsur yang mudah larut seperti Ni, Co, dan Fe.

Air hujan yang mengandung $CO_2$ dari udara meresap ke bawah sampai ke permukaan air tanah sambil melindi mineral primer tidak stabil seperti olivin, piroksen, atau serpentin. Air tanah meresap secara perlahan dari atas ke bawah sampai ke batas antara zona limonit dan zona saprolit, kemudian mengalir secara lateral.

Secara umum, penampang endapan nikel laterit dari bawah ke atas berturut-turut adalah sebagai berikut **(Gambar II-4):**

- Batuan dasar (fresh rock/bed rock), umumnya didominasi oleh batuan ultramafik seperti dunit, peridotit, piroksenit, dan serpentinit yang masih segar belum mengalami pelapukan. Struktur dan tekstur asli batuan masih nampak jelas.
- Zona saprolit, batuan asal ultramafik pada zona ini akan berubah menjadi saprolit akibat pengaruh air tanah. Mineral-mineral utamanya adalah serpentin, kuarsa sekunder, Ni-kalsedon, garnierit, dan beberapa tempat sudah terbentuk limonit (Fe-hidroksida).
- Garnierit, merupakan bijih nikel silikat kelompok mineral green hydrous magnesian nickel silicates (serpentin yang mengandung nikel, Ni-talk, dan Ni-klorit).
- Melalui penggantian magnesium oleh nikel, kadar nikel dalam serpentin akan bertambah. Garnierit selalu hadir tercampur dengan Ni-serpentin kadar rendah lainnya, sehingga kadar nikel dalam bijih menjadi menurun.
- Zona pelindian/transisi, merupakan zona transisi dari zona saprolit ke zona limonit di atasnya. Di sini terjadi perubahan geokimia unsur yang terbesar dalam penampang. Kadar $Fe_2O_3$ dan $Al_2O_3$ naik, sedangkan kadar $SiO_2$ dan MgO turun.
- Zona limonit, pada zona ini hampir seluruh unsur yang mudah larut hilang terlindi, kadar MgO dan silika akan semakin berkurang, sebaliknya kadar $Fe_2O_3$ dan $Al_2O_3$ akan bertambah. Zona ini didominasi oleh mineral goetit, magnetit, hematit, talk, serta kuarsa sekunder.
- Zona tanah penutup, umumnya pada zona ini didominasi oleh humus dan bersifat gembur. Kadar Fe pada lapisan ini tinggi dan sering dijumpai konkresi-konkresi besi. Kadar nikel relatif rendah.



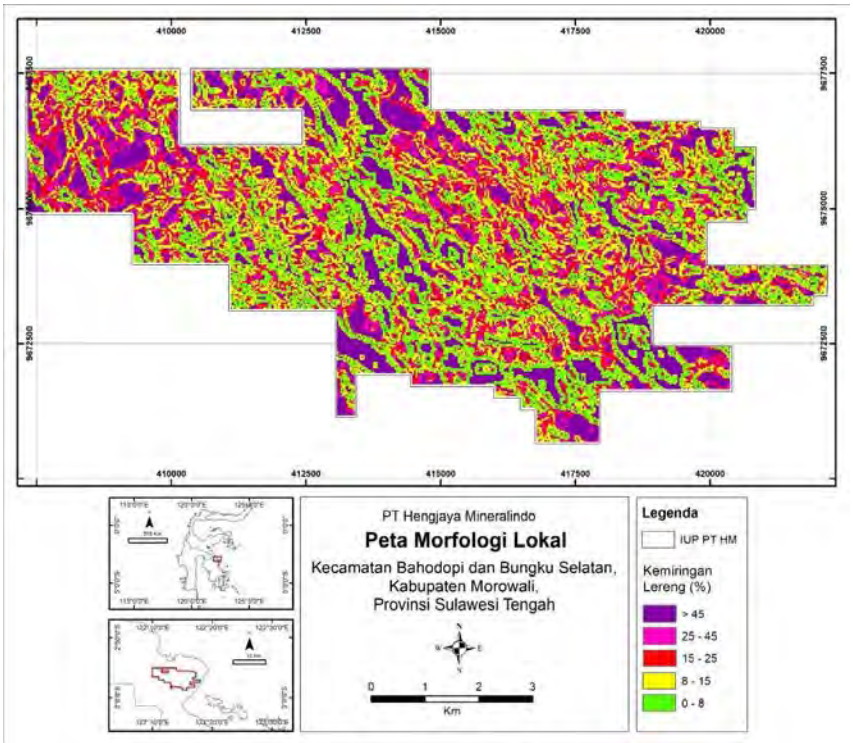

Gambar II-4 Penampang Endapan Nikel Laterit (Elias, 2013)

## II.2 Geologi Lokal

### II.2.1 Topografi dan Geomorfologi

Peta morfologi menggunakan citra satelit Digital Elevation Model (DEM) yang menggambarkan kondisi bentang alam daerah sebelum adanya kegiatan penambangan. Morfologi daerah eksploitasi memiliki kemiringan lereng yang bervariasi, dari 0% hingga lebih dari 45%. Pada topografi yang curam, jumlah air yang mengalir (run off) akan lebih banyak daripada air yang meresap dan menyebabkan pelapukannya menjadi tidak intensif.

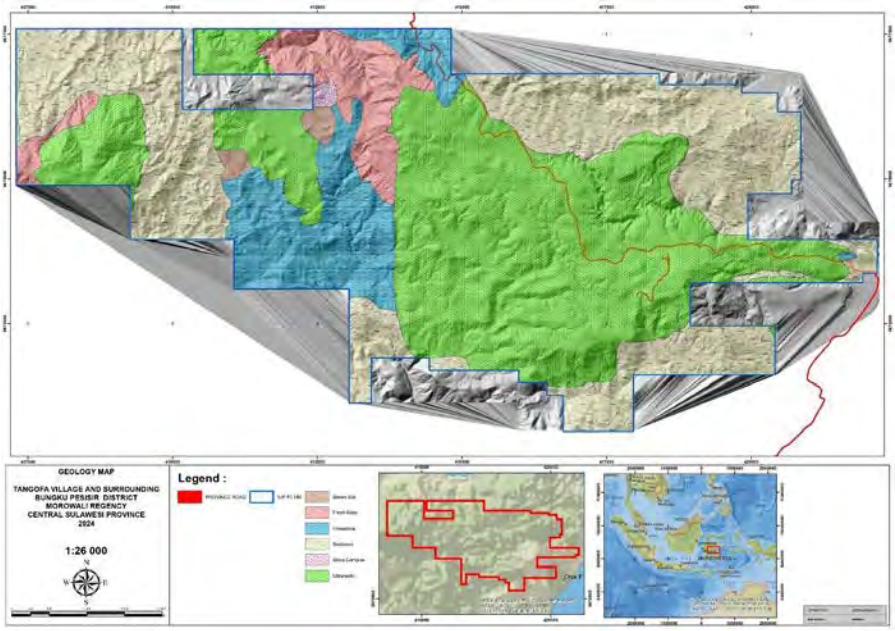
Secara deskripsi kuantitatif/morfometri, maka morfologi masing-masing daerah wilayah penelitian dengan wilayah sekitarnya dapat dikelompokkan berdasarkan arah umum kemiringan lereng menjadi lima satuan morfologi, yaitu datar (0 – 8%) ditunjukkan dengan warna hijau, landai (8 – 15%) ditunjukkan dengan warna kuning, agak curam (15 – 25%) ditunjukkan dengan warna merah, curam (25 – 45%) ditunjukkan dengan warna merah muda, dan sangat curam (> 45%) ditunjukkan dengan warna ungu **(Gambar II-5).**




Gambar II-5 Peta Morfologi Lokal

### II.2.2 Litologi

Peta geologi lokal yang digunakan dibuat oleh HM sebagai acuan untuk melihat kondisi geologi permukaan selama program eksplorasi berlangsung saat ini **(Gambar II-6).** Reliabilitas data yang digunakan sudah dikonfirmasi pada Desember 2019 selama pemetaan yang dilakukan oleh ahli geologi PT Danmar Eksplorindo dalam pencarian batugamping dan agregat untuk pembangunan proyek jalan. Pada peta geologi lokal, terdapat perbedaan yang signifikan dengan Peta Geologi Regional Lembar Bungku **(Gambar II-6)** yang memperlihatkan wilayah konsesi HM seluruhnya disusun oleh Formasi Tokala. Faktanya, Kompleks Ultramafik adalah batuan penyusun dominan di kawasan HM dan menyebar lebih dari 60% wilayah konsesi. Formasi Tokala adalah batuan yang lebih tua dan secara stratigrafi terdapat di bawah Kompleks Ultramafik.




Gambar II-6 Peta Geologi Lokal

### II.2.3 Struktur Geologi

Interpretasi struktur geologi didapatkan dari peta geologi regional **(Gambar II-1)** berupa sesar naik di sebelah tenggara, sesar mendatar mengiri di sebelah timurlaut, dan kelurusan-kelurusan struktur yang mendominasi di dalam wilayah IUP. Namun faktanya, jika dilihat dari peta geologi lokal yang dibuat oleh HM **(Gambar II-6),** struktur geologi tidak begitu berkembang seperti yang diinterpretasikan pada peta geologi regional. Hal tersebut kemungkinan karena wilayah IUP yang sudah mengalami pelapukan dan lateritisasi, sehingga sulit untuk menemukan bukti-bukti keberadaan jejak struktur geologi di lapangan.

### II.2.4 Alterasi

Lapisan yang kaya akan bijih nikel umumnya terdapat di bawah zona pelapukan dan di atas batuan dasar. Di bagian atas zona pelapukan ini umumnya ditumbuhi pepohonan (hutan) yang mengindikasikan bahwa lapisan tersebut cukup subur. Pada daerah penelitian di wilayah IUP dari hasil pengamatan survei geologi banyak dijumpai blok-blok/spot area yang merupakan zona laterit, dengan ketebalan rata-rata ± 10 meter.

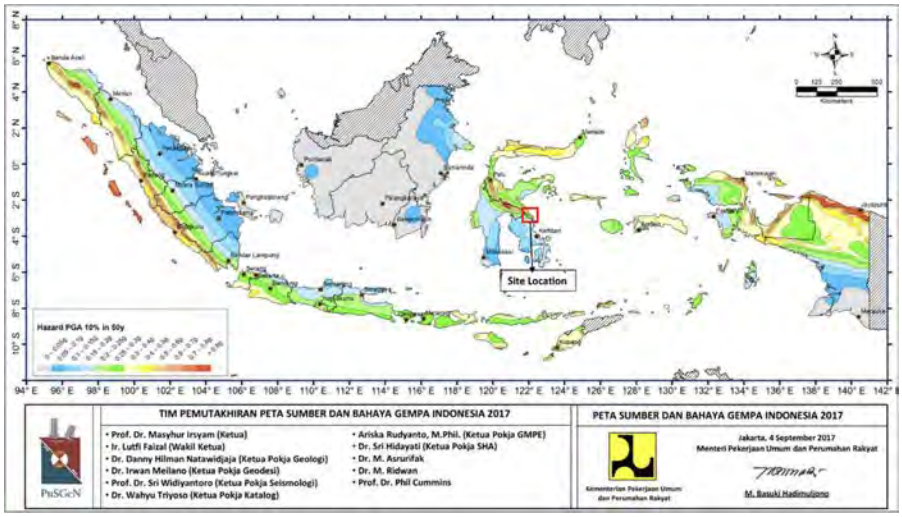
Penampakan laterit secara visual terutama dari sisi warna permukaan memiliki perubahan-perubahan yang cukup drastis, hal ini sebagai akibat adanya perbedaan derajat serpentinisasi pada batuan ultramafik di wilayah tersebut. Sedangkan keberadaan mineral pembawa nikel seperti garnierit dan krisopras berada pada bongkah-bongkah dan membentuk zona serta

jalur-jalur tertentu dalam satu zona vein. Kondisi ini menyebabkan tingginya kandungan silika ($SiO_2$). Kondisi ini dapat dilihat pada lereng sepanjang jalan Trans Sulawesi yang melintasi wilayah IUP Produksi PT Hengjaya Mineralindo.

# III. ANALISIS GEOTEKNIK

## III.1 Kegempaan (*Seismic Load*)

Tingkat bahaya gempa (*seismic hazard*) diperoleh melalui Peta Sumber dan Bahaya Gempa Indonesia Tahun 2017 yang disusun Pusat Studi Gempa Nasional (ISBN 978-602-5489-01-3). Peta percepatan gempa di batuan dasar (PGA) tersedia untuk berbagai periode ulang. Dalam studi ini percepatan gempa di batuan dasar (PGA) menggunakan periode ulang 500 tahun (10% dalam 50 tahun). Berdasarkan peta sumber dan bahaya gempa Indonesia tahun 2017, percepatan gempa di batuan dasar (PGA) pada periode ulang 500 tahun adalah sebesar 0.25g (Gambar III-1).




Gambar III-1 Peta Percepatan Gempa di Batuan Dasar (PGA) Periode Ulang 200 Tahun (Kementrian Pekerjaan Umum dan Perumahan Rakyat, 2017)

Untuk mengetahui pengaruh kondisi tanah setempat terhadap perambatan gelombang gempa terkait dengan fenomena amplifikasi, kriteria berdasarkan ASCE 07-16 **(Tabel III-1)** digunakan untuk pengklasifikasian kelas *site*. Selain dipengaruhi oleh ketebalan dan kekerasan tanah setempat, besaran amplifikasi juga sangat dipengaruhi oleh kandungan frekuensi dan percepatan gelombang gempa. Berdasarkan ASCE 07-16, besaran koefisien PGA untuk masing-masing kelas site dapat dilihat pada **Tabel III-2**.

Tabel III-1 Sistem klasifikasi *site* terkait dengan fenomena amplifikasi (ASCE 07-16)

| Site Class | $\overline{v}_s$ | $\overline{N}$ or $\overline{N}_{ch}$ | $\overline{s}_u$ |
|---|---|---|---|
| A. Hard rock | >5,000 ft/s | NA | NA |
| B. Rock | 2,500 to 5,000 ft/s | NA | NA |
| C. Very dense soil and soft rock | 1,200 to 2,500 ft/s | >50 | >2,000 psf |
| D. Stiff soil | 600 to 1,200 ft/s | 15 to 50 | 1,000 to 2,000 psf |
| E. Soft clay soil | <600 ft/s | <15 | <1,000 psf |
| | Any profile with more than 10 ft of soil having the following characteristics:<br>—Plasticity index $PI > 20$,<br>—Moisture content $w \geq 40\%$,<br>—Undrained shear strength $\overline{s}_u < 500$ psf | | |
| F. Soils requiring site response analysis in accordance with Section 21.1 | See Section 20.3.1 | | |

For SI: 1 ft/s = 0.3048 m/s; 1 lb/ft$^2$ = 0.0479 kN/m$^2$.

Tabel III-2 Koefisien PGA berdasarkan kelas *site* (ASCE 07-16)

| | Mapped Maximum Considered Geometric Mean ($MCE_G$) Peak Ground Acceleration, PGA | | | | |
|---|---|---|---|---|---|
| Site Class | PGA ≤ 0.1 | PGA = 0.2 | PGA = 0.3 | PGA = 0.4 | PGA ≥ 0.5 |
| A | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| B | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| C | 1.2 | 1.2 | 1.1 | 1.0 | 1.0 |
| D | 1.6 | 1.4 | 1.2 | 1.1 | 1.0 |
| E | 2.5 | 1.7 | 1.2 | 0.9 | 0.9 |
| F | See Section 11.4.7 | | | | |

Note: Use straight-line interpolation for intermediate values of PGA.

Berdasarkan hasil klasifikasi site secara dominan lokasi rencana *backfill* masuk ke kelas *stiff soil*, sehingga dipilih *site coefficient* Fpga = 1.2 untuk PGA 0.25g dan *site class* D.

Pada analisis pseudo-statik, *peak ground acceleration* (PGA) diubah menjadi gaya inersia pseudo-statik dan diterapkan sebagai beban gravitasi tambahan horizontal. Ada beberapa cara untuk menentukan koefisien pseudo-statik, seperti dapat dilihat pada **Tabel II-3**. Dalam hal ini dipilih metode penentuan koefisien pseudo-statik dengan menggunakan metode Marcuson (1981) dan Hynes-Griffin dengan k = 0.5 PGA / g. Menggunakan Fpga 1.2, koefisien pseudo-statik untuk periode ulang 500 tahun, adalah:

k = 0.5x0.25x1.2= 0.150 (return periods of 500 years)

Tabel III-3 *Determining the Value of Pseudo-Static Coefficient*

| Investigator | Recommended Pseudo static Coefficient (k) | Recommended factor of safety (FS) | Calibration conditions |
|---|---|---|---|
| Terzhagi [8] | 0.1(R-F=IX) | >1.0 | Unspecified |
| | 0.2(R-F=X) | | |
| | 0.5(R-F>X) | | |
| Seed (1979) [16] | 0.10(M=6.50) | > 1.15 | <1 m displacement in earth dams |
| | 0.15 (M=8.25) | | |
| Marcuson (1981) [17] | 0.33-0.50 PGA/g | >1.0 | Unspecified |
| Hynes- Griffin and Franklin (1984) [18] | 0.5 PGA/g | >1.0 | <1 m displacement in earth dams |
| California Division Of Mines and Geology (1997) | 0.15 | >1.1 | Unspecified: probably based on <1 m displacement in dams |
| JCOLD Japan | 0.12-0.25 | | |
| Corps of Engineering | 0.1 (Major Earthquake) | >1 | Unspecified |
| | 0.15 (Great Earthquake) | >1 | |
| IRI Road and Railway Bridges Seismic Resistant Design Code NO: 463 | 0.5 A | >1 | Unspecified |
| Indian standard for Seismic design of earth | 0.33 Z I S | >1 | Unspecified |

R-F is Rossi –Forel earthquake intensity scale.
M is earthquake magnitude.
PGA is Peak Ground Acceleration.
G is acceleration of gravity.
A is ratio of design acceleration to acceleration of gravity (0.2 to 0.35)
Z is zone factor (0.1 to 0.36)
I importance factor (1.0 to 2.0)
S site amplification factor (1.0 to 2.0)

## III.2 Karakteristik Material

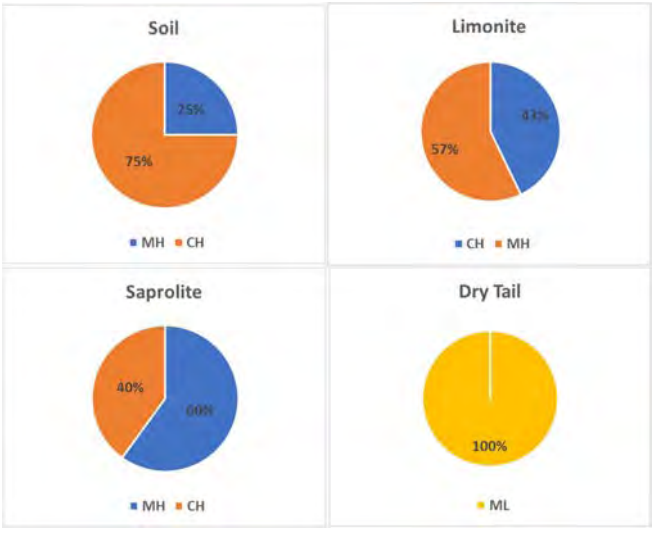
### III.2.1 Klasifikasi Material Soil

Mengingat bahwa jenis material yang dominan di tambang PT HM adalah material mirip tanah (dengan kekuatan kurang dari 1 MPa), penting untuk memahami karakteristik perilaku tanah di lokasi penelitian. Pengujian ini menyediakan metode untuk menentukan distribusi ukuran partikel tanah melalui penyaringan, sesuai dengan Standar ASTM D422. Sifat-sifat Batas Atterberg untuk klasifikasi disediakan berdasarkan referensi ASTM D4318.

Klasifikasi tanah di lokasi IUP PT HM, berdasarkan Sistem Klasifikasi Tanah Terpadu (USCS), ditampilkan dalam Tabel III-4 Klasifikasi Material Tanah PT FMI-HM**Tabel III-4** dan **Gambar III-3**, yang menggambarkan grafik distribusi jenis tanah berdasarkan klasifikasi ASTM D4318 di setiap lokasi. Berdasarkan hasil investigasi, litologi di area PT HM bervariasi dan meliputi tanah, limonit, dan saprolit, yang diklasifikasikan sebagai MH, CH dan ML.

Tabel III-4 Klasifikasi Material Tanah PT FMI-HM

| Lithology | Sample Type | Grain Size & Double Hydrometer | | | | Atterberg Limit | | | Class |
|---|---|---|---|---|---|---|---|---|---|
| | | Non-Sodium | | | | (Atterberg Limits) | | | |
| | | Gravel | Sand | Silt | Clay | WL | Wp | Ip | |
| | | (%) | (%) | (%) | (%) | (%) | (%) | (%) | |
| Soil | UDS | 0.00 | 5.53 | 58.81 | 35.66 | 74.13 | 36.11 | 38.02 | MH |
| Soil | UDS | 0.00 | 6.23 | 40.91 | 52.86 | 88.32 | 31.04 | 57.28 | CH |
| Soil | UDS | 2.35 | 7.52 | 35.19 | 54.94 | 73.68 | 29.14 | 44.54 | CH |
| Soil | UDS | 0.00 | 5.95 | 39.80 | 54.25 | 67.12 | 28.16 | 38.96 | CH |
| Limonite | UDS | 0.00 | 14.13 | 52.45 | 33.42 | 85.26 | 43.09 | 42.17 | MH |
| Limonite | UDS | 0.00 | 5.32 | 33.04 | 61.64 | 98.47 | 32.15 | 66.32 | CH |
| Limonite | UDS | 2.32 | 20.79 | 42.85 | 34.04 | 67.51 | 33.15 | 34.36 | MH |
| Limonite | UDS | 0.60 | 45.51 | 18.57 | 35.32 | 75.42 | 36.04 | 39.38 | MH |
| Limonite | UDS | 0.00 | 4.84 | 44.50 | 50.66 | 78.20 | 34.11 | 44.09 | CH |
| Limonite | UDS | 0.00 | 3.33 | 45.88 | 50.79 | 127.60 | 35.15 | 92.45 | CH |
| Limonite | UDS | 0.01 | 21.64 | 46.94 | 31.41 | 92.37 | 46.22 | 46.15 | MH |
| Saprolite | UDS | 14.30 | 33.03 | 32.74 | 19.93 | 62.78 | 34.01 | 28.77 | MH |
| Saprolite | UDS | 0.00 | 12.13 | 41.41 | 46.46 | 167.85 | 61.53 | 106.32 | MH |
| Saprolite | UDS | 17.89 | 17.89 | 40.32 | 32.17 | 131.34 | 52.27 | 79.07 | MH |
| Saprolite | UDS | 0.00 | 8.12 | 30.36 | 61.52 | 94.56 | 32.12 | 62.44 | CH |
| Saprolite | UDS | 0.00 | 6.56 | 40.95 | 52.49 | 133.85 | 42.01 | 91.84 | CH |
| Dry Tailing | Bulk | 0.00 | 2.00 | 28.00 | 70.00 | 47.00 | 31.00 | 16.00 | ML |
| Dry Tailing | Bulk | 0.00 | 2.00 | 30.00 | 68.00 | 42.00 | 30.00 | 12.00 | ML |
| Dry Tailing | Bulk | 0.00 | 2.00 | 24.00 | 74.00 | 42.00 | 31.00 | 11.00 | ML |




Gambar III-2 Distribusi Jenis Tanah

### III.2.2 Sifat Fisik dan Plastisitas

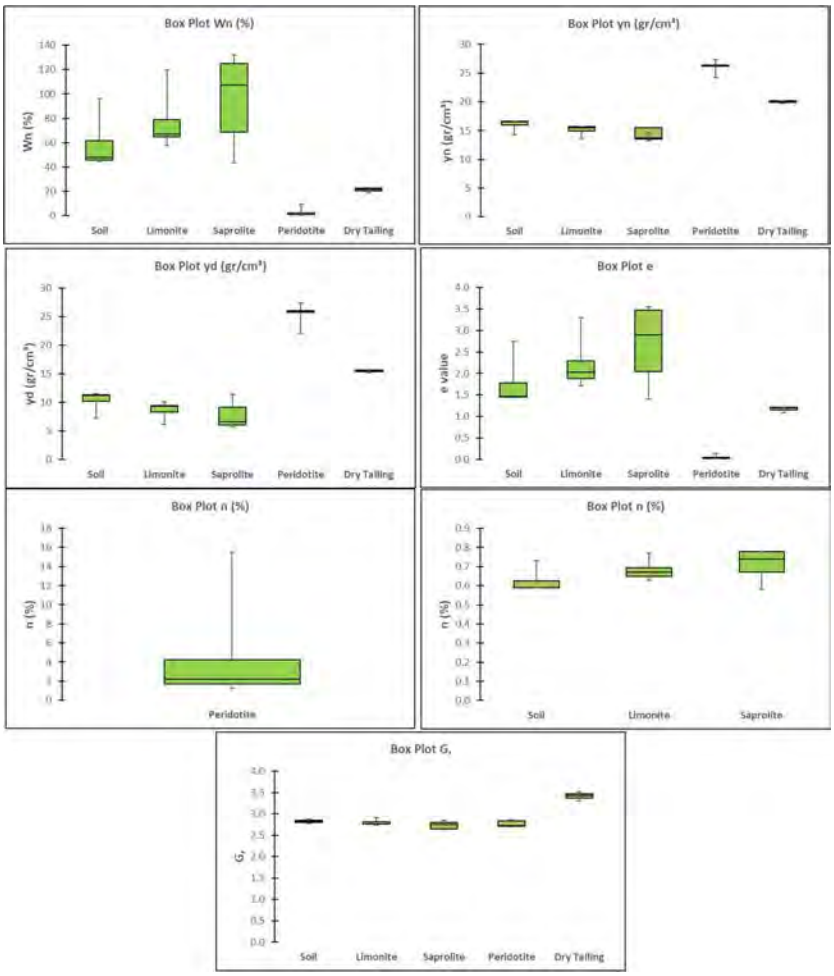
Pengujian sifat fisik, baik untuk material tanah maupun batuan, mencakup parameter seperti kadar air, berat isi, berat jenis, dan derajat kejenuhan. Statistik deskriptif dari hasil uji sifat fisik disajikan dalam **Tabel III-5**, dengan diagram box plot ditampilkan pada **Gambar III-3**.

Plastisitas adalah sifat fisik tanah yang mengalami perubahan bentuk tanpa retak atau perubahan volume yang signifikan. Tanah dapat berada dalam bentuk cair, plastik, semi-padat, dan padat. Perubahan kadar air pada batas kategori ini dikenal sebagai batas Atterberg, yang terdiri dari: batas cair, batas plastis, dan batas susut. Ringkasan batas Atterberg dari hasil uji laboratorium disajikan dalam

**Tabel** III-6, dan diagram *box plot* dari hasil uji laboratorium ditampilkan dalam **Gambar III-4**.

Tabel III-5 Statistik Deskriptif Hasil Uji Sifat Fisik Material PT HM

| Material | Statistic | Wn | yn | yd | G, | e | n |
|---|---|---|---|---|---|---|---|
| | | (%) | (gr/cm³) | (gr/cm³) | | | (%) |
| Soil | Minimum | 44.60 | 14.26 | 7.27 | 2.77 | 1.45 | 0.59 |
| | Maximum | 96.30 | 16.64 | 11.51 | 2.88 | 2.75 | 0.73 |
| | 1st Quartile | 45.74 | 15.94 | 10.23 | 2.81 | 1.46 | 0.59 |
| | Median | 48.04 | 16.50 | 11.26 | 2.83 | 1.46 | 0.59 |
| | 3rd Quartile | 61.55 | 16.53 | 11.35 | 2.85 | 1.78 | 0.63 |
| | Mean | 59.25 | 15.98 | 10.32 | 2.83 | 1.78 | 0.63 |
| | Variance | 615.34 | 1.31 | 4.16 | 0.00 | 0.42 | 0.00 |
| | Standard deviation | 24.81 | 1.14 | 2.04 | 0.04 | 0.65 | 0.07 |
| Limonite | Minimum | 57.88 | 13.59 | 6.19 | 2.74 | 1.71 | 0.63 |
| | Maximum | 119.56 | 15.90 | 10.07 | 2.91 | 3.30 | 0.77 |
| | 1st Quartile | 64.88 | 14.94 | 8.35 | 2.76 | 1.88 | 0.65 |
| | Median | 66.84 | 15.47 | 9.34 | 2.77 | 2.03 | 0.67 |
| | 3rd Quartile | 78.82 | 15.65 | 9.46 | 2.81 | 2.29 | 0.70 |
| | Mean | 75.95 | 15.16 | 8.75 | 2.79 | 2.20 | 0.68 |
| | Variance | 429.39 | 0.62 | 1.66 | 0.00 | 0.29 | 0.00 |
| | Standard deviation | 20.72 | 0.79 | 1.29 | 0.06 | 0.53 | 0.05 |
| Saprolite | Minimum | 43.69 | 13.24 | 5.71 | 2.64 | 1.40 | 0.58 |
| | Maximum | 131.95 | 16.42 | 11.43 | 2.85 | 3.55 | 0.78 |
| | 1st Quartile | 68.74 | 13.56 | 6.02 | 2.65 | 2.04 | 0.67 |
| | Median | 107.23 | 13.74 | 6.63 | 2.75 | 2.90 | 0.74 |
| | 3rd Quartile | 125.11 | 15.51 | 9.19 | 2.80 | 3.48 | 0.78 |
| | Mean | 95.34 | 14.50 | 7.80 | 2.74 | 2.67 | 0.71 |
| | Variance | 1435.80 | 1.94 | 6.00 | 0.01 | 0.87 | 0.01 |
| | Standard deviation | 37.89 | 1.39 | 2.45 | 0.09 | 0.93 | 0.09 |
| Peridotite | Minimum | 0.44 | 24.19 | 22.07 | 2.70 | 0.01 | 1.26 |
| | Maximum | 9.39 | 27.50 | 27.37 | 2.86 | 0.13 | 15.48 |
| | 1st Quartile | 1.04 | 26.16 | 25.75 | 2.72 | 0.02 | 1.72 |
| | Median | 1.09 | 26.20 | 25.90 | 2.73 | 0.02 | 2.24 |
| | 3rd Quartile | 2.51 | 26.41 | 26.05 | 2.84 | 0.04 | 4.25 |
| | Mean | 2.32 | 26.20 | 25.64 | 2.77 | 0.04 | 4.06 |
| | Variance | 7.75 | 0.77 | 2.05 | 0.00 | 0.00 | 20.02 |
| | Standard deviation | 2.78 | 0.88 | 1.43 | 0.07 | 0.04 | 4.47 |
| Dry Tailing | Minimum | 18.93 | 19.73 | 15.24 | 3.31 | 1.09 | 0.00 |
| | Maximum | 23.36 | 20.31 | 15.61 | 3.52 | 1.21 | 0.00 |
| | 1st Quartile | 20.33 | 19.90 | 15.40 | 3.37 | 1.15 | - |
| | Median | 21.73 | 20.07 | 15.55 | 3.43 | 1.20 | - |
| | 3rd Quartile | 22.55 | 20.19 | 15.58 | 3.48 | 1.21 | - |
| | Mean | 21.34 | 20.04 | 15.47 | 3.42 | 1.17 | - |
| | Variance | 5.02 | 0.08 | 0.04 | 0.01 | 0.00 | - |
| | Standard deviation | 2.24 | 0.29 | 0.20 | 0.11 | 0.07 | - |

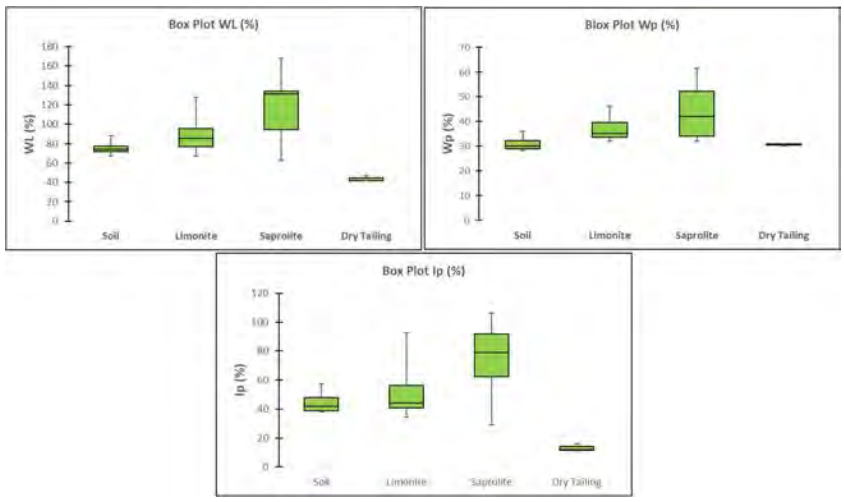



Gambar III-3 *Box Plot* dari Sifat Fisik Material PT HM

Tabel III-6 Rangkuman Hasil Pengujian Attberberg Limit

| Material | Statistic | WL (%) | Wp (%) | Ip (%) |
|---|---|---|---|---|
| **Soil** | Minimum | 67.12 | 28.16 | 38.02 |
| | Maximum | 88.32 | 36.11 | 57.28 |
| | 1st Quartile | 72.04 | 28.90 | 38.73 |
| | Median | 73.91 | 30.09 | 41.75 |
| | 3rd Quartile | 77.68 | 32.31 | 47.73 |
| | Mean | 75.81 | 31.11 | 44.70 |
| | Variance | 79.79 | 12.53 | 78.62 |

| Material | Statistic | WL (%) | Wp (%) | Ip (%) |
|---|---|---|---|---|
| | Standard deviation | 8.93 | 3.54 | 8.87 |
| **Limonite** | Minimum | 67.51 | 32.15 | 34.36 |
| | Maximum | 127.60 | 46.22 | 92.45 |
| | 1st Quartile | 76.81 | 33.63 | 40.78 |
| | Median | 85.26 | 35.15 | 44.09 |
| | 3rd Quartile | 95.42 | 39.57 | 56.24 |
| | Mean | 89.26 | 37.13 | 52.13 |
| | Variance | 394.56 | 28.84 | 417.50 |
| | Standard deviation | 19.86 | 5.37 | 20.43 |
| **Saprolite** | Minimum | 62.78 | 32.12 | 28.77 |
| | Maximum | 167.85 | 61.53 | 106.32 |
| | 1st Quartile | 94.56 | 34.01 | 62.44 |
| | Median | 131.34 | 42.01 | 79.07 |
| | 3rd Quartile | 133.85 | 52.27 | 91.84 |
| | Mean | 118.08 | 44.39 | 73.69 |
| | Variance | 1628.21 | 154.96 | 891.86 |
| | Standard deviation | 40.35 | 12.45 | 29.86 |
| **Dry Tailing** | Minimum | 42.00 | 30.00 | 11.00 |
| | Maximum | 47.00 | 31.00 | 16.00 |
| | 1st Quartile | 42.00 | 30.50 | 11.50 |
| | Median | 42.00 | 31.00 | 12.00 |
| | 3rd Quartile | 44.50 | 31.00 | 14.00 |
| | Mean | 43.67 | 30.67 | 13.00 |
| | Variance | 8.33 | 0.33 | 7.00 |
| | Standard deviation | 2.89 | 0.58 | 2.65 |



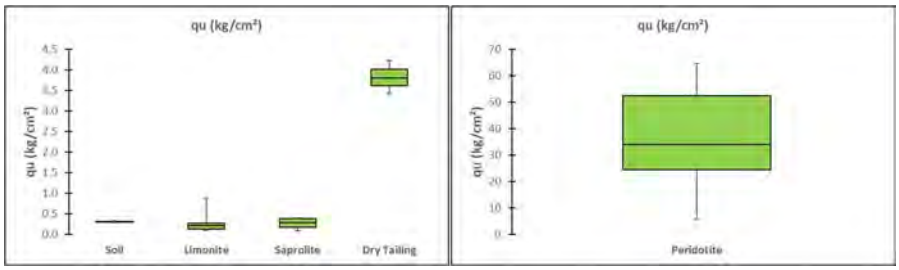

Gambar III-4 Diagram *Box Plot* Hasil Uji Atterberg Limit

### III.2.3 Kuat Tekan dan Kuat Geser

Uji Kuat tekan (UCT) dan Uji Kekuatan Tekan Uniaxial (UCS Test) adalah metode laboratorium yang digunakan untuk menentukan kekuatan tekan tanah atau batuan. Uji ini mengukur seberapa kuat tanah/batuan dalam menahan gaya tekan yang diberikan hingga partikel-partikel tanah terpisah atau batuan runtuh. Rekapitulasi hasil uji kekuatan tekan bebas dari pengujian laboratorium serta diagram *box plot* dari hasil uji tersebut dapat dilihat pada **Tabel III-7** dan **Gambar III-5**.

Tabel III-7 Rekapitulasi Hasil Uji Kuat Tekan Uniaksial Tanah

| Material | Statistic | qu (kg/cm²) | cu (kg/cm²) |
|---|---|---|---|
| Soil | Minimum | 0.29 | 0.14 |
| | Maximum | 0.33 | 0.16 |
| | 1st Quartile | 0.30 | 0.15 |
| | Median | 0.31 | 0.15 |
| | 3rd Quartile | 0.32 | 0.16 |
| | Mean | 0.31 | 0.15 |
| | Variance | 0.00 | 0.00 |
| | Standard deviation | 0.03 | 0.01 |
| Limonite | Minimum | 0.11 | 0.05 |
| | Maximum | 0.88 | 0.44 |
| | 1st Quartile | 0.13 | 0.06 |
| | Median | 0.22 | 0.11 |
| | 3rd Quartile | 0.27 | 0.14 |
| | Mean | 0.32 | 0.16 |
| | Variance | 0.10 | 0.03 |
| | Standard deviation | 0.32 | 0.16 |
| Saptolite | Minimum | 0.09 | 0.05 |
| | Maximum | 0.40 | 0.20 |
| | 1st Quartile | 0.17 | 0.09 |
| | Median | 0.29 | 0.15 |
| | 3rd Quartile | 0.39 | 0.20 |
| | Mean | 0.27 | 0.14 |
| | Variance | 0.02 | 0.01 |
| | Standard deviation | 0.15 | 0.08 |
| Peridotite | Minimum | 5.78 | - |
| | Maximum | 64.70 | - |
| | 1st Quartile | 24.53 | - |
| | Median | 34.00 | - |
| | 3rd Quartile | 52.33 | - |
| | Mean | 36.89 | - |
| | Variance | 441.66 | - |
| | Standard deviation | 21.02 | - |
| Dry Tailing | Minimum | 3.41 | - |
| | Maximum | 4.22 | - |
| | 1st Quartile | 3.61 | - |
| | Median | 3.80 | - |
| | 3rd Quartile | 4.01 | - |
| | Mean | 3.81 | - |
| | Variance | 0.16 | - |
| | Standard deviation | 0.40 | - |



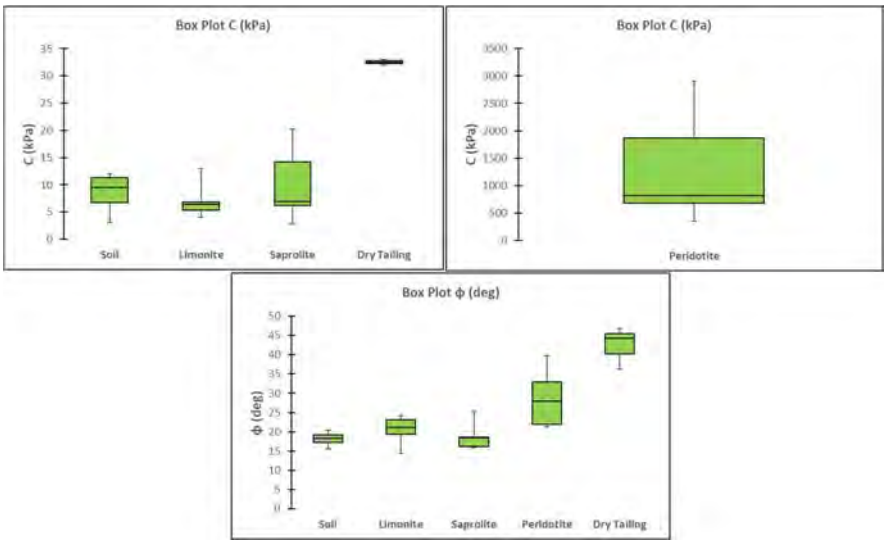

Gambar III-5 Diagram Box Plot Kuat Tekan Uniaksial

Kekuatan geser tanah dan batuan dapat didefinisikan sebagai gaya tahan oleh partikel tanah/batuan terhadap gaya tekan atau tarik. Menurut Coulomb (1776), tegangan geser merupakan fungsi dari kohesi tanah, sudut gesekan dalam, dan tegangan normal. Data tegangan geser tanah diperoleh melalui uji laboratorium triaxial dan uji geser langsung. Uji triaxial yang dilakukan di sini adalah uji triaxial terkonsolidasi tidak terdrainasi (*Consolidated Undrained/*CU), yang tidak hanya menghasilkan nilai kohesi alami dan sudut gesekan, tetapi juga kohesi efektif dan sudut gesekan efektif, yaitu nilai kekuatan efektif setelah konsolidasi. Rekapitulasi hasil uji kekuatan geser tanah dan batuan serta diagram *box plot* hasil uji laboratorium dapat dilihat pada **Tabel III-8** dan **Gambar III-6.**

Tabel III-8 Kuat Geser Material dari Hasil Pengujian Laboratorium

| Material | Statistic | C (kpa) | ϕ (deg) | C' (kpa) | ϕ' (deg) |
|---|---|---|---|---|---|
| **Soil** | Minimum | 3.14 | 15.62 | 9.72 | 24.77 |
| | Maximum | 11.93 | 20.44 | 10.84 | 26.52 |
| | 1st Quartile | 6.74 | 17.25 | 10.00 | 25.21 |
| | Median | 9.54 | 18.27 | 10.28 | 25.65 |
| | 3rd Quartile | 11.33 | 19.17 | 10.56 | 26.08 |
| | Mean | 8.54 | 18.15 | 10.28 | 25.65 |
| | Variance | 15.92 | 4.05 | 0.62 | 1.53 |
| | Standard deviation | 3.99 | 2.01 | 0.79 | 1.24 |
| **Limonite** | Minimum | 4.02 | 14.43 | 3.87 | 23.81 |
| | Maximum | 12.98 | 24.21 | 12.02 | 30.72 |
| | 1st Quartile | 5.34 | 19.27 | 4.97 | 25.72 |
| | Median | 6.37 | 21.12 | 6.03 | 27.46 |
| | 3rd Quartile | 6.84 | 23.14 | 8.04 | 29.10 |
| | Mean | 6.82 | 20.65 | 6.99 | 27.36 |
| | Variance | 8.65 | 12.16 | 12.62 | 8.78 |
| | Standard deviation | 2.94 | 3.49 | 3.55 | 2.96 |
| **Saprolite** | Minimum | 2.77 | 15.88 | 1.51 | 21.83 |
| | Maximum | 20.20 | 25.30 | 13.01 | 24.54 |
| | 1st Quartile | 6.18 | 16.11 | 4.39 | 22.51 |
| | Median | 6.96 | 18.51 | 7.26 | 23.19 |
| | 3rd Quartile | 14.25 | 18.64 | 10.14 | 23.86 |
| | Mean | 10.07 | 18.89 | 7.26 | 23.19 |
| | Variance | 49.57 | 14.53 | 66.16 | 3.67 |
| | Standard deviation | 7.04 | 3.81 | 8.13 | 1.92 |
| **Peridotite** | Minimum | 346.17 | 21.36 | 59.82 | 6.24 |

| Material | Statistic | C (kpa) | ϕ (deg) | C' (kpa) | ϕ' (deg) |
|---|---|---|---|---|---|
| | Maximum | 2907.67 | 39.65 | 705.69 | 14.70 |
| | 1st Quartile | 681.56 | 21.84 | 138.27 | 7.18 |
| | Median | 816.89 | 27.93 | 181.32 | 7.37 |
| | 3rd Quartile | 1869.15 | 32.86 | 216.73 | 9.78 |
| | Mean | 1350.05 | 28.37 | 235.29 | 8.67 |
| | Variance | 930782.42 | 43.21 | 37319.37 | 7.41 |
| | Standard deviation | 964.77 | 6.57 | 193.18 | 2.72 |
| Dry Tailing | Minimum | 32.00 | 36.20 | - | - |
| | Maximum | 33.00 | 46.80 | - | - |
| | 1st Quartile | 32.25 | 40.20 | - | - |
| | Median | 32.50 | 44.20 | - | - |
| | 3rd Quartile | 32.75 | 45.50 | - | - |
| | Mean | 32.50 | 42.40 | - | - |
| | Variance | 0.50 | 30.52 | - | - |
| | Standard deviation | 0.71 | 5.52 | - | - |




Gambar III-6 Diagram Box Plot Kuat Geser Tanah dari Uji Triaxial dan Geser Langsung

## III.3 Analisis Daya Dukung Tanah

### III.3.1 Berdasarkan Hasil SPT

#### III.3.1.1 Koreksi Nilai N-SPT

Hasil uji SPT yang telah dijelaskan pada bab sebelumnya kemudian dianalisis untuk dapat menentukan korelasi daya dukung tanah. Nilai N-SPT yang di dapat dari data lapangan terlebih dahulu dikoreksi agar diperoleh parameter yang telah disesuaikan, setelah itu dilakukan perhitungan untuk mendapat daya dukung tanah. Nilai daya dukung tanah ini kemudian dibandingkan dengan beban timbunan yang direncanakan berada di atasnya.

SPT pada titik yang lebih dalam akan memberikan nilai N yang lebih tinggi dibandingkan dengan kedalaman yang relatif dangkal. Oleh sebab itu nilai N dari hasil tes SPT perlu dikoreksi terhadap tekanan overburden (khusus untuk tanah pasiran) dan juga terhadap metod pelaksanaan tes di lapangan (untuk semua jenis tanah). Koreksi nilai N-SPT yang diperoleh di lapangan dikoreksi menggunakan persamaan sebagai berikut (Skempton,1986):

$$N_{60} = \frac{E_m . C_b . C_s . C_r . N}{0.60}$$

di mana:

Em = efesiensi hammer

Cb = koreksi terhadap diameter lubang bor

Cs = koreksi terhadap metode pengambilan sampel

Cr = koreksi terhadap panjang stang bor

N = nilai N yang diperoleh selama pelaksanaan tes SPT

N60 = hasil koreksi nilai N-SPT terhadap metode pelaksanaan lapangan

σ'v = tekanan vertikal efektif pada kedalaman yang ditinjau

Tabel III-9 Efesiensi Hammer SPT (Clayton, 1990)

| Country | Hammer Type | Hammer Release Mechanism | Hammer Effeciency, Em |
|---|---|---|---|
| Argentina | Donut | Cathead | 0.45 |
| Brazil | Pin weight | Hand dropped | 0.72 |
| China | Automatic | Trip | 0.60 |
| | Donut | Hand dropped | 0.55 |
| | Donut | Cathead | 0.50 |
| Colombia | Donut | Cathead | 0.50 |
| Japan | Donut | Tombi trigger | 0.78 – 0.85 |
| | Donut | Cathead 2 turns + special release | 0.65 – 0.67 |
| UK | Automatic | Trip | 0.73 |
| US | Safety | 2 turns on cathead | 0.55 – 0.60 |
| | Donut | 2 turns on cathead | 0.45 |
| Venezuela | Donut | Cathead | 0.43 |

Sedangkan koreksi nilai N-SPT terhadap tekanan overburden menggunakan persamaan berikut (Liao dan Whitman,1985):

$$(N_1)_{60} = C_N . N_{60}$$

di mana:

(N1)60 = nilai N-SPT yang telah dikoreksi terhadap tekanan overburden

CN = faktor koreksi (dapat dilihat dalam gambar di bawah)

$\sigma'0$ = tekanan vertikal efektif dalam ton/ft$^2$

Tabel III-10 Faktor Koreksi *Borehole*, *Sampler* dan *Rod* (Skempton, 1986)

| Factor | Equipment Variables | Value |
|---|---|---|
| Borehole diameter factor, CB | 65 – 115 mm (2.5 – 4.5 in) | 1.00 |
| | 150 mm (6 in) | 1.05 |
| | 200 mm (8 in) | 1.15 |
| Sampling method factor, CS | Standard sampler | 1.00 |
| | Sampler without liner (not recommended) | 1.20 |
| Rod length factor, CR | 3 – 4 m (10 – 13 ft) | 0.75 |
| | 4 – 6 m (13 – 20 ft) | 0.85 |
| | 6 – 10 m (20 – 30 ft) | 0.95 |
| | > 10 m (> 30 ft) | 1.00 |

Liao dan Whitman merekomendasikan besar faktor koreksi terhadap tekanan overburden (1986) sebagai berikut :

$C_N = 9{,}78.\ \sqrt{\frac{1}{\sigma_v'}}$ for $\sigma_v' \geq 25$ kN/m2

Berdasarkan persamaan-persamaan tersebut diatas didapat nilai koreksi SPT lapangan yang dapat dilihat pada **Tabel III-11**.

Tabel III-11 Correction to Field N-SPT Values

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| BFG-01 | Limonite | 2 | 2.45 | 3 | 1.88 |
| | Limonite | 4 | 4.45 | 0 | 0.00 |
| | Limonite | 6 | 6.45 | 3 | 2.38 |
| | Saprolite | 8 | 8.45 | 0 | 0.00 |
| | Saprolite | 10 | 10.45 | 0 | 0.00 |
| | Peridotite | 20 | 20.30 | 50 | 41.67 |
| BFG-02 | Limonite | 2 | 2.45 | 0 | 0.00 |
| | Saprolite | 4 | 4.45 | 3 | 2.13 |
| | Saprolite | 8 | 8.10 | 50 | 39.58 |
| BFG-03 | Limonite | 2 | 2.45 | 2 | 1.25 |
| | Limonite | 4 | 4.45 | 1 | 0.71 |
| | Limonite | 6 | 6.45 | 2 | 1.58 |
| | Saprolite | 10 | 10.45 | 10 | 8.33 |
| | Saprolite | 12 | 12.45 | 10 | 8.33 |
| | Peridotite | 16 | 16.45 | 36 | 30.00 |
| BFG-04 | Soil | 2 | 2.45 | 1 | 0.63 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| BFH-05 | Limonite | 2 | 2.45 | 2 | 1.25 |
| | Limonite | 4 | 4.50 | 0 | 0.00 |
| | Limonite | 6 | 6.45 | 4 | 3.17 |
| | Limonite | 8 | 8.45 | 2 | 1.58 |
| | Limonite | 10 | 10.45 | 8 | 6.67 |
| | Limonite | 12 | 12.45 | 7 | 5.83 |
| | Limonite | 14 | 14.45 | 4 | 3.33 |
| | Limonite | 16 | 16.45 | 4 | 3.33 |
| | Limonite | 18 | 18.45 | 6 | 5.00 |
| | Limonite | 20 | 20.45 | 2 | 1.67 |
| | Saprolite | 22 | 22.00 | 50 | 41.67 |
| BFHB-01 | Limonite | 2 | 2.45 | 12 | 7.50 |
| | Saprolite | 4 | 4.45 | 12 | 8.50 |
| | Saprolite | 8 | 8.45 | 3 | 2.38 |
| | Saprolite | 10 | 10.00 | 50 | 41.67 |
| BFHB-02 | Limonite | 2 | 2.45 | 2 | 1.25 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| | Limonite | 4 | 4.45 | 1 | 0.71 |
| | Limonite | 6 | 6.45 | 0 | 0.00 |
| | Limonite | 8 | 8.45 | 3 | 2.38 |
| | Saprolite | 10 | 10.45 | 2 | 1.67 |
| | Saprolite | 13 | 13.45 | 5 | 4.17 |
| | Peridotite | 15 | 15.25 | 50 | 41.67 |
| BFGB-01 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Limonite | 4 | 4.45 | 1 | 0.71 |
| | Limonite | 6 | 6.45 | 1 | 0.79 |
| | Saprolite | 8 | 8.45 | 20 | 15.83 |
| BFGB-02 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Limonite | 4 | 4.45 | 3 | 2.13 |
| | Limonite | 6 | 6.45 | 2 | 1.58 |
| | Limonite | 8 | 8.45 | 3 | 2.38 |
| | Saprolite | 12 | 12.45 | 5 | 4.17 |
| | Saprolite | 14 | 14.45 | 7 | 5.83 |
| | Saprolite | 16 | 16.25 | 50 | 41.67 |
| BFGB-03 | Soil | 2 | 2.45 | 2 | 1.25 |
| | Saprolite | 4 | 4.45 | 3 | 2.13 |
| | Saprolite | 6 | 6.45 | 17 | 13.46 |
| | Saprolite | 8 | 8.45 | 4 | 3.17 |
| | Saprolite | 10 | 10.00 | 50 | 41.67 |
| | Saprolite | 14 | 14.10 | 50 | 41.67 |
| | Saprolite | 20 | 20.15 | 50 | 41.67 |
| BFGB-04 | Saprolite | 2 | 2.45 | 18 | 11.25 |
| | Saprolite | 6 | 6.45 | 6 | 4.75 |
| | Saprolite | 8 | 8.45 | 2 | 1.58 |
| BFGD-01 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Soil | 4 | 4.45 | 1 | 0.71 |
| | Limonite | 6 | 6.45 | 4 | 3.17 |
| | Limonite | 8 | 8.45 | 2 | 1.58 |
| | Limonite | 10 | 10.45 | 1 | 0.83 |
| | Limonite | 12 | 12.45 | 1 | 0.83 |
| | Limonite | 14 | 14.45 | 1 | 0.83 |
| | Limonite | 16 | 16.45 | 1 | 0.83 |
| | Saprolite | 20 | 20.45 | 2 | 1.67 |
| BFGD-02 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Soil | 4 | 4.45 | 4 | 2.83 |
| | Limonite | 6 | 6.45 | 4 | 3.17 |
| | Limonite | 8 | 8.45 | 1 | 0.79 |
| | Limonite | 10 | 10.45 | 5 | 4.17 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| | Saprolite | 4 | 4.00 | 50 | 35.42 |
| | Saprolite | 6 | 6.00 | 50 | 39.58 |
| | Saprolite | 8 | 8.45 | 0 | 0.00 |
| | Saprolite | 10 | 10.45 | 2 | 1.67 |
| | Peridotite | 12 | 12.00 | 50 | 41.67 |
| BFHB-03 | Soil | 2 | 2.45 | 9 | 5.63 |
| | Soil | 4 | 4.45 | 2 | 1.42 |
| | Limonite | 6 | 6.45 | 5 | 3.96 |
| | Limonite | 8 | 8.45 | 4 | 3.17 |
| | Limonite | 10 | 10.45 | 3 | 2.50 |
| | Limonite | 12 | 12.45 | 1 | 0.83 |
| | Limonite | 14 | 14.45 | 6 | 5.00 |
| | Limonite | 16 | 16.45 | 0 | 0.00 |
| | Limonite | 18 | 18.45 | 6 | 5.00 |
| | Limonite | 20 | 20.45 | 8 | 6.67 |
| | Limonite | 22 | 22.45 | 4 | 3.33 |
| | Saprolite | 24 | 24.45 | 13 | 10.83 |
| | Saprolite | 26 | 26.45 | 50 | 41.67 |
| BFHB-04 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Limonite | 4 | 4.45 | 2 | 1.42 |
| | Limonite | 6 | 6.45 | 4 | 3.17 |
| | Limonite | 8 | 8.45 | 3 | 2.38 |
| | Limonite | 10 | 10.45 | 6 | 5.00 |
| | Limonite | 12 | 12.45 | 5 | 4.17 |
| | Limonite | 14 | 14.45 | 7 | 5.83 |
| | Limonite | 16 | 16.45 | 7 | 5.83 |
| | Limonite | 18 | 18.45 | 6 | 5.00 |
| | Saprolite | 20 | 20.45 | 8 | 6.67 |
| | Saprolite | 22 | 22.45 | 2 | 1.67 |
| | Saprolite | 24 | 24.45 | 2 | 1.67 |
| | Saprolite | 26 | 26.45 | 3 | 2.50 |
| | Saprolite | 28 | 28.45 | 5 | 4.17 |
| BFHB-05 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Soil | 4 | 4.45 | 4 | 2.83 |
| | Limonite | 6 | 6.45 | 7 | 5.54 |
| | Limonite | 8 | 8.45 | 8 | 6.33 |
| | Saprolite | 12 | 12.45 | 9 | 7.50 |
| | Saprolite | 14 | 14.45 | 9 | 7.50 |
| | Saprolite | 16 | 16.45 | 17 | 14.17 |
| | Saprolite | 18 | 18.45 | 12 | 10.00 |
| | Saprolite | 20 | 20.45 | 3 | 2.50 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| | Limonite | 12 | 12.45 | 3 | 2.50 |
| | Limonite | 14 | 14.45 | 2 | 1.67 |
| | Limonite | 16 | 16.45 | 7 | 5.83 |
| | Saprolite | 18 | 18.45 | 12 | 10.00 |
| | Saprolite | 20 | 20.40 | 50 | 41.67 |
| | Saprolite | 24 | 24.15 | 50 | 41.67 |
| | Saprolite | 26 | 26.45 | 16 | 13.33 |
| BFH-01 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Limonite | 4 | 4.45 | 2 | 1.42 |
| | Limonite | 6 | 6.45 | 3 | 2.38 |
| | Limonite | 8 | 8.45 | 7 | 5.54 |
| | Limonite | 10 | 10.45 | 6 | 5.00 |
| | Limonite | 12 | 12.45 | 4 | 3.33 |
| | Limonite | 14 | 14.45 | 8 | 6.67 |
| | Limonite | 16 | 16.45 | 6 | 5.00 |
| | Limonite | 18 | 18.45 | 7 | 5.83 |
| | Limonite | 20 | 20.45 | 3 | 2.50 |
| | Limonite | 22 | 22.45 | 3 | 2.50 |
| | Limonite | 24 | 24.45 | 1 | 0.83 |
| | Saprolite | 26 | 26.45 | 14 | 11.67 |
| | Saprolite | 28 | 28.45 | 5 | 4.17 |
| | Saprolite | 30 | 30.45 | 5 | 4.17 |
| | Peridotite | 32 | 32.45 | 50 | 41.67 |
| BFH-02 | Soil | 2 | 2.45 | 4 | 2.50 |
| | Soil | 4 | 4.35 | 3 | 2.13 |
| | Limonite | 6 | 6.45 | 1 | 0.79 |
| | Limonite | 8 | 8.45 | 0 | 0.00 |
| | Saprolite | 10 | 10.45 | 6 | 5.00 |
| | Saprolite | 12 | 12.25 | 50 | 41.67 |
| BFH-03 | Soil | 2 | 2.45 | 2 | 1.25 |
| | Soil | 4 | 4.45 | 2 | 1.42 |
| | Limonite | 6 | 6.45 | 4 | 3.17 |
| | Limonite | 8 | 8.45 | 2 | 1.58 |
| | Saprolite | 10 | 10.45 | 6 | 5.00 |
| | Saprolite | 12 | 12.45 | 11 | 9.17 |
| | Saprolite | 14 | 14.45 | 11 | 9.17 |
| | Saprolite | 16 | 16.25 | 50 | 41.67 |
| BFH-04 | Soil | 2 | 2.45 | 2 | 1.25 |
| | Limonite | 4 | 4.45 | 4 | 2.83 |
| | Limonite | 6 | 6.45 | 3 | 2.38 |
| | Limonite | 8 | 8.45 | 3 | 2.38 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| | Saprolite | 22 | 22.45 | 0 | 0.00 |
| | Saprolite | 24 | 24.45 | 10 | 8.33 |
| BFHB-06 | Soil | 2 | 2.45 | 4 | 2.50 |
| | Limonite | 4 | 4.45 | 3 | 2.13 |
| | Saprolite | 6 | 6.00 | 50 | 39.58 |
| | Saprolite | 8 | 8.45 | 13 | 10.29 |
| | Saprolite | 10 | 10.45 | 6 | 5.00 |
| | Peridotite | 12 | 12.05 | 50 | 41.67 |
| BFHB-07 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Limonite | 4 | 4.45 | 2 | 1.42 |
| | Saprolite | 6 | 6.45 | 7 | 5.54 |
| | Peridotite | 8 | 8.00 | 50 | 39.58 |
| BFHD-01 | Limonite | 2 | 2.45 | 7 | 4.38 |
| | Limonite | 4 | 4.45 | 0 | 0.00 |
| | Limonite | 6 | 6.45 | 4 | 3.17 |
| | Saprolite | 8 | 8.45 | 10 | 7.92 |
| | Saprolite | 14 | 14.45 | 50 | 41.67 |
| BFHD-02 | Soil | 2 | 2.45 | 2 | 1.25 |
| | Soil | 4 | 4.45 | 4 | 2.83 |
| | Limonite | 6 | 6.45 | 6 | 4.75 |
| | Limonite | 8 | 8.45 | 4 | 3.17 |
| | Limonite | 10 | 10.45 | 4 | 3.33 |
| | Limonite | 12 | 12.45 | 2 | 1.67 |
| | Limonite | 14 | 14.45 | 2 | 1.67 |
| | Limonite | 16 | 16.45 | 0 | 0.00 |
| | Saprolite | 18 | 18.45 | 4 | 3.33 |
| | Saprolite | 20 | 20.45 | 0 | 0.00 |
| | Saprolite | 22 | 22.45 | 1 | 0.83 |
| | Saprolite | 24 | 24.45 | 7 | 5.83 |
| | Saprolite | 28 | 28.45 | 18 | 15.00 |
| | Saprolite | 30 | 30.45 | 50 | 41.67 |
| | Saprolite | 32 | 32.25 | 50 | 41.67 |
| BFHD-03 | Soil | 2 | 2.45 | 1 | 0.63 |
| | Soil | 4 | 4.45 | 1 | 0.71 |
| | Limonite | 6 | 6.45 | 2 | 1.58 |
| BFHD-04 | Soil | 2 | 2.45 | 4 | 2.50 |
| | Soil | 4 | 4.45 | 1 | 0.71 |
| | Limonite | 6 | 6.45 | 2 | 1.58 |
| | Limonite | 8 | 8.45 | 1 | 0.79 |
| | Saprolite | 10 | 10.45 | 8 | 6.67 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|
| | Limonite | 10 | 10.45 | 2 | 1.67 |
| | Saprolite | 12 | 12.30 | 50 | 41.67 |

| Borehole | Lithology | From (m) | To (m) | N-SPT | N60 |
|---|---|---|---|---|---|

### III.3.1.2 Koreksi Data N-SPT

#### III.3.1.2.1 Sudut geser friksi tanah (ϕ)

Sudut geser friksi tanah dapat dijumpai pada tanah jenis granular atau pasiran (*sand*). Parameter tanah jenis ini sangat diperlukan dalam analisa dan desain baik itu untuk pondasi dangkal maupun pondasi dalam. Grafik yang menghubungkan antara nilai sudut geser friksi dengan nilai N-SPT dapat dilihat pada **Gambar III-7.**

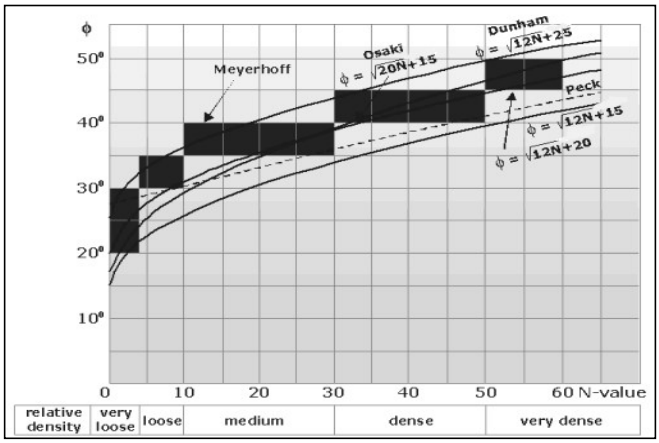
Berdasarkan grafik **Gambar III-7**, sebuah persamaan yang bisa dipakai untuk menentukan sudut geser friksi berdasarkan nilai N-SPT adalah sebagai berikut (Dunham, 1954) :

$\phi = \sqrt{12N'}+15$

di mana :

$\phi$ = sudut geser friksi ( 0)

N' = nilai N-SPT yang telah dikoreksi terhadap prosedur tes dan terhadap tegangan vertikal

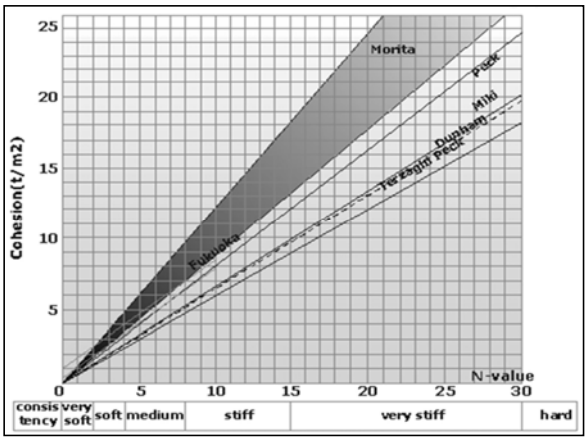



Gambar III-7 Korelasi sudut geser friksi (°) dengan nilai N-SPT (K. Terzaghi)

#### III.3.1.2.2 Kohesi (Cu)

Lain halnya dengan tanah granular (pasir), parameter kohesi umum dijumpai pada tanah jenis lempung (clay). Parameter kohesi ini juga memegang peranan penting dalam hal analisa

pondasi terutama pada tanah lempung (clay). Grafik di bawah ini dapat digunakan sebagai acuan untuk menentukan besarnya nilai kohesi tanah kondisi undrained dari nilai N-SPT.




Gambar III-8 Korelasi kohesi (cu) dengan nilai N-SPT (K. Terzaghi)

Berdasarkan grafik di atas, besarnya nilai kohesi untuk kondisi undrained dapat dihitung dengan menggunakan persamaan sebagai berikut:

cu = 6,67.N' (kN/m2)

di mana :

cu = kohesi untuk kondisi undrained

N' = nilai N-SPT yang telah dikoreksi terhadap prosedur tes dan terhadap tegangan vertikal

### III.3.1.2.3 Bobot Isi Tanah (γ)

Terdapat beberapa hubungan antara nilai N-SPT yang belum terkoreksi dengan nilai parameter tanah. Estimasi yang terdapat dalam **Tabel III-12** adalah salah satu dari beberapa parameter korelasi yang dipakai didalam estimasi parameter tanah.

Tabel III-12 Hubungan antara N-SPT dan berat isi tanah (Bowles, 1984)

| Parameter | Cohesionless Soil | | | | |
|---|---|---|---|---|---|
| N | 0 – 10 | 11 – 30 | 31 – 50 | > 50 | |
| Unit weight, γ (kN/m3) | 12 – 16 | 14 – 18 | 16 – 20 | 18 – 23 | |
| Angle of friction, ϕ | 25 – 32 | 28 – 36 | 30 – 40 | > 35 | |
| State | Loose | Medium | Dense | Very dense | |
| Relative Density, Dr | Based on equation for calculating Dr below | | | | |
| | | | | | |
| Parameter | Cohesive Soil | | | | |
| N | < 4 | 4 – 6 | 6 – 15 | 16 – 25 | > 25 |

| | | | | | |
|---|---|---|---|---|---|
| Unit weight, γ (kN/m3) | 14 – 18 | 16 – 18 | 16 – 18 | 16 – 20 | > 20 |
| qu, kPa | < 25 | 20 – 50 | 30 – 60 | 40 – 200 | > 100 |
| Consistency | Very soft | Soft | Medium | Stiff | Hard |

Menurut Marcusson dan Bieganousky (1977):

$D_r = 0.086 + 0.0083(2311 + 222N - 711(OCR) - C_1\sigma_v')^{1/2}$

Menurut Fardis dan Veneziano (1981):

$\ln N = C_2 + 2.06\ lnD_r + C_3 ln\sigma_v'$

di mana:

C = 7.7 untuk $\sigma_v'$ dalam kPa; 53 dalam psi

C = fungsi kedalaman berdasarkan nilai N dan Dr

C = 0.222 untuk $\sigma_v'$ dalam kPa; 0.422 dalam psi

OCR = over consolidation ratio

Dengan menggunakan persamaan yang telah dijabarkan di atas maka didapatkan parameter bobot isi, kohesi dan sudut geser dalam yang merupakan korelasi dari N-SPT. Hasil korelasi dari masing-masing parameter dapat dilihat pada **Tabel III-13**.

Tabel III-13 Nilai Parameter Geoteknik Berdasarkan Hasil Korelasi N-SPT

| Borehole ID | Lithology | Depth (m) | | Thickness (m) | N-SPT | N60 | γ (kN/m3) | Cu (kPa) | ϕ(°) |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | | | | | |
| BFG-01 | Limonite | 0 | 2 | 2 | 3 | 1.88 | 14.00 | 12.51 | 19.74 |
| | Limonite | 2 | 4 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Limonite | 4 | 6 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Saprolite | 6 | 8 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 8 | 10 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Peridotite | 18 | 20 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFG-02 | Limonite | 0 | 2 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 2 | 4 | 2 | 3 | 2.13 | 14.00 | 14.17 | 20.05 |
| | Saprolite | 6 | 8 | 2 | 50 | 39.58 | 25.00 | 264.02 | 36.79 |
| BFG-03 | Limonite | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Limonite | 2 | 4 | 2 | 1 | 0.71 | 14.00 | 4.72 | 17.92 |
| | Limonite | 4 | 6 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| | Saprolite | 8 | 10 | 2 | 10 | 8.33 | 18.00 | 55.58 | 25.00 |
| | Saprolite | 10 | 12 | 2 | 10 | 8.33 | 18.00 | 55.58 | 25.00 |
| | Peridotite | 14 | 16 | 2 | 36 | 30.00 | 25.00 | 200.10 | 33.97 |
| BFG-04 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Limonite | 2 | 4 | 2 | 1 | 0.71 | 14.00 | 4.72 | 17.92 |
| | Limonite | 4 | 6 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Limonite | 6 | 8 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Saprolite | 8 | 10 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Saprolite | 11 | 13 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| | Peridotite | 13 | 15 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFGB-01 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Limonite | 2 | 4 | 2 | 1 | 0.71 | 14.00 | 4.72 | 17.92 |
| | Limonite | 4 | 6 | 2 | 1 | 0.79 | 14.00 | 5.28 | 18.08 |

| Borehole ID | Lithology | Depth (m) | | Thickness (m) | N-SPT | N60 | γ (kN/m3) | Cu (kPa) | ϕ(°) |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | | | | | |
| | Saprolite | 6 | 8 | 2 | 20 | 15.83 | 20.00 | 105.61 | 28.78 |
| BFGB-02 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Limonite | 2 | 4 | 2 | 3 | 2.13 | 14.00 | 14.17 | 20.05 |
| | Limonite | 4 | 6 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| | Limonite | 6 | 8 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Saprolite | 10 | 12 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| | Saprolite | 12 | 14 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Saprolite | 14 | 16 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFGB-03 | Soil | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Saprolite | 2 | 4 | 2 | 3 | 2.13 | 14.00 | 14.17 | 20.05 |
| | Saprolite | 4 | 6 | 2 | 17 | 13.46 | 18.00 | 89.77 | 27.71 |
| | Saprolite | 6 | 8 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Saprolite | 8 | 10 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| | Saprolite | 12 | 14 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| | Saprolite | 18 | 20 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFGB-04 | Saprolite | 0 | 2 | 2 | 18 | 11.25 | 18.00 | 75.04 | 26.62 |
| | Saprolite | 4 | 6 | 2 | 6 | 4.75 | 16.00 | 31.68 | 22.55 |
| | Saprolite | 6 | 8 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| BFGD-01 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Soil | 2 | 4 | 2 | 1 | 0.71 | 14.00 | 4.72 | 17.92 |
| | Limonite | 4 | 6 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 6 | 8 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| | Limonite | 8 | 10 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Limonite | 10 | 12 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Limonite | 12 | 14 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Limonite | 14 | 16 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Saprolite | 18 | 20 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| BFGD-02 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Soil | 2 | 4 | 2 | 4 | 2.83 | 14.00 | 18.90 | 20.83 |
| | Limonite | 4 | 6 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 6 | 8 | 2 | 1 | 0.79 | 14.00 | 5.28 | 18.08 |
| | Limonite | 8 | 10 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| | Limonite | 10 | 12 | 2 | 3 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Limonite | 12 | 14 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Limonite | 14 | 16 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Saprolite | 16 | 18 | 2 | 12 | 10.00 | 18.00 | 66.70 | 25.95 |
| | Saprolite | 18 | 20 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| | Saprolite | 22 | 24 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| | Saprolite | 24 | 26 | 2 | 16 | 13.33 | 18.00 | 88.93 | 27.65 |
| BFH-01 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Limonite | 2 | 4 | 2 | 2 | 1.42 | 14.00 | 9.45 | 19.12 |
| | Limonite | 4 | 6 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Limonite | 6 | 8 | 2 | 7 | 5.54 | 16.00 | 36.96 | 23.15 |
| | Limonite | 8 | 10 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Limonite | 10 | 12 | 2 | 4 | 3.33 | 14.00 | 22.23 | 21.32 |
| | Limonite | 12 | 14 | 2 | 8 | 6.67 | 18.00 | 44.47 | 23.94 |
| | Limonite | 14 | 16 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Limonite | 16 | 18 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Limonite | 18 | 20 | 2 | 3 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Limonite | 20 | 22 | 2 | 3 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Limonite | 22 | 24 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Saprolite | 24 | 26 | 2 | 14 | 11.67 | 18.00 | 77.82 | 26.83 |

| Borehole ID | Lithology | Depth (m) | | Thickness (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | | | | | |
| | Saprolite | 26 | 28 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| | Saprolite | 28 | 30 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| | Peridotite | 30 | 32 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFH-02 | Soil | 0 | 2 | 2 | 4 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Soil | 2 | 4 | 2 | 3 | 2.13 | 14.00 | 14.17 | 20.05 |
| | Limonite | 4 | 6 | 2 | 1 | 0.79 | 14.00 | 5.28 | 18.08 |
| | Limonite | 6 | 8 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 8 | 10 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Saprolite | 10 | 12 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFH-03 | Soil | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Soil | 2 | 4 | 2 | 2 | 1.42 | 14.00 | 9.45 | 19.12 |
| | Limonite | 4 | 6 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 6 | 8 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| | Saprolite | 8 | 10 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Saprolite | 10 | 12 | 2 | 11 | 9.17 | 18.00 | 61.14 | 25.49 |
| | Saprolite | 12 | 14 | 2 | 11 | 9.17 | 18.00 | 61.14 | 25.49 |
| | Saprolite | 14 | 16 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFH-04 | Soil | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Limonite | 2 | 4 | 2 | 4 | 2.83 | 14.00 | 18.90 | 20.83 |
| | Limonite | 4 | 6 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Limonite | 6 | 8 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Limonite | 8 | 10 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Saprolite | 10 | 12 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFH-05 | Limonite | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Limonite | 2 | 4 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Limonite | 4 | 6 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 6 | 8 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| | Limonite | 8 | 10 | 2 | 8 | 6.67 | 18.00 | 44.47 | 23.94 |
| | Limonite | 10 | 12 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Limonite | 12 | 14 | 2 | 4 | 3.33 | 14.00 | 22.23 | 21.32 |
| | Limonite | 14 | 16 | 2 | 4 | 3.33 | 14.00 | 22.23 | 21.32 |
| | Limonite | 16 | 18 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Limonite | 18 | 20 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Saprolite | 20 | 22 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHB-01 | Limonite | 0 | 2 | 2 | 12 | 7.50 | 18.00 | 50.03 | 24.49 |
| | Saprolite | 2 | 4 | 2 | 12 | 8.50 | 18.00 | 56.70 | 25.10 |
| | Saprolite | 6 | 8 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Saprolite | 8 | 10 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHB-02 | Limonite | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Saprolite | 2 | 4 | 2 | 50 | 35.42 | 25.00 | 236.23 | 35.62 |
| | Saprolite | 4 | 6 | 2 | 50 | 39.58 | 25.00 | 264.02 | 36.79 |
| | Saprolite | 6 | 8 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 8 | 10 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Peridotite | 10 | 12 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHB-03 | Soil | 0 | 2 | 2 | 9 | 5.63 | 16.00 | 37.52 | 23.22 |
| | Soil | 2 | 4 | 2 | 2 | 1.42 | 14.00 | 9.45 | 19.12 |
| | Limonite | 4 | 6 | 2 | 5 | 3.96 | 14.00 | 26.40 | 21.89 |
| | Limonite | 6 | 8 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 8 | 10 | 2 | 3 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Limonite | 10 | 12 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Limonite | 12 | 14 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Limonite | 14 | 16 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |

| Borehole ID | Lithology | Depth (m) | | Thickness (m) | N-SPT | N60 | γ (kN/m3) | Cu (kPa) | ϕ(°) |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | | | | | |
| | Limonite | 16 | 18 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Limonite | 18 | 20 | 2 | 8 | 6.67 | 18.00 | 44.47 | 23.94 |
| | Limonite | 20 | 22 | 2 | 4 | 3.33 | 14.00 | 22.23 | 21.32 |
| | Saprolite | 22 | 24 | 2 | 13 | 10.83 | 18.00 | 72.26 | 26.40 |
| | Saprolite | 24 | 26 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHB-04 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Limonite | 2 | 4 | 2 | 2 | 1.42 | 14.00 | 9.45 | 19.12 |
| | Limonite | 4 | 6 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 6 | 8 | 2 | 3 | 2.38 | 14.00 | 15.84 | 20.34 |
| | Limonite | 8 | 10 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Limonite | 10 | 12 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| | Limonite | 12 | 14 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Limonite | 14 | 16 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Limonite | 16 | 18 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Saprolite | 18 | 20 | 2 | 8 | 6.67 | 18.00 | 44.47 | 23.94 |
| | Saprolite | 20 | 22 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Saprolite | 22 | 24 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Saprolite | 24 | 26 | 2 | 3 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Saprolite | 26 | 28 | 2 | 5 | 4.17 | 16.00 | 27.79 | 22.07 |
| BFHB-05 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Soil | 2 | 4 | 2 | 4 | 2.83 | 14.00 | 18.90 | 20.83 |
| | Limonite | 4 | 6 | 2 | 7 | 5.54 | 16.00 | 36.96 | 23.15 |
| | Limonite | 6 | 8 | 2 | 8 | 6.33 | 18.00 | 42.24 | 23.72 |
| | Saprolite | 10 | 12 | 2 | 9 | 7.50 | 18.00 | 50.03 | 24.49 |
| | Saprolite | 12 | 14 | 2 | 9 | 7.50 | 18.00 | 50.03 | 24.49 |
| | Saprolite | 14 | 16 | 2 | 17 | 14.17 | 18.00 | 94.49 | 28.04 |
| | Saprolite | 16 | 18 | 2 | 12 | 10.00 | 18.00 | 66.70 | 25.95 |
| | Saprolite | 18 | 20 | 2 | 3 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Saprolite | 20 | 22 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 22 | 24 | 2 | 10 | 8.33 | 18.00 | 55.58 | 25.00 |
| BFHB-06 | Soil | 0 | 2 | 2 | 4 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Limonite | 2 | 4 | 2 | 3 | 2.13 | 14.00 | 14.17 | 20.05 |
| | Saprolite | 4 | 6 | 2 | 50 | 39.58 | 25.00 | 264.02 | 36.79 |
| | Saprolite | 6 | 8 | 2 | 13 | 10.29 | 18.00 | 68.65 | 26.11 |
| | Saprolite | 8 | 10 | 2 | 6 | 5.00 | 16.00 | 33.35 | 22.75 |
| | Peridotite | 10 | 12 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHB-07 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Limonite | 2 | 4 | 2 | 2 | 1.42 | 14.00 | 9.45 | 19.12 |
| | Saprolite | 4 | 6 | 2 | 7 | 5.54 | 16.00 | 36.96 | 23.15 |
| | Peridotite | 6 | 8 | 2 | 50 | 39.58 | 25.00 | 264.02 | 36.79 |
| BFHD-01 | Limonite | 0 | 2 | 2 | 7 | 4.38 | 16.00 | 29.18 | 22.25 |
| | Limonite | 2 | 4 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Limonite | 4 | 6 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Saprolite | 6 | 8 | 2 | 10 | 7.92 | 18.00 | 52.80 | 24.75 |
| | Saprolite | 12 | 14 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHD-02 | Soil | 0 | 2 | 2 | 2 | 1.25 | 14.00 | 8.34 | 18.87 |
| | Soil | 2 | 4 | 2 | 4 | 2.83 | 14.00 | 18.90 | 20.83 |
| | Limonite | 4 | 6 | 2 | 6 | 4.75 | 16.00 | 31.68 | 22.55 |
| | Limonite | 6 | 8 | 2 | 4 | 3.17 | 14.00 | 21.12 | 21.16 |
| | Limonite | 8 | 10 | 2 | 4 | 3.33 | 14.00 | 22.23 | 21.32 |
| | Limonite | 10 | 12 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |
| | Limonite | 12 | 14 | 2 | 2 | 1.67 | 14.00 | 11.12 | 19.47 |

| Borehole ID | Lithology | Depth (m) | | Thickness (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) |
|---|---|---|---|---|---|---|---|---|---|
| | | From | To | | | | | | |
| | Limonite | 14 | 16 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 16 | 18 | 2 | 4 | 3.33 | 14.00 | 22.23 | 21.32 |
| | Saprolite | 18 | 20 | 2 | 0 | 0.00 | 14.00 | 0.00 | 15.00 |
| | Saprolite | 20 | 22 | 2 | 1 | 0.83 | 14.00 | 5.56 | 18.16 |
| | Saprolite | 22 | 24 | 2 | 7 | 5.83 | 16.00 | 38.91 | 23.37 |
| | Saprolite | 26 | 28 | 2 | 18 | 15.00 | 20.00 | 100.05 | 28.42 |
| | Saprolite | 28 | 30 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| | Saprolite | 30 | 32 | 2 | 50 | 41.67 | 25.00 | 277.92 | 37.36 |
| BFHD-03 | Soil | 0 | 2 | 2 | 1 | 0.63 | 14.00 | 4.17 | 17.74 |
| | Soil | 2 | 4 | 2 | 1 | 0.71 | 14.00 | 4.72 | 17.92 |
| | Limonite | 4 | 6 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| BFHD-04 | Soil | 0 | 2 | 2 | 4 | 2.50 | 14.00 | 16.68 | 20.48 |
| | Soil | 2 | 4 | 2 | 1 | 0.71 | 14.00 | 4.72 | 17.92 |
| | Limonite | 4 | 6 | 2 | 2 | 1.58 | 14.00 | 10.56 | 19.36 |
| | Limonite | 6 | 8 | 2 | 1 | 0.79 | 14.00 | 5.28 | 18.08 |
| | Saprolite | 8 | 10 | 2 | 8 | 6.67 | 18.00 | 44.47 | 23.94 |

#### III.3.1.3 Perhitungan Daya Dukung Tanah bedasarkan SPT

Analisis daya dukung tanah dilakukan terhadap data SPT. Daya dukung tanah merupakan kemampuan tanah untuk menahan tekanan atau beban yang berada diatasnya tanpa menyebabkan keruntuhan dan penurunan. Daya dukung yang dipakai pada studi ini adalah daya dukung pondasi dangkal. Daya dukung jenis ini (Bowles, 1984) bergantung pada kohesi (c) dan sudut geser dalam (ϕ). Pada tahun 1948, Terzaghi mempopulerkan rumus daya dukung tanah yang diperhitungkan dalam keadaan ultimate bearing capacity (daya dukung batas, qult) yang merupakan suatu batas nilai daya dukung yang apabila dilampaui akan menyebabkan keruntuhan pada tanah (failure). Oleh karena itu, nilai daya dukung yang diijinkan (allowable bearing capacity, qa) harus lebih kecil dibandingkan dengan nilai daya dukung batasnya. Persamaan daya dukung tanah pada pondasi dangkal yang digunakan adalah sebagai berikut:

$$q_u = cN_c + \gamma D_f N_q + 0{,}5\gamma N_\gamma B$$

di mana:

qu : daya dukung batas (kPa)

Df : kedalaman pondasi dari permukaan(m)

B : lebar pondasi (m)

c : kohesi tanah (kPa)

γ : bobot isi tanah (kN/m2)

Nc, Nq, Nγ : faktor-faktor daya dukung

Nilai faktor daya dukung diberikan pada Tabel III-14 sebagai fungsi dari sudut geser dalam.

Tabel III-14 Faktor daya dukung Terzaghi (Das, 1994)

| $\phi'$ | $N_c$ | $N_q$ | $N_\gamma$[a] | $\phi'$ | $N_c$ | $N_q$ | $N_\gamma$[a] |
|---|---|---|---|---|---|---|---|
| 0 | 5.70 | 1.00 | 0.00 | 26 | 27.09 | 14.21 | 9.84 |
| 1 | 6.00 | 1.10 | 0.01 | 27 | 29.24 | 15.90 | 11.60 |
| 2 | 6.30 | 1.22 | 0.04 | 28 | 31.61 | 17.81 | 13.70 |
| 3 | 6.62 | 1.35 | 0.06 | 29 | 34.24 | 19.98 | 16.18 |
| 4 | 6.97 | 1.49 | 0.10 | 30 | 37.16 | 22.46 | 19.13 |
| 5 | 7.34 | 1.64 | 0.14 | 31 | 40.41 | 25.28 | 22.65 |
| 6 | 7.73 | 1.81 | 0.20 | 32 | 44.04 | 28.52 | 26.87 |
| 7 | 8.15 | 2.00 | 0.27 | 33 | 48.09 | 32.23 | 31.94 |
| 8 | 8.60 | 2.21 | 0.35 | 34 | 52.64 | 36.50 | 38.04 |
| 9 | 9.09 | 2.44 | 0.44 | 35 | 57.75 | 41.44 | 45.41 |
| 10 | 9.61 | 2.69 | 0.56 | 36 | 63.53 | 47.16 | 54.36 |
| 11 | 10.16 | 2.98 | 0.69 | 37 | 70.01 | 53.80 | 65.27 |
| 12 | 10.76 | 3.29 | 0.85 | 38 | 77.50 | 61.55 | 78.61 |
| 13 | 11.41 | 3.63 | 1.04 | 39 | 85.97 | 70.61 | 95.03 |
| 14 | 12.11 | 4.02 | 1.26 | 40 | 95.66 | 81.27 | 115.31 |
| 15 | 12.86 | 4.45 | 1.52 | 41 | 106.81 | 93.85 | 140.51 |
| 16 | 13.68 | 4.92 | 1.82 | 42 | 119.67 | 108.75 | 171.99 |
| 17 | 14.60 | 5.45 | 2.18 | 43 | 134.58 | 126.50 | 211.56 |
| 18 | 15.12 | 6.04 | 2.59 | 44 | 151.95 | 147.74 | 261.60 |
| 19 | 16.56 | 6.70 | 3.07 | 45 | 172.28 | 173.28 | 325.34 |
| 20 | 17.69 | 7.44 | 3.64 | 46 | 196.22 | 204.19 | 407.11 |
| 21 | 18.92 | 8.26 | 4.31 | 47 | 224.55 | 241.80 | 512.84 |
| 22 | 20.27 | 9.19 | 5.09 | 48 | 258.28 | 287.85 | 650.67 |
| 23 | 21.75 | 10.23 | 6.00 | 49 | 298.71 | 344.63 | 831.99 |
| 24 | 23.36 | 11.40 | 7.08 | 50 | 347.50 | 415.14 | 1072.80 |
| 25 | 25.13 | 12.72 | 8.34 | | | | |

Kondisi lapisan tanah yang ada di bawah timbunan merupakan tanah berlapis-lapis sehingga penentuan nilai daya dukung tanah harus mempertimbangkan kondisi ini. Salah satu cara yang dipakai adalah dengan metode pembobotan. Adapun beban ijin rencana (qa) ditentukan dengan rumus sebagai berikut:

$$q_a = \frac{q_u}{FS}$$

Pada studi ini nilai Faktor Keamanan (FK) yang dipakai adalah sebesar 2. Beban timbunan diasumsikan sebagai beban merata (q) dan nilainya ditentukan sebagai berikut:

q=γ.H

di mana:

q = beban merata akibat timbunan (kPa)

γ = berat isi timbunan (kN/m3)

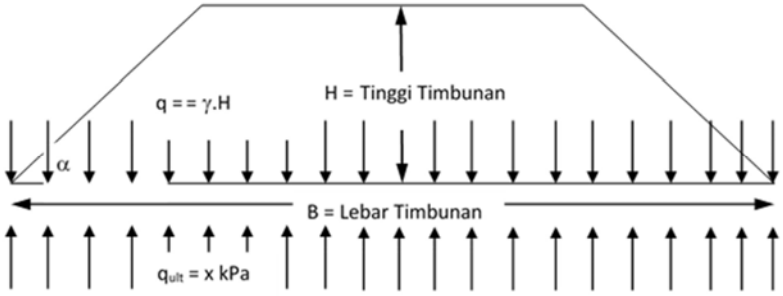
H = tinggi timbunan (m)

Dalam perhitungan ini, nilai γ timbunan diasumsikan sebesar 20.04 kN/m$^3$ dengan tinggi timbunan rata-rata mencapai 50 m. Hasil perhitungan beban timbunan untuk lokasi rencana penimbunan dapat dilihat pada **Tabel III-15**.

Tabel III-15 Hasil Perhitungan Beban Timbunan

| Jenis Timbunan | Tinggi Timbunan | $\gamma$ (kN/m$^3$) | q (kPa) |
|---|---|---|---|
| Backfill | 50 | 20.04 | 1002 |

Nilai q dari perhitungan di atas kemudian digunakan untuk melihat apakah daya dukung tanah yang ada lebih kecil atau lebih besar dari beban timbunan ini, ilustrasi daya dukung tanah terhadap beban timbunan dapat dilihat pada **Gambar III-9**. Jika nilai daya dukung tanah lebih besar dari nilai ini maka lapisan tanah dasar masih kuat dan aman menanggung beban timbunan yang ada di atasnya.




Gambar III-9 Ilustrasi Daya Dukung Tanah terhadap Beban Timbunan

Daya dukung tanah dihitung dengan menggunakan persamaan Terzaghi pada pondasi menerus berdasarkan data parameter tanah yang ditentukan berdasarkan korelasi empiris yang telah dijelaskan pada sub-bab sebelumnya. Kondisi lapisan dasar timbunan merupakan tanah berlapis-lapis (layered soil) sehingga perhitungan daya dukung tanah dilakukan dengan metode faktor bobot (weighting factor, Coduto, 2001). Adapun hasil perhitungan menggunakan metode pembobotan untuk masing-masing titik SPT dapat dilihat pada **Tabel III-16**.

Metode lain yang digunakan dalam menghitung daya dukung tanah adalah metode numerik menggunakan NovoSPT. NovoSPT membantu menghitung daya dukung tanah dengan memasukkan parameter seperti kedalaman pengujian SSPT, nilai NSPT, berat isi, dan ketebalan litologi di setiap lubang bor.

Dengan memeriksa hasil perhitungan daya dukung tanah di bawah ini, terlihat bahwa setiap lokasi lubang bor geoteknik di area timbunan memiliki nilai daya tahan yang lebih rendah dibandingkan beban timbunan. Oleh karena itu, diperlukan penggalian atau penggantian material di lokasi tersebut.

Tabel III-16 Resume Hasil Perhitungan Daya Dukung Tanah dari SPT

| Drillhole | Lithology | Depth (m) | N-SPT | N60 | γ (kN/m3) | Cu (kPa) | ϕ(°) | Nc | Nq | Nγ | qu (kPa) | qa (kPa) | q load (kPa) | qa (kPa) - NovoSPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BFG-01 | Limonite | 2 | 3 | 1.88 | 14.00 | 12.51 | 20 | 17.69 | 7.44 | 3.64 | 455.04 | 151.68 | 1002.00 | 235 |
| BFG-01 | Limonite | 4 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 259.84 | 86.61 | 1002.00 | 226 |
| BFG-01 | Limonite | 6 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 930.67 | 310.22 | 1002.00 | 645 |
| BFG-01 | Saprolite | 8 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 509.04 | 169.68 | 1002.00 | 441 |
| BFG-01 | Saprolite | 10 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 633.64 | 211.21 | 1002.00 | 548 |
| BFG-01 | Peridotite | 20 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 47172.82 | 15724.27 | 1002.00 | 9987 |
| BFG-02 | Limonite | 2 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 135.24 | 45.08 | 1002.00 | 203 |
| BFG-02 | Saprolite | 4 | 3 | 2.13 | 14.00 | 14.17 | 20 | 17.69 | 7.44 | 3.64 | 692.85 | 230.95 | 1002.00 | 453 |
| BFG-02 | Saprolite | 8 | 50 | 39.58 | 25.00 | 264.02 | 37 | 70.01 | 53.8 | 65.27 | 30059.97 | 10019.99 | 1002.00 | 7193 |
| BFG-03 | Limonite | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFG-03 | Limonite | 4 | 1 | 0.71 | 14.00 | 4.72 | 18 | 15.12 | 6.04 | 2.59 | 427.81 | 142.60 | 1002.00 | 329 |
| BFG-03 | Limonite | 6 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 759.18 | 253.06 | 1002.00 | 565 |
| BFG-03 | Saprolite | 10 | 10 | 8.33 | 18.00 | 55.58 | 25 | 25.13 | 12.72 | 8.34 | 3761.47 | 1253.82 | 1002.00 | 1634 |
| BFG-03 | Saprolite | 12 | 10 | 8.33 | 18.00 | 55.58 | 25 | 25.13 | 12.72 | 8.34 | 4219.39 | 1406.46 | 1002.00 | 1816 |
| BFG-03 | Peridotite | 16 | 36 | 30.00 | 25.00 | 200.10 | 34 | 15.12 | 6.04 | 2.59 | 5473.89 | 1824.63 | 1002.00 | 6009 |
| BFG-04 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFG-04 | Limonite | 4 | 1 | 0.71 | 14.00 | 4.72 | 18 | 15.12 | 6.04 | 2.59 | 427.81 | 142.60 | 1002.00 | 329 |
| BFG-04 | Limonite | 6 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 384.44 | 128.15 | 1002.00 | 334 |
| BFG-04 | Limonite | 8 | 3 | 2.38 | 14.00 | 15.84 | 20 | 16.56 | 6.7 | 3.07 | 1034.22 | 344.74 | 1002.00 | 851 |
| BFG-04 | Saprolite | 10 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 1143.58 | 381.19 | 1002.00 | 922 |
| BFG-04 | Saprolite | 13 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 2515.58 | 838.53 | 1002.00 | 1506 |
| BFG-04 | Peridotite | 15 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 40447.82 | 13482.61 | 1002.00 | 9171 |
| BFGB-01 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFGB-01 | Limonite | 4 | 1 | 0.71 | 14.00 | 4.72 | 18 | 15.12 | 6.04 | 2.59 | 427.81 | 142.60 | 1002.00 | 329 |
| BFGB-01 | Limonite | 6 | 1 | 0.79 | 14.00 | 5.28 | 18 | 15.12 | 6.04 | 2.59 | 605.33 | 201.78 | 1002.00 | 483 |
| BFGB-01 | Saprolite | 8 | 20 | 15.83 | 20.00 | 105.61 | 29 | 34.24 | 19.98 | 16.18 | 6974.63 | 2324.88 | 1002.00 | 2311 |
| BFGB-02 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFGB-02 | Limonite | 4 | 3 | 2.13 | 14.00 | 14.17 | 20 | 17.69 | 7.44 | 3.64 | 692.85 | 230.95 | 1002.00 | 488 |
| BFGB-02 | Limonite | 6 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 759.18 | 253.06 | 1002.00 | 564 |
| BFGB-02 | Limonite | 8 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 1138.99 | 379.66 | 1002.00 | 851 |
| BFGB-02 | Saprolite | 12 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 2368.54 | 789.51 | 1002.00 | 1393 |
| BFGB-02 | Saprolite | 14 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 3185.78 | 1061.93 | 1002.00 | 1774 |
| BFGB-02 | Saprolite | 16 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 41792.82 | 13930.94 | 1002.00 | 9521 |

| Drillhole | Lithology | Depth (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) | Nc | Nq | Nɣ | qu (kPa) | qa (kPa) | q load (kPa) | qa (kPa) - NovoSPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BFGB-03 | Soil | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFGB-03 | Saprolite | 4 | 3 | 2.13 | 14.00 | 14.17 | 20 | 17.69 | 7.44 | 3.64 | 692.85 | 230.95 | 1002.00 | 486 |
| BFGB-03 | Saprolite | 6 | 17 | 13.46 | 18.00 | 89.77 | 28 | 31.61 | 17.81 | 13.7 | 4884.32 | 1628.11 | 1002.00 | 1760 |
| BFGB-03 | Saprolite | 8 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1354.91 | 451.64 | 1002.00 | 939 |
| BFGB-03 | Saprolite | 10 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 33722.82 | 11240.94 | 1002.00 | 9031 |
| BFGB-03 | Saprolite | 14 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 39102.82 | 13034.27 | 1002.00 | 9148 |
| BFGB-03 | Saprolite | 20 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 47172.82 | 15724.27 | 1002.00 | 10228 |
| BFGB-04 | Saprolite | 2 | 18 | 11.25 | 18.00 | 75.04 | 27 | 29.24 | 15.9 | 11.6 | 2870.90 | 956.97 | 1002.00 | 869 |
| BFGB-04 | Saprolite | 6 | 6 | 4.75 | 16.00 | 31.68 | 23 | 21.75 | 10.23 | 6 | 1719.17 | 573.06 | 1002.00 | 858 |
| BFGB-04 | Saprolite | 8 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 946.78 | 315.59 | 1002.00 | 743 |
| BFGD-01 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFGD-01 | Soil | 4 | 1 | 0.71 | 14.00 | 4.72 | 18 | 15.12 | 6.04 | 2.59 | 427.81 | 142.60 | 1002.00 | 329 |
| BFGD-01 | Limonite | 6 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1123.63 | 374.54 | 1002.00 | 715 |
| BFGD-01 | Limonite | 8 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 946.78 | 315.59 | 1002.00 | 744 |
| BFGD-01 | Limonite | 10 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 947.77 | 315.92 | 1002.00 | 793 |
| BFGD-01 | Limonite | 12 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 1116.89 | 372.30 | 1002.00 | 948 |
| BFGD-01 | Limonite | 14 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 1286.01 | 428.67 | 1002.00 | 1103 |
| BFGD-01 | Limonite | 16 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 1455.13 | 485.04 | 1002.00 | 1258 |
| BFGD-01 | Saprolite | 20 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 2081.58 | 693.86 | 1002.00 | 1566 |
| BFGD-02 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFGD-02 | Soil | 4 | 4 | 2.83 | 14.00 | 18.90 | 21 | 18.92 | 8.26 | 4.31 | 850.29 | 283.43 | 1002.00 | 488 |
| BFGD-02 | Limonite | 6 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1123.63 | 374.54 | 1002.00 | 715 |
| BFGD-02 | Limonite | 8 | 1 | 0.79 | 14.00 | 5.28 | 18 | 15.12 | 6.04 | 2.59 | 774.45 | 258.15 | 1002.00 | 639 |
| BFGD-02 | Limonite | 10 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 2074.46 | 691.49 | 1002.00 | 1168 |
| BFGD-02 | Limonite | 12 | 3 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 1570.38 | 523.46 | 1002.00 | 1104 |
| BFGD-02 | Limonite | 14 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 1518.78 | 506.26 | 1002.00 | 1103 |
| BFGD-02 | Limonite | 16 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 3513.14 | 1171.05 | 1002.00 | 1849 |
| BFGD-02 | Saprolite | 18 | 12 | 10.00 | 18.00 | 66.70 | 26 | 27.09 | 14.21 | 9.84 | 6499.50 | 2166.50 | 1002.00 | 2701 |
| BFGD-02 | Saprolite | 20 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 47172.82 | 15724.27 | 1002.00 | 9798 |
| BFGD-02 | Saprolite | 24 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 52552.82 | 17517.61 | 1002.00 | 10610 |
| BFGD-02 | Saprolite | 26 | 16 | 13.33 | 18.00 | 88.93 | 28 | 31.61 | 17.81 | 13.7 | 11269.56 | 3756.52 | 1002.00 | 4165 |
| BFH-01 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFH-01 | Limonite | 4 | 2 | 1.42 | 14.00 | 9.45 | 19 | 16.56 | 6.7 | 3.07 | 553.17 | 184.39 | 1002.00 | 440 |
| BFH-01 | Limonite | 6 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 930.67 | 310.22 | 1002.00 | 645 |
| BFH-01 | Limonite | 8 | 7 | 5.54 | 16.00 | 36.96 | 23 | 21.75 | 10.23 | 6 | 2161.38 | 720.46 | 1002.00 | 1133 |

| Drillhole | Lithology | Depth (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) | Nc | Nq | Nɣ | qu (kPa) | qa (kPa) | q load (kPa) | qa (kPa) - NovoSPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BFH-01 | Limonite | 10 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 2410.16 | 803.39 | 1002.00 | 1280 |
| BFH-01 | Limonite | 12 | 4 | 3.33 | 14.00 | 22.23 | 21 | 18.92 | 8.26 | 4.31 | 1838.50 | 612.83 | 1002.00 | 1261 |
| BFH-01 | Limonite | 14 | 8 | 6.67 | 18.00 | 44.47 | 24 | 23.36 | 11.4 | 7.08 | 3975.26 | 1325.09 | 1002.00 | 1777 |
| BFH-01 | Limonite | 16 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 3392.24 | 1130.75 | 1002.00 | 1849 |
| BFH-01 | Limonite | 18 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 3840.50 | 1280.17 | 1002.00 | 2075 |
| BFH-01 | Limonite | 20 | 3 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 2403.66 | 801.22 | 1002.00 | 1823 |
| BFH-01 | Limonite | 22 | 3 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 2611.98 | 870.66 | 1002.00 | 2003 |
| BFH-01 | Limonite | 24 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 2131.61 | 710.54 | 1002.00 | 1877 |
| BFH-01 | Saprolite | 26 | 14 | 11.67 | 18.00 | 77.82 | 27 | 29.24 | 15.9 | 11.6 | 9820.96 | 3273.65 | 1002.00 | 3881 |
| BFH-01 | Saprolite | 28 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 4721.18 | 1573.73 | 1002.00 | 2541 |
| BFH-01 | Saprolite | 30 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 5015.26 | 1671.75 | 1002.00 | 2721 |
| BFH-01 | Peridotite | 32 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 63312.82 | 21104.27 | 1002.00 | 11616 |
| BFH-02 | Soil | 2 | 4 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 528.78 | 176.26 | 1002.00 | 287 |
| BFH-02 | Soil | 4 | 3 | 2.13 | 14.00 | 14.17 | 20 | 17.69 | 7.44 | 3.64 | 692.85 | 230.95 | 1002.00 | 488 |
| BFH-02 | Limonite | 6 | 1 | 0.79 | 14.00 | 5.28 | 18 | 15.12 | 6.04 | 2.59 | 605.33 | 201.78 | 1002.00 | 484 |
| BFH-02 | Limonite | 8 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 509.04 | 169.68 | 1002.00 | 441 |
| BFH-02 | Saprolite | 10 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 2410.16 | 803.39 | 1002.00 | 1278 |
| BFH-02 | Saprolite | 12 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 36412.82 | 12137.61 | 1002.00 | 9045 |
| BFH-03 | Soil | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFH-03 | Soil | 4 | 2 | 1.42 | 14.00 | 9.45 | 19 | 16.56 | 6.7 | 3.07 | 553.17 | 184.39 | 1002.00 | 440 |
| BFH-03 | Limonite | 6 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1123.63 | 374.54 | 1002.00 | 715 |
| BFH-03 | Limonite | 8 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 946.78 | 315.59 | 1002.00 | 744 |
| BFH-03 | Saprolite | 10 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 2410.16 | 803.39 | 1002.00 | 1278 |
| BFH-03 | Saprolite | 12 | 11 | 9.17 | 18.00 | 61.14 | 25 | 25.13 | 12.72 | 8.34 | 4359.07 | 1453.02 | 1002.00 | 1950 |
| BFH-03 | Saprolite | 14 | 11 | 9.17 | 18.00 | 61.14 | 25 | 25.13 | 12.72 | 8.34 | 4816.99 | 1605.66 | 1002.00 | 2111 |
| BFH-03 | Saprolite | 16 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 41792.82 | 13930.94 | 1002.00 | 9521 |
| BFH-04 | Soil | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFH-04 | Limonite | 4 | 4 | 2.83 | 14.00 | 18.90 | 21 | 18.92 | 8.26 | 4.31 | 850.29 | 283.43 | 1002.00 | 488 |
| BFH-04 | Limonite | 6 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 930.67 | 310.22 | 1002.00 | 645 |
| BFH-04 | Limonite | 8 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 1138.99 | 379.66 | 1002.00 | 851 |
| BFH-04 | Limonite | 10 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 1143.58 | 381.19 | 1002.00 | 922 |
| BFH-04 | Saprolite | 12 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 36412.82 | 12137.61 | 1002.00 | 9045 |
| BFH-05 | Limonite | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFH-05 | Limonite | 4 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 259.84 | 86.61 | 1002.00 | 226 |
| BFH-05 | Limonite | 6 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1123.63 | 374.54 | 1002.00 | 715 |

| Drillhole | Lithology | Depth (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) | Nc | Nq | Nɣ | qu (kPa) | qa (kPa) | q load (kPa) | qa (kPa) - NovoSPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BFH-05 | Limonite | 8 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 946.78 | 315.59 | 1002.00 | 744 |
| BFH-05 | Limonite | 10 | 8 | 6.67 | 18.00 | 44.47 | 24 | 23.36 | 11.4 | 7.08 | 3154.46 | 1051.49 | 1002.00 | 1405 |
| BFH-05 | Limonite | 12 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 2858.42 | 952.81 | 1002.00 | 1528 |
| BFH-05 | Limonite | 14 | 4 | 3.33 | 14.00 | 22.23 | 21 | 18.92 | 8.26 | 4.31 | 2069.78 | 689.93 | 1002.00 | 1466 |
| BFH-05 | Limonite | 16 | 4 | 3.33 | 14.00 | 22.23 | 21 | 18.92 | 8.26 | 4.31 | 2301.06 | 767.02 | 1002.00 | 1671 |
| BFH-05 | Limonite | 18 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 3719.60 | 1239.87 | 1002.00 | 2075 |
| BFH-05 | Limonite | 20 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 2081.58 | 693.86 | 1002.00 | 1567 |
| BFH-05 | Saprolite | 22 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 49862.82 | 16620.94 | 1002.00 | 10307 |
| BFHB-01 | Limonite | 2 | 12 | 7.50 | 18.00 | 50.03 | 24 | 23.36 | 11.4 | 7.08 | 1642.70 | 547.57 | 1002.00 | 560 |
| BFHB-01 | Saprolite | 4 | 12 | 8.50 | 18.00 | 56.70 | 25 | 25.13 | 12.72 | 8.34 | 2415.65 | 805.22 | 1002.00 | 957 |
| BFHB-01 | Saprolite | 8 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 1138.99 | 379.66 | 1002.00 | 849 |
| BFHB-01 | Saprolite | 10 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 33722.82 | 11240.94 | 1002.00 | 9403 |
| BFHB-02 | Limonite | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFHB-02 | Saprolite | 4 | 50 | 35.42 | 25.00 | 236.23 | 36 | 63.53 | 47.16 | 54.36 | 20403.14 | 6801.05 | 1002.00 | 4081 |
| BFHB-02 | Saprolite | 6 | 50 | 39.58 | 25.00 | 264.02 | 37 | 70.01 | 53.8 | 65.27 | 27369.97 | 9123.32 | 1002.00 | 5879 |
| BFHB-02 | Saprolite | 8 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 509.04 | 169.68 | 1002.00 | 441 |
| BFHB-02 | Saprolite | 10 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 1143.58 | 381.19 | 1002.00 | 922 |
| BFHB-02 | Peridotite | 12 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 36412.82 | 12137.61 | 1002.00 | 8922 |
| BFHB-03 | Soil | 2 | 9 | 5.63 | 16.00 | 37.52 | 23 | 21.75 | 10.23 | 6 | 1191.39 | 397.13 | 1002.00 | 432 |
| BFHB-03 | Soil | 4 | 2 | 1.42 | 14.00 | 9.45 | 19 | 16.56 | 6.7 | 3.07 | 553.17 | 184.39 | 1002.00 | 440 |
| BFHB-03 | Limonite | 6 | 5 | 3.96 | 14.00 | 26.40 | 22 | 20.27 | 9.19 | 5.09 | 1342.76 | 447.59 | 1002.00 | 784 |
| BFHB-03 | Limonite | 8 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1354.91 | 451.64 | 1002.00 | 942 |
| BFHB-03 | Limonite | 10 | 3 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 1362.06 | 454.02 | 1002.00 | 924 |
| BFHB-03 | Limonite | 12 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 1116.89 | 372.30 | 1002.00 | 948 |
| BFHB-03 | Limonite | 14 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 3064.88 | 1021.63 | 1002.00 | 1622 |
| BFHB-03 | Limonite | 16 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 1007.44 | 335.81 | 1002.00 | 871 |
| BFHB-03 | Limonite | 18 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 3719.60 | 1239.87 | 1002.00 | 2075 |
| BFHB-03 | Limonite | 20 | 8 | 6.67 | 18.00 | 44.47 | 24 | 23.36 | 11.4 | 7.08 | 5206.46 | 1735.49 | 1002.00 | 2302 |
| BFHB-03 | Limonite | 22 | 4 | 3.33 | 14.00 | 22.23 | 21 | 18.92 | 8.26 | 4.31 | 2994.90 | 998.30 | 1002.00 | 2003 |
| BFHB-03 | Saprolite | 24 | 13 | 10.83 | 18.00 | 72.26 | 26 | 27.09 | 14.21 | 9.84 | 8184.76 | 2728.25 | 1002.00 | 3586 |
| BFHB-03 | Saprolite | 26 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 55242.82 | 18414.27 | 1002.00 | 11008 |
| BFHB-04 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFHB-04 | Limonite | 4 | 2 | 1.42 | 14.00 | 9.45 | 19 | 16.56 | 6.7 | 3.07 | 553.17 | 184.39 | 1002.00 | 440 |
| BFHB-04 | Limonite | 6 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1123.63 | 374.54 | 1002.00 | 715 |
| BFHB-04 | Limonite | 8 | 3 | 2.38 | 14.00 | 15.84 | 20 | 17.69 | 7.44 | 3.64 | 1138.99 | 379.66 | 1002.00 | 851 |

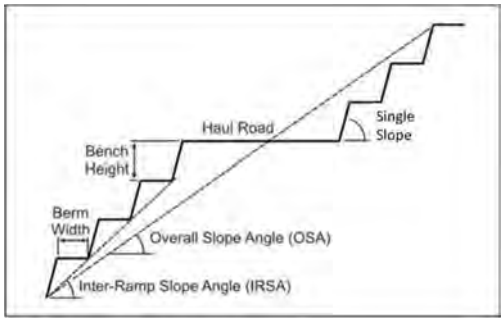
| Drillhole | Lithology | Depth (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) | Nc | Nq | Nɣ | qu (kPa) | qa (kPa) | q load (kPa) | qa (kPa) - NovoSPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BFHB-04 | Limonite | 10 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 2410.16 | 803.39 | 1002.00 | 1280 |
| BFHB-04 | Limonite | 12 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 2368.54 | 789.51 | 1002.00 | 1395 |
| BFHB-04 | Limonite | 14 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 3185.78 | 1061.93 | 1002.00 | 1777 |
| BFHB-04 | Limonite | 16 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 3513.14 | 1171.05 | 1002.00 | 1849 |
| BFHB-04 | Limonite | 18 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 3719.60 | 1239.87 | 1002.00 | 2075 |
| BFHB-04 | Saprolite | 20 | 8 | 6.67 | 18.00 | 44.47 | 24 | 23.36 | 11.4 | 7.08 | 5206.46 | 1735.49 | 1002.00 | 2300 |
| BFHB-04 | Saprolite | 22 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 2269.18 | 756.39 | 1002.00 | 1720 |
| BFHB-04 | Saprolite | 24 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 2456.78 | 818.93 | 1002.00 | 1875 |
| BFHB-04 | Saprolite | 26 | 3 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 3028.62 | 1009.54 | 1002.00 | 2361 |
| BFHB-04 | Saprolite | 28 | 5 | 4.17 | 16.00 | 27.79 | 22 | 20.27 | 9.19 | 5.09 | 4721.18 | 1573.73 | 1002.00 | 2541 |
| BFHB-05 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFHB-05 | Soil | 4 | 4 | 2.83 | 14.00 | 18.90 | 21 | 18.92 | 8.26 | 4.31 | 850.29 | 283.43 | 1002.00 | 488 |
| BFHB-05 | Limonite | 6 | 7 | 5.54 | 16.00 | 36.96 | 23 | 21.75 | 10.23 | 6 | 1834.02 | 611.34 | 1002.00 | 935 |
| BFHB-05 | Limonite | 8 | 8 | 6.33 | 18.00 | 42.24 | 24 | 23.36 | 11.4 | 7.08 | 2692.12 | 897.37 | 1002.00 | 1230 |
| BFHB-05 | Saprolite | 12 | 9 | 7.50 | 18.00 | 50.03 | 24 | 23.36 | 11.4 | 7.08 | 3694.70 | 1231.57 | 1002.00 | 1816 |
| BFHB-05 | Saprolite | 14 | 9 | 7.50 | 18.00 | 50.03 | 24 | 23.36 | 11.4 | 7.08 | 4105.10 | 1368.37 | 1002.00 | 1945 |
| BFHB-05 | Saprolite | 16 | 17 | 14.17 | 18.00 | 94.49 | 28 | 31.61 | 17.81 | 13.7 | 8239.46 | 2746.49 | 1002.00 | 3171 |
| BFHB-05 | Saprolite | 18 | 12 | 10.00 | 18.00 | 66.70 | 26 | 27.09 | 14.21 | 9.84 | 6499.50 | 2166.50 | 1002.00 | 2701 |
| BFHB-05 | Saprolite | 20 | 3 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 2403.66 | 801.22 | 1002.00 | 1822 |
| BFHB-05 | Saprolite | 22 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 1381.24 | 460.41 | 1002.00 | 1193 |
| BFHB-05 | Saprolite | 24 | 10 | 8.33 | 18.00 | 55.58 | 25 | 25.13 | 12.72 | 8.34 | 6966.91 | 2322.30 | 1002.00 | 3015 |
| BFHB-06 | Soil | 2 | 4 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 528.78 | 176.26 | 1002.00 | 287 |
| BFHB-06 | Limonite | 4 | 3 | 2.13 | 14.00 | 14.17 | 20 | 17.69 | 7.44 | 3.64 | 692.85 | 230.95 | 1002.00 | 488 |
| BFHB-06 | Saprolite | 6 | 50 | 39.58 | 25.00 | 264.02 | 37 | 70.01 | 53.8 | 65.27 | 27369.97 | 9123.32 | 1002.00 | 5879 |
| BFHB-06 | Saprolite | 8 | 13 | 10.29 | 18.00 | 68.65 | 26 | 27.09 | 14.21 | 9.84 | 3994.40 | 1331.47 | 1002.00 | 1619 |
| BFHB-06 | Saprolite | 10 | 6 | 5.00 | 16.00 | 33.35 | 23 | 21.75 | 10.23 | 6 | 2410.16 | 803.39 | 1002.00 | 1278 |
| BFHB-06 | Peridotite | 12 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 36412.82 | 12137.61 | 1002.00 | 9346 |
| BFHB-07 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFHB-07 | Limonite | 4 | 2 | 1.42 | 14.00 | 9.45 | 19 | 16.56 | 6.7 | 3.07 | 553.17 | 184.39 | 1002.00 | 440 |
| BFHB-07 | Saprolite | 6 | 7 | 5.54 | 16.00 | 36.96 | 23 | 21.75 | 10.23 | 6 | 1834.02 | 611.34 | 1002.00 | 932 |
| BFHB-07 | Peridotite | 8 | 50 | 39.58 | 25.00 | 264.02 | 37 | 70.01 | 53.8 | 65.27 | 30059.97 | 10019.99 | 1002.00 | 8071 |
| BFHD-01 | Limonite | 2 | 7 | 4.38 | 16.00 | 29.18 | 22 | 20.27 | 9.19 | 5.09 | 926.30 | 308.77 | 1002.00 | 401 |
| BFHD-01 | Limonite | 4 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 259.84 | 86.61 | 1002.00 | 226 |
| BFHD-01 | Limonite | 6 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1123.63 | 374.54 | 1002.00 | 715 |
| BFHD-01 | Saprolite | 8 | 10 | 7.92 | 18.00 | 52.80 | 25 | 25.13 | 12.72 | 8.34 | 3233.71 | 1077.90 | 1002.00 | 1317 |

| Drillhole | Lithology | Depth (m) | N-SPT | N60 | ɣ (kN/m3) | Cu (kPa) | ϕ(°) | Nc | Nq | Nɣ | qu (kPa) | qa (kPa) | q load (kPa) | qa (kPa) - NovoSPT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BFHD-01 | Saprolite | 14 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 39102.82 | 13034.27 | 1002.00 | 9148 |
| BFHD-02 | Soil | 2 | 2 | 1.25 | 14.00 | 8.34 | 19 | 16.56 | 6.7 | 3.07 | 347.16 | 115.72 | 1002.00 | 205 |
| BFHD-02 | Soil | 4 | 4 | 2.83 | 14.00 | 18.90 | 21 | 18.92 | 8.26 | 4.31 | 850.29 | 283.43 | 1002.00 | 488 |
| BFHD-02 | Limonite | 6 | 6 | 4.75 | 16.00 | 31.68 | 23 | 21.75 | 10.23 | 6 | 1719.17 | 573.06 | 1002.00 | 861 |
| BFHD-02 | Limonite | 8 | 4 | 3.17 | 14.00 | 21.12 | 21 | 18.92 | 8.26 | 4.31 | 1354.91 | 451.64 | 1002.00 | 942 |
| BFHD-02 | Limonite | 10 | 4 | 3.33 | 14.00 | 22.23 | 21 | 18.92 | 8.26 | 4.31 | 1607.22 | 535.74 | 1002.00 | 1056 |
| BFHD-02 | Limonite | 12 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 1331.18 | 443.73 | 1002.00 | 948 |
| BFHD-02 | Limonite | 14 | 2 | 1.67 | 14.00 | 11.12 | 19 | 16.56 | 6.7 | 3.07 | 1518.78 | 506.26 | 1002.00 | 1103 |
| BFHD-02 | Limonite | 16 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 1007.44 | 335.81 | 1002.00 | 871 |
| BFHD-02 | Saprolite | 18 | 4 | 3.33 | 14.00 | 22.23 | 21 | 18.92 | 8.26 | 4.31 | 2532.34 | 844.11 | 1002.00 | 1642 |
| BFHD-02 | Saprolite | 20 | 0 | 0.00 | 14.00 | 0.00 | 15 | 12.86 | 4.45 | 1.52 | 1256.64 | 418.88 | 1002.00 | 1086 |
| BFHD-02 | Saprolite | 22 | 1 | 0.83 | 14.00 | 5.56 | 18 | 15.12 | 6.04 | 2.59 | 1962.49 | 654.16 | 1002.00 | 1720 |
| BFHD-02 | Saprolite | 24 | 7 | 5.83 | 16.00 | 38.91 | 23 | 21.75 | 10.23 | 6 | 4822.58 | 1607.53 | 1002.00 | 2753 |
| BFHD-02 | Saprolite | 28 | 18 | 15.00 | 20.00 | 100.05 | 28 | 31.61 | 17.81 | 13.7 | 13273.18 | 4424.39 | 1002.00 | 4813 |
| BFHD-02 | Saprolite | 30 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 60622.82 | 20207.61 | 1002.00 | 11508 |
| BFHD-02 | Saprolite | 32 | 50 | 41.67 | 25.00 | 277.92 | 37 | 70.01 | 53.8 | 65.27 | 63312.82 | 21104.27 | 1002.00 | 1161 |
| BFHD-03 | Soil | 2 | 1 | 0.63 | 14.00 | 4.17 | 18 | 15.12 | 6.04 | 2.59 | 250.28 | 83.43 | 1002.00 | 205 |
| BFHD-03 | Soil | 4 | 1 | 0.71 | 14.00 | 4.72 | 18 | 15.12 | 6.04 | 2.59 | 427.81 | 142.60 | 1002.00 | 329 |
| BFHD-03 | Limonite | 6 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 759.18 | 253.06 | 1002.00 | 564 |
| BFHD-04 | Soil | 2 | 4 | 2.50 | 14.00 | 16.68 | 20 | 17.69 | 7.44 | 3.64 | 528.78 | 176.26 | 1002.00 | 287 |
| BFHD-04 | Soil | 4 | 1 | 0.71 | 14.00 | 4.72 | 18 | 15.12 | 6.04 | 2.59 | 427.81 | 142.60 | 1002.00 | 329 |
| BFHD-04 | Limonite | 6 | 2 | 1.58 | 14.00 | 10.56 | 19 | 16.56 | 6.7 | 3.07 | 759.18 | 253.06 | 1002.00 | 564 |
| BFHD-04 | Limonite | 8 | 1 | 0.79 | 14.00 | 5.28 | 18 | 15.12 | 6.04 | 2.59 | 774.45 | 258.15 | 1002.00 | 639 |
| BFHD-04 | Saprolite | 10 | 8 | 6.67 | 18.00 | 44.47 | 24 | 23.36 | 11.4 | 7.08 | 3154.46 | 1051.49 | 1002.00 | 1402 |

## III.4 Analisis Stabilitas Lereng Timbunan

### III.4.1 Kriteria Desain

Terminologi yang digunakan pada desain kemantapan lereng timbunan dalam kajian ini mengacu kepada istilah yang ditunjukkan pada **Gambar III-10**. Kriteria Desain yang dapat diterima (*design acceptance criteria*) pada studi ini mengacu kepada Keputusan Menteri Energi dan Sumber Daya Mineral Republik Indonesia Nomor 1827K/30/ MEM/2018 (KepMen ESDM 1827) tentang pedoman untuk Penerapan Standar Praktik Penambangan yang Baik. **Tabel III-17** memperlihatkan kriteria faktor keamanan dan probabilitas kegagalan dalam analisis desain lereng tambang berdasarkan KepMen ESDM 1827.




Gambar III-10 Terminologi Pada Desain Kemantapan Lereng

Tabel III-17 Standar Kriteria Faktor Keamanan dan Probabilitas Kegagalan (KepMen ESDM Nomor 1827/30/MEM/2018)

| Slope Type | Consequences of Failure/ CoF) | Acceptance Criteria | | |
|---|---|---|---|---|
| | | FK Statik (minimum) | FK Dinamik (minimum) | Probability of Failure (maximum) PoF (SF< 1) |
| Single slope | Low – High | 1.1 | - | 25-50% |
| Inter-ramp | Low | 1.15-1.2 | 1.0 | 25% |
| | Medium | 1.2-1.3 | 1.0 | 20% |
| | High | 1.2-1.3 | 1.1 | 10% |
| Overall slope | Low | 1.2-1.3 | 1.0 | 15-20% |
| | Medium | 1.3 | 1.05 | 10% |
| | High | 1.3-1.5 | 1.1 | 5% |

### III.4.2 Metode dan Pendekatan

Analisis stabilitas lereng timbunan dilakukan untuk melakukan penilaian desain lereng timbunan yang aman. Pendekatan longsoran busur (*circular failure*) digunakan untuk memodelkan kegagalan (*failure*) mengingat karakteristik material yang akan ditimbun (*slag*) memiliki kekuatan yang relatif lemah. Metode kesetimbangan batas (*limit equilibrium method*) digunakan untuk menganalisis stabilitas lereng, potensi kegagalan dan faktor keamanan.

Pendekatan probabilistik digunakan dalam parameter sifat mekanik material. Metode analitik dilakukan pada beberapa tipe lereng: (i) lereng tunggal dan (ii) lereng keseluruhan. Parameter geoteknik yang digunakan dalam analisis menggunakan data hasil uji laboratorium dan hasil uji lapangan.

Mayoritas material diyakini akan gagal karena mekanisme geser (*shear mechanism*), oleh karena itu kriteria kegagalan *Mohr-Coulomb* akan digunakan sebagai pendekatan kuantitatif parameter kekuatan batuan. Parameter ini adalah kohesi, sudut gesek dalam dan satuan berat yang kemudian akan digunakan sebagai input dalam simulasi stabilitas.

### III.4.3 Parameter Kekuatan Material dalam Simulasi Geoteknik

Analisis probabilitas dilakukan untuk mengidentifikasi distribusi probabilitas pada setiap parameter kekuatan batuan untuk setiap litologi/material yang hadir. Untuk menentukan fungsi distribusi yang paling tepat untuk digunakan, uji kesesuaian distribusi dilakukan. Fungsi distribusi utama yang diuji adalah fungsi distribusi normal, log-normal, beta, gamma, dan eksponensial. Uji kesesuaian dilakukan menggunakan metode Chi-square dan Kolmogorov-Smirnov. Mayoritas material diyakini akan gagal karena mekanisme geser (shear mechanism), oleh karena itu kriteria kegagalan Mohr-Coulomb akan digunakan sebagai pendekatan kuantitatif parameter kekuatan batuan. Parameter ini adalah kohesi, sudut gesek dalam dan satuan berat yang kemudian akan digunakan sebagai input dalam simulasi stabilitas.

Sifat material untuk analisis stabilitas lereng tunggal (*single slope*) menggunakan distribusi probabilitas dari parameter kekuatan geser residual tailing. Sedangkan pada analisis stabilitas keseluruhan menggunakan distribusi probabilitas dari parameter kekuatan geser puncak. Resume parameter kekuatan yang digunakan dalam analisis kestabilan geoteknik ditunjukkan pada Tabel III-18 dan **Tabel III-19**.

Tabel III-18 Parameter kekuatan material tailing

| Dry Tailing | Variable | Mean | Stdev | Min | Max | Rel.min | Rel.max |
|---|---|---|---|---|---|---|---|
| Peak | C (kPa) | 32.50 | 0.71 | 32.00 | 33.00 | 0.50 | 0.50 |
| | θ (°) | 42.40 | 5.52 | 36.20 | 46.80 | 6.20 | 4.40 |
| | $\rho_n$ (kN/m$^3$) | 20.04 | 0.29 | 19.73 | 20.31 | 0.31 | 0.27 |

| Dry Tailing | Variable | Mean | Stdev | Min | Max | Rel.min | Rel.max |
|---|---|---|---|---|---|---|---|
| Residual | C (kPa) | 11.97 | 1.96 | 9.72 | 13.29 | 2.25 | 1.32 |
| | θ (°) | 25.57 | 21.99 | 8.06 | 50.25 | 17.51 | 24.68 |
| | $\rho_n$ (kN/m³) | 20.04 | 0.29 | 19.73 | 20.31 | 0.31 | 0.27 |

Tabel III-19 Properti kekuatan batuan pada lokasi studi

| Lithology | Variable | Mean | Stdev | Min | Max | Rel.min | Rel.max |
|---|---|---|---|---|---|---|---|
| Soil | C (kPa) | 8.54 | 3.99 | 3.14 | 11.93 | 5.40 | 3.40 |
| | θ (°) | 18.15 | 2.01 | 15.62 | 20.44 | 2.53 | 2.29 |
| | $\rho_n$ (kN/m³) | 15.98 | 1.14 | 14.26 | 16.64 | 1.71 | 0.66 |
| Limonite | C (kPa) | 6.82 | 2.94 | 4.02 | 12.98 | 2.80 | 6.16 |
| | θ (°) | 20.65 | 3.49 | 14.43 | 24.21 | 6.22 | 3.56 |
| | $\rho_n$ (kN/m³) | 15.16 | 0.79 | 13.59 | 15.90 | 1.58 | 0.74 |
| Saprolite | C (kPa) | 10.07 | 7.04 | 2.77 | 20.20 | 7.31 | 10.13 |
| | θ (°) | 18.89 | 3.81 | 15.88 | 25.30 | 3.01 | 6.41 |
| | $\rho_n$ (kN/m³) | 14.50 | 1.39 | 13.24 | 16.42 | 1.25 | 1.93 |
| Peridotite | C (kPa) | 1350.05 | 964.77 | 346.17 | 2907.67 | 1003.87 | 1557.62 |
| | θ (°) | 28.37 | 6.57 | 21.36 | 39.65 | 7.01 | 11.28 |
| | $\rho_n$ (kN/m³) | 26.20 | 0.88 | 24.19 | 27.50 | 2.01 | 1.29 |

### III.4.4 Analisis Lereng Tunggal

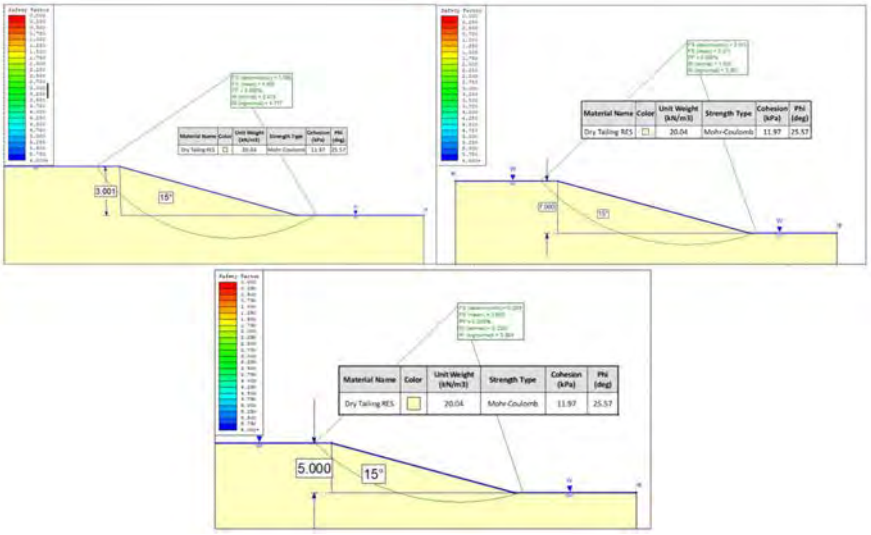
Analisis lereng tunggal dilakukan dengan simulasi menggunakan berbagai aspek geometris (tinggi dan sudut kemiringan) untuk material *tailing*. Semua parameter kekuatan mengikuti Kriteria Kegagalan Mohr-Coulomb. Beberapa pendekatan untuk simulasi lereng tunggal adalah sebagai berikut:

- Unit litologi diasumsikan homogen;
- Sifat fisik dan mekanik batuan didasarkan pada data pengujian laboratorium dengan nilai kohesi dan sudut gesek dalam mengadopsi nilai kekuatan geser residu, dan pendekatan probabilistik digunakan;
- Metode kegagalan menggunakan metode kesetimbangan batas (*limit equilibrium method*);
- Simulasi kekuatan menggunakan Mohr-Coulomb;
- Simulasi menggunakan kondisi pembebanan statis;
- Kondisi muka air tanah diasumsikan jenuh;

Hasil perhitungan nilai faktor keamanan (FK) untuk berbagai variasi tinggi dan sudut lereng diperlihatkan pada **Tabel III-20**. Tipikal simulasi untuk berbagai variasi sudut dan tinggi lereng dapat dilihat pada **Gambar III-11**.

Tabel III-20 Hasil Simulasi Kestabilan Lereng Tunggal

| Height (m) | Angle ($^0$) | FoS | PoF |
|---|---|---|---|
| 3 | 15 | 3.986 | 0.0% |
| | 20 | 3.374 | 0.0% |
| | 25 | 3.001 | 0.0% |
| | 30 | 2.71 | 0.0% |
| 5 | 15 | 3.289 | 0.0% |
| | 20 | 2.715 | 0.0% |
| | 25 | 2.339 | 0.0% |
| | 30 | 2.089 | 0.0% |
| 7 | 15 | 2.975 | 0.0% |
| | 20 | 2.418 | 0.0% |
| | 25 | 2.099 | 0.0% |
| | 30 | 1.836 | 0.0% |




Gambar III-11 Tipikal Hasil Simulasi Lereng Tunggal

Dari hasil perhitungan kestabilan lereng tunggal dengan berbagai ketinggian dan sudut lereng, dapat dilihat bahwa untuk material *tailing* untuk dimensi lereng tunggal dengan ketinggian 5 meter dan sudut 15$^o$ menunjukkan nilai aman.

### III.4.5 Verifikasi Desain Timbunan

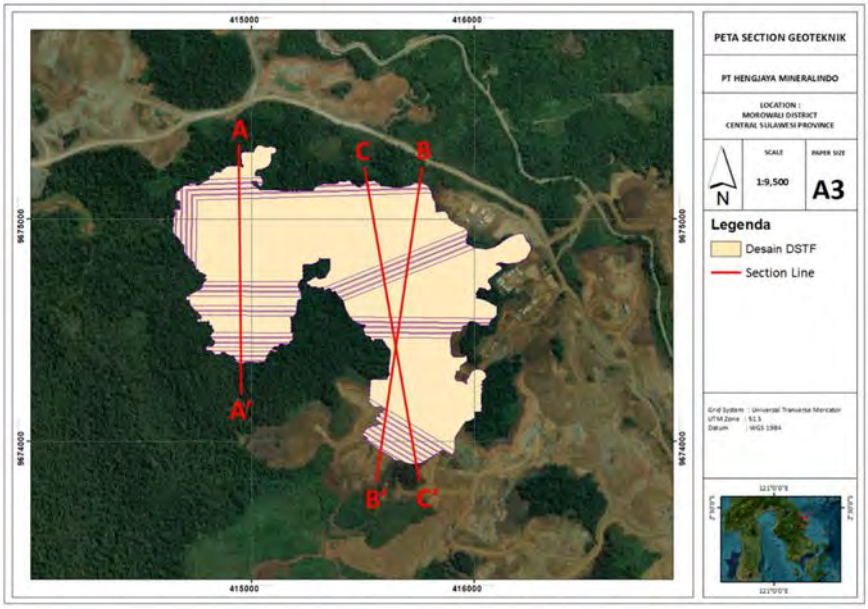
Analisis lereng keseluruhan (verifikasi desain) dilakukan dengan menghitung kestabilan lereng pada desain rencana dari tahap awal hingga tahap akhir. Hasil simulasi analisis dapat dilihat pada Gambar III-14 hingga Gambar III-21 dan garis penampang yang digunakan dalam analisis dapat dilihat pada Gambar III-12 dan Gambar III-13. Beberapa asumsi dan pendekatan yang digunakan pada analisis stabilitas lereng keseluruhan adalah sebagai berikut:

- Sifat fisik dan mekanik batuan didasarkan pada data pengujian laboratorium dengan nilai kohesi dan sudut gesek dalam mengadopsi nilai kekuatan geser puncak, dan pendekatan probabilistik digunakan;
- Metode kegagalan menggunakan metode kesetimbangan batas (*limit equilibrium method*);
- Simulasi kekuatan menggunakan Mohr-Coulomb;
- Kondisi muka air tanah menyesuaikan dengan hasil pengukuran lapangan;
- Simulasi menggunakan kondisi pembebanan statis dan *pseudo-static*;
- Simulasi dinamis menggunakan kondisi beban semu-Statis dengan koefisien 0.15g
- Simulasi dilakukan berulang (iteratif) hingga mencapai nilai minimum FK dan maksimum PoF sesuai desain standar kriteria.

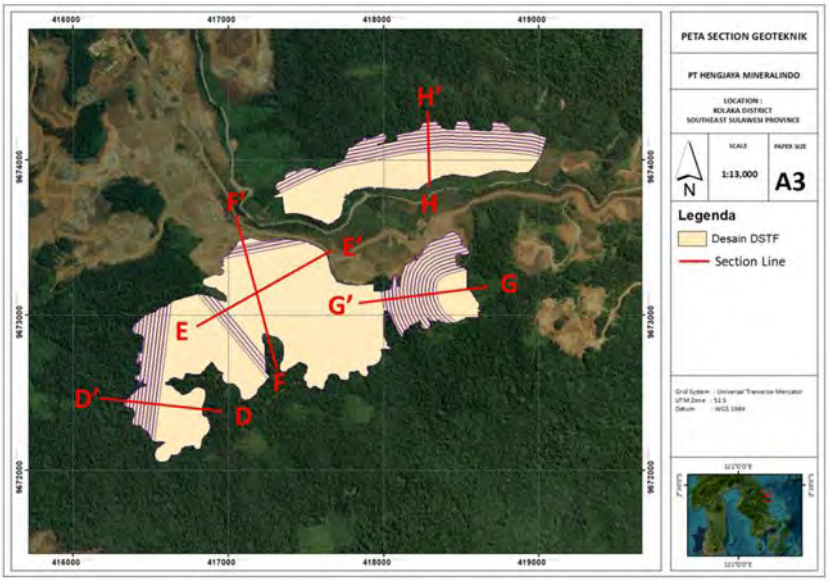
Hasil perhitungan nilai faktor keamanan (FK) untuk verifikasi desain diperlihatkan pada **Tabel III-21.** Dari hasil simulasi dapat dilihat bahwa nilai FK dan PoF pada setiap stage memenuhi kriteria yang ditentukan dengan FK diatas 1.1 dan PoF dibawah 5%, sehingga dapat disimpulkan bahwa desain penimbunan stabil dengan geometri yang telah ditentukan.

Tabel III-21 Hasil Simulasi Kestabilan Lereng Verifikasi Desain

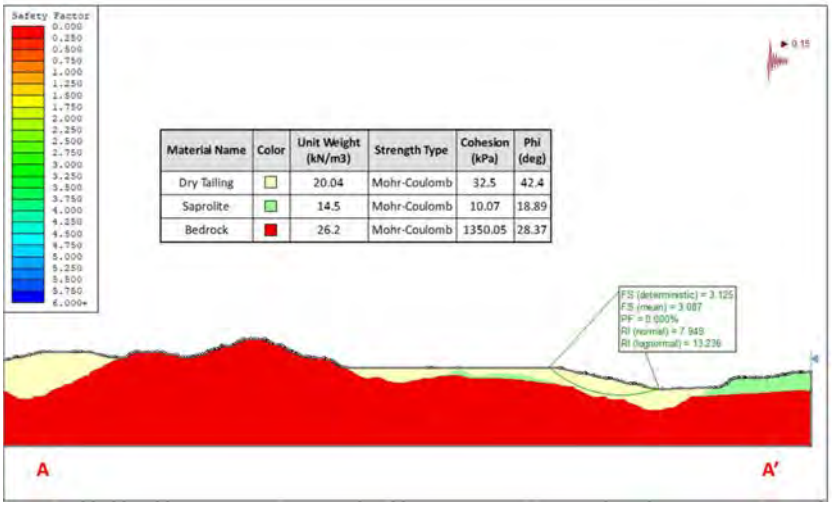
| Section | FK Statis | PoF | FK Dinamis | PoF |
|---|---|---|---|---|
| Sect A-A' | 5.404 | 0% | 3.087 | 0% |
| Sect B-B' | 5.451 | 0% | 3.303 | 0% |
| Sect C-C' | 5.455 | 0% | 3.100 | 0% |
| Sect D-D' | 4.941 | 0% | 2.809 | 0% |
| Sect E-E' | 5.800 | 0% | 3.281 | 0% |
| Sect F-F' | 5.860 | 0% | 3.117 | 0% |
| Sect G-G' | 2.642 | 0% | 1.514 | 0% |
| Sect H-H' | 5.007 | 0% | 2.885 | 0% |



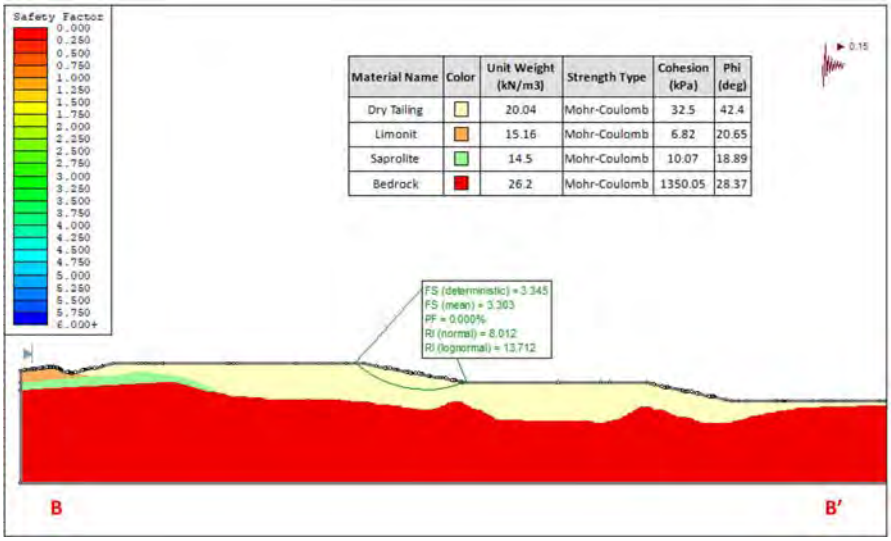

Gambar III-12 Peta *Section* Geoteknik A, B dan C



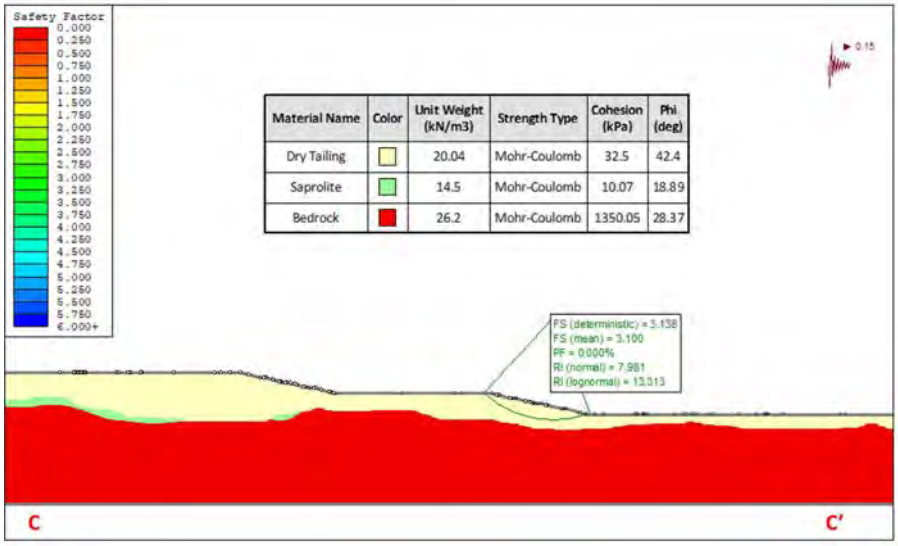

Gambar III-13 Hasil Peta *Section* Geoteknik D s/d H



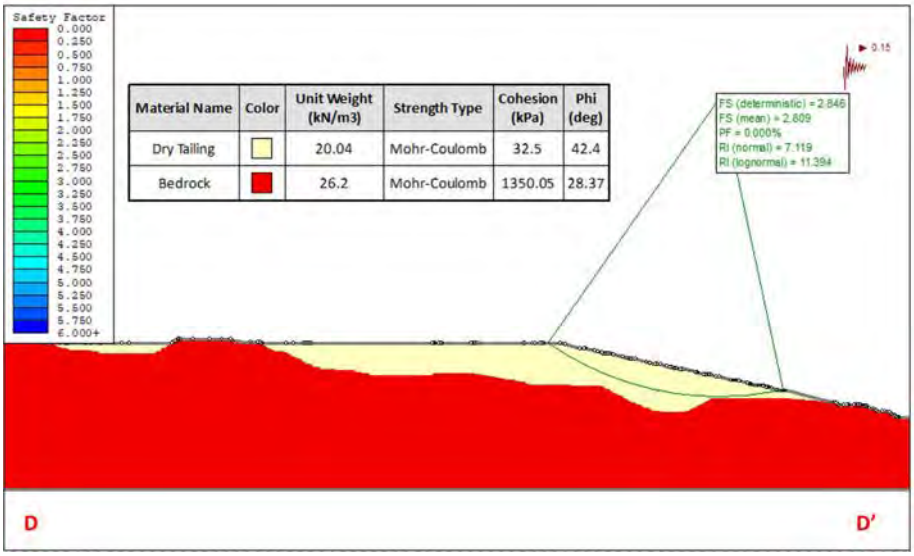

Gambar III-14 Hasil Simulasi Verifikasi Desain Section A-A'



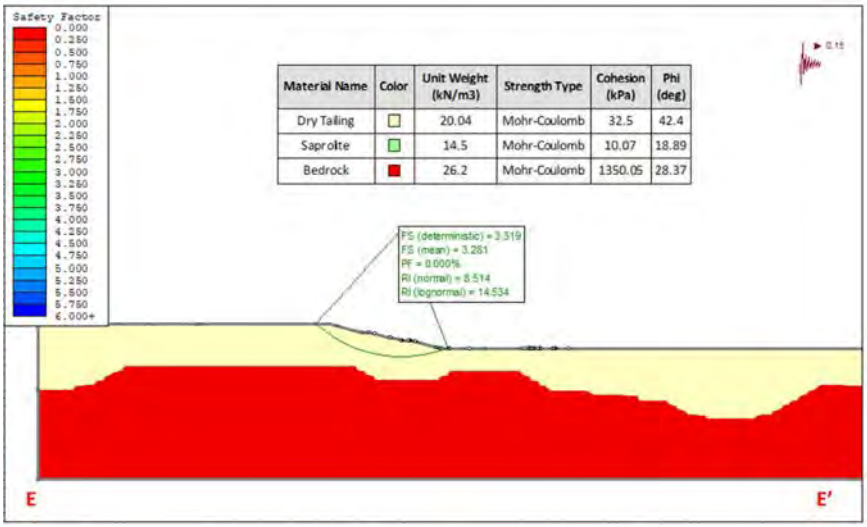

Gambar III-15 Hasil Simulasi Verifikasi Desain Section B-B'



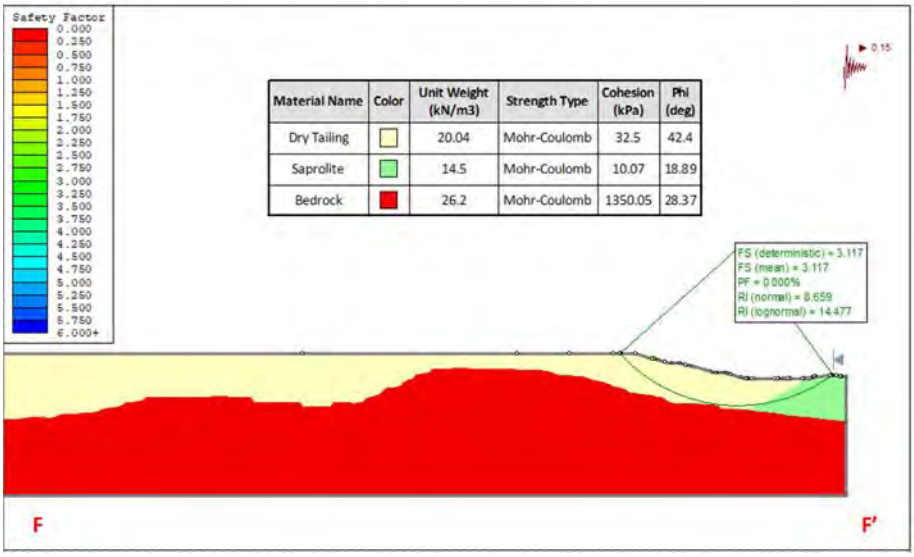

Gambar III-16 Hasil Simulasi Verifikasi Desain Section C-C'



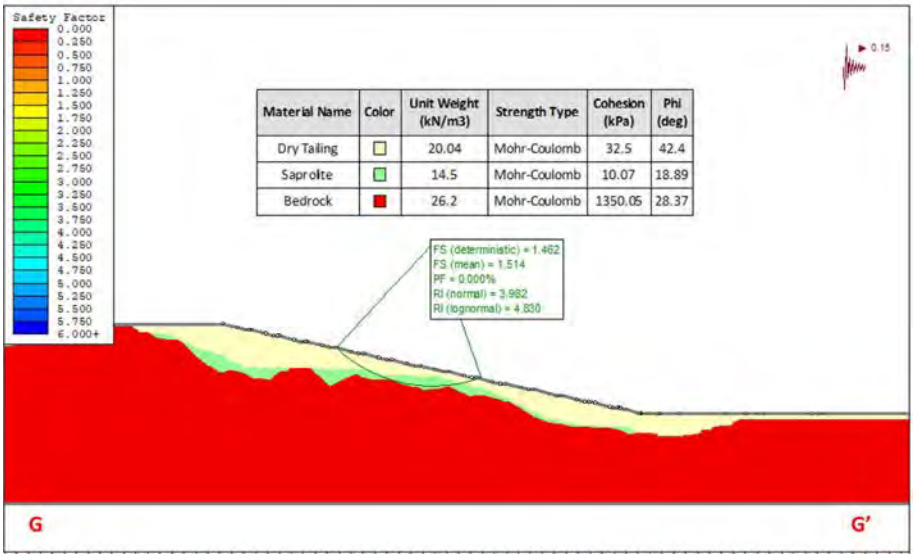

Gambar III-17 Hasil Simulasi Verifikasi Desain Section D-D'



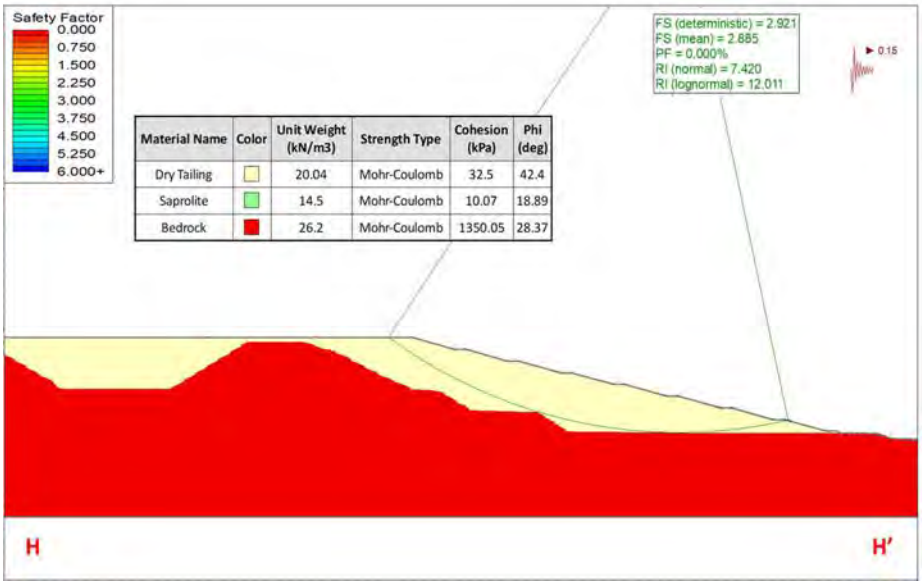

Gambar III-18 Hasil Simulasi Verifikasi Desain Section E-E'




Gambar III-19 Hasil Simulasi Verifikasi Desain Section F-F'




Gambar III-20 Hasil Simulasi Verifikasi Desain Section G-G'

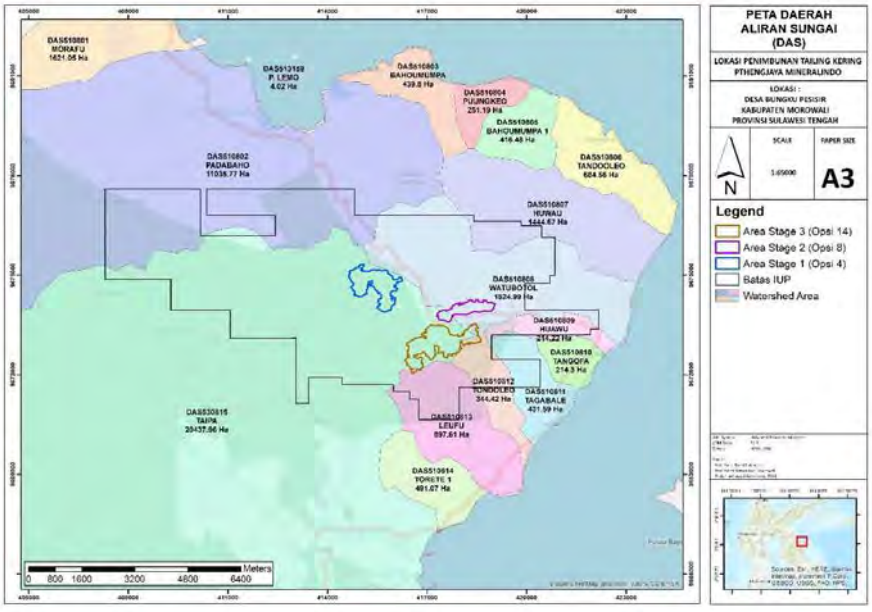



Gambar III-21 Hasil Simulasi Verifikasi Desain Section H-H'

# IV. ANALISIS HIDROLOGI

## IV.1 Kondisi Umum Hidrologi

Lokasi DSTF berada didalam Daerah Aliran Sungai (DAS) Taipa dan Watubotol, dengan lokasi DSTF-04 dan DSTF-14 berada pada DAS Taipa dan DSTF-08 berada pada DAS Watubotol. DAS Taipa dengan kode DAS530815 memiliki luas 20437 Ha dengan sungai utama merupakan sungai Taipa yang mengalir dari utara ke selatan dan bermuara ke laut, sedangkan DAS Watubotol dengan kode DAS510808 memiliki luas 1824 Ha mengalir dari barat ke timur dan bermuara di laut yang berada pada sebelah utara dari area DSTF-08.




Gambar IV-1 Peta Daerah Aliran Sungai pada Lokasi DSTF

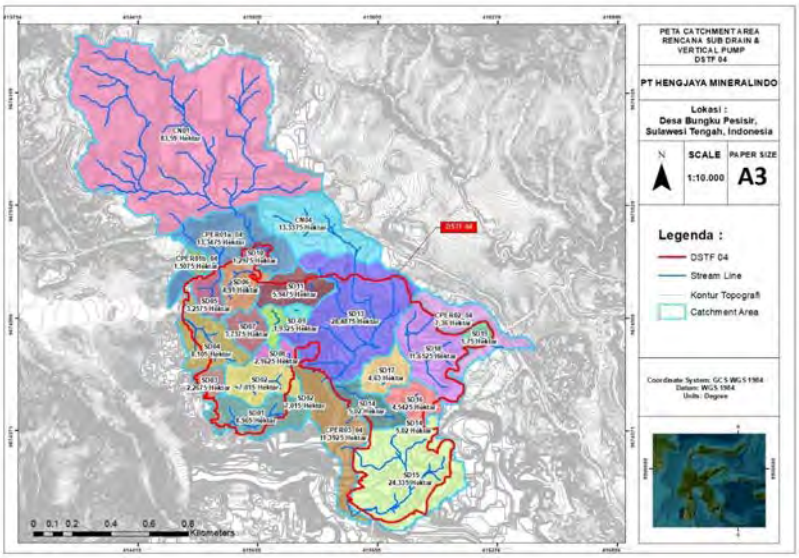
## IV.2 Daerah Tangkapan Air Permukaan

Deliniasi daerah tangkapan air permukaan/*catchment area* dibuat untuk mengetahui perkiraan aliran permukaan yang berpengaruh pada area rencana DSTF dan sebagai dasar untuk melakukan penanganannya dalam bentuk perencanaan drainase. Deliniasi dibuat berdasarkan data topografi akhir tambang dan topografi desain DSTF pada *stage* akhir.

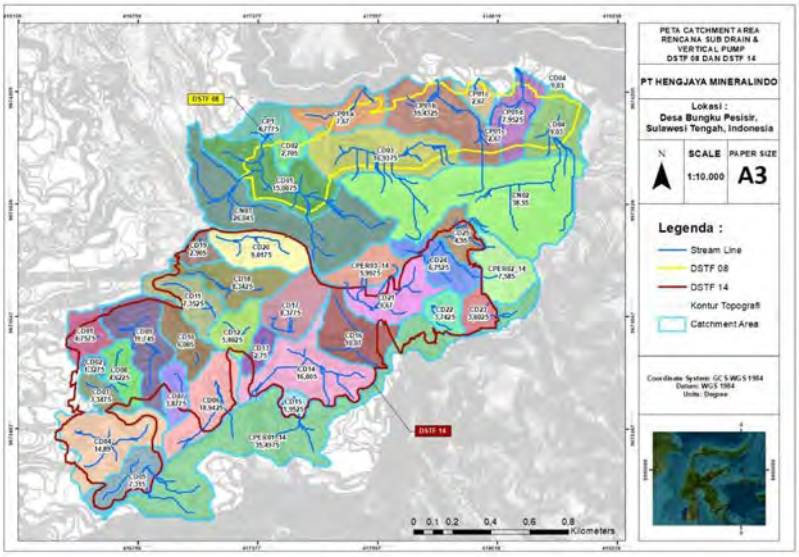
Deliniasi pada kondisi akhir tambang dilakukan untuk menentukan area *depression point* (titik terendah *outlet* aliran air). Pada lokasi ini nantinya akan dipasang pompa untuk mengalirkan air keluar dari area tersebut guna memastikan bahwa pada saat operasional penimbunan, area yang akan diisi material tidak tergenang oleh air. Selain itu, lokasi ini juga digunakan sebagai dasar untuk penentuan lokasi pemasangan *vertical drain* yang berfungsi untuk memompa airtanah pada kondisi ketika timbunan jenuh oleh air maka air dipompa melalui sumur ini hingga sampai pada batas level tertentu. Hasil deliniasi dengan kondisi topografi akhir tambang diperlihatkan pada **Gambar IV-2** untuk area DSTF-04 dan **Gambar IV-3** untuk area DSTF-08 dan DSTF-14. Deliniasi pada *boundary area* DSTF-04 menghasilkan 19 area *catchment depression point* (**Gambar IV-2**), pada boundary DSTF-08 membagi menjadi 26 area *catchment depression point* dan pada area DSTF-14 membagi menjadi 4 area *catchment depression point (***Gambar IV-3**).

Selanjutnya, deliniasi dilakukan dengan menggunakan kondisi topografi final setelah penempatan DSTF. Deliniasi dibagi menjadi 2 skenario yaitu pembagian catchment berdasarkan perencanaan drainase dan berdasarkan rencana lokasi *collection pond*. Rencana drainase dibagi menjadi 2 yaitu saluran untuk mengurangi aliran air dari luar area DSTF (air non-kontak) yang disebut dengan drainase perimeter (*perimeter drainage*) dan saluran untuk mengumpulkan air dari limpasan area DSTF (air kontak) ke kolam pengumpul lindi yang disebut dengan drainase pengumpul (*collection drainage*). Saluran drainase perimeter ini akan dialirkan menuju kolam sedimen sedangkan saluran dari *collection drainage* ini akan dialirkan menuju *collection pond* (kolam pengumpul lindi/air kontak). Peta hasil deliniasi *catchment area* untuk rencana drainase perimeter dan *pond* pada lokasi DSTF-04 diperlihatkan pada **Gambar IV-4** dan **Gambar IV-6** dan untuk lokasi DSTF-08, DSTF-14 diperlihatkan pada **Gambar IV-4** dan **Gambar IV-6**.

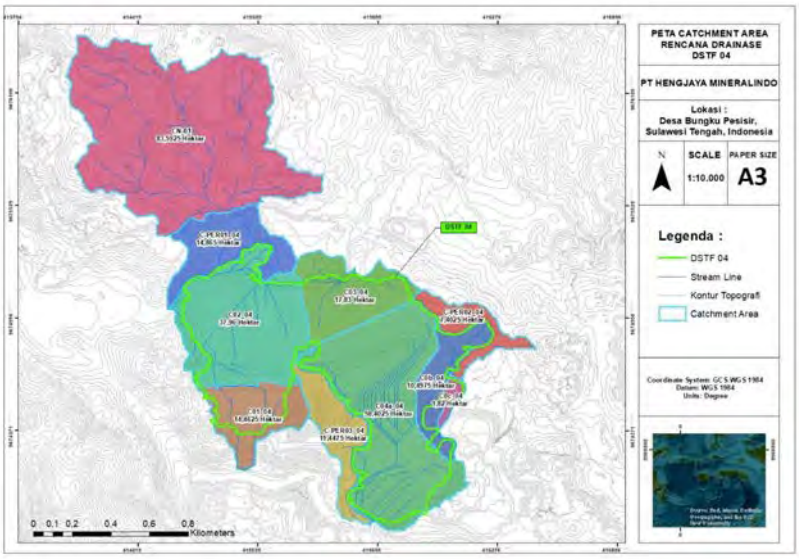
Hasil deliniasi untuk rencana drainase pada area DSTF-4 terbagi menjadi 6 catchment area air kontak dan 3 area non-kontak, pada area DSTF-08 terbagi menjadi 6 catchment air kontak serta pada area DSTF-14 terbagi menjadi 7 area catchment air kontak dan 3 area catchment air non-kontak. Karakteristik fisik dari masing-masing catchment berupa luas, kemiringan, panjang basin dan parameter lainnya untuk masing-masing *cathment* diperlihatkan pada **Tabel IV-2** dan **Tabel IV-3**.



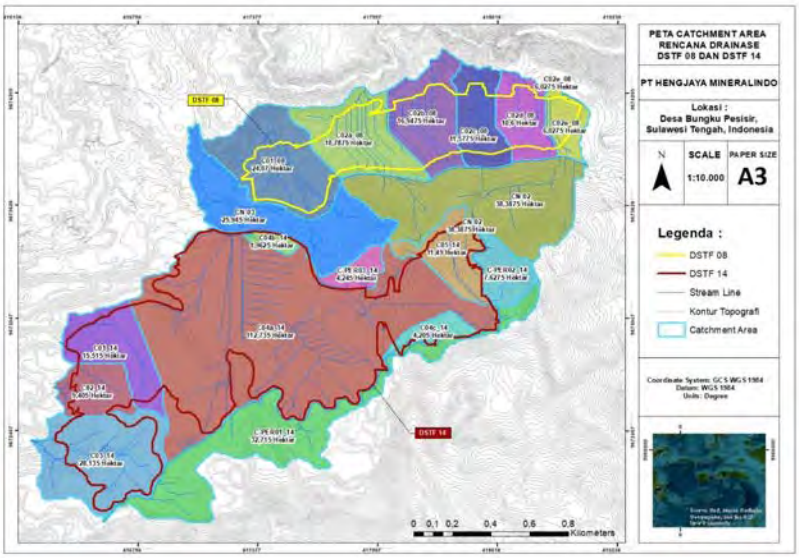

Gambar IV-2 Peta *catchment area* dengan topografi akhir tambang pada lokasi DSTF 04



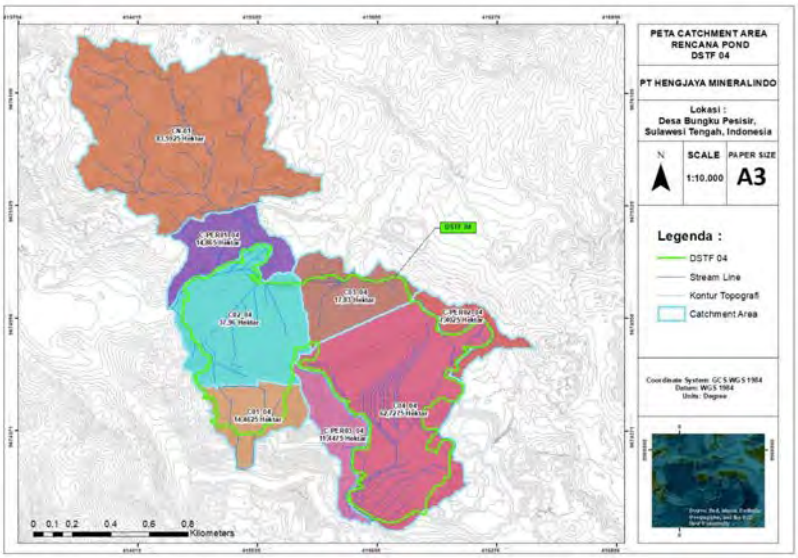
Gambar IV-3 Peta catchment area dengan topografi akhir tambang pada lokasi DSTF-08 dan DSTF-14



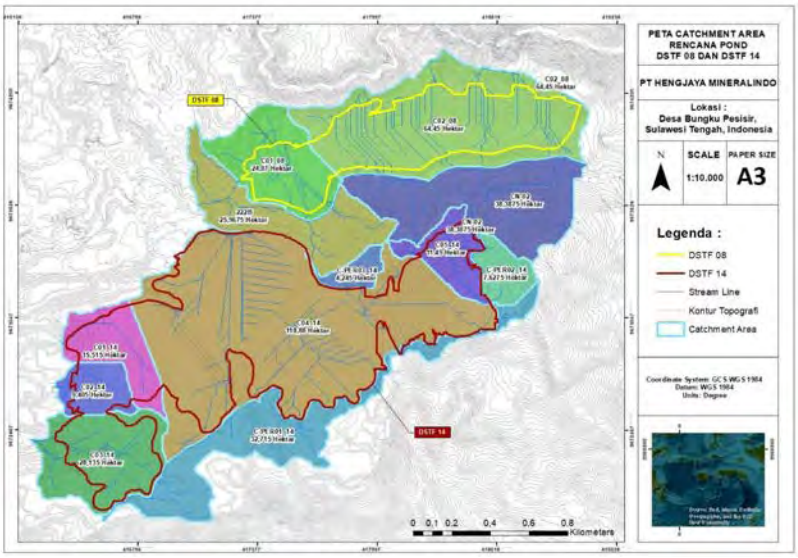

Gambar IV-4 Peta daerah tangkapan air permukaan rencana drainase area DSTF-04




Gambar IV-5 Peta daerah tangkapan air permukaan rencana drainase area DSTF-08 dan DSTF-14




Gambar IV-6 Peta daerah tangkapan air permukaan rencana *pond* area DSTF-04




Gambar IV-7 Peta *catchment area* rencana *pond* area DSTF-08 dan DSTF-14

Tabel IV-1 Karakteristik fisik *catchment area* kondisi topografi akhir tambang dengan *outlet depression point*

| Note | Basin Name | New-Code | Area | Basin Slope | Basin Length | Basin Perimeter | Max Flow Distance | Max Flow Slope | Max Stream Length | Max Stream Slope |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ha | m/m | m | m | m | m/m | m | m/m |
| DSTF 04 | SD01 | SD01_04 | 8.57 | 0.33 | 321 | 1923 | 389.87 | 0.21 | 232 | 0.14 |
| | SD02 | SD02_04 | 7.02 | 0.35 | 347 | 1675 | 421.94 | 0.18 | 259 | 0.08 |
| | SD03 | SD03_04 | 2.27 | 0.30 | 136 | 801 | 168.14 | 0.14 | 56 | 0.11 |
| | SD04 | SD04_04 | 8.11 | 0.27 | 412 | 1907 | 496.33 | 0.14 | 396 | 0.10 |
| | SD05 | SD05_04 | 3.26 | 0.27 | 144 | 1058 | 205.29 | 0.18 | 144 | 0.11 |
| | SD06 | SD06_04 | 4.91 | 0.28 | 224 | 1282 | 286.88 | 0.14 | 165 | 0.13 |
| | SD07 | SD07_04 | 3.74 | 0.30 | 186 | 1123 | 236.86 | 0.15 | 112 | 0.03 |
| | SD08 | SD08_04 | 2.16 | 0.31 | 182 | 941 | 264.89 | 0.18 | 138 | 0.08 |
| | SD09 | SD09_04 | 1.93 | 0.27 | 202 | 934 | 266.06 | 0.12 | 144 | 0.18 |
| | SD10 | SD10_04 | 1.30 | 0.18 | 108 | 639 | 150.45 | 0.07 | 91 | 0.08 |
| | SD11 | SD11_04 | 5.95 | 0.23 | 252 | 1517 | 331.4 | 0.08 | 197 | 0.07 |
| | SD12 | SD12_04 | 1.01 | 0.32 | 90 | 518 | 108.25 | 0.13 | 18 | 0.15 |
| | SD13 | SD13_04 | 28.49 | 0.22 | 608 | 3628 | 732.02 | 0.07 | 603 | 0.08 |
| | SD14 | SD14_04 | 5.02 | 0.22 | 369 | 1534 | 400.45 | 0.13 | 370 | 0.10 |
| | SD15 | SD15_04 | 24.34 | 0.26 | 574 | 2756 | 874.52 | 0.08 | 797 | 0.07 |
| | SD16 | SD16_04 | 4.54 | 0.22 | 238 | 1211 | 322.39 | 0.12 | 185 | 0.10 |
| | SD17 | SD17_04 | 4.63 | 0.24 | 182 | 1180 | 227.24 | 0.14 | 65 | 0.05 |
| | SD18 | SD18_04 | 11.65 | 0.24 | 312 | 2186 | 375.46 | 0.16 | 321 | 0.17 |
| | SD19 | SD19_04 | 1.75 | 0.35 | 101 | 699 | 139.07 | 0.16 | 58 | 0.31 |
| DSTF 14 | CD01 | SD01_14 | 4.76 | 0.31 | 215 | 1266 | 260.39 | 0.23 | 116 | 0.07 |
| | CD02 | SD02_14 | 1.33 | 0.26 | 113 | 602 | 142.75 | 0.12 | 47 | 0.00 |
| | CD03 | SD03_14 | 3.35 | 0.22 | 293 | 1109 | 362.06 | 0.13 | 209 | 0.13 |
| | CD04 | SD04_14 | 14.89 | 0.27 | 468 | 2444 | 623.56 | 0.12 | 449 | 0.13 |
| | CD05 | SD05_14 | 7.32 | 0.31 | 296 | 1669 | 377.16 | 0.11 | 243 | 0.07 |
| | CD06 | SD06_14 | 10.94 | 0.22 | 476 | 2097 | 573.38 | 0.09 | 461 | 0.10 |
| | CD07 | SD07_14 | 3.88 | 0.19 | 289 | 1123 | 339.23 | 0.10 | 170 | 0.14 |
| | CD08 | SD08_14 | 4.62 | 0.21 | 323 | 1324 | 425.17 | 0.11 | 264 | 0.10 |
| | CD09 | SD09_14 | 11.75 | 0.23 | 530 | 2379 | 672.55 | 0.08 | 481 | 0.08 |
| | CD10 | SD10_14 | 6.00 | 0.16 | 332 | 1624 | 411.13 | 0.03 | 70 | 0.04 |
| | CD11 | SD11_14 | 7.35 | 0.32 | 385 | 1817 | 444.59 | 0.15 | 313 | 0.11 |
| | CD12 | SD12_14 | 5.40 | 0.29 | 238 | 1401 | 330.88 | 0.11 | 159 | 0.02 |
| | CD13 | SD13_14 | 2.75 | 0.31 | 220 | 969 | 326.2 | 0.16 | 76 | 0.15 |
| | CD14 | SD14_14 | 16.00 | 0.31 | 440 | 3336 | 501.96 | 0.13 | 418 | 0.14 |

| Note | Basin Name | New-Code | Area | Basin Slope | Basin Length | Basin Perimeter | Max Flow Distance | Max Flow Slope | Max Stream Length | Max Stream Slope |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ha | m/m | m | m | m | m/m | m | m/m |
| | CD15 | SD15_14 | 1.95 | 0.32 | 119 | 713 | 142.61 | 0.20 | 114 | 0.18 |
| | CD16 | SD16_14 | 10.07 | 0.22 | 346 | 1930 | 431.36 | 0.10 | 363 | 0.08 |
| | CD17 | SD17_14 | 8.38 | 0.12 | 365 | 1569 | 513.76 | 0.08 | 179 | 0.15 |
| | CD18 | SD18_14 | 8.34 | 0.16 | 362 | 2132 | 439.02 | 0.06 | 268 | 0.05 |
| | CD19 | SD19_14 | 2.91 | 0.25 | 210 | 1036 | 270.49 | 0.12 | 73 | 0.07 |
| | CD20 | SD20_14 | 9.02 | 0.18 | 523 | 1756 | 611.57 | 0.06 | 454 | 0.05 |
| | CD21 | SD21_14 | 9.67 | 0.20 | 422 | 2003 | 525.41 | 0.11 | 360 | 0.12 |
| | CD22 | SD22_14 | 3.74 | 0.25 | 230 | 1009 | 301.68 | 0.12 | 189 | 0.14 |
| | CD23 | SD23_14 | 3.60 | 0.25 | 146 | 1001 | 200.71 | 0.15 | 132 | 0.22 |
| | CD24 | SD24_14 | 6.75 | 0.25 | 322 | 1951 | 459.57 | 0.15 | 299 | 0.22 |
| | CD25 | SD25_14 | 4.95 | 0.33 | 251 | 1535 | 340.88 | 0.21 | 228 | 0.19 |
| DSTF 08 | CD01 | SD01_08 | 15.01 | 0.30 | 564 | 2666 | 680.81 | 0.12 | 542 | 0.09 |
| | CD02 | SD02_08 | 2.71 | 0.18 | 157 | 879 | 201.65 | 0.10 | 45 | 0.17 |
| | CD03 | SD03_08 | 16.94 | 0.28 | 616 | 2575 | 748.55 | 0.10 | 679 | 0.10 |
| | CD04 | SD04_08 | 9.03 | 0.27 | 288 | 1695 | 352.08 | 0.20 | 282 | 0.18 |
| | CP01 | - | 4.78 | 0.26 | 275 | 1450 | 373.35 | 0.14 | 178 | 0.09 |
| | CP02a | - | 7.67 | 0.25 | 418 | 1770 | 545.58 | 0.13 | 424 | 0.11 |
| | CP02b | - | 15.43 | 0.21 | 557 | 2405 | 661.36 | 0.11 | 596 | 0.12 |
| | CP02c | - | 2.67 | 0.12 | 297 | 1158 | 340.71 | 0.07 | 98 | 0.01 |
| | CP02d | - | 7.95 | 0.16 | 504 | 1903 | 690.96 | 0.13 | 457 | 0.08 |

Tabel IV-2 Karakteristik fisik *catchment area* rencana drainase

| Lokasi | Basin Name | Area | Basin Slope | Basin Length | Basin Perimeter | Max Flow Distance | Max Flow Slope | Max Stream Length | Max Stream Slope |
|---|---|---|---|---|---|---|---|---|---|
| | | Ha | m/m | m | m | m | m/m | m | m/m |
| DSTF_04 | C01_04 | 14,46 | 0,20 | 522 | 2408 | 852 | 0,100 | 648 | 0,11 |
| | C02_04 | 37,96 | 0,08 | 775 | 3703 | 1628 | 0,040 | 1350 | 0,03 |
| | C03_04 | 17,83 | 0,07 | 476 | 2647 | 551 | 0,048 | 413 | 0,03 |
| | C04a_04 | 50,4 | 0,09 | 1164 | 4957 | 1377 | 0,065 | 1276 | 0,06 |
| | C04b_04 | 10,5 | 0,07 | 617 | 2775 | 819 | 0,051 | 792 | 0,03 |
| | C04c_04 | 1,82 | 0,14 | 281 | 891 | 341 | 0,071 | 225 | 0,07 |
| | C-PER01_04 | 14,87 | 0,18 | 716 | 3356 | 1007 | 0,060 | 903 | 0,03 |
| | C-PER02_04 | 7,4 | 0,17 | 508 | 3099 | 1023 | 0,030 | 975 | 0,02 |
| | C-PER03_04 | 11,45 | 0,30 | 912 | 2985 | 1254 | 0,083 | 1192 | 0,07 |
| DSTF_08 | C01_08 | 24,07 | 0,15 | 510 | 2732 | 618 | 0,058 | 603 | 0,05 |

| Lokasi | Basin Name | Area | Basin Slope | Basin Length | Basin Perimeter | Max Flow Distance | Max Flow Slope | Max Stream Length | Max Stream Slope |
|---|---|---|---|---|---|---|---|---|---|
| | | Ha | m/m | m | m | m | m/m | m | m/m |
| | C02a_08 | 18,79 | 0,16 | 582 | 2687 | 706 | 0,118 | 559 | 0,11 |
| | C02b_08 | 16,95 | 0,16 | 615 | 2430 | 880 | 0,091 | 754 | 0,08 |
| | C02c_08 | 11,58 | 0,18 | 521 | 1867 | 588 | 0,148 | 543 | 0,16 |
| | C02d_08 | 10,6 | 0,17 | 483 | 1671 | 576 | 0,137 | 550 | 0,13 |
| | C02e_08 | 6,03 | 0,15 | 370 | 1428 | 508 | 0,076 | 423 | 0,09 |
| DSTF_14 | C01_14 | 15,52 | 0,11 | 690 | 2444 | 957 | 0,063 | 765 | 0,07 |
| | C02_14 | 9,41 | 0,13 | 455 | 1564 | 617 | 0,072 | 461 | 0,07 |
| | C03_14 | 28,14 | 0,11 | 720 | 2901 | 917 | 0,082 | 771 | 0,09 |
| | C04a_14 | 112,74 | 0,06 | 1588 | 8354 | 2207 | 0,044 | 2138 | 0,04 |
| | C04b_14 | 1,96 | 0,06 | 289 | 924 | 382 | 0,033 | 159 | 0,03 |
| | C04c_14 | 4,21 | 0,16 | 512 | 1577 | 643 | 0,118 | 463 | 0,14 |
| | C05_14 | 11,49 | 0,18 | 445 | 2559 | 679 | 0,077 | 623 | 0,09 |
| | C-PER01_14 | 32,72 | 0,20 | 2571 | 9428 | 3322 | 0,045 | 3138 | 0,03 |
| | C-PER02_14 | 7,63 | 0,37 | 476 | 1920 | 858 | 0,155 | 657 | 0,10 |
| | C-PER03_14 | 4,25 | 0,20 | 370 | 1384 | 575 | 0,077 | 360 | 0,05 |
| Natural | CN-01 | 83,59 | 0,19 | 1126 | 6162 | 2032 | 0,050 | 1863 | 0,03 |
| | CN-02 | 38,39 | 0,30 | 1279 | 4643 | 1647 | 0,044 | 1511 | 0,04 |
| | CN-03 | 25,95 | 0,18 | 1044 | 4573 | 1231 | 0,061 | 1105 | 0,06 |

Tabel IV-3 Karakteristik fisik *catchment area* rencana *pond*

| Note | Basin Name | Area | Basin Slope | Basin Length | Basin Perimeter | Max Flow Distance | Max Flow Slope | Max Stream Length | Max Stream Slope |
|---|---|---|---|---|---|---|---|---|---|
| | | Ha | m/m | m | m | m | m/m | m | m/m |
| DSTF-04 | C01_04 | 14,46 | 0,20 | 522 | 2408 | 852 | 0,10 | 647,73 | 0,11 |
| | C02_04 | 37,96 | 0,08 | 775 | 3703 | 1628 | 0,04 | 1350 | 0,03 |
| | C03_04 | 17,83 | 0,07 | 476 | 2647 | 551 | 0,05 | 413 | 0,03 |
| | C04_04 | 62,73 | 0,09 | 1187 | 5660 | 1656 | 0,05 | 1630 | 0,04 |
| DSTF-08 | C01_08 | 24,07 | 0,15 | 510 | 2732 | 618 | 0,06 | 603 | 0,05 |
| | C02_08 | 64,45 | 0,16 | 957 | 5179 | 1249 | 0,05 | 1164 | 0,06 |
| DSTF-14 | C01_14 | 15,52 | 0,11 | 690 | 2444 | 957 | 0,06 | 765 | 0,07 |
| | C02_14 | 9,41 | 0,13 | 455 | 1564 | 617 | 0,07 | 461 | 0,07 |

| Note | Basin Name | Area | Basin Slope | Basin Length | Basin Perimeter | Max Flow Distance | Max Flow Slope | Max Stream Length | Max Stream Slope |
|---|---|---|---|---|---|---|---|---|---|
| | | Ha | m/m | m | m | m | m/m | m | m/m |
| | C03_14 | 28,14 | 0,11 | 720 | 2901 | 917 | 0,08 | 771 | 0,09 |
| | C04_14 | 118,88 | 0,07 | 1588 | 8057 | 2207 | 0,04 | 2138 | 0,04 |
| | C05_14 | 11,49 | 0,18 | 445 | 2559 | 679 | 0,08 | 623 | 0,09 |
| Natural Area | CN-01 | 83,59 | 0,19 | 1126 | 6162 | 2032 | 0,05 | 1863 | 0,03 |
| | CN-02 | 38,39 | 0,30 | 1279 | 4643 | 1647 | 0,04 | 1511 | 0,04 |
| | CN-03 | 25,97 | 0,18 | 1044 | 4541 | 1231 | 0,06 | 1105 | 0,06 |
| Perimeter Area | C-PER01_04 | 14,87 | 0,18 | 716 | 3356 | 1007 | 0,06 | 903 | 0,03 |
| | C-PER01_14 | 32,72 | 0,20 | 2571 | 9428 | 3322 | 0,05 | 3138 | 0,03 |
| | C-PER02_04 | 7,4 | 0,17 | 508 | 3099 | 1023 | 0,03 | 975 | 0,02 |
| | C-PER02_14 | 7,63 | 0,37 | 476 | 1920 | 858 | 0,16 | 657 | 0,10 |
| | C-PER03_04 | 11,45 | 0,30 | 912 | 2985 | 1254 | 0,08 | 1192 | 0,07 |
| | C-PER03_14 | 4,25 | 0,20 | 370 | 1384 | 575 | 0,08 | 360 | 0,05 |

## IV.3 Analisis Hujan

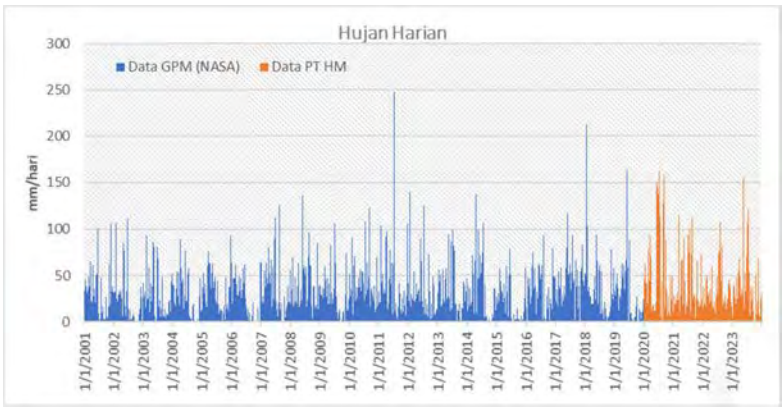
### IV.3.1 Desain Hujan Puncak

Desain hujan puncak diprediksi melalui analisis frekuensi. Analisis frekuensi bertujuan untuk mencari hubungan antara besarnya suatu kejadian (maksimum atau minimum) dan frekuensinya berdasarkan distribusi probabilitas. Hubungan antara besarnya kejadian dan frekuensinya, atau peluang kejadiannya adalah berbanding terbalik. Pengambilan seri data untuk tujuan analisis frekuensi dilakukan dilakukan terhadap data maksimum tahunan (*annual maximum series*).

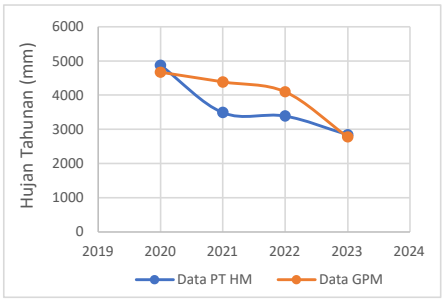
Data yang diperlukan untuk analisis adalah curah hujan harian panjang, yaitu diperlukan data terus menerus minimal 10 tahun untuk menentukan persentil ke-95 kejadian hujan di suatu lokasi. Berdasarkan kelengkapan data hujan yang dimiliki oleh PT HM, pencatatan curah hujan harian yang lengkap hanya terdapat pada periode tahun 2020 – 2023 (4 tahun) sehingga diperlukan tambahan data hujan yang lebih panjang.

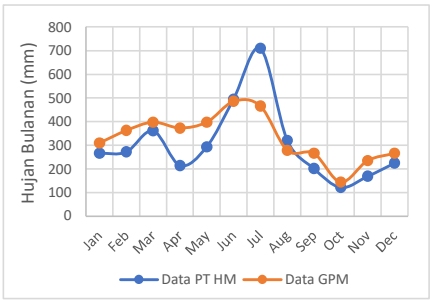
Pelengkapan data hujan harian dilakukan dengan pengambilan dari data NASA (https://giovanni.gsfc.nasa.gov, Satelit mean_GPM_3IMERGDF_07_precipitation) dengan periode perekaman data tahun 2001 sd 2023 (23 tahun). Kelengkapan data hujan harian Satelit dan Stasiun PT HM ditampilkan dalam bentuk grafik pada **Gambar IV-8**. Selanjutnya, kurva massa ganda digunakan untuk memeriksa konsistensi kedua data hujan tersebut. Teori kurva massa ganda didasarkan pada grafik akumulasi satu kuantitas terhadap kumulasi kuantitas lain selama

periode yang sama akan diplot sebagai garis lurus selama datanya proporsional; Kemiringan garis akan mewakili konstanta proporsionalitas antara kuantitas. Uji kurva massa ganda ini menunjukkan konsistensi data, dimana ketika suatu seri data panggah (konsisten), grafik akan membentuk garis lurus dengan landai (slope) tertentu. Namun, ketika grafik tidak konsisten, grafik akan berubah kelandaiannya pada satu titik tertentu. Data hujan tahunan yang akan digunakan yaitu data hujan dengan periode pencatatan lengkap (2019 – 2023) dengan data tahunan dan kumulatifnya pada kedua stasiun diperlihatkan pada **Tabel IV-4**. Hasil plot kurva massa ganda antara data satelit dan Stasiun hujan PT HM diperlihatkan pada **Gambar IV-10** yang menunjukkan data cukup konsisten dengan ditandai dengan data yang mengikuti garis *trendline* yang linear dengan koefisien korelasi 0,99. Selain itu, pola curah hujan bulanan juga cendrung menunjukkan pola yang sama **Gambar IV-9**. Selanjutnya, data gabungan antar kedua data tersebut akan digunakan untuk analisis hujan puncak.

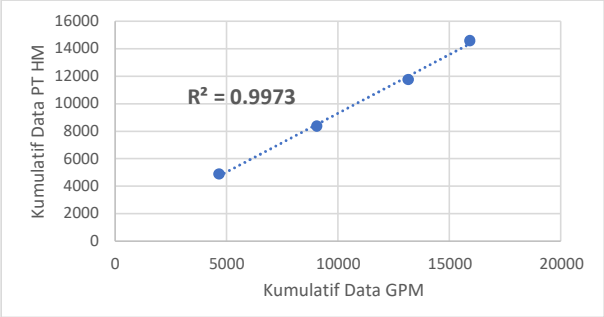



Gambar IV-8 Grafik Kelengkapan Data Curah Hujan Harian Sta. HM dan Satelit NASA



Gambar IV-9 Komparasi Data Akumulasi Hujan Tahunan dan Rata-rata Bulanan antara Data Pengukuran PT HM dan Data Hujan Satelit (GPM_3IMERGDF)




Gambar IV-10 Scatter Plots Data Akumulasi Hujan Tahunan Data HM dengan Data Hujan Satelit (GPM_3IMERGDF) Periode Jan 2020 – Des 2023

Tabel IV-4 Curah Hujan Tahunan dan Kumulatif Rata-rata Data Pengukuran PT HM dan Data Hujan NASA (GPM_3IMERGDF)

| Tahun | Rata-rata Stasiun PT HM | | Curah Hujan Satelit (GPM_3IMERGDF) | |
|---|---|---|---|---|
| | Curah Hujan Tahunan (mm) | Kumulatif Tahunan (mm) | Curah Hujan Tahunan (mm) | Kumulatif Tahunan (mm) |
| 2020 | 4872 | 4872 | 4666 | 4666 |
| 2021 | 3488 | 8360 | 4384 | 9050 |
| 2022 | 3390 | 11751 | 4094 | 13144 |
| 2023 | 2839 | 14590 | 2776 | 15920 |

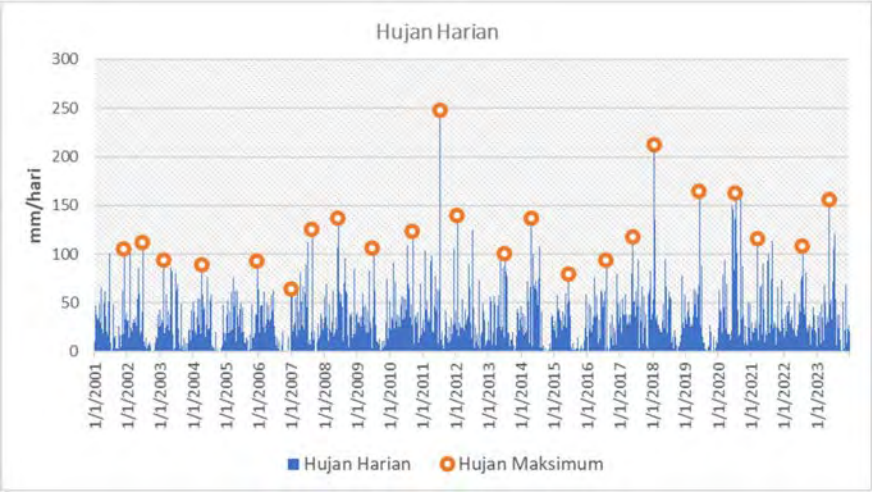
Selanjutnya, analisis hujan menggunakan kombinasi data antara data pengukuran hujan PT HM dan data Hujan Satelit. Dimana data satelit NASA dipakai untuk mengisi kekosongan dan ketidaklengkapan data harian hujan antara tahun 2001 – 2019. Data curah hujan gabungan antara rata-rata stasiun di lokasi dan data satelit GPM yang akan digunakan dalam analisis diperlihatkan pada **Gambar IV-11**. Selanjutnya, data hujan akan digunakan untuk melakukan analisis frekuensi. Analisis frekuensi bertujuan untuk mencari hubungan antara besarnya suatu kejadian (maksimum atau minimum) dan frekuensinya berdasarkan distribusi probabilitas. Hubungan antara besarnya kejadian dan frekuensinya, atau peluang kejadiannya adalah berbanding terbalik.

Pengambilan seri data untuk tujuan analisis frekuensi dilakukan terhadap data maksimum tahunan (*annual maximum series*). Data maksimum tahunan dibuat dua skenario yaitu data

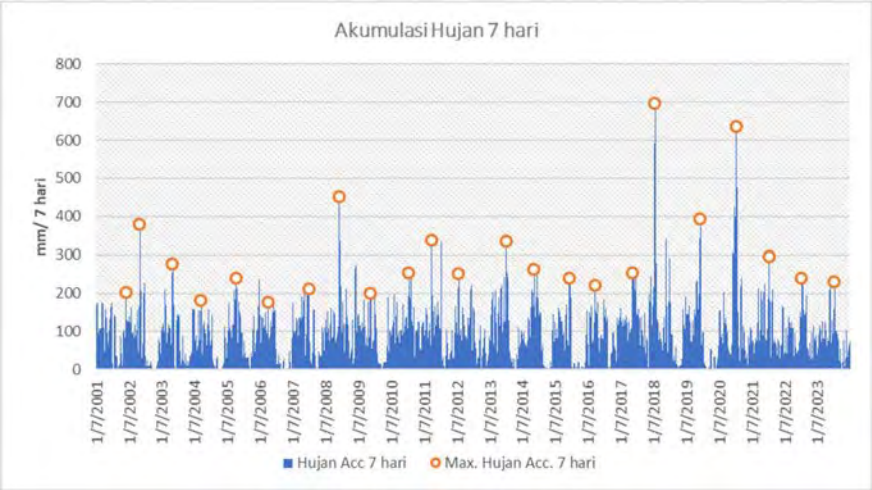
maksimum hujan harian dan data maksimum hujan akumulasi 7 hari. Data maksimum hujan akumulasi 7 hari dibuat dengan ketentuan berdasarkan Permen LHK No. 06/2021 bahwa fasilitas kolam harus memenuhi ketentuan memiliki kapasitas tampung air lindi yang timbul selama 1 (satu) minggu pada curah hujan paling tinggi. Perhitungan IDF dengan data hujan harian maksimum digunakan perhitungan debit rencana untuk saluran drainase sedangkan dengan data akumulasi hujan 7 hari untuk menghitung debit rencana volume kolam pengumpul lindi. Berdasarkan data hujan harian yang diperoleh, selanjutnya diambil satu data maksimum untuk setiap tahunnya. Data hujan maksimum harian dan maksimum akumulasi 7 hari hujan yang digunakan dalam analisis selanjutnya diperlihatkan pada **Tabel IV-5** dan **Gambar IV-11**, **Gambar IV-12**.

Tabel IV-5 Data Curah Hujan Maksimum Harian

| Tahun | Max. Acc 7 Hari | Max | Tanggal |
|---|---|---|---|
| 2001 | 202,48 | 105,76 | 24 November 2001 |
| 2002 | 378,53 | 111,87 | 19 Juni 2002 |
| 2003 | 277,83 | 93,88 | 08 Februari 2003 |
| 2004 | 181,76 | 89,58 | 08 April 2004 |
| 2005 | 240,60 | 93,16 | 16 Desember 2005 |
| 2006 | 176,53 | 64,67 | 27 Desember 2006 |
| 2007 | 211,92 | 125,90 | 18 Agustus 2007 |
| 2008 | 451,58 | 136,81 | 31 Mei 2008 |
| 2009 | 201,27 | 106,13 | 30 Juni 2009 |
| 2010 | 252,84 | 123,36 | 07 September 2010 |
| 2011 | 338,33 | 247,71 | 11 Juli 2011 |
| 2012 | 250,52 | 139,55 | 18 Januari 2012 |
| 2013 | 335,31 | 100,25 | 01 Juli 2013 |
| 2014 | 262,94 | 137,02 | 20 April 2014 |
| 2015 | 240,87 | 79,48 | 08 Juni 2015 |
| 2016 | 221,92 | 93,59 | 01 Agustus 2016 |
| 2017 | 254,73 | 117,37 | 24 Mei 2017 |
| 2018 | 696,98 | 212,66 | 17 Januari 2018 |
| 2019 | 393,56 | 164,32 | 02 Juni 2019 |
| 2020 | 635,17 | 163,00 | 10 Juli 2020 |
| 2021 | 295,33 | 115,50 | 12 Maret 2021 |
| 2022 | 238,96 | 107,88 | 30 Juli 2022 |
| 2023 | 230,88 | 155,75 | 21 Mei 2023 |




Gambar IV-11 Grafik Data Curah Hujan Maksimum




Gambar IV-12 Grafik Data Curah Hujan Maksimum Akumulasi hujan 7 hari

Frekuensi data hujan dapat diartikan sebagai suatu cara untuk memprediksi suatu besaran curah hujan di masa yang akan datang dengan menggunakan data curah hujan di masa yang lalu berdasarkan distribusi frekuensi. Dalam studi ini fungsi distribusi yang dianalisis menggunakan

fungsi distribusi normal, distribusi Log-Normal, distribusi Log Pearson III, dan distribusi Gumbel. Untuk mendapatkan fungsi distribusi yang sesuai digunakan, uji kompatibilitas dilakukan dengan metode Kolmogorov Smirnov dan Chi-Square. Sebelum pengujian, data curah hujan harian maksimum yang diperoleh akan diurutkan terlebih dahulu dari yang terbesar ke terkecil. Hasil uji kesesuaian distribusi ditunjukkan pada **Tabel IV-6**. Dimana, berdasarkan hasil analisis distribusi yang paling mendekati adalah distribusi Log Pearson III.

Tabel IV-6 Hasil uji kecocokan distribusi frekuensi data hujan harian maksimum

| Kolmogorov-Smirnov Test | Normal | Log Normal | Gumbel | Log Pearson III |
|---|---|---|---|---|
| D-value | 0,12 | 0,07 | 0,063 | 0,048 |
| D-Critical | 0,27 | 0,27 | 0,27 | 0,27 |
| **Chi-Square Test** | **Normal** | **Log Normal** | **Gumbel** | **Log Pearson III** |
| Chi-square (Observed value) | 4,913 | 3,348 | 3,35 | 1,78 |
| Derajat Kebebasan (DK) | 3 | 3 | 3 | 2 |
| Chi-square (Critical value) | 7,815 | 7,815 | 7,815 | 5,991 |

Tabel IV-7 Hasil uji kecocokan distribusi frekuensi data hujan akumulasi 7 hari maksimum

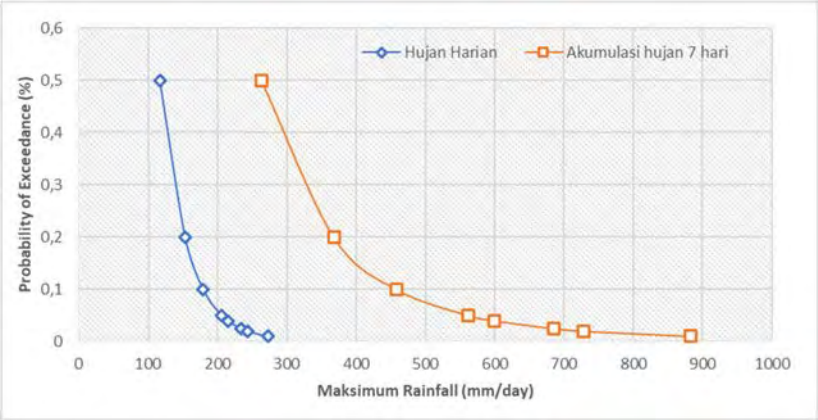
| Kolmogorov-Smirnov Test | Normal | Log Normal | Gumbel | Log Pearson III |
|---|---|---|---|---|
| D-value | 0,20 | 0,16 | 0,15 | 0,08 |
| D-Critical | 0,27 | 0,27 | 0,27 | 0,27 |
| **Chi-Square Test** | **Normal** | **Log Normal** | **Gumbel** | **Log Pearson III** |
| Chi-square (Observed value) | 16,93 | 8,04 | 9,08 | 3,87 |
| Derajat Kebebasan (DK) | 3 | 3 | 3 | 2 |
| Chi-square (Critical value) | 7,82 | 7,82 | 7,82 | 5,99 |

Selanjutnya, perhitungan hujan rencana (hujan puncak) dihitung dengan menggunakan fungsi distribusi Log Pearson III. Resume hasil perhitungan hujan puncak dengan probabilitas atau periode ulang tertentu dapat dilihat pada **Tabel IV-8.**

Tabel IV-8 Hasil Perhitungan Hujan Rencana

| P (x >= Xm) | Tahun | Hujan Puncak Harian | Hujan Puncak Acc. 7 Hari |
|---|---|---|---|
| Probabilitas | Kala-Ulang | (mm/hari) | (mm/7hari) |
| 0,5 | 2 | 116,73 | 263,67 |
| 0,2 | 5 | 153,41 | 368,06 |
| 0,1 | 10 | 179,59 | 457,83 |
| 0,05 | 20 | 206,17 | 562,09 |

| P (x >= Xm) | Tahun | Hujan Puncak Harian | Hujan Puncak Acc. 7 Hari |
|---|---|---|---|
| Probabilitas | Kala-Ulang | (mm/hari) | (mm/7hari) |
| 0,04 | 25 | 214,93 | 599,37 |
| 0,025 | 40 | 233,79 | 684,69 |
| 0,02 | 50 | 242,97 | 728,73 |
| 0,01 | 100 | 272,53 | 882,01 |




Gambar IV-13 Grafik Probabilitas Hujan Puncak Rencana

### IV.3.2 Intensitas Hujan Maksimum

Hasil yang didapatkan dari analisis frekuensi hujan masih berupa curah hujan harian (akumulasi selama 24 jam). Selanjutnya data hujan harian perlu diubah terlebih dahulu menjadi data intensitas. Intensitas hujan dapat dikatakan sebagai ketinggian atau kederasan hujan per satuan waktu, biasanya dinyatakan dalam satuan yang lebih pendek (mm/jam). Jika volume hujan adalah tetap, maka intensitas hujan akan makin tinggi seiring dengan durasi hujan yang makin singkat, sebaliknya intensitas hujan makin rendah seiring dengan durasi hujan yang makin lama. Nilai intensitas hujan dapat dinyatakan sebagai intensitas pada satu titik, yang dinyatakan melalui kurva IDF (*Intensity Duration Frequency*) atau hujan yang terdistribusi dalam hujan jam-jaman.

Jika data hujan jangka pendek tidak tersedia, dan data hujan harian tersedia, maka persamaan regresi Curve IDF diturunkan dengan persamaan:

$$I = \frac{R_{24}}{24}\left(\frac{24}{t}\right)^{m}$$

dimana:

$R_{24}$ = Curah Hujan untuk 1 hari

t = Periode Ulang (2, 5, 10, 15, 20, 25, 40, 50 dan 100 tahun)

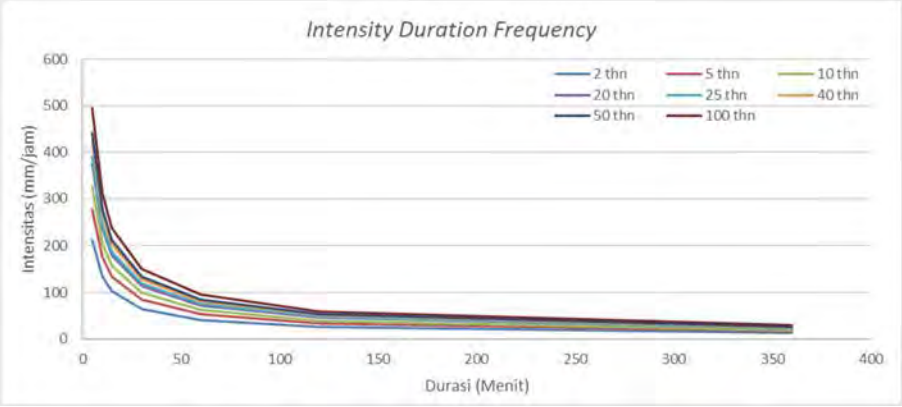
m = Koefisien Hujan

Hasil perhitungan intensitas hujan periode ulang tertentu (*Intensity Duration Frequency*) dapat dilihat pada **Tabel IV-9** dan **Gambar IV-14** untuk maksimum hujan harian serta

Tabel IV-10 dan **Gambar IV-15** untuk maksimum akumulasi curah hujan 1 minggu.

Tabel IV-9 Hasil perhitungan intensitas periode ulang hujan (IDF) hujan maksimum harian

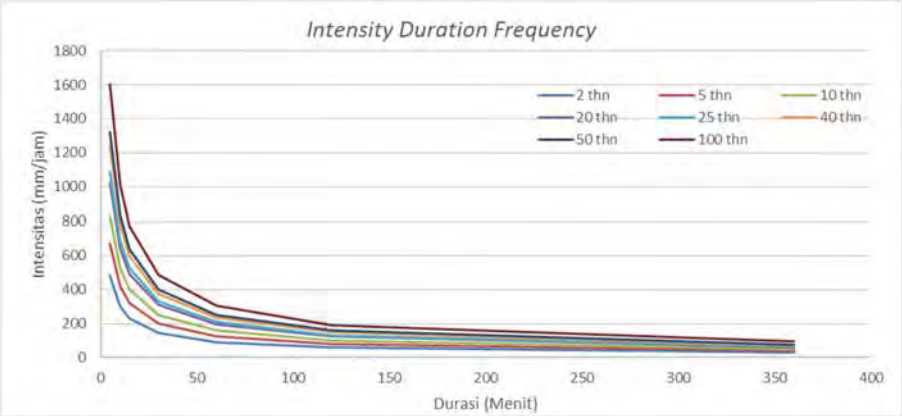
| Durasi (Menit) | Intensitas Hujan (mm/jam) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Periode Ulang | | | | | | | |
| | 2 thn | 5 thn | 10 thn | 20 thn | 25 thn | 40 thn | 50 thn | 100 thn |
| 5 | 212,12 | 278,76 | 326,33 | 374,64 | 390,55 | 424,82 | 441,50 | 495,22 |
| 10 | 133,63 | 175,61 | 205,58 | 236,01 | 246,03 | 267,62 | 278,13 | 311,97 |
| 15 | 101,98 | 134,02 | 156,88 | 180,11 | 187,76 | 204,23 | 212,25 | 238,07 |
| 30 | 64,24 | 84,42 | 98,83 | 113,46 | 118,28 | 128,66 | 133,71 | 149,98 |
| 60 | 40,47 | 53,18 | 62,26 | 71,48 | 74,51 | 81,05 | 84,23 | 94,48 |
| 120 | 25,49 | 33,50 | 39,22 | 45,03 | 46,94 | 51,06 | 53,06 | 59,52 |
| 360 | 12,26 | 16,11 | 18,86 | 21,65 | 22,57 | 24,55 | 25,51 | 28,61 |



Gambar IV-14 Kurva *Intensity Duration Frequency* (IDF) maksimum hujan harian

Tabel IV-10 Hasil perhitungan intensitas periode ulang hujan (IDF) hujan maksimum akumulasi 7 harian

| Durasi (Menit) | Intensitas Hujan (mm/jam) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Periode Ulang | | | | | | | |
| | 2 thn | 5 thn | 10 thn | 20 thn | 25 thn | 40 thn | 50 thn | 100 thn |
| 5 | 479,12 | 668,81 | 831,93 | 1021,39 | 1089,12 | 1244,17 | 1324,19 | 1602,71 |
| 10 | 301,83 | 421,33 | 524,09 | 643,43 | 686,11 | 783,78 | 834,19 | 1009,65 |
| 15 | 230,34 | 321,53 | 399,95 | 491,03 | 523,60 | 598,14 | 636,61 | 770,50 |
| 30 | 145,10 | 202,55 | 251,95 | 309,33 | 329,85 | 376,80 | 401,04 | 485,39 |
| 60 | 91,41 | 127,60 | 158,72 | 194,87 | 207,79 | 237,37 | 252,64 | 305,78 |
| 120 | 57,58 | 80,38 | 99,99 | 122,76 | 130,90 | 149,53 | 159,15 | 192,63 |
| 360 | 27,68 | 38,64 | 48,07 | 59,02 | 62,93 | 71,89 | 76,51 | 92,61 |




Gambar IV-15 Kurva *Intensity Duration Frequency* (IDF) maksimum akumulasi hujan 7 harian

## IV.4 Koefisien Limpasan

Koefisien limpasan adalah persentase jumlah air yang dapat melimpas melalui permukaan tanah dari keseluruhan air hujan yang jatuh pada suatu daerah. Semakin kedap suatu permukaan, maka semakin tinggi nilai koefisien pengalirannya. Nilai koefisien pengaliran (C) berkisar antara 0 – 1. Nilai C = 0 menunjukkan bahwa semua air hujan terintersepsi dan terinfiltrasi ke dalam tanah, sebaliknya untuk nilai C = 1 menunjukkan bahwa air hujan mengalir sebagai aliran permukaan.

Penentuan nilai faktor C dihitung dengan mengintegrasikan beberapa faktor yang mempengaruhi, yaitu: topografi, kapasitas infiltrasi, tutupan lahan, dan *surface storage*. Nilai koefisien C merupakan kombinasi dari beberapa faktor tersebut, dihitung berdasarkan referensi yang dapat dilihat pada **Tabel IV-11** (Hydraulic Design Manual, TxDOT, 2016). Hasil perhitungan koefisien pengaliran (C) untuk masing-masing *sub-catchment* yang mempengaruhi area rencana DSTF dapat dilihat pada

**Tabel** IV-12**.**

Tabel IV-11 Kurva Perhitungan Koefisien *Runoff* (*Hydraulic Design Manuan*, TxDOT, 2016)

| Watershed Characteristic | Extreme | High | Normal | Low |
|---|---|---|---|---|
| Relief - $C_r$ | 0.28-0.36<br>Steep, rugged terrain with average slopes above 30% | 0.20-0.28<br>Hilly, with average slopes of 10-30% | 0.14-0.20<br>Rolling, with average slopes of 5-10% | 0.08-0.14<br>*Relatif*ly flat land, with average slopes of 0-5% |
| Soil infiltration - $C_i$ | 0.12-0.16<br>No effective soil cover; either rock or thin soil mantle of negligible infiltration capacity | 0.08-0.12<br>Slow to take up water, clay or shallow loam soils of low infiltration capacity or poorly drained | 0.06-0.08<br>Normal; well drained light or medium textured soils, sandy loams | 0.04-0.06<br>Deep sand or other soil that takes up water readily; very light, well-drained soils |
| Vegetal cover - $C_v$ | 0.12-0.16<br>No effective plant cover, bare or very sparse cover | 0.08-0.12<br>Poor to fair; clean cultivation, crops or poor natural cover, less than 20% of drainage area has good cover | 0.06-0.08<br>Fair to good; about 50% of area in good grassland or woodland, not more than 50% of area in crops | 0.04-0.06<br>Good to excellent; about 90% of drainage area in good grassland, woodland |
| | 0.10-0.12 | 0.08-0.10 | 0.06-0.08 | 0.04-0.06 |

| Watershed Characteristic | Extreme | High | Normal | Low |
|---|---|---|---|---|
| Surface Storage - $C_s$ | Negligible; surface depressions few and shallow, no marshes | Well-defined system of small drainage ways, no ponds or marshes | Normal; considerable surface depression, e.g., storage lakes and ponds | Much surface storage, large number of ponds or marshes |

Tabel IV-12 Estimasi Nilai Koefisien Limpasan pada *Catchment* DSTF dan Natural

| Parameter | DSTF Area | Natural (Perimeter) |
|---|---|---|
| Relief - Cr | 0,25 | 0,25 |
| Soil infiltration - Ci | 0,16 | 0,16 |
| Vegetal cover - Cv | 0,16 | 0,12 |
| Surface Storage - Cs | 0,12 | 0,12 |
| Total | **0,69** | **0,65** |

## IV.5 Analisis Debit Puncak

Estimasi debit puncak air permukaan diperlukan untuk memperkirakan jumlah air maksimum yang mungkin mengalir melalui dan menuju lokasi rencana penimbunan. Analisis debit puncak air permukaan dihitung dengan menggunakan metode rasional, di mana berdasarkan SNI 2415:2016 metode rasional dapat digunakan untuk luas DAS yang relatif kecil (<5000 Ha). Metode rasional adalah metode empiris dari hubungan sederhana antara intensitas curah hujan dengan debit puncak, di mana persamaan pada metode rasional adalah sebagai berikut:

$$Q = CIA$$

Q = Debit banjir maksimum ($m^3$/dtk)

C = Koefisien pengaliran/limpasan

I = Intensitas curah hujan rata-rata (mm/jam)

A = Luas daerah pengaliran ($m^2$)

Metode rasional pada prinsipnya menggunakan beberapa dasar asumsi, sebagai berikut:

- Curah hujan didistribusikan secara merata ke seluruh area drainase dan konstan sepanjang waktu
- Estimasi debit puncak memiliki probabilitas kejadian yang sama (periode ulang) seperti yang digunakan pada distribusi intensitas hujan (I)
- Estimasi debit puncak dapat direpresentasikan oleh intensitas curah hujan rata-rata selama periode waktu yang sama dengan waktu konsentrasi (Tc)
- Koefisien pengaliran dianggap konstan

Penentuan intensitas hujan yang digunakan mengacu kepada asumsi bahwa hujan terdistribusi merata dengan intensitas hujan terjadi selama periode waktu yang sama dengan waktu konsentrasi.

### IV.5.1 Debit Puncak Periode Ulang

Hasil estimasi debit puncak limpasan air permukaan dengan metode rasional rencana DSTF PT HM pada masing-masing catchment untuk rencana drainase dan pond diperlihatkan pada **Tabel IV-13** dan

**Tabel** IV-14. Hasil tersebut merupakan estimasi debit puncak 5 tahun yang akan digunakan untuk perhitungan drainase dan periode ulang 25 tahun untuk perencanaan rencana sedimen pond.

Tabel IV-13 Estimasi debit puncak catchment rencana drainase pada periode ulang 5 dan 10 tahun

| Area | Name | Runoff Coefficient (C) | Area (A) | Time of concentration (Tc) | 5 Tahun | | 25 Tahun | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Rainfall Intensity (I) | Flowrate (Q) | Rainfall Intensity (I) | Flowrate (Q) |
| | | | Ha | menit | mm/jam | $m^3/s$ | mm/jam | $m^3/s$ |
| DSTF-04 | C01_04 | 0,69 | 14,46 | 8,52 | 195,55 | 5,42 | 273,96 | 7,59 |
| | C02_04 | 0,69 | 37,96 | 20,07 | 110,53 | 8,04 | 154,77 | 11,26 |
| | C03_04 | 0,69 | 17,83 | 8,09 | 202,42 | 6,92 | 283,58 | 9,69 |
| | C04a_04 | 0,69 | 50,4 | 14,55 | 136,88 | 13,22 | 191,69 | 18,52 |
| | C04b_04 | 0,69 | 10,5 | 10,76 | 167,41 | 3,37 | 234,49 | 4,72 |
| | C04c_04 | 0,69 | 1,82 | 4,80 | 286,46 | 1,00 | 401,55 | 1,40 |
| | C-PER01_04 | 0,69 | 14,87 | 11,84 | 157,01 | 4,48 | 219,90 | 6,27 |
| | C-PER02_04 | 0,69 | 7,4 | 15,60 | 130,70 | 1,85 | 183,03 | 2,60 |
| | C-PER03_04 | 0,69 | 11,45 | 12,34 | 152,78 | 3,35 | 213,98 | 4,70 |
| DSTF-08 | C01_08 | 0,69 | 24,07 | 8,22 | 200,32 | 9,24 | 280,64 | 12,95 |
| | C02a_08 | 0,69 | 18,79 | 6,93 | 224,34 | 8,08 | 314,34 | 11,32 |
| | C02b_08 | 0,69 | 16,95 | 9,06 | 187,71 | 6,10 | 262,95 | 8,54 |
| | C02c_08 | 0,69 | 11,58 | 5,51 | 261,34 | 5,80 | 366,28 | 8,13 |
| | C02d_08 | 0,69 | 10,6 | 5,58 | 259,09 | 5,26 | 363,12 | 7,38 |
| | C02e_08 | 0,69 | 6,03 | 6,37 | 237,29 | 2,74 | 332,52 | 3,84 |
| DSTF-14 | C01_14 | 0,69 | 15,52 | 11,16 | 163,30 | 4,86 | 228,73 | 6,80 |
| | C02_14 | 0,69 | 9,41 | 7,55 | 211,96 | 3,82 | 296,97 | 5,36 |
| | C03_14 | 0,69 | 28,14 | 9,75 | 178,69 | 9,64 | 250,31 | 13,50 |
| | C04a_14 | 0,69 | 112,74 | 24,43 | 96,98 | 20,96 | 135,78 | 29,34 |
| | C04b_14 | 0,69 | 1,96 | 7,09 | 220,90 | 0,83 | 309,51 | 1,16 |
| | C04c_14 | 0,69 | 4,21 | 6,45 | 235,35 | 1,90 | 329,79 | 2,66 |
| | C05_14 | 0,69 | 11,49 | 7,94 | 204,92 | 4,51 | 287,10 | 6,32 |

| Area | Name | Runoff Coefficient (C) | Area (A) | Time of concentration (Tc) | 5 Tahun | | 25 Tahun | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Rainfall Intensity (I) | Flowrate (Q) | Rainfall Intensity (I) | Flowrate (Q) |
| | | | Ha | menit | mm/jam | $m^3/s$ | mm/jam | $m^3/s$ |
| | C-PER01_14 | 0,69 | 32,72 | 32,96 | 79,46 | 4,98 | 111,24 | 6,98 |
| | C-PER02_14 | 0,69 | 7,63 | 7,24 | 217,89 | 3,19 | 305,29 | 4,47 |
| | C-PER03_14 | 0,69 | 4,25 | 6,97 | 223,44 | 1,82 | 313,08 | 2,55 |

Tabel IV-14 Estimasi debit puncak catchment rencana pond pada periode ulang 25 tahun

| Name | Runoff Coefficient (C) | Area (A) | Time of concentration (Tc) | Rainfall Intensity (I) | Flowrate (Q) |
|---|---|---|---|---|---|
| | | Ha | menit | mm/jam | $m^3/s$ |
| C01_04 | 0,69 | 14,46 | 8,52 | 273,96 | 7,59 |
| C02_04 | 0,69 | 37,96 | 20,07 | 154,77 | 11,26 |
| C03_04 | 0,69 | 17,83 | 8,09 | 283,58 | 9,69 |
| C04_04 | 0,69 | 62,73 | 18,14 | 165,56 | 19,91 |
| C01_08 | 0,69 | 24,07 | 8,22 | 280,64 | 12,95 |
| C02_08 | 0,69 | 64,45 | 14,51 | 192,08 | 23,73 |
| C01_14 | 0,69 | 15,52 | 11,16 | 228,73 | 6,80 |
| C02_14 | 0,69 | 9,41 | 7,55 | 296,97 | 5,36 |
| C03_14 | 0,69 | 28,14 | 9,75 | 250,31 | 13,50 |
| C04_14 | 0,69 | 118,88 | 24,43 | 135,78 | 30,94 |
| C05_14 | 0,69 | 11,49 | 7,94 | 287,10 | 6,32 |
| C-PER01_04 | 0,69 | 14,87 | 11,84 | 219,90 | 6,27 |
| C-PER02_04 | 0,69 | 7,40 | 15,60 | 183,03 | 2,60 |
| C-PER03_04 | 0,69 | 11,45 | 12,34 | 213,98 | 4,70 |
| C-PER01_14 | 0,69 | 32,72 | 32,96 | 111,24 | 6,98 |
| C-PER02_14 | 0,69 | 7,63 | 7,24 | 305,29 | 4,47 |
| C-PER03_14 | 0,69 | 4,25 | 6,97 | 313,08 | 2,55 |

### IV.5.2 Debit Akumulasi Hujan 1 Minggu

Perhitungan curah hujan tertinggi yang terjadi dalam 1 minggu sepanjang data pengamatan hujan dilakukan berdasarkan kriteria yang tercantum di dalam Permen LHK 6/2021 pasal 187 ayat 5. Berdasarkan hasil perhitungan IDF hujan, didapatkan akumulasi curah hujan tertinggi selama seminggu dengan periode ulang 10 tahun sebesar 457,83 mm/7hari. Selanjutnya debit hujan puncak dihitung dengan persamaan rational untuk mendapatkan volume yang dihasilkan selama

periode hujan tersebut. **Tabel IV-15** memperlihatkan volume limpasan air permukaan pada masing-masing catchment DSTF. Volume ini kemudian akan digunakan untuk menentukan dimensi dari kolam pengumpul air limpasan kontak *tailing* (*collection pond*).

Tabel IV-15 Estimasi volume limpasan air permukaan berdasarkan akumulasi hujan tertinggi 1 minggu

| Name | Runoff Coefficient (C) | Area (A) | Rainfall Intensity (I) | Volume |
|---|---|---|---|---|
| | | Ha | mm | $m^3$ |
| C01_04 | 0,69 | 14,46 | 457,83 | 45.680 |
| C02_04 | 0,69 | 37,96 | 457,83 | 119.917 |
| C03_04 | 0,69 | 17,83 | 457,83 | 56.326 |
| C04_04 | 0,69 | 62,73 | 457,83 | 198.166 |
| C01_08 | 0,69 | 24,07 | 457,83 | 76.038 |
| C02_08 | 0,69 | 64,45 | 457,83 | 203.600 |
| C01_14 | 0,69 | 15,52 | 457,83 | 49.028 |
| C02_14 | 0,69 | 9,41 | 457,83 | 29.727 |
| C03_14 | 0,69 | 28,14 | 457,83 | 88.895 |
| C04_14 | 0,69 | 118,88 | 457,83 | 375.546 |
| C05_14 | 0,69 | 11,49 | 457,83 | 36.297 |

## IV.6 Debit Rata-Rata Bulanan

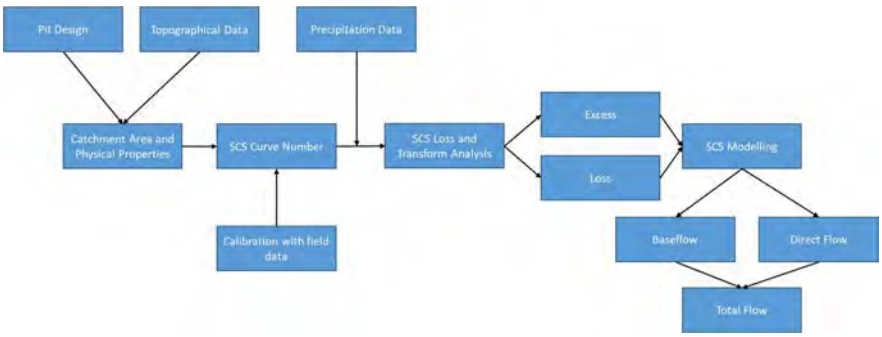
Analisis debit rata-rata bulanan digunakan untuk mengetahui rata-rata debit bulanan limpasan dari area DSTF. Perhitungan debit ini dilakukan untuk perencanaan pemompaan dari area *collection pond* dengan tujuan untuk mengurangi kapasitas volume kolam. Hal ini dilakukan karena adanya keterbatasan area untuk pembangunan *collection pond.* Metode analisis yang digunakan yaitu model *rainfall-runoff* dengan data curah hujan sepanjang rentang pengamatan (tahun 2001-2023).

### IV.6.1 Model *Rainfall-Runoff*

Model rainfall – runoff merupakan suatu proses pemodelan dalam bidang hidrologi yang digunakan untuk melakukan simulasi dan prediksi dari proses perubahan air hujan menjadi aliran pada suatu daerah aliran sungai atau *catchment area*. Model ini memberikan pendekatan terhadap aliran yang terbentuk dari suatu *catchment area* hingga menghasilkan nilai debit dalam jangka waktu panjang sesuai dengan data masukannya sehingga bisa diperhitungkan debit hariannya, debit bulanan serta debit andalan yang bisa digunakan sebagai dasar terhadap rencana pemompaan dari kolam *collection pond* area DSTF.

Dalam studi ini, model yang digunakan adalah HEC-HMS yang merupakan salah satu perangkat lunak yang umum digunakan dalam studi hidrologi. Model ini akan memproses data-data spasial terutama data Digital Elevation Model (DEM) yang akan menghasilkan prediksi aliran yang akan terbentuk di suatu DEM. Selanjutnya akan ditentukan titik-titik outlet yang disesuaikan dengan kondisi lapangan aktual dari lokasi.

Pemodelan HEC-HMS memiliki beberapa metode perhitungan, dalam kasus ini metode perhitungan yang digunakan adalah metode SCS-CN (*Soil Conservation Service Curve Number*). Metode ini adalah sebuah metode yang dikembangkan oleh USDA (*United States Department of Agriculture*) berupa nilai empiris *surface runoff* yang mengestimasikan *precipitation excess* (nilai curah hujan yang menjadi *runoff*) dari faktor-faktor seperti curah hujan, tata guna lahan, tutupan lahan, tipe tanah menjadi suatu angka (*Curve Number*) yang merepresentasikan suatu area secara umum. Nilai CN berada dalam rentang 30 – 100 dimana nilai yang rendah mengindikasikan potensi *runoff* yang lebih rendah dan begitupun sebaliknya. Diagram alir dari pemodelan ini bisa dilihat pada **Gambar IV-16**.



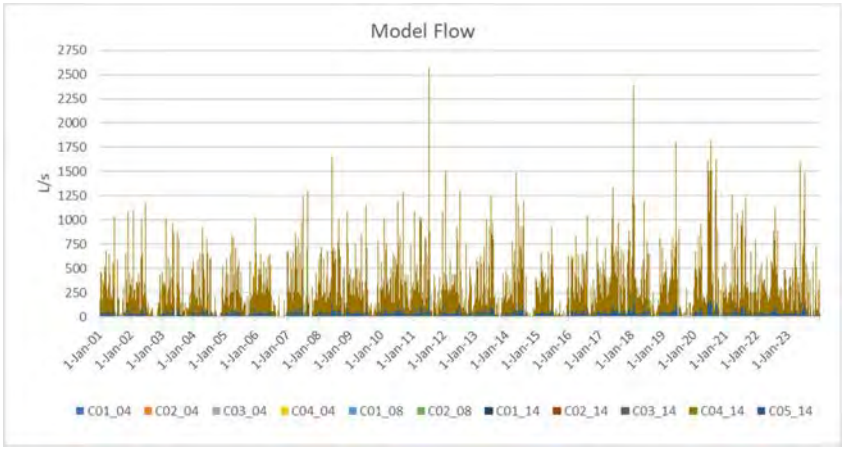

Gambar IV-16 Workflow of HEC-HMS Rainfall-Runoff Modelling

Berdasarkan analisis area tangkapan hujan, masing-masing area terbagi menjadi beberapa *catchment* yang telah dijelaskan pada sub-bab sebelumnya. Umumnya, sebelum pemodelan sebaiknya dilakukan kalibrasi dengan pengukuran data lapangan (pengukuran debit) secara berkelanjutan dilokasi yang akan ditentukan sebagai outlet. Proses kalibrasi ini akan menghasilkan nilai *Curve Number* yang mendekati debit yang teramati dilapangan. Namun karena keterbatasan data, maka pemodelan dilakukan dengan menggunakan nilai *Curve Number* yang mengacu kepada literatur (**Tabel IV-16**).

Tabel IV-16 Nilai Curve Number berdasarkan Jenis Penggunaan Lahan (Liew, Yuk & Desa, 2021)

| No | Land Use Category | CN |
|---|---|---|
| 1 | Forest | 60 |
| 2 | Others Agriculture | 70 |
| 3 | Aquaculture | 74 |
| 4 | Rubber | 77 |
| 5 | Grassland | 79 |
| 6 | Bare Land | 79 |
| 7 | Animal Husbandary | 80 |
| 8 | Orchard | 82 |
| 9 | Developed Area | 85 |
| 10 | Oil Palm | 87 |
| 11 | Swamp Forest | 92 |
| 12 | Transportation | 92 |
| 13 | Mining | 98 |
| 14 | Waterbody | 100 |

Hasil model *rainfall-runoff* menghasilkan nilai debit harian yang ditampilkan dalam bentuk grafik pada **Gambar IV-17** dengan rata-rata debit bulanan sebesar 10,15 hingga 128 L/s dari semua *catchment area* dengan rangkuman data debit bulanan dapat dilihat pada **Tabel IV-17**. Nilai debit ini yang kemudian akan dipompakan dari *collection pond* untuk mengurangi kapasitas kolam tersebut.




Gambar IV-17 Grafik hasil debit harian berdasarkan *rainfall runoff model*

Tabel IV-17 Rangkuman rata-rata debit bulanan berdasarkan model *rainfall runoff model*

| Month | Debit (L/s) pada tiap *Catchment* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | C01_ 04 | C02_ 04 | C03_ 04 | C04_ 04 | C01_ 08 | C02_ 08 | C01_ 14 | C02_ 14 | C03_ 14 | C04_ 14 | C05_ 14 |
| Jan | 20,50 | 53,82 | 25,28 | 88,94 | 34,13 | 91,38 | 22,01 | 13,34 | 39,90 | 168,55 | 16,29 |
| Feb | 18,14 | 47,63 | 22,37 | 78,71 | 30,20 | 80,87 | 19,47 | 11,81 | 35,31 | 149,16 | 14,42 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar | 20,10 | 52,78 | 24,79 | 87,22 | 33,47 | 89,61 | 21,58 | 13,08 | 39,13 | 165,29 | 15,98 |
| Apr | 19,06 | 50,04 | 23,50 | 82,69 | 31,73 | 84,96 | 20,46 | 12,41 | 37,09 | 156,70 | 15,15 |
| May | 21,25 | 55,78 | 26,20 | 92,19 | 35,37 | 94,72 | 22,81 | 13,83 | 41,36 | 174,70 | 16,88 |
| Jun | 23,51 | 61,71 | 28,98 | 101,97 | 39,13 | 104,76 | 25,23 | 15,30 | 45,74 | 193,24 | 18,68 |
| Jul | 18,57 | 48,75 | 22,90 | 80,56 | 30,91 | 82,77 | 19,93 | 12,08 | 36,14 | 152,68 | 14,76 |
| Aug | 8,58 | 22,54 | 10,58 | 37,24 | 14,29 | 38,27 | 9,21 | 5,59 | 16,71 | 70,58 | 6,82 |
| Sep | 6,29 | 16,52 | 7,76 | 27,30 | 10,48 | 28,05 | 6,75 | 4,09 | 12,25 | 51,74 | 5,00 |
| Oct | 4,88 | 12,81 | 6,02 | 21,17 | 8,12 | 21,75 | 5,24 | 3,17 | 9,49 | 40,11 | 3,87 |
| Nov | 9,99 | 26,21 | 12,31 | 43,32 | 16,62 | 44,51 | 10,72 | 6,50 | 19,43 | 82,09 | 7,93 |
| Dec | 16,19 | 42,51 | 19,97 | 70,24 | 26,95 | 72,17 | 17,38 | 10,54 | 31,51 | 133,11 | 12,86 |
| **Rata-Rata** | **15,589** | **40,925** | **19,222** | **67,629** | **25,949** | **69,484** | **16,732** | **10,144** | **30,338** | **128,165** | **12,387** |
| **Maksimum** | **23,51** | **61,71** | **28,98** | **101,97** | **39,13** | **104,76** | **25,23** | **15,30** | **45,74** | **193,24** | **18,68** |

## IV.7 Analisis Potensi Banjir 100 Tahun

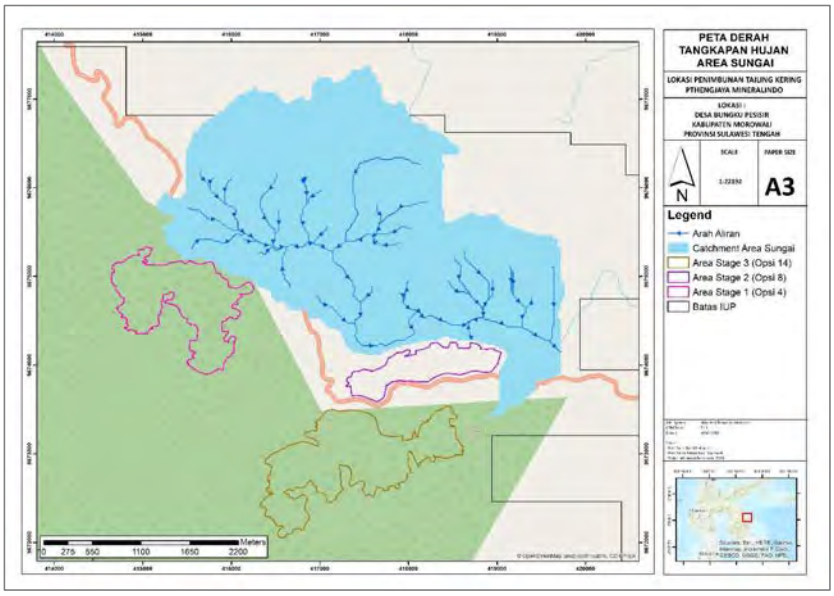
Analisis potensi banjir sungai dilakukan dengan metode analisis hujan puncak pada periode ulang 100 tahun dan analisis genangan banjir dengan model HEC-RAS. Analisis hujan puncak telah dibahas pada bab sebelumnya yang selanjutnya nilai intensitas hujan maksimum pada periode ulang 100 tahun akan digunakan sebagai input dalam perhitungan debit puncak dan genangan banjir.

Lokasi penimbunan kembali (*backfill*) terletak di Daerah Tangkapan Air (DTA) Taipa (DAS530815) dan Watubotol (DAS510808). Letak lokasi penimbunan kembali dan daerah tangkapan air dapat dilihat pada **Gambar IV-1**. Pada lokasi rencana penimbunan akhir sendiri, tidak terdapat sungai mengalir sepanjang tahun (*perennial river*). Aliran sungai terdekat dari lokasi penimbunan berada pada bagian utara area DSTF-08 yang merupakan sungai dari DAS Watubotol. Berdasarkan hal tersebut, potensi banjir ditinjau dari kemungkinan luapan air yang terjadi dari aliran sungai tersebut dengan perhitungan periode ulang hujan puncak 100 tahun.

Analisis potensi banjir dari area ini dilakukan untuk memastikan apakah area penimbunan terdampak oleh genangan banjir pada tangkapan hujan tersebut. Analisis genangan banjir dilakukan dengan menggunakan software HEC-RAS 6.4.1. Analisis dilakukan berdasarkan data curah hujan, elevasi permukaan tanah (DEM), jaringan sungai, dan tutupan lahan. Data hujan digunakan untuk menentukan karakteristik dan nilai hujan puncak, DEM untuk mendefinisikan DAS dan karakteristiknya, serta tutupan lahan digunakan untuk menentukan koefisien limpasan permukaan pada daerah yang akan dimodelkan. Deliniasi daerah tangkapan hujan dihitung pada area sungai di dekat lokasi penimbunan dengan outlet point diletakkan pada bagian hilir dari daerah tangkapan air permukaan. Hasil deliniasi daerah tangkapan hujan DAS Watubotol diperlihatkan pada **Gambar IV-18** dengan karakteristik fisik daerah tangkapan ditunjukkan pada **Tabel IV-18** dengan luas area sebesar 933.37 Ha.

Tabel IV-18 Karakteristik Sub-DAS pada masing-masing Catchment

| Basin Name | Unit | C_RIVER |
|---|---|---|
| Area | Ha | 933.37 |
| Basin Slope | m/m | 0.28 |
| Basin Length | m | 4861.66 |
| Basin Perimeter | m | 20648.88 |




Gambar IV-18 Peta Daerah Tangkapan Hujan Area Sungai pada Lokasi Penimbunan Kembali

**Estimasi Debit Puncak**

Berdasarkan luas dan karakteristik area tangkapan, kemudian ditentukan debit puncak banjir rencana dengan periode ulang 100 tahun. Berdasarkan hasil perhitungan, didapatkan debit banjir rencana pada periode ulang 100 tahun ($Q_{100}$) sebesar 466,31 $m^3/s$, dengan area dan waktu konsentrasi diperlihatkan pada **Tabel IV-19**. Hasil debit puncak rencana ini kemudian digunakan sebagai *input* pada analisis genangan banjir.

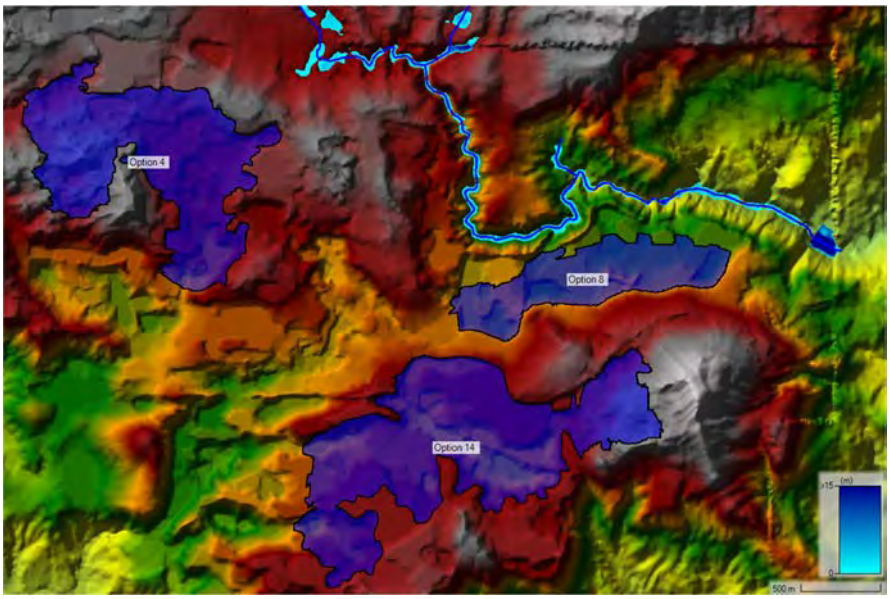
Tabel IV-19 Estimasi Debit Puncak Area Tangkapan Sungai pada Periode Ulang 100 tahun

| Name | Unit | C_RIVER |
|---|---|---|
| Runoff Coefficient (C) | | 0.65 |
| Rainfall Intensity (I) | mm/hour | 276.70 |
| Area (A) | Ha | 933.37 |
| Time of concentration (Tc) | Minutes | 12.49 |
| Flowrate (Q) | $m^3/s$ | 466.31 |

**Estimasi Genangan Banjir**

Simulasi genangan banjir dibuat berdasarkan model hidrolika sederhana dari kondisi hidrologi prediksi. Model hidrolika pada studi ini dibuat untuk mempelajari fungsi dan respon dari debit rencana yang mungkin terjadi. Model yang dibuat adalah model basis sel geografis (*dirichlet tesselation*) yang digunakan untuk menggambarkan kondisi daratan (*upland*) dan saluran (*channel*). Parameter input berupa morfologi dan debit rencana. Idealnya analisis hidrologi-hidrolika membutuhkan data dari debit sungai secara kontinu (*time series*). Pada kasus ini, analisis debit puncak dihitung melalui pendekatan model hujan-debit (*rainfall-runoff*), dan analisis hidrolika menggunakan model *steady flow*. Analisis hidrolika dilakukan untuk memperkirakan ketinggian air banjir secara umum, dengan fokus area pada dampak banjir di sekitar lokasi area penimbunan. Karena tidak ada data geometri sungai dan debit yang memadai, model ini akan memiliki hasil dan akurasi yang terbatas. Kalibrasi model tidak dilakukan dalam studi ini karena tidak ada data kontinu yang tersedia. Model ini hanya dibuat untuk mendapatkan gambaran tentang risiko awal potensi banjir pada Sub DAS di sekitar Area Penimbunan. Hasil level banjir air mungkin akan lebih tinggi dari yang seharusnya (over estimasi). Pembaruan model dapat dan seharusnya dilakukan menggunakan pembaruan data dengan memantau aliran dan ketinggian level muka air dari sungai.

Bentuk skematik pemodelan dibangun berdasarkan geometri sungai hasil potongan melintang data dari perkiraan berdasarkan data topografi (DEM). Kondisi batas (boundary conditon) menggunakan *normal depth*, dengan kemiringan sungai diasumsikan dan disederhanakan sebesar 0.27 persen. Hasil area dan ketinggian genangan banjir rencana periode ulang 100 tahun dapat dilihat pada **Gambar IV-19**. Berdasarkan hasil deliniasi, tinggi genangan banjir mencapai 15 meter pada area tertentu dan rata-rata berada di bawah 5 meter dengan sebaran banjir secara umum berada pada area di sekitar sungai. Area penimbunan kembali (*backfill*) tampak tidak terdampak oleh banjir.

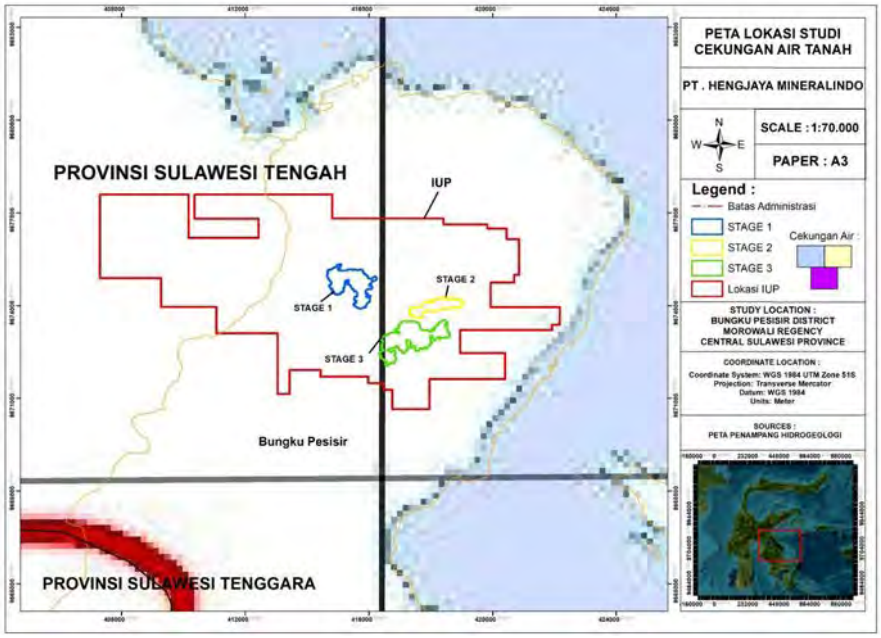



Gambar IV-19 Hasil Simulasi Model Genangan Banjir pada Lokasi Penimbunan

# V. ANALISIS HIDROGEOLOGI

## V.1 Hidrogeologi Regional

Berdasarkan Peta Cekungan Air Tanah Provinsi Sulawesi Tenggara, daerah penelitian tidak terletak pada Cekungan Air Tanah yang potensial (**Gambar V-1**). Secara regional, air tanah di daerah perbukitan umumnya terdapat pada batuan saprolit dan/atau batuan rekahan dengan kandungan air tanah yang relatif kecil. Cadangan air tanah di daerah ini umumnya rendah dan tidak ekonomis. Muka air tanah di daerah ini diperkirakan mengikuti topografi daerah studi, dimana muka air tanah berada di lembah atau dekat sedangkan di daerah perbukitan muka air tanah lebih dalam.

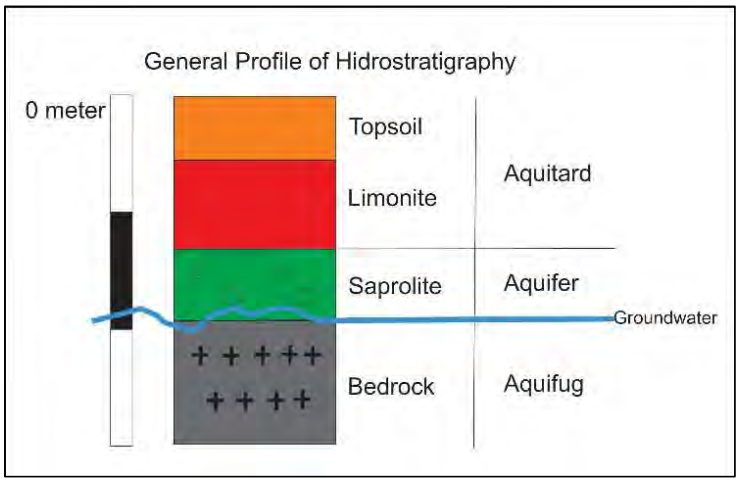



Gambar V-1 Peta Cekungan Air Tanah Area Studi

## V.2 Hidrostratigrafi

Secara umum sistem hidrogeologi di daerah penelitian dan sekitarnya didominasi oleh sistem air tanah laterit dan ultramafik. Berdasarkan Peta Geologi Lembar Bungku, daerah penelitian

memiliki empat formasi: Endapan Aluvial, Formasi Tomata, Kompleks Ultramafik, dan Formasi Tokala. Daerah penelitian sebagian besar terletak di Formasi Tokala, yang sebagian besar terdiri dari lempung berpasir. Data pemboran menunjukkan bahwa daerah penelitian menunjukkan sistem hidrogeologi batuan terbatas yang terdiri dari dua jenis media akifer, yaitu media akifer berpori yang merupakan bagian dari batuan beku dan media lapisan rekahan yang dikontrol oleh struktur di dalam daerah penelitian. Lapisan akifer diyakini melapisi sebagian besar sistem ini, tersebar hampir di seluruh permukaan. Batuan dasar di daerah penelitian ini adalah saprolit yang berfungsi sebagai lapisan akifer. Gambaran konseptual sistem hidrostratigrafi di daerah penelitian dapat dilihat pada Gambar V-2.




Gambar V-2 Konseptual Hidrostratigrafi Area Studi

## V.3 Data Muka Airtanah

Sebanyak 80 data muka airtanah yang diamati di wilayah studi digunakan untuk data model. Pengukuran kedalaman muka airtanah dilakukan pada lokasi sumur pantau yang telah dikonstruksi, ex. Lubang bor geoteknik dan ex. Lubang bor eksplorasi dengan data diperlihatkan pada **Tabel I-7** dan sebaran lokasi pengukuran diperlihatkan pada **Gambar I-6**. Kedalaman muka airtanah pada lokasi area DSTF sekitarnya cukup dangkal dengan rentang nilai dari 3 hingga 42 meter atau pada elevasi 291 hingga 545 masl. Namun untuk data yang digunakan dalam kalibrasi, hanya dari sumur yang terkonstruksi dengan posisi screen yang telah terdefinisikan.

## V.4 Model Hidrogeologi

### V.4.1 Konseptual Model

Model hidrogeologi dibuat untuk mengetahui kondisi muka airtanah di lokasi penambangan, memprediksi perubahan pola aliran airtanah, dan memprediksi muka airtanah di masa mendatang terkait dengan kegiatan penambangan. Model aliran airtanah dirancang untuk mendapatkan gambaran perubahan pola aliran airtanah antara kondisi eksisting dan penambangan. Beberapa pendekatan dan asumsi yang digunakan dalam model aliran, antara lain:

- Simulation menggunakan metode *finite difference*
- Airtanah dianggap sebagai satu sistem besar dengan koneksi hidrolik melalui media rekahan
- Input awal parameter hidrolik (K) menggunakan data hasil pengujian lapangan, laboratorium dan literatur, serta penyesuaian nilai parameter hidrolik (K) dilakukan selama proses kalibrasi model.
- Parameter hidrolik lainnya (storativitas, porositas efektif, specific yield dan lainnya) diasumsikan berdasarkan literatur dan merupakan bentuk ketidakpastian
- *Initial head* dibuat berdasarkan hasil dari interpolasi pengukuran muka airtanah di lapangan
- Kalibrasi model dilakukan di kondisi tunak (*steady state)*, menggunakan data elevasi airtanah yang diambil dari pengukuran lapangan pada sumur pantau yang terkonstruksi (*piezometer*).
- Model kondisi tunak (*steady state*) dibuat untuk memverifikasi model fisik. Model *transient* yang terkalibrasi kemudian dibuat untuk mengetahui potensi persebaran kontaminan menggunakan kemungkinan yang paling buruk serta pola perubahan kontur air tanah.

### V.4.2 Dimensi Model Fisik

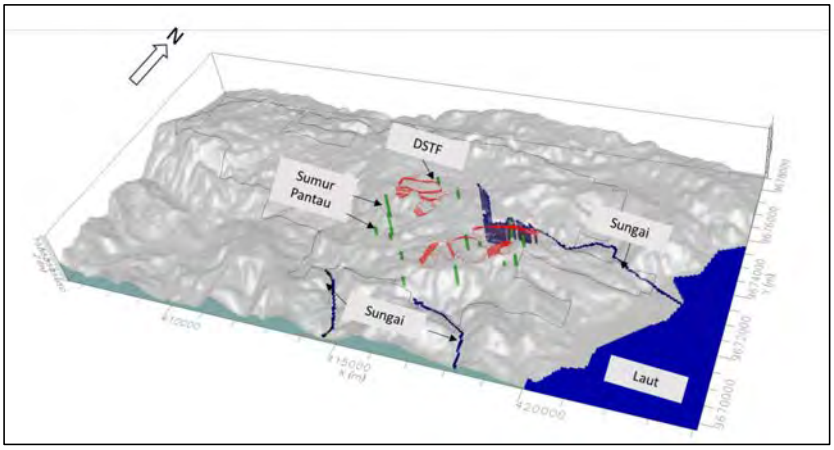
Model hidrogeologi dibuat dengan dimensi mengikuti lokasi IUP, yaitu 17,6 km dari timur ke barat dan 8,7 km dari utara ke selatan, dengan luas area 153,12 km$^2$. Model dibuat lebih luas dari *area of interest* agar dapat melihat pola aliran airtanah secara lebih luas. Model ini menggunakan ukuran grid 50 m x 50 m. Dimensi dan ukuran grid model fisik dapat dilihat pada **Tabel V-1**.

Tabel V-1 Dimensi dan Ukuran Model FIsik

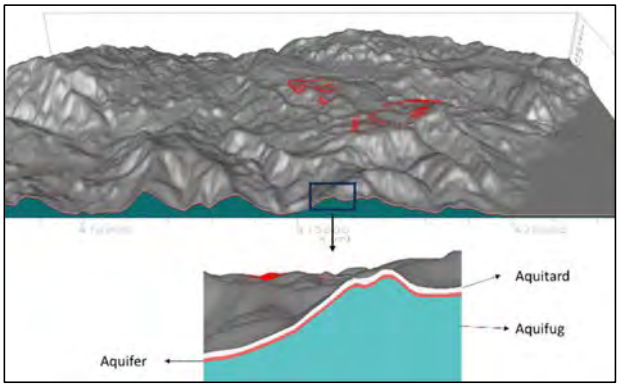
| Dimensi Model | | | Jarak (m) | Ukuran Grid (m) | Jumlah Grid |
|---|---|---|---|---|---|
| *Easting (column)* | Min | 406500 | 17.600 | 50 | 352 |
| | Max | 424100 | | | |

| Dimensi Model | | | Jarak (m) | Ukuran Grid (m) | Jumlah Grid |
|---|---|---|---|---|---|
| *Northing (row)* | Min | 9669800 | 8.700 | 50 | 174 |
| | Max | 9678500 | | | |
| Elevation (layer) | Min | -50 | - | - | 3 |
| | Max | Topography | | | |

Aliran airtanah dimodelkan berdasarkan pendekatan hidrostratigrafi, dimana lapisan-lapisan yang terbentuk mengikuti hidrostratigrafi yang sama berdasarkan interpretasi data sumur bor, yang berarti setiap lapisan yang terbentuk akan memiliki nilai parameter hidraulik yang tertentu. Selanjutnya, data topografi digunakan sebagai batas permukaan tanah dalam pemodelan. Bentuk fisik model dapat dilihat pada **Gambar V-3**.



(a)




(b)

Gambar V-3 Model Hidrogeologi 3 Dimensi Area Studi (A) Model Hidrogeologi 3 Dimensi Area Studi dengan Boundaries (Vertical Exaggeration 2)

### V.4.3 Parameter Hidrolik dan Kondisi Batas

Data konduktifitas hidrolik yang dipakai disekitar rencana pengajuan DSTF diambil berdasarkan uji lapangan berupa falling head test dan laboratorium dari sampel core batuan sedangkan parameter lainnya diambil dari literatur. Properti hidrolik yang digunakan pada model dirangkum pada **Tabel I-3** yang merupakan data input dari setiap layernya. Skema dan input parameter hidrolik pada model hidrogeologi dapat dilihat pada **Gambar V-3**.

Tabel V-2 Rangkuman input parameter hidrolik pada model

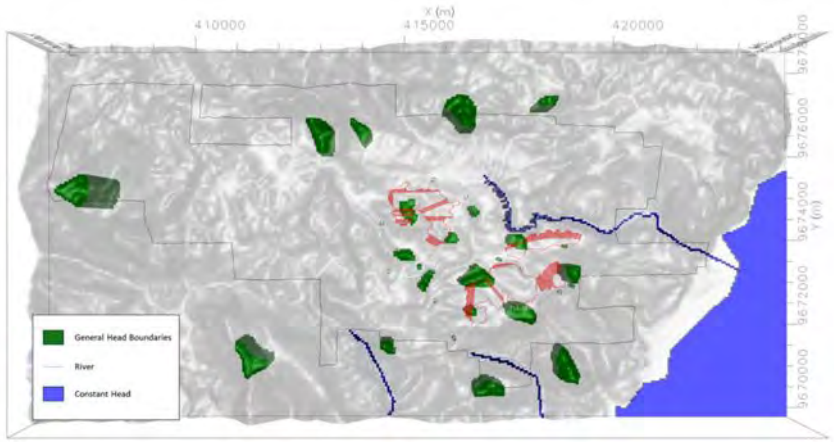
| Geological Unit | Hydro-stratigraphy | Kx = Ky | Kz | Classification and Assumption |
|---|---|---|---|---|
| | | m/s | m/s | |
| Limonite | Aquitard | $1x10^{-7}$ | $1x10^{-8}$ | Rata-rata hasil slugtest, uji lab, dan penyesuaian saat proses kalibrasi |
| Saprolite | Aquifer | $3x10^{-6}$ | $3x10^{-7}$ | |
| Bedrock | Aquifug | $1x10^{-9}$ | $1x10^{-10}$ | |
| Source/Literature | | Domenico & Schwartz, 1990; Slug-test dan Permeability test | | |

| Geological Unit | Hydro-stratigraphy | Ss | Classification and Assumption | Sy | Classification and Assumption | Effective Porosity | Total Porosity | Classification and Assumption |
|---|---|---|---|---|---|---|---|---|
| | | $m^{-1}$ | | | | | | |
| Limonite | Aquitard | 1 x $10^{-5}$ | Dense Sand | 0.33 | Sand, fine | 0.25 | 0.49 | Sand, fine |
| Saprolite | Aquifer | | | | | | | |

| Geological Unit | Hydro-stratigraphy | Ss $m^{-1}$ | Classification and Assumption | Sy | Classification and Assumption | Effective Porosity | Total Porosity | Classification and Assumption |
|---|---|---|---|---|---|---|---|---|
| Bedrock | Aquifug | | | | | | | |
| Source/Literature | | Domenico & Mifflin, 1965 | | Morris & Johnson, 1967 | | | | |

**Boundary Condition**

Penyesuaian secara ilmiah dilakukan salah satunya berupa kondisi batas yang digunakan di model. Sungai yang berada pada daerah penelitian menjadi salah satu kondisi batas di permukaan dan mempunyai konektifitas hidrolik dengan aquifer. Untuk "mengisi" kekosongan data muka airtanah. General Head Boundary digunakan mengikuti bentuk topografi, sementara laut menjadi *constant head*. Skema kondisi batas dapat dilihat pada model airtanah pada **Gambar V-4**.




Gambar V-4 Kondisi Batas Area Studi

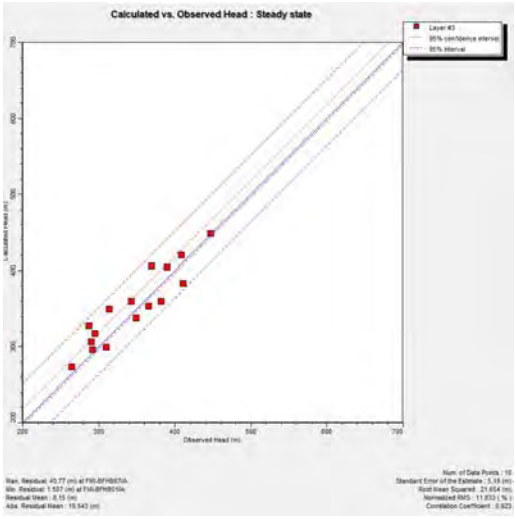
### V.4.4 Model Steady / Kalibrasi Model

Kalibrasi model adalah modifikasi data masukan model dengan tujuan memastikan model sesuai dengan nilai yang diamati (misalnya *head* dan aliran). Kalibrasi model diperlukan untuk memastikan bahwa properti, asumsi, dan metodologi yang digunakan mendekati kondisi lapangan. Model awalnya dikalibrasi berdasarkan kondisi tunak (*steady state*) yang menggambarkan pemodelan hidrogeologi pada kondisi awal. Keadaan tunak (*steady state*) adalah keadaan dimana jumlah airtanah yang masuk (*recharge*) sama dengan jumlah airtanah

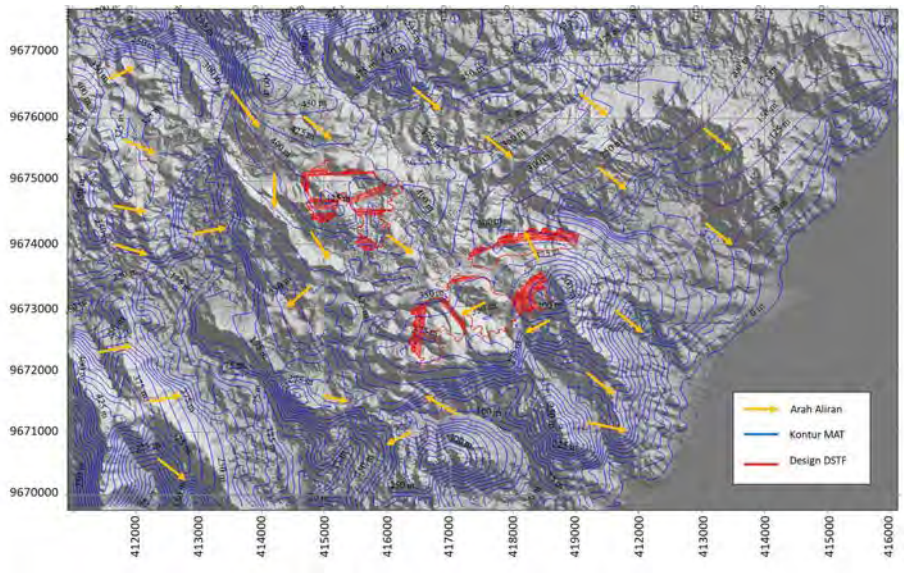
yang keluar (*discharge*). Simulasi pada kondisi ini bertujuan untuk mendapatkan gambaran model fisik yang telah mendekati kondisi sebenarnya.

Grafik kalibrasi antara model dengan data terukur ditunjukkan pada **Gambar V-5** yang merupakan grafik kalibrasi model pada kondisi *steady* yang membandingkan kondisi model (yang dihitung) dengan kondisi lapangan (yang diamati). Model kalibrasi menunjukkan koefisien korelasi sebesar 0,9, dengan standar kesalahan estimasi sebesar 8,15 m. Hal ini menggambarkan bahwa kondisi yang dimodelkan cukup dekat dengan kondisi lapangan dan dapat digunakan untuk memprediksi perubahan head pada kondisi transient dengan perubahan aliran airtanah.

Kontur muka airtanah hasil model *steady* merepresentasikan kondisi muka airtanah eksisting. **Gambar V-6** menunjukkan kontur muka airtanah kondisi eksisting dengan elevasi muka airtanah berada pada rentang 0-725 masl dengan pola aliran airtanah yang beragam. Untuk area disekitar rencana DSTF memiliki elevasi airtanah pada rentang elevasi 365 - 440 masl dengan pola aliran tanah yang memiliki *trend* mengalir dari utara ke selatan untuk DSTF-04 sementara untuk DSTF-08 dan DSTF-14 dari barat ke timur. Pola aliran airtanah ini selanjutnya akan digunakan untuk pemodelan transien untuk memodelkan perubahan airtanah dan kontaminan.




Gambar V-5 Kalibrasi model pada kondisi *steady*




Gambar V-6 Kontur dan arah aliran airtanah hasil pemodelan pada kondisi *steady / eksisting*

### V.4.5 Model Transient / Model Prediksi

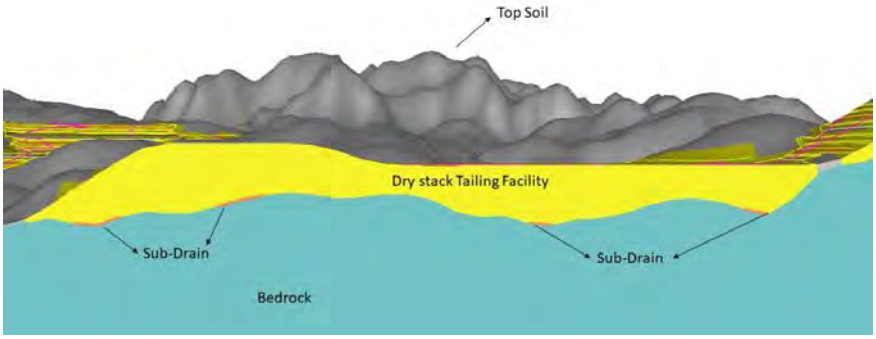
Setelah simulasi kondisi *steady* selesai, simulasi dilanjutkan dengan simulasi aliran transien. Simulasi ini memiliki perubahan topografi dan properti material yaitu material tailing. Penimbunan tailing pada area DSTF menjadi dasar perubahan.

Terdapat 2 simulasi yang dijalankan pada model transient untuk mengetahui kondisi airtanah yaitu:

1. Kondisi setelah Paska Tambang dan menggunakan kontur akhir tambang
2. Kondisi setelah penempatan tailing (DSTF) dengan topografi desain final

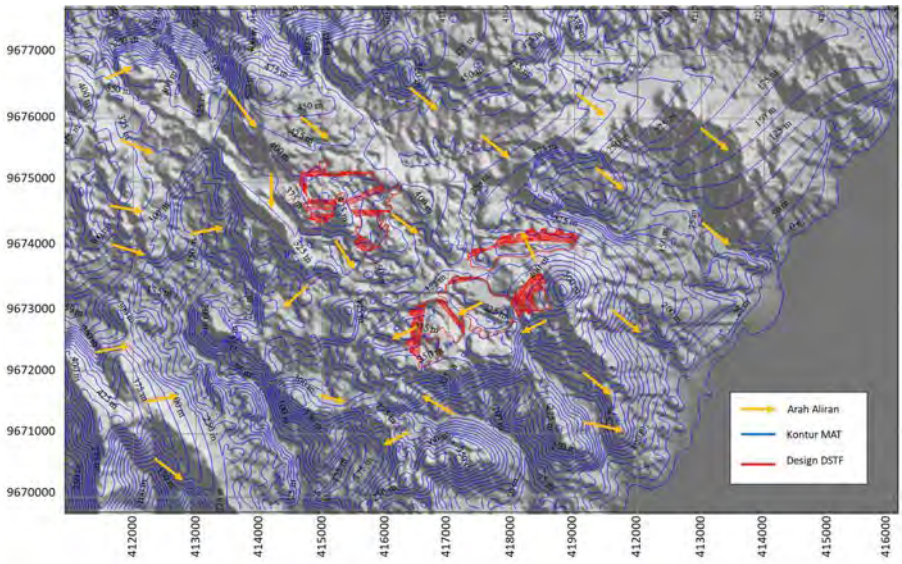
Kondisi penempatan DSTF (**Gambar V-7**) ini mempunyai beberapa aspek yang dipertimbangkan pada model ini:

1. DSTF dibuat menjadi jenuh untuk melihat kemungkinan terburuk yang dapat terjadi
2. Terdapat layer tambahan untuk *subdrain* dengan konduktifitas hidraulik 1 x $10^{-5}$
3. Konduktifitas Hidraulik tailing sebesar 3 x $10^{8}$ m/s.

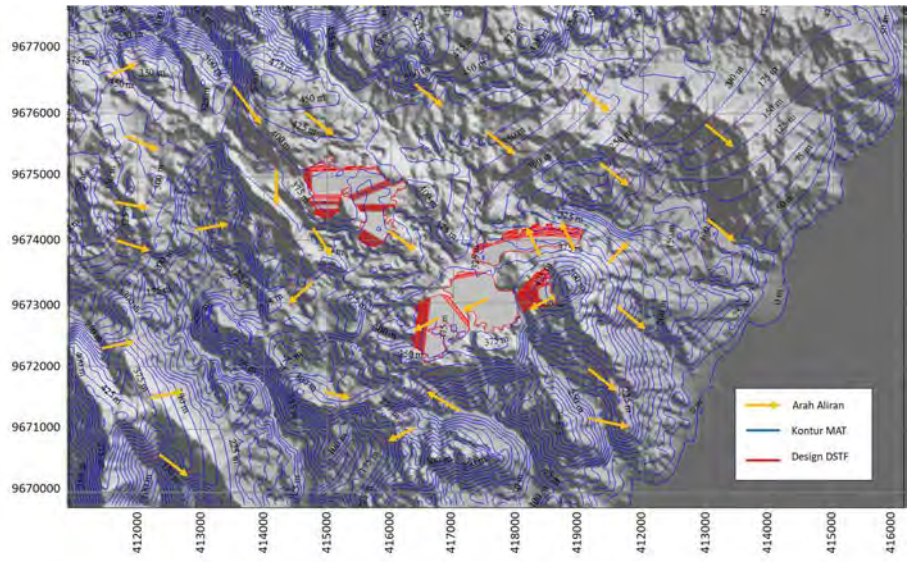



Gambar V-7 Skenario model pada kondisi topografi final DSTF

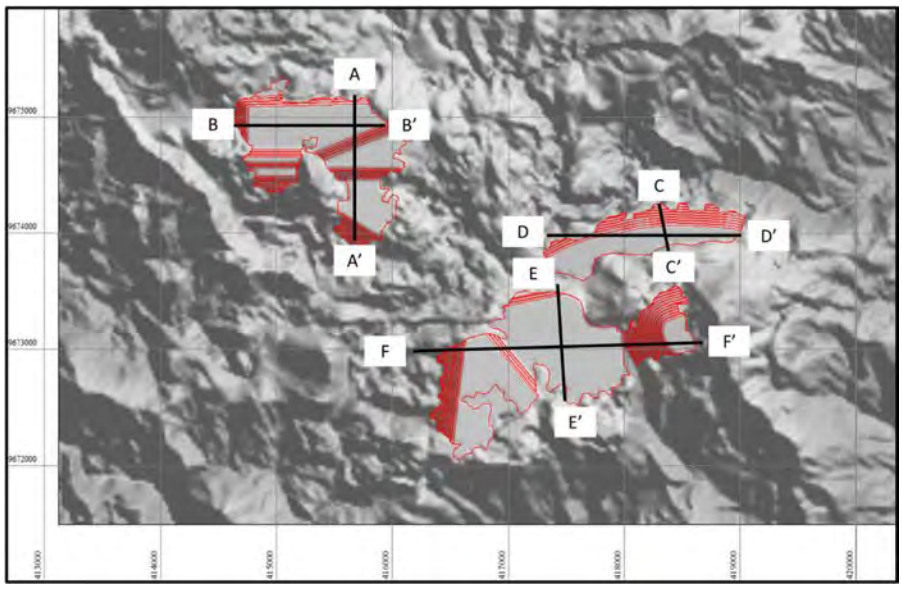
Berdasarkan hasil pemodelan, kondisi muka airtanah saat ini (**Gambar V-6**) dibandingkan dengan kondisi muka airtanah pada kondisi paska tambang (**Gambar V-8**) terlihat bahwa terjadi perubahan di beberapa lokasi dengan penurunan muka airtanah paling dalam mencapai 10 meter. Sedangkan, pada kontur muka airtanah pada simulasi dengan kondisi topografi final DSTF (**Gambar V-9**), terjadi perubahan pola aliran airtanah secara lokal, dimana perubahan hanya terjadi di area sekitar DSTF tanpa mengubah aliran airtanah secara regional. Pada simulasi DSTF, airtanah naik mendekati posisi MAT natural. Muka airtanah mengalami kenaikan pada area rencana DSTF disebabkan oleh perubahan topografi setelah akhir tambang tetapi tidak naik secara signifikan. Hal ini diduga karena lapisan DSTF memiliki permeabilitas dan kemampuan menyimpan air yang rendah sehingga kenaikan muka airtanah minim. *Cross section* muka airtanah pada masing-masing model dapat dilihat pada **Gambar V-11** hingga **Gambar V-16** dengan peta lokasi *cross section* pada **Gambar V-10**.



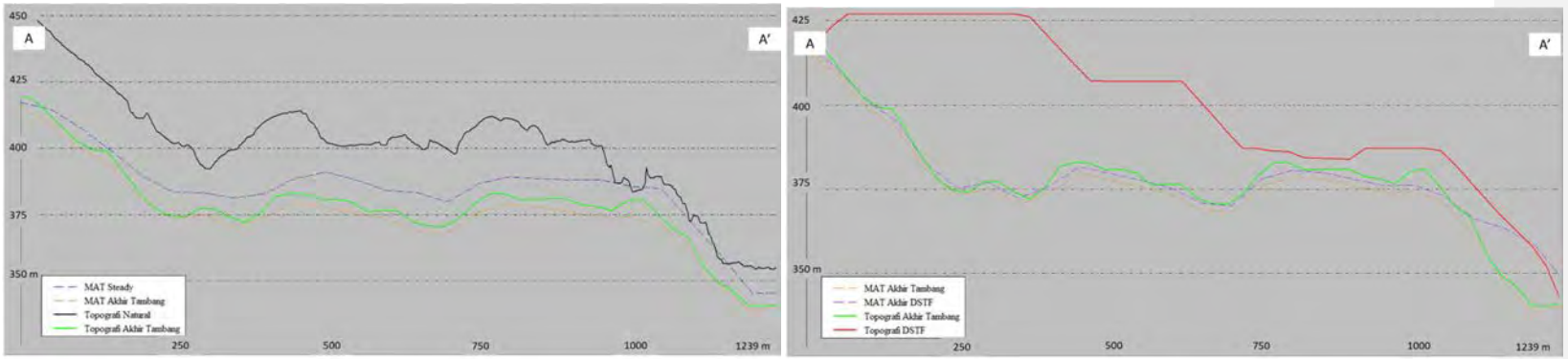

Gambar V-8 Peta Muka Airtanah Kondisi Akhir Tambang



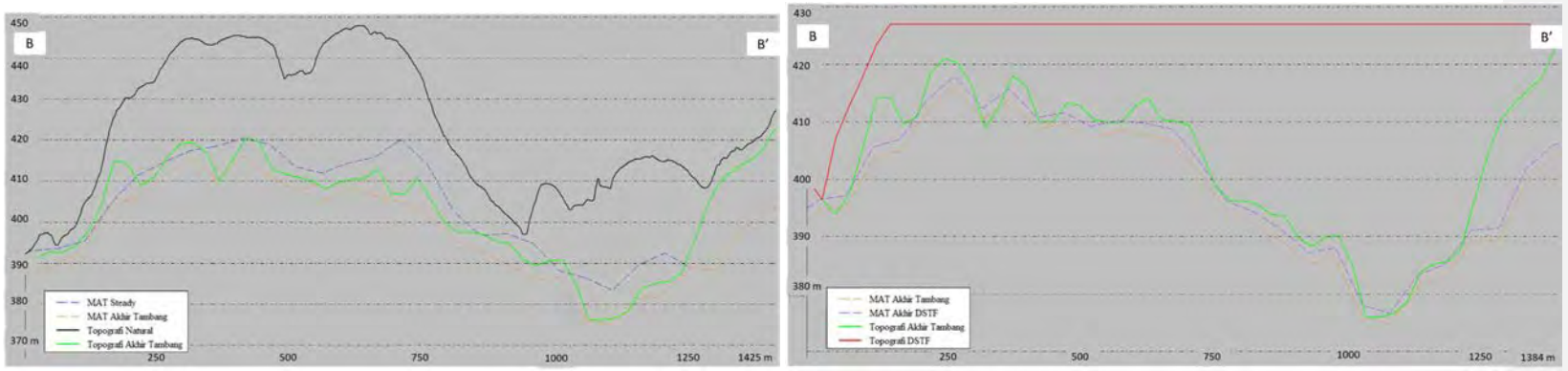

Gambar V-9 Peta Muka Airtanah dengan DSTF



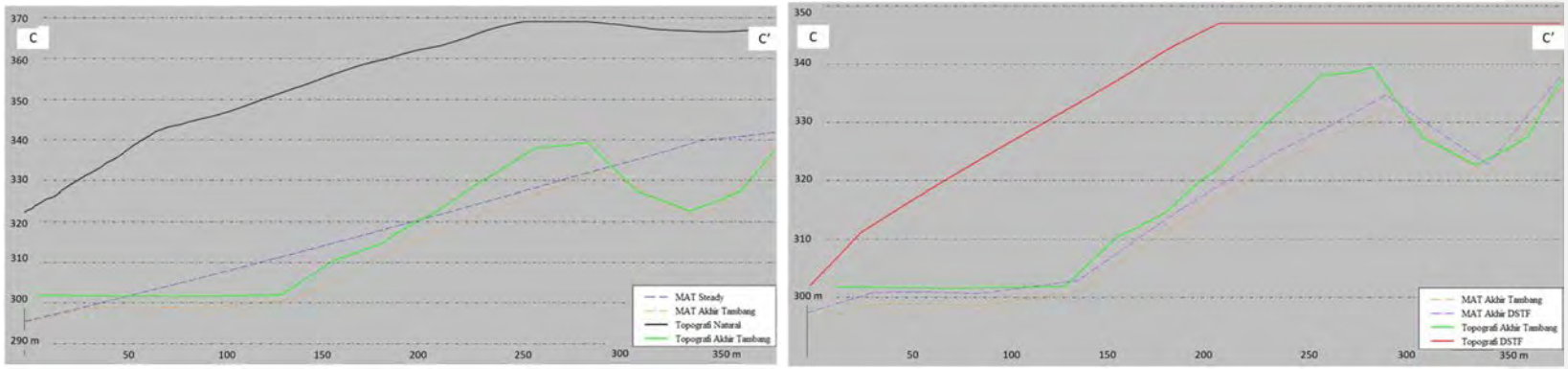

Gambar V-10 Peta Lokasi Cross Section



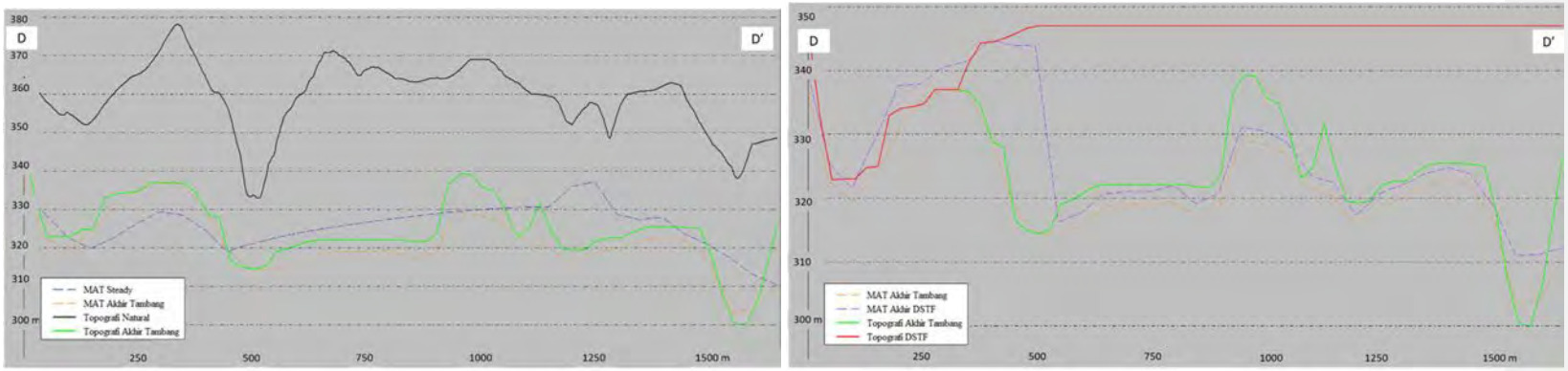

Gambar V-11 Cross Section A-A' Kondisi (kiri) Natural dan Akhir Tambang ; (kanan) Akhir Tambang dan Design DSTF



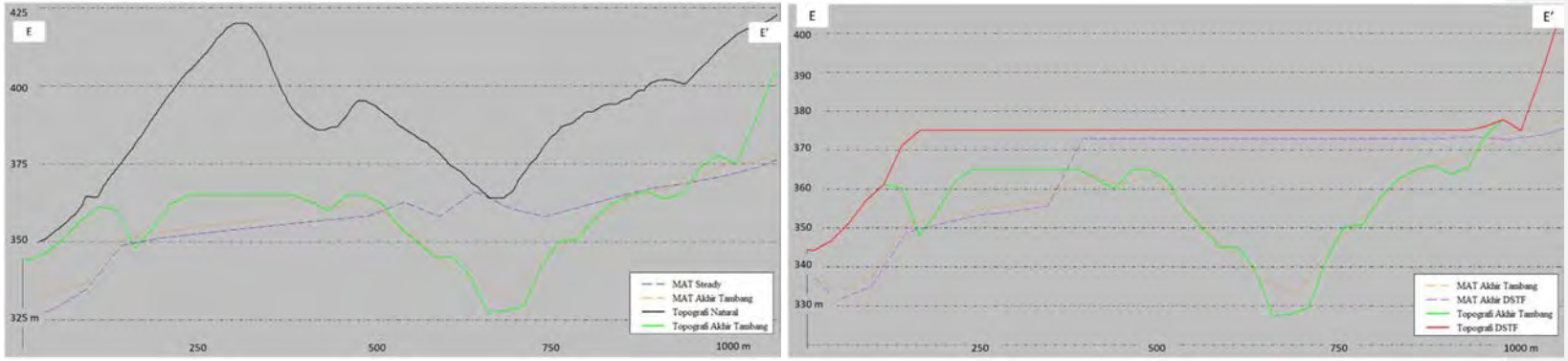

Gambar V-12 Cross Section B-B' Kondisi (kiri) Natural dan Akhir Tambang ; Akhir Tambang dan Design DSTF



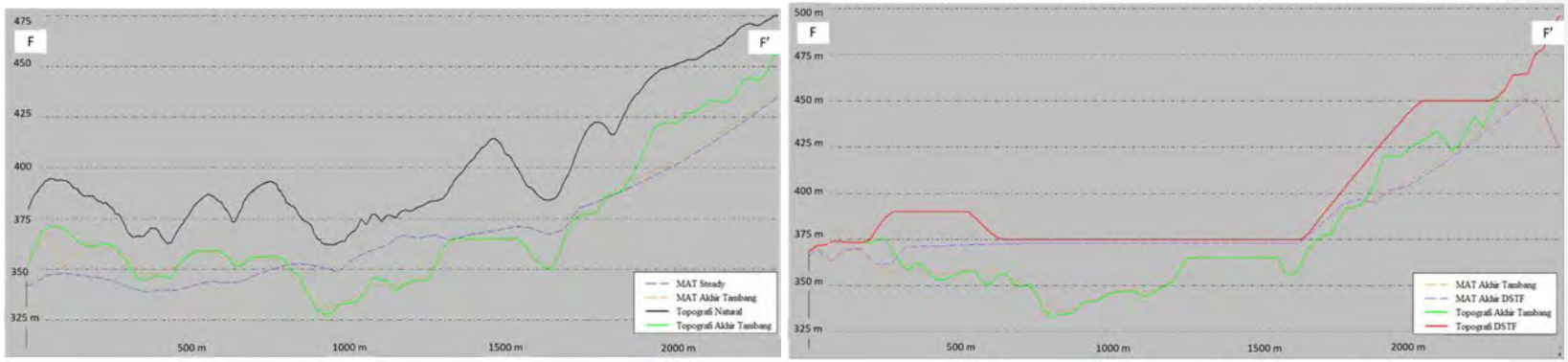

Gambar V-13 Cross Section C-C' Kondisi (kiri) Natural dan Akhir Tambang ; (kanan) Akhir Tambang dan Design DSTF




Gambar V-14 Cross Section D-D' (kiri) Kondisi Natural dan Akhir Tambang ; (kanan) Akhir Tambang dan Design DSTF




Gambar V-15 Cross Section E-E' Kondisi (kiri) Natural dan Akhir Tambang ; (kanan) Akhir Tambang dan Design DSTF




Gambar V-16 Cross Section F-F' Kondisi (kiri) Natural dan Akhir Tambang ; (kanan) Akhir Tambang dan Design DSTF

### V.4.6 Model Transport Kontaminan

Secara umum, tujuan pemodelan transportasi zat terlarut adalah untuk memberikan pemahaman yang lebih baik mengenai potensi dan dampak kontaminasi terhadap airtanah yang bersumber dari lokasi DSTF. Analisis transport kontaminan dilakukan untuk memprediksi dampak dari kontaminan jika terjadi resiko kebocoran dari DSTF dan memperkirakan seberapa jauh potensi kontaminan dapat menyebar. Model dibuat dengan area yang lebih luas dari DSTF dan dimodelkan untuk 100 tahun ke depan.

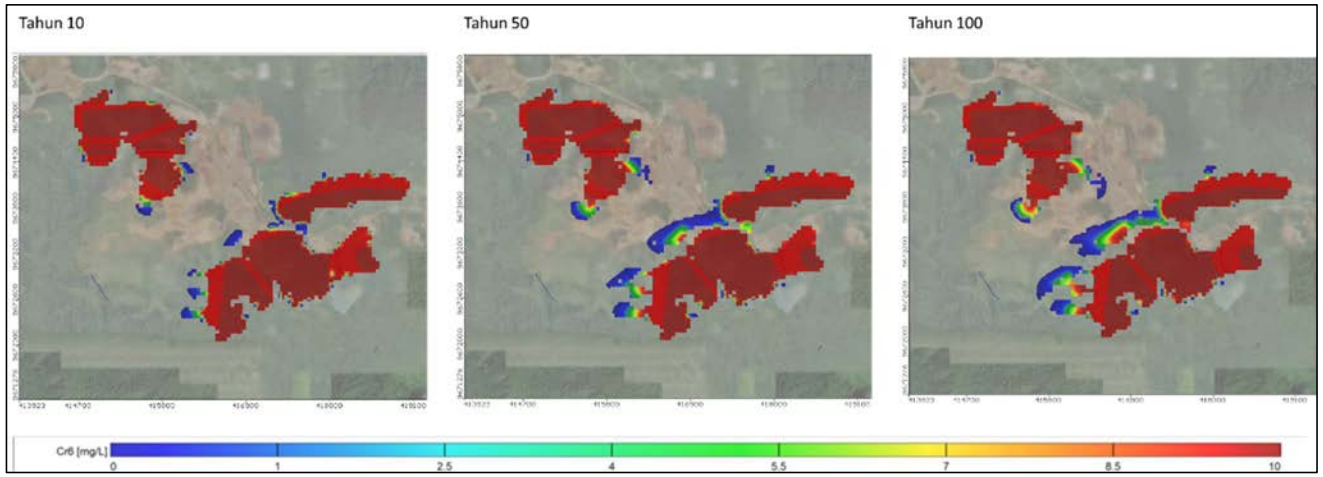
Kalibrasi kuantitatif model tidak dilakukan karena kurangnya data kualitas kontaminan potensial yang tersedia untuk kalibrasi model. Simulasi transport zat terlarut tidak akurat secara kuantitatif dalam hal ini, namun penggunaan model numerik untuk mensimulasikan radius pengaruh transport kontaminan dengan tujuan memperoleh gambaran pergerakan kontaminan dan radiusnya dimungkinkan. Simulasi transport menggunakan kode MT3DMS digunakan untuk membangun model transport zat terlarut.

**Parameter Transport dan Kriteria solusi numerik**

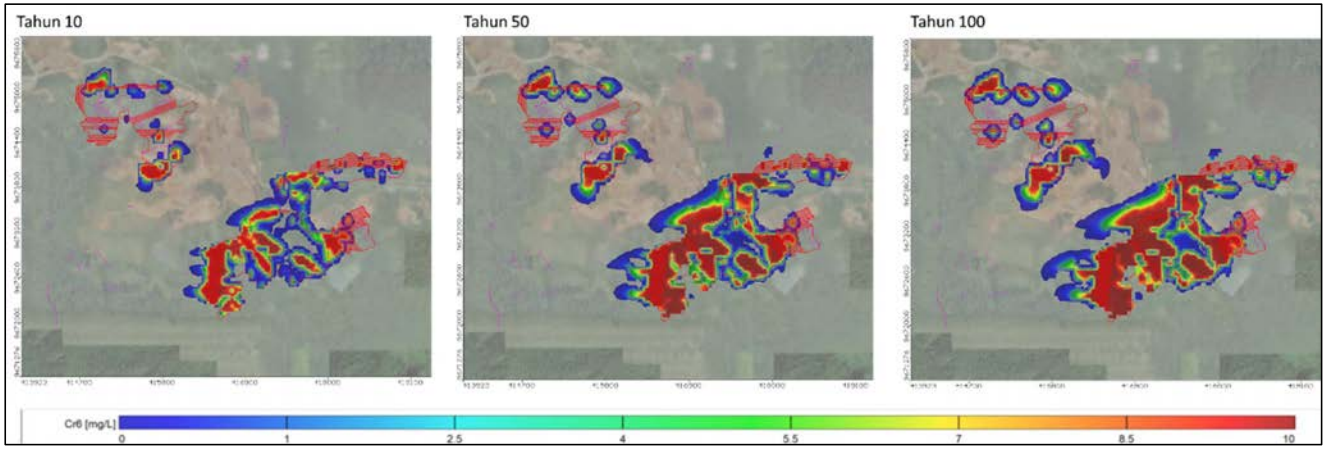
Model kontaminan transport dibuat dari 5 layer (**Gambar V-7**), dimana layer 1 Dry Stack pada DSTF yang memiliki litologi semula limonit , Layer 2 sub drain pada DSTF ,dan layer 3 bagian bawah DSTF pada litologi semula saprolite, layer 4 dan 5 adalah lapisan bedrock.

Model menggunakan design DSTF yang disesuaikan dengan design akhir paska tambang. Parameter kontaminan yang dicantumkan berupa Chromium Hexavalent [Cr(VI)] dengan konsentrasi merujuk pada skenario yang terburuk. Kontaminan tersebut diasumsikan memiliki *constant concentration* dan *recharge concentration* dengan nilai 10 mg/L. Konsentrasi awal dari model dibuat dengan nilai 0 mg/L. Simulasi ini dibuat sepanjang 100 tahun dengan output di tahun ke 10, 50, dan 100.

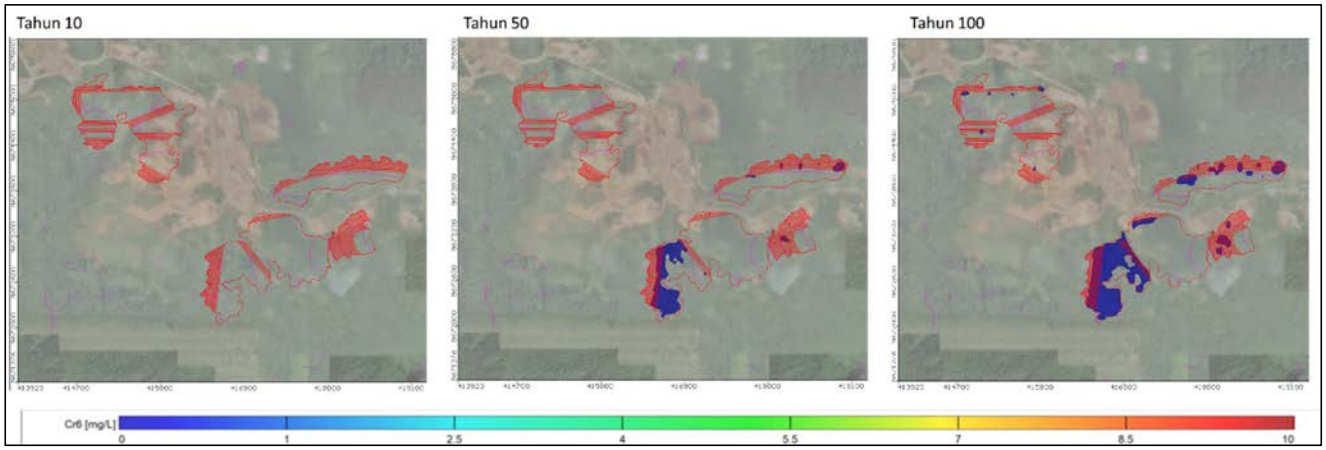
Hasil tampak atas pemodelan transport kontaminan dibagi menjadi 3 rentang waktu yaitu 10,50, dan 100 tahun. Arah aliran kontaminan cenderung mengikuti arah pola aliran airtanah yang mengalir dari timur laut ke arah barat daya. Jarak terjauh persebaran mencapai 200 meter. Hasil tampak atas pemodelan transport kontaminan chromium layer 1, 2 dan 3 dapat dilihat pada **Gambar V-17** hingga **Gambar V-19** dengan sebaran secara vertikal diperlihatkan pada *cross-section* **Gambar V-21** hingga **Gambar V-25**.



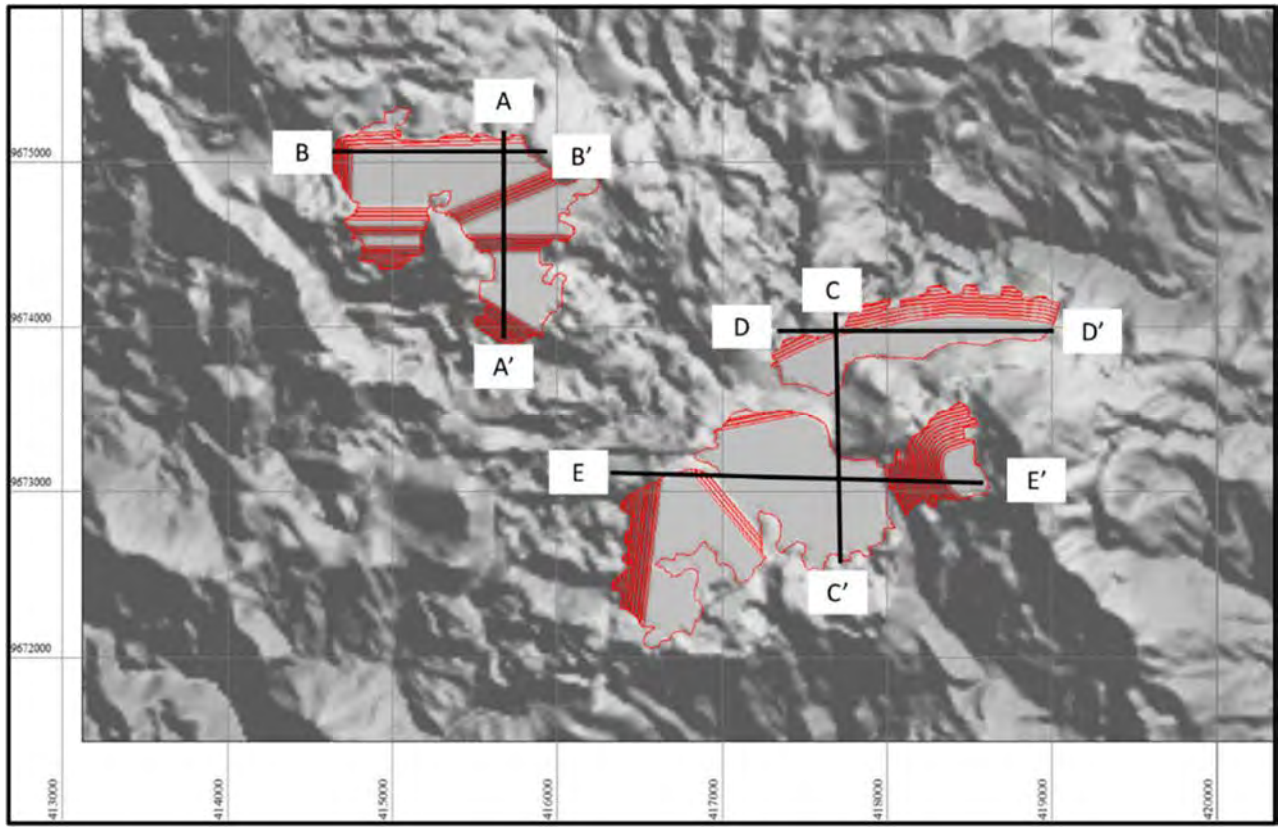

Gambar V-17 Persebaran Kontaminan Chromium VI di Layer 1



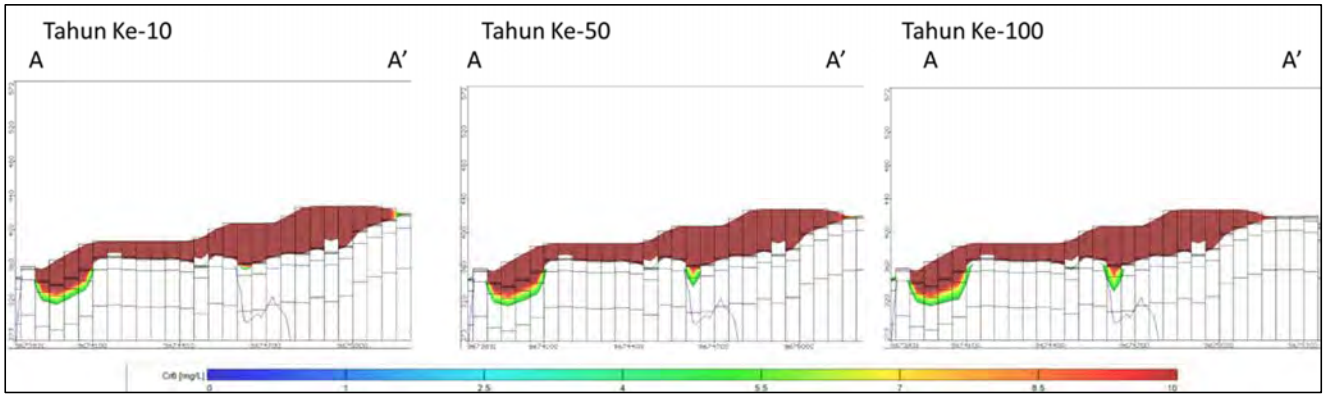

Gambar V-18 Persebaran Kontaminan Chromium VI di Layer 3



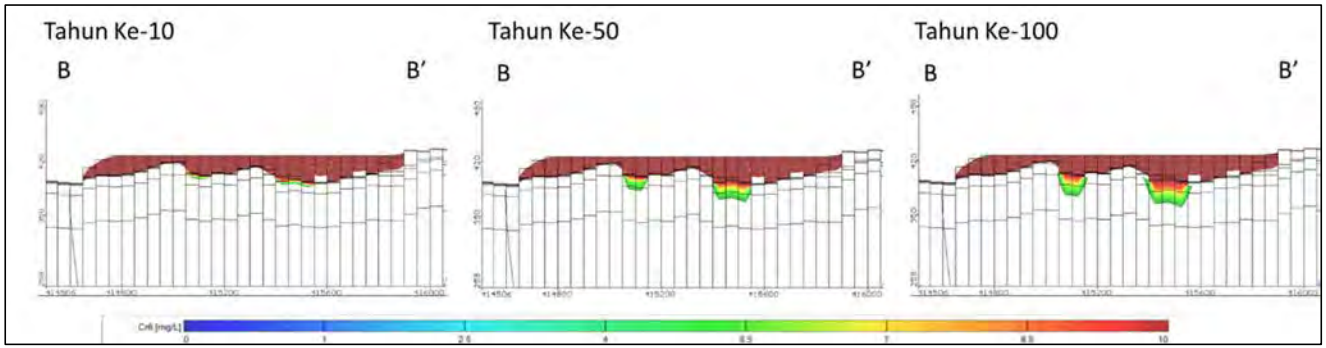

Gambar V-19 Persebaran Kontaminan Chromium VI di  Layer 5



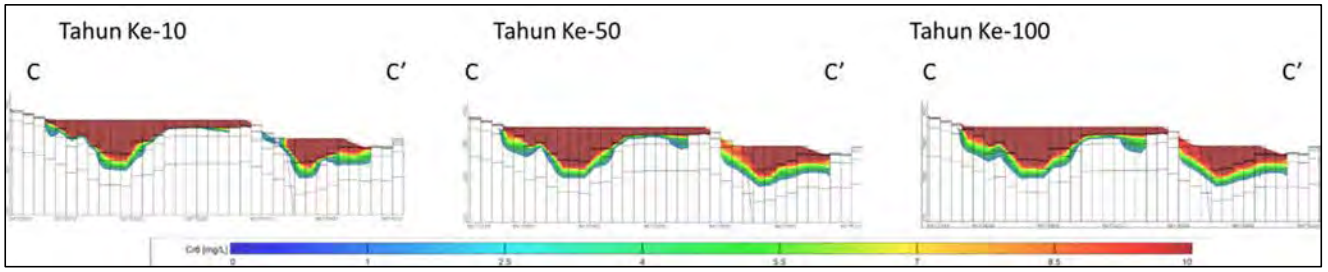

Gambar V-20 Peta Lokasi Cross Section Kontaminan



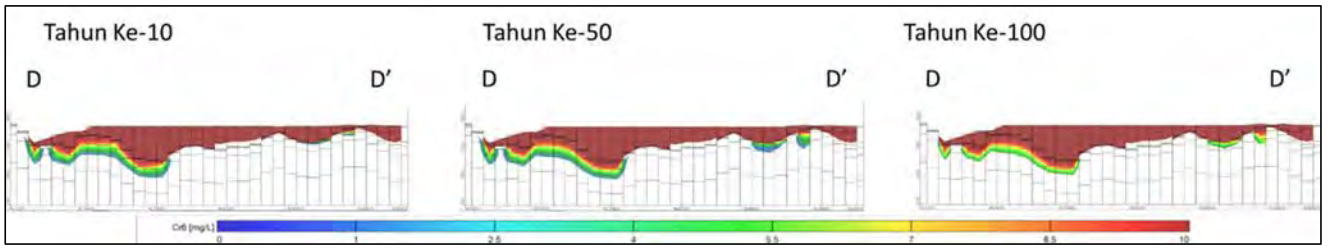

Gambar V-21 Cross Section A-A' (DSTF-04) Tahun 10,50, dan 100



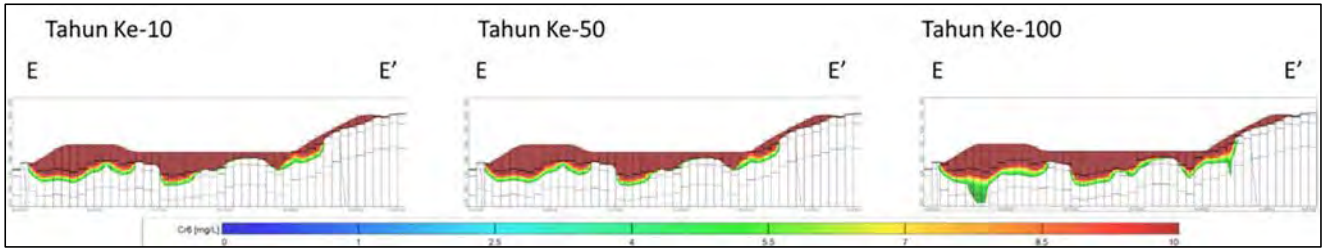

Gambar V-22 Cross Section B-B' (DSTF-04) Tahun 10,50, dan 100




Gambar V-23 Cross Section C-C' (DSTF-08 dan DSTF 14) Tahun 10,50, dan 100




Gambar V-24 Cross Section D-D' (DSTF-08)Tahun 10,50, dan 100




Gambar V-25 Cross Section E-E' (DSTF-14) Tahun 10,50, dan 100

# VI. ESTIMASI KUANTITAS PERKOLASI *LEACHATE*

Pembentukan lindi terutama disebabkan oleh air yang merembes melalui endapan tailing. Setelah bersentuhan dengan tailing, air yang merembes menjadi terkontaminasi, dan jika kemudian mengalir keluar dari deposit tailing, itu disebut lindi.

Tailing yang keluar dari filter press akan ditempatkan di area DSTF dan memiliki kadar air sekitar 20%. DSTF akan memiliki potensi lindi sebagai cairan yang menyusup melalui tumpukan tailing. Leachates terbentuk dari cairan yang masuk ke area tumpukan kering dari sumber luar, seperti Subdrainase permukaan, air hujan, dan sumber eksternal lainnya. Kualitas dan kuantitas lindi tergantung pada banyak faktor, antara lain karakteristik dan komposisi tailing, iklim, kondisi kelembaban di DSTF, dan umur DSTF.

Hydrologic Evaluation of Landfill Performance (HELP) digunakan untuk memperkirakan efek komponen DSTF pada perkolasi leachete. Menurut USEPA, Model HELP merupakan metode yang banyak digunakan untuk dapat memprediksi jumlah leachete dan menganalisis kesetimbangan air pada landfill atau sistem pembuangan limbah padat (Schroeder dkk., 1994). Model ini menggunakan parameter cuaca, tanah, dan data desain serta menggunakan solusi teknis yang memperhitungakan efek dari penyimpanan permukaan, runoff, infiltrasi, evapotranspirasi, pertumbuhan vegetasi, kelembaban tanah, Subdrainase lateral bawah permukaan, resirkulasi leachete, Subdrainase vertikal tidak jenuh, kebocoran melalui tanah, geo-membran, atau composite liner.

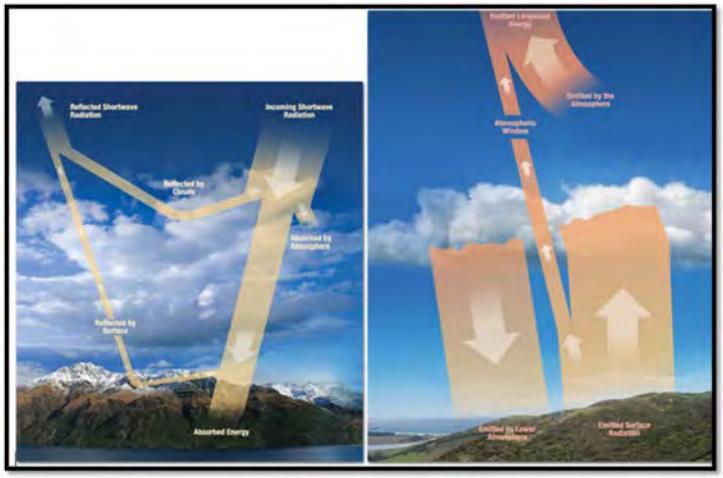
## VI.1 Data

### VI.1.1 Penyinaran Matahari

Sinar ultraviolet, cahaya tampak, dan sebagian gelombang infra merah secara kolektif disebut sebagai radiasi gelombang pendek (*shortwave radiation*). Sebagian dari radiasi ini dipantulkan oleh awan, sebagian diserap oleh atmosfer, dan sebagian diteruskan ke permukaan bumi. Partikel aerosol di atmosfer berinteraksi dan menyerap sebagain radiasi sehingga menyebabkan atmosfer menghangat. Panas yang dihasilkan oleh penyerapan ini dipancarkan sebagai radiasi infra merah gelombang panjang, dan sebagian memancar ke luar angkasa. Gambar skematik untuk kondisi ini ditunjukkan pada **Gambar VI-1**.

Solar radiation merupakan salah satu parameter masukan yang digunakan untuk memperkirakan laju evapotranspirasi dari permukaan DSTF. Solar radiation mengacu pada jumlah energi yang diterima dari matahari yang mencapai permukaan bumi. Energi ini dapat diserap oleh permukaan DSTF dan digunakan untuk menguapkan air dari permukaan, serta untuk mendorong proses transpirasi tumbuhan, dimana tumbuhan mengambil air dari tanah dan melepaskannya ke atmosfer. Solar radiation penting untuk penilaian kinerja DSTF, karena dapat berdampak signifikan pada laju evapotranspirasi dan jumlah air yang tersedia untuk infiltrasi ke lapisan tailing dan pembentukan lindi. Dalam simulasi model HELP, data yang

digunakan adalah data harian penjumlahan Net Shortwave Radiation Flux (nilainya positif, mengarah ke Bumi) Net Longwave Radiation Flux (nilainya negatif, keluar dari atmosfer Bumi) dan dari produk NASA MERRA-2 (Modern-Era Retrospective analysis for Research and Applications, Version 2) spesifik pada koordinat lokasi DSTF, dengan rentang waktu 1 Januari 2001 hingga 12 Desember 2023 (23 tahun), yang diresumekan dalam bentuk bulanan pada **Tabel VI-1**. Pengurangan antara *Longwave Radiation* dan *Shortwave Radiation* dilakukan untuk mendapatkan *Tolat Net Radiation*.




Gambar VI-1 Skematik Solar Radiation (Kiri: *Shortwave*, Kanan: *Longwave*)

Tabel VI-1 Rangkuman Data *Shortwave Radiation* MERRA-2, Tahun 2001 hingga 2023

| Tahun | Total Net Radiation, Bulanan (MJ/m²) | | | | | | | | | | | | Total Net Radiation, Tahunan (MJ/m²) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| 2001 | 538 | 541 | 593 | 535 | 697 | 655 | 613 | 553 | 465 | 385 | 497 | 598 | 6670 |
| 2002 | 535 | 536 | 537 | 539 | 681 | 733 | 587 | 545 | 372 | 347 | 418 | 465 | 6296 |
| 2003 | 573 | 486 | 546 | 613 | 647 | 571 | 619 | 583 | 420 | 416 | 460 | 604 | 6538 |
| 2004 | 568 | 548 | 539 | 577 | 569 | 643 | 584 | 463 | 382 | 392 | 439 | 516 | 6218 |
| 2005 | 564 | 559 | 501 | 631 | 756 | 603 | 711 | 624 | 409 | 469 | 488 | 605 | 6920 |
| 2006 | 570 | 527 | 553 | 570 | 723 | 710 | 557 | 590 | 424 | 421 | 414 | 488 | 6546 |
| 2007 | 583 | 478 | 519 | 535 | 614 | 687 | 622 | 645 | 432 | 434 | 537 | 541 | 6626 |
| 2008 | 580 | 576 | 549 | 614 | 750 | 691 | 755 | 728 | 521 | 505 | 490 | 632 | 7392 |
| 2009 | 570 | 519 | 526 | 559 | 627 | 627 | 645 | 487 | 378 | 484 | 507 | 538 | 6467 |
| 2010 | 593 | 397 | 511 | 565 | 627 | 681 | 713 | 661 | 525 | 498 | 490 | 598 | 6859 |
| 2011 | 576 | 522 | 573 | 578 | 747 | 702 | 696 | 578 | 545 | 432 | 489 | 577 | 7014 |
| 2012 | 558 | 487 | 560 | 518 | 701 | 708 | 723 | 566 | 434 | 472 | 453 | 549 | 6729 |
| 2013 | 579 | 498 | 562 | 611 | 625 | 626 | 736 | 575 | 460 | 426 | 485 | 596 | 6780 |

| Tahun | Total Net Radiation, Bulanan (MJ/m²) | | | | | | | | | | | | Total Net Radiation, Tahunan (MJ/m²) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| 2014 | 608 | 512 | 571 | 560 | 670 | 761 | 683 | 564 | 371 | 370 | 438 | 567 | 6675 |
| 2015 | 567 | 492 | 583 | 533 | 617 | 737 | 575 | 477 | 362 | 420 | 416 | 532 | 6310 |
| 2016 | 501 | 494 | 581 | 623 | 601 | 643 | 656 | 567 | 458 | 546 | 493 | 550 | 6712 |
| 2017 | 570 | 540 | 556 | 566 | 710 | 759 | 709 | 648 | 555 | 477 | 471 | 567 | 7127 |
| 2018 | 577 | 493 | 573 | 583 | 735 | 676 | 653 | 553 | 421 | 440 | 479 | 548 | 6731 |
| 2019 | 591 | 541 | 535 | 636 | 722 | 740 | 660 | 486 | 380 | 431 | 393 | 537 | 6652 |
| 2020 | 565 | 501 | 608 | 527 | 653 | 765 | 781 | 577 | 572 | 494 | 471 | 627 | 7141 |
| 2021 | 576 | 535 | 540 | 595 | 717 | 627 | 744 | 682 | 613 | 476 | 498 | 586 | 7188 |
| 2022 | 563 | 497 | 604 | 568 | 659 | 624 | 773 | 652 | 572 | 526 | 558 | 615 | 7210 |
| 2023 | 607 | 543 | 524 | 563 | 723 | 678 | 688 | 623 | 467 | 385 | 466 | 569 | 6836 |

### VI.1.2 Temperatur

Temperatur merupakan salah satu input yang digunakan untuk memperkirakan laju berbagai proses fisika dan kimia yang terjadi di dalam *backfill*. Secara khusus, temperatur digunakan untuk memperkirakan laju dekomposisi biologis limbah yang merupakan proses penting yang dapat menghasilkan panas, gas, dan *leachate* pada *backfill*. Tingkat dekomposisi dipengaruhi oleh berbagai faktor, termasuk temperatur *tailing* dan ketersediaan oksigen dan kelembaban. Model HELP memerlukan data suhu harian yang diperoleh berdasarkan *Average Surface Skin Temperature* dari MERRA-2 (*Modern-Era Retrospective analysis for Research and Applications, Version 2*) spesifik pada koordinat lokasi DSTF dengan rentang waktu 1 Januari 2001 hingga 31 Desember 2023 (23 tahun), yang diresumekan dalam bentuk bulanan pada **Tabel VI-2**.

Tabel VI-2 Rangkuman Data Temperatur MERRA-2, Tahun 2001 hingga 2023

| Tahun | Temperatur Rata-rata Tiap Bulan (°C) | | | | | | | | | | | | Temperatur Rata-rata Tahunan (°C) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| 2001 | 26.84 | 27.52 | 27.11 | 27.10 | 27.12 | 26.15 | 25.90 | 25.58 | 26.56 | 27.65 | 27.58 | 26.87 | 26.83 |
| 2002 | 27.05 | 27.21 | 27.05 | 27.28 | 27.10 | 26.53 | 25.92 | 25.64 | 26.51 | 28.02 | 28.39 | 28.16 | 27.07 |
| 2003 | 27.23 | 27.21 | 27.02 | 27.33 | 27.08 | 26.74 | 25.99 | 26.17 | 26.54 | 27.89 | 28.21 | 27.45 | 27.07 |
| 2004 | 27.13 | 27.48 | 27.76 | 27.59 | 27.17 | 26.53 | 25.70 | 25.36 | 26.39 | 27.88 | 28.51 | 28.00 | 27.12 |
| 2005 | 27.55 | 27.08 | 27.70 | 27.12 | 26.97 | 26.79 | 26.19 | 26.06 | 26.80 | 27.57 | 27.80 | 27.32 | 27.08 |
| 2006 | 27.53 | 27.26 | 27.30 | 27.07 | 27.04 | 26.21 | 25.78 | 25.32 | 26.01 | 26.84 | 27.93 | 28.27 | 26.88 |
| 2007 | 27.71 | 27.19 | 27.28 | 27.29 | 27.05 | 26.97 | 25.99 | 25.58 | 26.07 | 27.20 | 27.89 | 27.69 | 26.99 |
| 2008 | 27.45 | 27.36 | 26.92 | 26.87 | 26.67 | 26.06 | 25.66 | 25.30 | 26.14 | 27.14 | 27.43 | 27.03 | 26.67 |
| 2009 | 27.26 | 27.24 | 26.95 | 27.45 | 27.37 | 26.64 | 26.21 | 26.23 | 27.26 | 27.69 | 28.23 | 27.89 | 27.20 |
| 2010 | 27.55 | 28.05 | 27.83 | 28.01 | 27.78 | 27.10 | 26.60 | 26.30 | 26.94 | 27.16 | 27.74 | 27.41 | 27.37 |
| 2011 | 27.38 | 27.19 | 27.20 | 27.18 | 26.99 | 26.30 | 25.90 | 25.80 | 26.38 | 27.52 | 28.10 | 27.77 | 26.97 |
| 2012 | 27.23 | 27.40 | 27.35 | 27.41 | 27.03 | 26.42 | 25.67 | 25.44 | 26.42 | 27.52 | 28.10 | 27.80 | 26.98 |
| 2013 | 27.68 | 27.49 | 27.69 | 27.57 | 27.46 | 27.03 | 25.98 | 25.89 | 26.75 | 27.83 | 27.77 | 27.38 | 27.21 |
| 2014 | 27.44 | 27.29 | 27.40 | 27.68 | 27.37 | 26.82 | 26.21 | 25.87 | 26.36 | 27.46 | 28.31 | 27.74 | 27.16 |
| 2015 | 27.61 | 27.04 | 27.08 | 27.62 | 27.15 | 26.53 | 25.91 | 25.52 | 26.26 | 27.13 | 28.57 | 28.23 | 27.05 |
| 2016 | 28.24 | 27.84 | 27.97 | 27.88 | 28.24 | 27.22 | 26.71 | 26.45 | 27.20 | 27.52 | 28.29 | 27.76 | 27.61 |
| 2017 | 27.62 | 27.43 | 27.38 | 27.63 | 27.39 | 26.31 | 26.11 | 26.03 | 26.45 | 27.74 | 28.02 | 28.09 | 27.18 |
| 2018 | 27.54 | 27.54 | 27.46 | 27.71 | 27.21 | 26.62 | 26.14 | 26.22 | 26.68 | 27.87 | 28.34 | 27.95 | 27.27 |

| Tahun | Temperatur Rata-rata Tiap Bulan (°C) | | | | | | | | | | | | Temperatur Rata-rata Tahunan (°C) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| 2019 | 27.64 | 27.45 | 27.59 | 27.47 | 27.51 | 26.49 | 25.55 | 25.57 | 25.91 | 26.98 | 28.44 | 28.71 | 27.11 |
| 2020 | 28.15 | 27.96 | 27.61 | 27.77 | 27.82 | 26.84 | 26.16 | 26.18 | 26.62 | 27.43 | 27.95 | 27.53 | 27.33 |
| 2021 | 27.55 | 27.32 | 27.46 | 27.74 | 27.45 | 26.95 | 26.25 | 26.44 | 26.56 | 27.75 | 27.80 | 27.80 | 27.25 |
| 2022 | 27.46 | 27.64 | 27.53 | 27.96 | 27.75 | 27.11 | 26.65 | 26.41 | 27.03 | 28.12 | 27.97 | 27.85 | 27.45 |
| 2023 | 27.52 | 27.44 | 27.59 | 27.76 | 27.68 | 27.13 | 26.78 | 26.33 | 26.57 | 27.97 | 28.78 | 28.60 | 27.51 |

### VI.1.3 Presipitasi

Presipitasi merupakan salah satu parameter masukan yang digunakan untuk memperkirakan *water balance* di DSTF. Secara umum, presipitasi mengacu pada jumlah *moisture* yang jatuh ke tanah (bisa dalam bentuk hujan, salju, atau bentuk presipitasi lainnya; pada lokasi dengan iklim tropis, terbatas pada hujan saja). Parameter input ini penting karena menentukan jumlah air yang tersedia untuk meresap ke DSTF dan menghasilkan lindi. Model HELP memerlukan data curah hujan harian sebagai parameter input, yang diperoleh berdasarkan data curah hujan gabungan dari Stasiun dan dari produk NASA MERRA-2 (*Modern-Era Retrospective analysis for Research and Applications, Version 2*) untuk periode 1 januari 2020 hinga 31 desember 2023 (4 tahun) dan dari stasiun curah hujan darat yang dimiliki oleh perusahan untuk periode 2019-2023 (5 tahun) . Pada model ini kesuluruhan data yang di gunakan tersebar dalam periode 23 tahun (1 januari 2001 hingga 31 desember 2023) yang diresumekan dalam bentuk bulanan pada **Tabel VI-3**.

Tabel VI-3 Rangkuman Data Presipitasi Tahun 2001 hingga 2023

| Tahun | Curah Hujan Bulanan (mm/bulan) | | | | | | | | | | | | Curah Hujan Rata-rata Tahunan (mm/tahun) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| 2001 | 393.3 | 335.2 | 419.3 | 358.7 | 268.4 | 341.9 | 198.9 | 67.8 | 115.4 | 45.1 | 395.9 | 380.4 | 3320.4 |
| 2002 | 395.5 | 318.9 | 315.2 | 348.7 | 457.2 | 396.2 | 39.3 | 40.6 | 15.8 | 4.1 | 109.4 | 140.7 | 2581.6 |
| 2003 | 348.7 | 370.7 | 289.9 | 346.5 | 346.7 | 237.2 | 212.6 | 124.2 | 52.6 | 44.1 | 94.3 | 391.0 | 2858.5 |
| 2004 | 219.8 | 241.6 | 299.7 | 344.8 | 268.7 | 222.1 | 182.8 | 18.4 | 59.6 | 3.7 | 86.6 | 184.5 | 2132.1 |
| 2005 | 360.8 | 221.2 | 415.7 | 380.8 | 456.3 | 165.9 | 161.8 | 88.6 | 49.5 | 195.0 | 201.1 | 506.8 | 3203.5 |
| 2006 | 295.2 | 377.9 | 414.3 | 339.4 | 414.5 | 404.7 | 50.5 | 25.1 | 39.8 | 4.5 | 50.0 | 167.4 | 2583.3 |
| 2007 | 347.2 | 358.8 | 372.5 | 477.5 | 347.6 | 499.2 | 112.4 | 246.0 | 44.0 | 61.6 | 196.4 | 286.3 | 3349.5 |
| 2008 | 382.6 | 290.1 | 247.0 | 319.0 | 623.6 | 453.0 | 339.7 | 518.1 | 149.4 | 200.9 | 350.0 | 348.7 | 4222.1 |
| 2009 | 373.4 | 314.5 | 414.3 | 317.2 | 351.7 | 294.3 | 205.9 | 37.9 | 25.0 | 45.3 | 286.3 | 237.0 | 2902.8 |
| 2010 | 368.6 | 320.2 | 410.0 | 327.6 | 361.3 | 436.3 | 483.6 | 480.9 | 315.5 | 320.4 | 190.7 | 360.2 | 4375.6 |
| 2011 | 354.3 | 345.7 | 546.9 | 385.8 | 427.4 | 308.6 | 399.6 | 49.0 | 179.9 | 81.7 | 179.5 | 428.4 | 3686.8 |
| 2012 | 463.5 | 218.8 | 401.8 | 300.1 | 411.9 | 323.0 | 271.9 | 99.8 | 130.6 | 138.9 | 110.6 | 164.7 | 3035.7 |
| 2013 | 450.0 | 244.8 | 393.8 | 482.4 | 381.9 | 442.8 | 766.3 | 81.0 | 68.6 | 40.5 | 191.0 | 259.3 | 3802.4 |
| 2014 | 260.3 | 212.5 | 289.5 | 438.9 | 527.5 | 688.0 | 349.4 | 85.6 | 13.9 | 3.3 | 34.7 | 397.5 | 3301.0 |
| 2015 | 249.4 | 446.2 | 333.3 | 249.1 | 293.0 | 472.5 | 25.0 | 16.9 | 24.7 | 12.7 | 6.8 | 311.9 | 2441.5 |
| 2016 | 198.8 | 332.6 | 552.0 | 381.5 | 184.9 | 387.9 | 282.6 | 117.2 | 88.6 | 173.8 | 205.6 | 448.3 | 3353.8 |
| 2017 | 376.9 | 299.8 | 376.0 | 352.9 | 714.9 | 598.0 | 474.8 | 213.6 | 266.0 | 151.2 | 493.6 | 455.2 | 4772.8 |
| 2018 | 1450.8 | 361.3 | 315.8 | 296.3 | 576.0 | 429.6 | 289.1 | 78.8 | 73.0 | 26.9 | 266.8 | 404.1 | 4568.4 |
| 2019 | 462.8 | 341.2 | 322.7 | 543.2 | 514.2 | 612.8 | 153.5 | 12.0 | 33.3 | 51.7 | 39.3 | 104.0 | 3190.8 |
| 2020 | 388.5 | 382.3 | 413.8 | 138.1 | 185.1 | 1091.8 | 1149.3 | 237.4 | 423.5 | 105.0 | 115.8 | 242.0 | 4872.4 |
| 2021 | 205.7 | 218.3 | 369.9 | 360.8 | 428.5 | 245.2 | 437.8 | 474.2 | 181.6 | 132.0 | 167.5 | 266.4 | 3487.8 |
| 2022 | 198.6 | 269.8 | 358.1 | 179.1 | 157.5 | 310.6 | 733.0 | 409.8 | 137.8 | 170.1 | 243.9 | 222.1 | 3390.4 |
| 2023 | 272.1 | 217.1 | 304.1 | 180.0 | 400.5 | 329.8 | 516.4 | 161.3 | 62.7 | 79.1 | 147.3 | 168.5 | 2839.0 |

### VI.1.4 Tipe Tanah dan Desain

Soil & Design merupakan parameter input yang penting untuk model HELP, karena mempengaruhi keseimbangan air dan potensi pergerakan air dan transportasi di dalam DSTF dan lingkungan sekitarnya. Secara lebih spesifik, sifat-sifat tanah (seperti tekstur, konduktivitas hidrolik, dan porositas) mempengaruhi infiltrasi air ke dalam DSTF, pergerakan air di dalam DSTF, dan potensi air meresap ke sumber air tanah dan air permukaan. Model HELP menggabungkan sifat-sifat tanah ini melalui penggunaan tekstur tanah, konduktivitas hidrolik jenuh, dan data kurva retensi air tanah.

Data tekstur tanah digunakan untuk memperkirakan daya ikat air tanah dan potensi air untuk menginfiltrasi permukaan DSTF. Data konduktivitas hidrolik jenuh digunakan untuk memperkirakan tingkat pergerakan air melalui tanah, yang memengaruhi potensi air untuk mengangkut kontaminan dari DSTF ke sekitarnya. Data kurva retensi air tanah digunakan untuk memperkirakan jumlah air yang dapat dipertahankan di dalam tanah dan potensi air meresap ke dalam air tanah. Model HELP juga mempertimbangkan pengaruh berbagai jenis tutupan tanah, seperti tutupan vegetatif atau tutupan sintetis, terhadap keseimbangan air dan potensi pergerakan dan transportasi air. Sifat penutup tanah seperti kekasaran permukaan dan konduktivitas hidrolik mempengaruhi laju infiltrasi air dan evapotranspirasi dari permukaan DSTF. Secara keseluruhan, desain model HELP menggabungkan sifat-sifat tanah dan efek dari berbagai jenis lapisan tanah untuk memperkirakan neraca air lokasi DSTF dan untuk mengevaluasi potensi pencemaran air dari air tanah dan sumber air permukaan.

Pada simulasi yang dilakukan, lapisan-lapisan yang diinput pada model HELP didekati berdasarkan dua lapisan yaitu lapisan Dry Tail dan lapisan tanah asli. Simulasi dilakukan berdasarkan daerah tangkapan hujan (catchment area) dimana DSTF akan ditempatkan, sehingga simulasi akan dibagi sesuai dengan bagian daerah tangkapan hujan (catchment area) yang berbeda-beda. Catchment area yang dipilih yaitu *catchment area depression point* dimana diharapkan *leachate* yang timbul dari area DSTF akan terkumpul melalui *subdrain* yang mengalir ke area terendah dari topografi pada area penimbunan kembali (*backfill*). Outlett dari subdrain ini akan dipasang vertical well yang akan dipompa apabila terjadi kenaikan muka airtanah pada area timbunan. Sub-cathment dari area timbunan (backfill) DSTF dapat dilihat pada **Gambar IV-2** dan Gambar IV-3 serta karakteristik fisik untuk masing-masing catchment area tersebut dapat di lihat pada Tabel IV-1.

Parameter untuk masing-masing lapisan ini diinterpretasi lalu disesuaikan dengan *Standard HELP Layer Category* yang tersedia. Resume untuk masing-masing lapisan/layer ini dapat dilihat pada **Tabel VI-4** dan ketebalan masing-masing lapisan dapat dilihat pada **Tabel VI-5**.

Tabel VI-4 Karakteristik lapisan tanah yang digunakan pada model help berdasarkan desain sistem pelapis

| Layer | | HELP Layer Category | Deskripsi | Total Porosity | Field Capacity | Wilting Point | Saturated Hydraulic Conductivity |
|---|---|---|---|---|---|---|---|
| | | | | (vol/vol) | (vol/vol) | (vol/vol) | (cm/s) |
| 1 | Dry Tail | Vertical Percolation Layer (Cover Soil) | SiCL - Silty Clay Loam | 0.464 | 0.31 | 0.187 | 6.40E-05 |
| 2 | Lapisan Tanah Asli | Barrier soil liner | SiC - Silty Clay (Moderate) | 0.452 | 0.411 | 0.311 | 1.20E-06 |

Tabel VI-5 Ketebalan lapisan masing-masing sub-catchment

| Area | Basin Name | Tebal lapisan Tailing (m) | Tebal lapisan tanah asli (m) |
|---|---|---|---|
| DSTF 14 | CD01 | 43.12 | 1 |
| | CD02 | 38.05 | 1 |
| | CD03 | 27.25 | 1 |
| | CD04 | 45.13 | 1 |
| | CD05 | 36.77 | 1 |
| | CD06 | 46.12 | 1 |
| | CD07 | 30.69 | 1 |
| | CD08 | 39.87 | 1 |
| | CD09 | 51.45 | 1 |
| | CD10 | 35.67 | 1 |
| | CD11 | 43.8 | 1 |
| | CD12 | 42.92 | 1 |
| | CD13 | 42.83 | 1 |
| | CD14 | 54.53 | 1 |
| | CD15 | 21.77 | 1 |
| | CD16 | 32.96 | 1 |
| | CD17 | 30.24 | 1 |
| | CD18 | 31.08 | 1 |
| | CD19 | 23.03 | 1 |
| | CD20 | 23.77 | 1 |
| | CD21 | 24.8 | 1 |
| | CD22 | 30.94 | 1 |

| Area | Basin Name | Tebal lapisan Tailing (m) | Tebal lapisan tanah asli (m) |
|---|---|---|---|
| DSTF 08 | CD01 | 33.96 | 1 |
| | CD02 | 23.23 | 1 |
| | CD03 | 45.93 | 1 |
| | CD04 | 32.27 | 1 |
| | CP01a | 20.58 | 1 |
| | CP01b | 31.34 | 1 |
| | CP01c | 27.85 | 1 |
| | CP01d | 28.12 | 1 |
| DSTF 04 | SD01 | 25.01 | 1 |
| | SD02 | 39.44 | 1 |
| | SD03 | 31.89 | 1 |
| | SD04 | 18.36 | 1 |
| | SD05 | 38.13 | 1 |
| | SD06 | 21.11 | 1 |
| | SD07 | 17.03 | 1 |
| | SD08 | 11.13 | 1 |
| | SD09 | 25.89 | 1 |
| | SD10 | 11.11 | 1 |
| | SD11 | 26 | 1 |
| | SD12 | 23.16 | 1 |
| | SD13 | 50.4 | 1 |
| | SD14 | 28.96 | 1 |

| Area | Basin Name | Tebal lapisan Tailing (m) | Tebal lapisan tanah asli (m) |
|---|---|---|---|
| | CD23 | 24.89 | 1 |
| | CD24 | 22.62 | 1 |
| | CD25 | 25.19 | 1 |

| Area | Basin Name | Tebal lapisan Tailing (m) | Tebal lapisan tanah asli (m) |
|---|---|---|---|
| | SD15 | 40.87 | 1 |
| | SD16 | 36.1 | 1 |
| | SD17 | 46.27 | 1 |
| | SD18 | 36.96 | 1 |
| | SD19 | 20.98 | 1 |

### VI.1.5 Data Lain

Selain data-data yang telah disebutkan di atas, terdapat input lain yang diperlukan untuk menjalankan simulasi model HELP. Data tersebut adalah data lain yang penting dalam perhitungan *water balance*, seperti data iklim yang punya peran besar dengan penentuan nilai *Potential Evapotranspiration* dan data fisik di area studi yang menentukan limpasan air. Data-data tersebut dapat dilihat pada **Tabel VI-6**.

Tabel VI-6 Input Data Lain Model HELP

| Parameter | Satuan | Nilai | Keterangan |
|---|---|---|---|
| Lama Simulasi | Tahun | 23 | Berdasarkan panjang data *time-series Solar Radiation*, Temperatur, dan Presipitasi |
| *Evaporative Zone Depth* | cm | 50 | Asumsi |
| Kecepatan Angin Rata-rata | KPH (kilometer per jam) | 10.88 | Data tahun 2010-2022 dari MERRA-2 spesifik pada koordinat lokasi DSTF |
| Kelembaban Udara (Quarterly) | % | Q1 = 81.04<br>Q2 = 82.69<br>Q3 = 81.37<br>Q4 = 77.77 | Data tahun 2010-2022 dari MERRA-2 spesifik pada koordinat lokasi DSTF |
| *Leaf Area Index* (LAI) | - | 0 | Nilai LAI diassimsukan nol karena lokasi studi adalah area terbuka |

## VI.2 Output Model

Penting untuk diketahui terdahulu bahwa estimasi pelindian dibuat dengan menggunakan pendekatan tentang komposisi dan fungsi lapisan dimana:

- Lapisan pertama terdiri dari "*Dry Tail*" yang ditetapkan sebagai "*Final Cover Soil",*

- Lapisan kedua terdiri dari lapisan Tanah asli yang ditetapkan sebagai "*Barrier soil liner*".

Pada Area DSTF 04, hasil simulasi menunjukkan bahwa total leachate tahunan yang tidak tembus lapisan dry tail berkisar anatara 3778 $m^3$/tahun hingga 94965 $m^3$/tahun , dengan puncak harian berkisar antara 38 $m^3$/hari hingga 961 $m^3$/hari.

Pada Area DSTF 08, hasil simulasi menunjukkan bahwa total leachate tahunan yang tidak tembus lapisan dry tail berkisar anatara 8895 $m^3$/tahun hingga 59409 $m^3$/tahun , dengan puncak harian berkisar antara 80 $m^3$/hari hingga 627 $m^3$/hari.

Pada Area DSTF 14, hasil simulasi menunjukkan bahwa total leachate tahunan yang tidak tembus lapisan dry tail berkisar anatara 4101 $m^3$/tahun hingga 49248 $m^3$/tahun , dengan puncak harian berkisar antara 35 $m^3$/hari hingga 435 $m^3$/hari.

Tabel VI-7 Rekapan Hasil Simulasi HELP pada semua DSTF area

| *Area* | *Sub-Catchment* | Volume Leachate Tahunan ($m^3$/tahun) | Volume Leachate Harian ($m^3$/hari) |
|---|---|---|---|
| DSTF 14 | CD01 | 14337 | 123,56 |
| | CD02 | 4102 | 35,13 |
| | CD03 | 11207 | 101,99 |
| | CD04 | 49249 | 408,12 |
| | CD05 | 28357 | 259,3 |
| | CD06 | 37210 | 376,88 |
| | CD07 | 15397 | 143,84 |
| | CD08 | 15642 | 129,83 |
| | CD09 | 38969 | 394,68 |
| | CD10 | 20019 | 173,78 |
| | CD11 | 27644 | 250,91 |
| | CD12 | 20387 | 185,16 |
| | CD13 | 10086 | 100,25 |
| | CD14 | 9050 | 88,18 |
| | CD15 | 7128 | 64,17 |
| | CD16 | 39610 | 366,85 |
| | CD17 | 34239 | 319,55 |
| | CD18 | 33046 | 308,25 |
| DSTF 08 | CD01 | 53855 | 550,44 |
| | CD02 | 8895 | 81,78 |
| | CD03 | 59409 | 627,64 |
| | CD04 | 29562 | 265,58 |
| | CP01a | 27156 | 261,2 |
| | CP01b | 54179 | 455,72 |
| | CP01c | 8902 | 80,79 |
| | CP01d | 28277 | 240,52 |
| DSTF 04 | SD01 | 29861 | 267,04 |
| | SD02 | 23813 | 197,73 |
| | SD03 | 7194 | 62,92 |
| | SD04 | 29879 | 292,76 |
| | SD05 | 10402 | 92,24 |
| | SD06 | 16792 | 155,84 |
| | SD07 | 15127 | 160,98 |
| | SD08 | 7849 | 96,35 |
| | SD09 | 7578 | 75,62 |
| | SD10 | 5034 | 57,56 |

| *Area* | *Sub-Catchment* | Volume Leachate Tahunan ($m^3$/tahun) | Volume Leachate Harian ($m^3$/hari) |
|---|---|---|---|
| | CD19 | 9884 | 91,17 |
| | CD20 | 34639 | 368,19 |
| | CD21 | 33720 | 301,74 |
| | CD22 | 12313 | 111,13 |
| | CD23 | 13769 | 146,46 |
| | CD24 | 11058 | 435,77 |
| | CD25 | 16677 | 152,7 |

| *Area* | *Sub-Catchment* | Volume Leachate Tahunan ($m^3$/tahun) | Volume Leachate Harian ($m^3$/hari) |
|---|---|---|---|
| | SD11 | 20654 | 184,18 |
| | SD12 | 3779 | 38,85 |
| | SD13 | 94965 | 961,54 |
| | SD14 | 17796 | 150,86 |
| | SD15 | 84781 | 862,06 |
| | SD16 | 14618 | 130,05 |
| | SD17 | 14219 | 125,6 |
| | SD18 | 39950 | 332,62 |
| | SD19 | 6598 | 67,62 |

# VII. ANALISIS HIDROGEOKIMIA dan KUALITAS AIR

## VII.1 Analisis Hidrogeokimia

Berdasarkan hasil pemetaan dan pengukuran parameter in situ fisik dan kimia lapangan, kemudian sampel dipilih untuk dilakukan pengujian parameter major ion dan logam terlarut di laboratorium. Pengujian dilakukan di laboratorium Hidrogeokimia ITB dan Intertek. Hasil pengujian laboratorium akan digunakan untuk analisis hidrogeokimia yang ditujukan untuk mengetahui indikator alami dari sumber dan mekanisme keberadaan airtanah dan air permukaan di lokasi studi.

### VII.1.1 Ion Balance

Ion utama merupakan ion-ion yang umum dijumpai dalam air dengan konsentrasi lebih dari 1 mg/L. Beberapa ion yang termasuk kategori ini ialah $Mg^{2+}$, $Ca^{2+}$, $Na^{+}$, $K^{+}$, $Cl^{-}$, $SO_4^{2-}$ dan $HCO_3^{-}$. Kesetimbangan antara anion dan kation penting diketahui untuk menunjukkan validitas data yang akan dianalisis. secara umum, hasil dianggap valid jika perbedaan konsentrasi antara kation dan anion menunjukkan persentase kurang dari 10%. Data major ion hasil uji laboratorium diperlihatkan pada **Tabel VII-1** dan **Tabel VII-2** dengan hasil perhitungan *ion balance* yang disajikan dalam bentuk grafis dapat dilihat pada **Gambar VII-1** dengan rangkuman hasil perhitungan diperlihatkan pada **Tabel VII-1** dan **Tabel VII-2**. Hasil perhitungan menunjukkan bahwa hampir semua sampel perbedaan major anion dan kation berada dibawah 10% kecuali pada sampel BFH-B06 dan BFH-B07. Idealnya, sampel dengan perbedaan major anion dan kation yang berada di bawah 10% dapat dilakukan analisis lanjut. Sampel dengan nilai balance lebih besar dari 10% kemungkinan terdapat ion-ion lain dengan konsentrasi yang tidak teranalisis pada uji laboratorium.

Tabel VII-1 Data major ion Airtanah (bagian 1)

| Kation | Airtanah | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | BFH-01 | BFH-02 | BFH-03 | BFH-04 | BFH-05 | BFH-B01 | BFH-B03 | BFH-B04 | BFH-B05 | BFH-B06 | BFH-B07 |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| $Ca^{2+}$ | 6,62 | 6,31 | 12,6 | 14,7 | 42 | 17,8 | 17,1 | 31,9 | 33,4 | 9,65 | 13,8 |
| $Mg^{2+}$ | 22 | 16,5 | 38 | 15,3 | 9,94 | 19,7 | 17,5 | 14,3 | 9,14 | 37,4 | 28,8 |
| $Na^{+}$ | 1,04 | 1,39 | 1,54 | 0,98 | 1,55 | 5,69 | 1,48 | 1,38 | 2,29 | 4,45 | 2,27 |
| $K^{+}$ | 0,53 | 0,23 | 0,23 | 0,53 | 0,62 | 1,45 | 0,4 | 0,44 | 0,27 | 0,59 | 0,39 |
| $NH_4^{+}$ | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 |
| Anion | | | | | | | | | | | |
| $HCO_3^{-}$ | 97 | 77 | 191 | 57 | 112 | 51 | 72 | 93 | 113 | 168 | 126 |

| Kation | Airtanah | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | BFH-01 | BFH-02 | BFH-03 | BFH-04 | BFH-05 | BFH-B01 | BFH-B03 | BFH-B04 | BFH-B05 | BFH-B06 | BFH-B07 |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| $Cl^-$ | 3,9 | 2,6 | 2,6 | 4,4 | 4,3 | 4,8 | 4,4 | 3,8 | 3,5 | 3,7 | 2,5 |
| $SO_4^{2-}$ | 6 | 5 | <2 | 39 | 23 | 89 | 42 | 64 | 25 | 2 | 2 |
| F- | 0,07 | <0,02 | 0,06 | 0,08 | 0,08 | 0,11 | 0,03 | 0,06 | 0,05 | 0,14 | 0,03 |
| $NO_3^-$ | 0,148 | 0,105 | 0,058 | 0,4 | 0,331 | <0,005 | 0,354 | 0,082 | 0,012 | 0,005 | <0,005 |
| $NO_2^-$ | 0,003 | <0,001 | <0,001 | 0,112 | 0,003 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| Br- | 0,011 | 0,006 | 0,009 | 0,017 | 0,019 | 0,017 | 0,017 | 0,014 | 0,01 | 0,012 | 0,009 |

Tabel VII-2 Data major ion Airtanah (bagian 2) dan Air Permukaan

| Kation | Air Tanah | | | | Air Permukaan | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | BFH-D01 | BFH-D02 | BFH-D03 | BFH-D04R | RV 01 | RV 02 | RV 03 | RV 04 | RV 05 | RV 06 |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| $Ca^{2+}$ | 53,9 | 3,14 | 8,49 | 36,2 | 4,26 | 32,47 | 5,47 | 6,48 | 18,51 | 4,6 |
| $Mg^{2+}$ | 24,8 | 3,32 | 30,5 | 35,7 | 26,05 | 36,62 | 23,24 | 24,81 | 26,88 | 27,41 |
| $Na^+$ | 4,83 | 1,17 | 1,26 | 8,15 | 1,06 | 37,36 | 0,95 | 1 | 1,66 | 0,732 |
| $K^+$ | 1,01 | 0,81 | 0,13 | 1,68 | 0,1 | 1,16 | 0,29 | 0,45 | 0,87 | 0,097 |
| $NH_4^+$ | <0,02 | <0,02 | <0,02 | <0,02 | 0,06 | 0,07 | 0,05 | 0,06 | 0,08 | NA |
| Anion | | | | | | | | | | |
| $HCO_3^-$ | 234 | 20 | 169 | 158 | 116,63 | 269,38 | 113,34 | 115,53 | 195,08 | 128,83 |
| $Cl^-$ | 3,9 | 3,8 | 2,8 | 4,4 | 2,13 | 74,36 | 1,7 | 2,21 | 3,06 | 1,26 |
| $SO_4^{2-}$ | 23 | 2 | <2 | 64 | 0,91 | 9,33 | 2,8 | 6,22 | 1,9 | 1,09 |
| F- | 0,15 | 0,1 | 0,05 | 0,09 | NA | 0,1 | NA | NA | 0,09 | NA |
| $NO_3^-$ | 0,233 | 1,12 | 0,409 | 0,114 | 2,06 | 1,22 | 1,02 | 2,11 | 0,94 | 1,18 |
| $NO_2^-$ | 0,206 | <0,001 | 0,008 | <0,001 | NA | NA | NA | NA | NA | NA |
| Br- | 0,013 | 0,009 | <0,005 | 0,012 | NA | 0,61 | NA | NA | NA | NA |

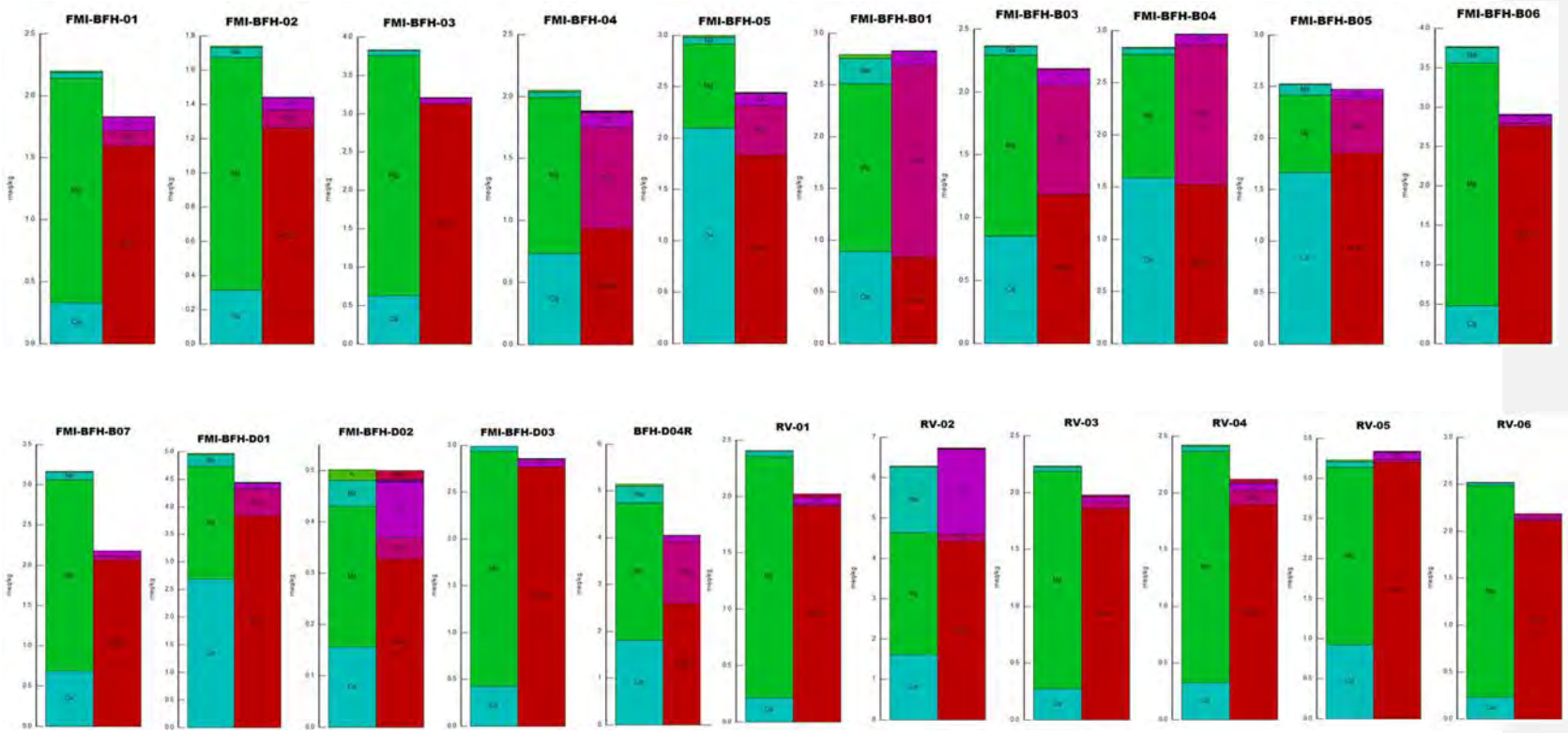
Tabel VII-3 Hasil perhitungan Ion Balance Air tanah (bagian 1)

| Anion/ Kation | Valensi | Mr | Airtanah | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | BFH-01 | BFH-02 | BFH-03 | BFH-04 | BFH-05 | BFH-B01 | BFH-B03 | BFH-B04 | BFH-B05 | BFH-B06 | BFH-B07 |
| | | | meq | meq | meq | meq | meq | meq | meq | meq | meq | meq | meq |
| $Ca^{2+}$ | 2,00 | 40,08 | 0,33 | 0,31 | 0,63 | 0,73 | 2,10 | 0,89 | 0,85 | 1,59 | 1,67 | 0.48 | 0.69 |
| $Mg^{2+}$ | 2,00 | 24,31 | 1,81 | 1,36 | 3,13 | 1,26 | 0,82 | 1,62 | 1,44 | 1,18 | 0,75 | 3.08 | 2.37 |
| $Na^{+}$ | 1,00 | 22,99 | 0,045 | 0,060 | 0,067 | 0,043 | 0,067 | 0,247 | 0,064 | 0,060 | 0,100 | 0.194 | 0.099 |
| $K^{+}$ | 1,00 | 39,10 | 0,014 | 0,006 | 0,006 | 0,014 | 0,016 | 0,037 | 0,010 | 0,011 | 0,007 | 0.015 | 0.010 |
| $NH^{4+}$ | 1,00 | 18,04 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0.000 | 0.000 |
| **Sum** | | | **2,199** | **1,739** | **3,829** | **2,049** | **2,997** | **2,794** | **2,368** | **2,840** | **2,525** | **3,768** | **3,167** |
| $HCO_3^{-}$ | 1,00 | 61,02 | 1,590 | 1,262 | 3,130 | 0,934 | 1,836 | 0,836 | 1,180 | 1,524 | 1,852 | 2.753 | 2.065 |
| $Cl^{-}$ | 1,00 | 35,45 | 0,110 | 0,073 | 0,073 | 0,124 | 0,121 | 0,135 | 0,124 | 0,107 | 0,099 | 0.104 | 0.071 |
| $SO_4^{2-}$ | 2,00 | 96,06 | 0,125 | 0,104 | 0,000 | 0,812 | 0,479 | 1,853 | 0,874 | 1,332 | 0,520 | 0.042 | 0.042 |
| F- | 1,00 | 19,00 | 0,004 | 0,0 | 0,003 | 0,004 | 0,004 | 0,006 | 0,002 | 0,003 | 0,003 | 0.007 | 0.002 |
| $NO_3^{-}$ | 1,00 | 62,00 | 0,002 | 0,002 | 0,001 | 0,006 | 0,005 | 0,0 | 0,006 | 0,001 | 0,0 | 0.0001 | 0.0 |
| $NO_2^{-}$ | 1,00 | 46,00 | 0,00007 | 0,0 | 0,0 | 0,00243 | 0,00007 | 0,0 | 0,0 | 0,0 | 0,0 | 0.0 | 0.0 |
| $Br^{-}$ | 1,00 | 79,90 | 0,00014 | 0,00008 | 0,00011 | 0,00021 | 0,00024 | 0,00021 | 0,00021 | 0,00018 | 0,00013 | 0.00015 | 0.00011 |
| **Sum** | | | **1,831** | **1,441** | **3,208** | **1,884** | **2,446** | **2,830** | **2,186** | **2,969** | **2,474** | **2,907** | **2,179** |
| **Ion balance** | | | **9%** | **9%** | **9%** | **4%** | **10%** | **1%** | **4%** | **2%** | **1%** | **13%** | **18%** |

Tabel VII-4 Hasil perhitungan Ion Balance Air tanah (bagian 2) dan Air Permukaan

| Anion/Kation | Valensi | Mr | Air Tanah | | | | Air Permukaan | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | BFH-D01 | BFH-D02 | BFH-D03 | BFH-D04R | RV 01 | RV 02 | RV 03 | RV 04 | RV 05 | RV 06 |
| | | | meq | meq | meq | meq | meq | meq | meq | meq | meq | meq |
| $Ca^{2+}$ | 2,00 | 40,08 | 2,69 | 0,16 | 0,42 | 1,81 | 0,21 | 1,62 | 0,27 | 0,32 | 0.92 | 0.23 |

| Anion/Kation | Valensi | Mr | Air Tanah | | | | Air Permukaan | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | BFH-D01 | BFH-D02 | BFH-D03 | BFH-D04R | RV 01 | RV 02 | RV 03 | RV 04 | RV 05 | RV 06 |
| | | | meq | meq | meq | meq | meq | meq | meq | meq | meq | meq |
| $Mg^{2+}$ | 2,00 | 24,31 | 2,04 | 0,27 | 2,51 | 2,94 | 2,14 | 3,01 | 1,91 | 2,04 | 2.21 | 2.26 |
| $Na^{+}$ | 1,00 | 22,99 | 0,210 | 0,051 | 0,055 | 0,355 | 0,046 | 1,625 | 0,041 | 0,043 | 0.072 | 0.032 |
| $K^{+}$ | 1,00 | 39,10 | 0,026 | 0,021 | 0,003 | 0,043 | 0,003 | 0,030 | 0,007 | 0,012 | 0.022 | 0.002 |
| $NH^{4+}$ | 1,00 | 18,04 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 | 0.000 | 0.000 |
| **Sum** | | | **4,966** | **0,501** | **2,992** | **5,142** | **2,405** | **6,288** | **2,234** | **2,420** | **3,230** | **2,519** |
| $HCO_3^{-}$ | 1,00 | 61,02 | 3,835 | 0,328 | 2,770 | 2,589 | 1,911 | 4,415 | 1,858 | 1,893 | 3.197 | 2.111 |
| $Cl^{-}$ | 1,00 | 35,45 | 0,110 | 0,107 | 0,079 | 0,124 | 0,060 | 2,097 | 0,048 | 0,062 | 0.086 | 0.036 |
| $SO_4^{2-}$ | 2,00 | 96,06 | 0,479 | 0,042 | 0,000 | 1,332 | 0,019 | 0,194 | 0,058 | 0,129 | 0.040 | 0.023 |
| F- | 1,00 | 19,00 | 0,008 | 0,005 | 0,003 | 0,005 | 0,000 | 0,005 | 0,0 | 0,0 | 0.005 | 0.0 |
| $NO_3^{-}$ | 1,00 | 62,00 | 0,004 | 0,018 | 0,007 | 0,002 | 0,033 | 0,020 | 0,016 | 0,034 | 0.015 | 0.019 |
| $NO_2^{-}$ | 1,00 | 46,00 | 0,00448 | 0,0 | 0,00017 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0.0 | 0.0 |
| $Br^{-}$ | 1,00 | 79,90 | 0,00016 | 0,00011 | 0,0 | 0,00015 | 0,0 | 0,00763 | 0,0 | 0,0 | 0.0 | 0.0 |
| **Sum** | | | **4,440** | **0,500** | **2,858** | **4,053** | **2,024** | **6,739** | **1,980** | **2,119** | **3,343** | **2,189** |
| **Ion balance** | | | **6%** | **0%** | **2%** | **12%** | **9%** | **3%** | **6%** | **7%** | **2%** | **7%** |



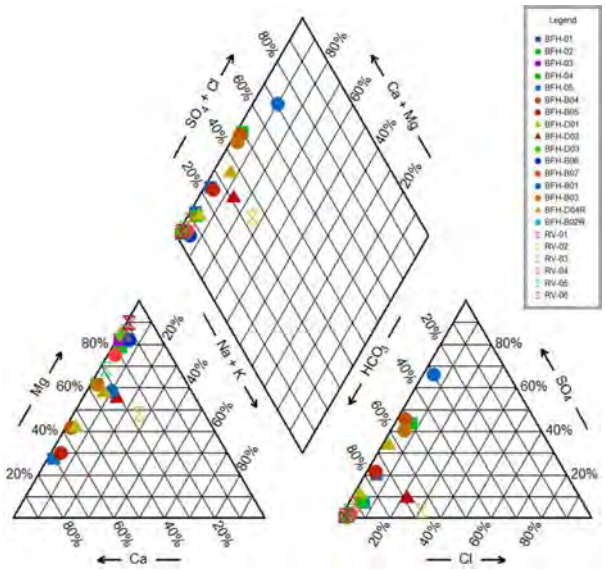

Gambar VII-1 Diagram Batang Ion Balance

### VII.1.2 Tipe Air

Tipe air dianalisis dengan memplot data major ion kedalam diagram piper. Analisis diagram piper dapat menunjukkan hubungan antara tipe batuan dan komposisi air daerah kajian. Hasil plotting ion utama pada diagram piper untuk sampel air tanah dan air permukaan diperlihatkan pada **Gambar VII-2**. Secara umum, sampel didominasi oleh ion Magnesium ($Mg^{2+}$) dan Bikarbonat ($HCO_3$).

Berdasarkan hasil plot, terlihat bahwa sebagian besar sampel berada pada sisi kiri diagram yang menunjukkan bahwa dominan tipikal $MgHCO_3$ (Magnesium Bikarbonat). Plot diagram piper menunjukkan 3 tipikal air diantaranya:

- Tipe $MgHCO_3$ (Magnesium Bikarbonat Type) pada semua sampel air permukaan (air sungai) dan airtanah pada lokasi BFH01, BFH02, BFH03, BFH04, BFH-B03, BFH-B06, BFH-B07, BFH-D02, BFH-D03R, BFH-B04R. Tipe ini merupakan tipikal dari airtanah dangkal dimana ion $HCO_3^-$ berasal dari interaksi $CO_2$ dari atmosfer atau tanah yang terjadi pada saat proses infiltrasi dan ion Mg berasal diduga berasal dari pelapukan batuan silikat seperti olivin, piroksen, serpentin yang umum ditemukan pada batuan ultramafik.
- Tipe $CaHCO_3$ (Kalsium Bikarbonat Type) pada sampel airtanah lokasi BFH05, BFH-B04, BFH-B05, dan BFH-D01. Tipe ini menunjukkan tipikal airtanah dangkal yang mengalami pergeseran ion $Ca^{2+}$. Ion Ca berasal dari pelapukan mineral yang mengandung kalsium seperti diopside, plagioklas kalsit. Mineral yang mengalami ini dapat lepas dan membentuk kalsium bikarbonat. Setelah ion Ca ini lepas, selanjutnya akan berinteraksi dengan $CO_2$ yang larut dalam air,
- Tipe $MgSO_4$ (Magnesium Sulfat Type) pada sampel BFH-B01 menunjukkan adanya interaksi dari pelapukan batuan kaya mineral magnesium dengan sulfat ($SO_4$). Batuan ultramafik dapat bisa menghasilkan air dengan kandungan magnesium sulfat pada lingkungan tertentu. Dalam hal ini, diduga sulfat berasal dari pengayaan dari lingkungan berupa sumber eksternal seperti air tanah yang bersikulasi di batuan yang berbeda yang mengandung sulfat seperti gipsum, anhidrit




Gambar VII-2 Diagram Piper Airtanah (BFH) dan Air Permukaan (RV)

## VII.2 Analisis Kualitas Air

Terdapat 16 sampel air tanah di wilayah penelitian yang dilakukan pengujian laboratorium. Sampel airtanah diambil dari lokasi sumur monitoring yang telah di konstruksi sebelumnya. Parameter kimia yang diuji berdasarkan pada Permen LHK No. 06/2021 tentang Parameter Uji Kualitas Air Tanah. Data kimia dari parameter ini akan dijadikan sebagai parameter baseline airtanah sebelum ada penimbunan tailing. Idealnya, sebelum dijadikan sebagai baseline, pengambilan perlu dilakukan beberapa waktu dengan interval waktu tertentu sehingga terlihat fluktuasi dari konsentrasi terukur dan nilai terukur yang paling tinggi diambil sebagai batas ambang konsentrasi kualitasnya. Rangkuman data kualitas airtanah dapat dilihat pada **Tabel VII-5**. Dari hasil analisis, tampak bahwa beberapa parameter seperti Cd, Hg, Pb, Sn, As, $CN^-$, $S^{2-}$, MBAS, Fenol, Minyal dan Lemak, PCBs, PCDFs, PCDDs memiliki nilai dibawah limit detection dari alat atau sangat kecil. Pada air sungai, kualitas air dilihat dari parameter logam terlarut yang diperlihatkan pada **Tabel VII-7** yang menunjukkan bahwa dominan unsur terlarut berturut-turut yaitu Mg>Ca>Na>K dengan konsentrasi lebih besar dari 1 ppm, sedangkan parameter lainnya memiliki konsentrasi yang kecil (<0.05 ppm) dengan urutan Sr>Mn>Cr>B>Ni>Ba>Li>Rb>Co>V dan untuk parameter lainnya berada dibawah detection limit alat (<0.0001 ppb).

Tabel VII-5 Rangkuman Parameter Kimia Airtanah Hasil uji Laboratorium (bagian 1)

| No. | Test Description | Units | BFH-01 | BFH-02 | BFH-03 | BFH-04 | BFH-05 | BFH-B01 | BFH-B02R | BFH-B03 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter Fisik** | | | | | | | | | | |

| No. | Test Description | Units | BFH-01 | BFH-02 | BFH-03 | BFH-04 | BFH-05 | BFH-B01 | BFH-B02R | BFH-B03 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Suhu | ºC | NA | NA | NA | NA | NA | NA | NA | NA |
| 2 | Zat padat terlarut | mg/L | 164 | 136 | 296 | 164 | 216 | 242 | NA | 216 |
| 3 | Zat padat tersuspensi | mg/L | 4 | 14 | 46800 | 7 | 6 | 8 | NA | 176 |
| **Parameter Kimia** | | | | | | | | | | |
| 1 | pH | mg/L | 7,51 | 6,77 | 7,29 | 7,29 | 7,32 | 7,65 | NA | 7,18 |
| 2 | Besi, terlarut, Fe | mg/L | 0,008 | <0,005 | 0,04 | 0,007 | 0,007 | <0,005 | 0,068 | <0,005 |
| 3 | Mangan terlarut, Mn | mg/L | 0,007 | 0,025 | 0,045 | 0,005 | 0,004 | 0,076 | 0,017 | 0,004 |
| 4 | Barium, Ba | mg/L | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 |
| 5 | Tembaga, Cu | mg/L | <0,001 | <0,001 | 0,012 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 6 | Seng, Zn | mg/L | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 |
| 7 | Krom valensi enam, $Cr^{6+}$ | mg/L | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | 0,856 |
| 8 | Krom Total, Cr | mg/L | 0,121 | 0,027 | 0,01 | 0,3 | 0,416 | <0,001 | 0,002 | 0,864 |
| 9 | Kadmium, Cd | mg/L | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 10 | Merkuri, Hg | mg/L | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 |
| 11 | Timbal, Pb | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 12 | Stanum, Sn | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 13 | Arsen, As | mg/L | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 |
| 14 | Selenium, Se | mg/L | <0,0005 | <0,0005 | 0,0005 | <0,0005 | <0,0005 | 0,0011 | <0,0005 | 0,0014 |
| 15 | Nikel, Ni | mg/L | 0,003 | 0,388 | 0,038 | 0,003 | 0,009 | 0,012 | 0,014 | 0,128 |
| 16 | Kobalt, Co | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | 0,002 | <0,001 | <0,001 |
| 17 | Sianida, $CN^-$ | mg/L | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 |
| 18 | Sulfida, $S^{2-}$ | mg/L | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 |
| 19 | Flourida, F | mg/L | 0,07 | <0,02 | 0,06 | 0,08 | 0,08 | 0,11 | NA | 0,03 |
| 20 | Klorin bebas, $Cl_2$ | mg/L | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | NA | 0,06 |
| 21 | Amoniak Bebas, NH3 | mg/L | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 |
| 22 | Nitrat, $NO^{3-}$ | mg/L | 0,148 | 0,105 | 0,058 | 0,4 | 0,331 | <0,005 | 0,027 | 0,354 |
| 23 | Nitrit, $NO^{2-}$ | mg/L | 0,003 | <0,001 | <0,001 | 0,112 | 0,003 | <0,001 | <0,001 | <0,001 |
| 24 | BOD5 | mg/L | 20 | 3 | <2 | 6 | 4 | 4 | NA | <2 |
| 25 | COD | mg/L | 98 | 22 | <20[a)] | 41 | 26 | 29 | NA | 5 |
| 26 | Senyawa aktif biru mitelin (MBAS) | mg/L | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | NA | <0,01 |
| 27 | Fenol | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | NA | <0,001 |
| 28 | Minyak dan lemak | mg/L | <1 | <1 | <1 | <1 | <1 | NA | NA | <1 |
| 29 | AOX | mg/L | <0,005 | NA | NA | NA | NA | NA | 0,15 | 0,12 |
| 30 | PCBs | µg/L | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | NA | NA | NA |

| No. | Test Description | Units | BFH-01 | BFH-02 | BFH-03 | BFH-04 | BFH-05 | BFH-B01 | BFH-B02R | BFH-B03 |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | PCDFs | ng/L | <0,03853 | NA | NA | NA | NA | NA | NA | NA |
| 32 | PCDDs | ng/L | <0,07553 | NA | NA | NA | NA | NA | NA | NA |

Tabel VII-6 Rangkuman Parameter Kimia Airtanah Hasil uji Laboratorium (bagian 2)

| No. | Test Description | Units | BFH-B04 | BFH-B05 | BFH-B06 | BFH-B07 | BFH-D01 | BFH-D02 | BFH-D03 | BFH-D04R |
|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter Fisik** | | | | | | | | | | |
| 1 | Suhu | ºC | NA | NA | NA | NA | NA | NA | NA | NA |
| 2 | Zat padat terlarut | mg/L | 286 | 236 | 314 | 264 | 424 | 52 | 274 | 414 |
| 3 | Zat padat tersuspensi | mg/L | 1970 | 22 | 96 | 29 | 5400 | 183 | 32 | 160 |
| **Parameter Kimia** | | | | | | | | | | |
| 1 | pH | mg/L | 7,13 | 7,5 | 7,88 | 7,61 | 7,2 | 5,89 | 7,24 | 7,25 |
| 2 | Besi, terlarut, Fe | mg/L | 0,005 | 0,029 | <0,005 | <0,005 | 0,01 | 0,011 | <0,005 | 0,006 |
| 3 | Mangan terlarut, Mn | mg/L | 0,007 | <0,001 | 0,002 | 0,634 | 0,003 | 0,047 | <0,001 | 0,012 |
| 4 | Barium, Ba | mg/L | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 |
| 5 | Tembaga, Cu | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 6 | Seng, Zn | mg/L | <0,005 | <0,005 | 0,016 | <0,005 | 0,006 | 0,011 | <0,005 | <0,005 |
| 7 | Krom valensi enam, $Cr^{6+}$ | mg/L | 1,42 | 1,48 | <0,002 | <0,002 | 1,26 | 0,045 | 0,011 | 0,328 |
| 8 | Krom Total, Cr | mg/L | 1,46 | 1,65 | <0,001 | <0,001 | 1,26 | 0,048 | 0,012 | 0,433 |
| 9 | Kadmium, Cd | mg/L | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 10 | Merkuri, Hg | mg/L | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 | <0,00005 |
| 11 | Timbal, Pb | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 12 | Stanum, Sn | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 13 | Arsen, As | mg/L | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 | <0,0005 |
| 14 | Selenium, Se | mg/L | 0,002 | <0,0005 | <0,0005 | <0,0005 | 0,0006 | <0,0005 | <0,0005 | <0,0005 |
| 15 | Nikel, Ni | mg/L | 0,038 | 0,005 | 0,125 | 0,065 | 0,01 | 0,159 | 0,025 | 0,003 |
| 16 | Kobalt, Co | mg/L | <0,001 | <0,001 | <0,001 | 0,003 | <0,001 | 0,004 | <0,001 | <0,001 |
| 17 | Sianida, $CN^-$ | mg/L | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 | <0,005 |
| 18 | Sulfida, $S^{2-}$ | mg/L | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 | <0,002 |
| 19 | Flourida, F | mg/L | 0,06 | 0,05 | 0,14 | 0,03 | 0,15 | 0,1 | 0,05 | 0,09 |
| 20 | Klorin bebas, $Cl_2$ | mg/L | 0,06 | 0,05 | <0,01 | <0,01 | 0,04 | 0,01 | <0,01 | <0,01 |
| 21 | Amoniak Bebas, NH3 | mg/L | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 | <0,02 |
| 22 | Nitrat, $NO^{3-}$ | mg/L | 0,082 | 0,012 | 0,005 | <0,005 | 0,233 | 1,12 | 0,409 | 0,114 |
| 23 | Nitrit, $NO^{2-}$ | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | 0,206 | <0,001 | 0,008 | <0,001 |
| 24 | BOD5 | mg/L | <2 | <2 | <2 | <2 | <2 | <2 | <2 | 3 |

| No. | Test Description | Units | BFH-B04 | BFH-B05 | BFH-B06 | BFH-B07 | BFH-D01 | BFH-D02 | BFH-D03 | BFH-D04R |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | COD | mg/L | <10[a)] | <4[a)] | 8 | 4 | <10[a)] | <2 | <2 | 20 |
| 26 | Senyawa aktif biru mitelin (MBAS) | mg/L | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 | <0,01 |
| 27 | Fenol | mg/L | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 | <0,001 |
| 28 | Minyak dan lemak | mg/L | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 29 | AOX | mg/L | NA | NA | 0,12 | 0,16 | NA | NA | NA | 0,09 |
| 30 | PCBs | µg/L | <0,005 | <0,005 | NA | <0,11406 | <0,005 | <0,005 | <0,005 | NA |
| 31 | PCDFs | ng/L | NA | NA | NA | <0,03853 | NA | NA | NA | NA |
| 32 | PCDDs | ng/L | NA | NA | NA | <0,07553 | NA | NA | NA | NA |

Tabel VII-7 Data analisis logam terlarut sampel air sungai

| Unsur | Unit | RV-01 | RV-02 | RV-03 | RV-04 | RV-05 | RV-06 |
|---|---|---|---|---|---|---|---|
| 7 Li | ppm | <0,0001 | 0,006 | <0,0001 | <0,0001 | 0,001 | <0,0001 |
| 9 Be | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 11 B | ppm | 0,019 | 0,052 | 0,005 | 0,064 | 0,044 | 0,033 |
| 23 Na | ppm | 1,762 | 38,785 | 1,475 | 1,498 | 2,120 | 1,182 |
| 24 Mg | ppm | 27,399 | 36,788 | 23,245 | 24,247 | 26,675 | 27,118 |
| 27 Al | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 39 K | ppm | 0,759 | 1,809 | 0,912 | 1,232 | 1,692 | 0,813 |
| 44 Ca | ppm | 1,690 | 34,200 | 2,189 | 5,504 | 19,994 | 2,236 |
| 51 V | ppm | 0,0000802 | 0,0008 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 52 Cr | ppm | 0,0162 | 0,0095 | 0,0993 | 0,0782 | 0,0149 | 0,0144 |
| 55 Mn | ppm | 0,0028 | <0,0001 | 0,0393 | 0,1151 | <0,0001 | 0,0000534 |
| 56 Fe | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 59 Co | ppm | 0,0002 | 0,0002 | 0,0005 | 0,0020 | 0,0002 | 0,0000871 |
| 60 Ni | ppm | 0,0114 | <0,0001 | <0,0001 | 0,0112 | 0,0000267 | 0,0284 |
| 63 Cu | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 66 Zn | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 71 Ga | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 75 As | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 78 Se | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 85 Rb | ppm | 0,0004 | 0,001 | 0,001 | 0,001 | 0,001 | 0,0004 |
| 88 Sr | ppm | 0,002 | 0,266 | 0,003 | 0,010 | 0,049 | 0,003 |
| 89 Y | ppm | <0,0001 | 0,0000178 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 97 Mo | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 98 Mo | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 107 Ag | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |

| Unsur | Unit | RV-01 | RV-02 | RV-03 | RV-04 | RV-05 | RV-06 |
|---|---|---|---|---|---|---|---|
| 111 Cd | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 114 Cd | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 125 Te | ppm | 0,0000214 | 0,0002 | 0,000021 | <0,0001 | <0,0001 | 0,0000958 |
| 135 Ba | ppm | 0,0228 | 0,0239 | <0,0001 | 0,0002 | 0,0217 | 0,0245 |
| 139 La | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | 0,0000638 | 0,0000038 |
| 140 Ce | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 141 Pr | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | 0,000006 |
| 146 Nd | ppm | 0,0000159 | 0,0000213 | 0,0000154 | 0,0000011 | 0,0000149 | 0,0000145 |
| 147 Sm | ppm | 0,0000022 | 0,0000109 | 0,0000151 | 0,0000022 | 0,0000236 | <0,0001 |
| 153 Eu | ppm | 0,0000466 | 0,0000206 | <0,0001 | <0,0001 | 0,0000233 | 0,0000328 |
| 157 Gd | ppm | 0,0000008 | 0,0000134 | 0,0000164 | 0,0000133 | 0,0000226 | 0,000007 |
| 163 Dy | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 165 Ho | ppm | 0,0000019 | 0,0000027 | <0,0001 | 0,0000007 | 0,0000019 | 0,0000039 |
| 166 Er | ppm | 0,0000056 | 0,0000058 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 169 Tm | ppm | 0,0000024 | 0,0000004 | <0,0001 | <0,0001 | 0,000001 | 0,0000024 |
| 172 Yb | ppm | <0,0001 | 0,0000072 | 0,000007 | <0,0001 | <0,0001 | 0,000007 |
| 205 Tl | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 206 [Pb] | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 207 [Pb] | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 208 Pb | ppm | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 | <0,0001 |
| 238 U | ppm | 0,0000066 | 0,0000605 | 0,0000053 | 0,000002 | 0,0000186 | 0,0000174 |

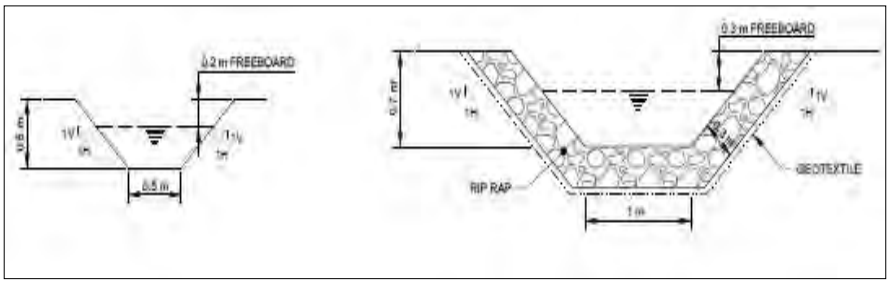
# VIII. REKOMENDASI

## VIII.1 Sistem Drainase

Perubahan morfologi akibat penempatan *tailing* akan merubah aliran air permukaan alami khususnya pada lokasi rencana DSTF. Berdasarkan hasil deliniasi desain akhir DSTF, terdapat dua tipe aliran yaitu aliran air dari area DSTF yang berpotensi melimpas ke badan air alami (selanjutnya disebut air kontak) dan aliran air alami yang berpotensi masuk kedalam area DSTF (selanjutnya disebut air non-kontak). Berdasarkan kedua tipe aliran tersebut, maka direkomendasikan dua tipe saluran drainase yaitu:

- Drainase perimeter (*perimeter drainage*) berfungsi untuk mencegah air dari luar area DSTF masuk kedalam area timbunan. Saluran ini berfungsi untuk mengurangi air kontak sehingga beban kolam lindi dapat berkurang. Drainase ini akan menyalurkan air non-kontak menuju sedimen pond.
- Drainase pengumpul (*collection drainage*) berfungsi untuk mengumpulkan air limpasan dari kontak tailing dan mengalirkan kedalam kolam lindi (*collection pond*) sehingga tidak ada air kontak yang lepas ke badan air alami sebelum dilakukan pengolahan di kolam IPAL.

Rekomendasi dimensi drainase perimeter ditentukan berdasarkan nilai debit puncak pada hujan rencana dengan periode ulang 5 tahun. Dimensi paritan harus memadai untuk mengakomodasi aliran maksimum yang telah diprediksi. Bentuk saluran drainase yang dibuat adalah trapesium dengan gradien longitudinal 2%. Besaran dimensi minimum paritan yang direkomendasikan pada masing-masing lokasi DSTF ditunjukkan pada **Tabel VIII-1**, **Tabel VIII-2** dan **Tabel VIII-3**.




Gambar VIII-1 Typikal Rekomendasi Paritan dan Dimensi

Tabel VIII-1 Rekomendasi mínimum dimensi dari saluran drainage dstf-04

| DIMENSI | SATUAN | DSTF-04 | | | |
|---|---|---|---|---|---|
| | | Perimeter Drainage | | | Collection |
| | | C-PER01_04 | C-PER02_04 | C-PER03_04 | C04c_04 |
| Discharge Design (Qc) | $m^3$/sec | 4,48 | 1,85 | 3,35 | 1,00 |
| Bottom Width (b) | m | 1,00 | 1,00 | 1,00 | 0,60 |
| Top Width (T) | m | 2,15 | 1,58 | 1,92 | 1,18 |
| Height (y) | m | 1,00 | 0,50 | 0,80 | 0,50 |
| Slope Ratio (z) | m | 0,58 | 0,58 | 0,58 | 0,58 |
| Manning coeff.(n) | | 0,04 | 0,04 | 0,04 | 0,04 |
| Drainage slope (s) | | 0,05 | 0,05 | 0,05 | 0,05 |
| Angle | ° | 60,06 | 60,06 | 60,06 | 60,06 |
| Area (A) | $m^2$ | 1,58 | 0,64 | 1,17 | 0,44 |
| Wet Perimeter (P) | m | 3,31 | 2,15 | 2,85 | 1,75 |
| Radius Hidrolic (R) | m | 0,48 | 0,30 | 0,41 | 0,25 |
| Velocity (v) | m/sec | 3,90 | 2,86 | 3,53 | 2,56 |
| **Discharge (Q)** | **$m^3$/sec** | **6,14** | **1,84** | **4,12** | **1,14** |

Tabel VIII-2 Rekomendasi mínimum dimensi dari saluran drainage dstf-08

| DIMENSI | SATUAN | DSTF-08 | | | |
|---|---|---|---|---|---|
| | | Collection Drainage | | | |
| | | C02a_08 | C02c_08 | C02d_08 | C02e_08 |
| Discharge Design (Qc) | $m^3$/sec | 8,08 | 13,81 | 8,01 | 2,74 |
| Bottom Width (b) | m | 1,00 | 1,10 | 1,00 | 1,00 |
| Top Width (T) | m | 2,38 | 2,83 | 2,38 | 1,75 |
| Height (y) | m | 1,20 | 1,50 | 1,20 | 0,65 |
| Slope Ratio (z) | m | 0,58 | 0,58 | 0,58 | 0,58 |
| Manning coeff.(n) | | 0,04 | 0,04 | 0,04 | 0,04 |
| Drainage slope (s) | | 0,05 | 0,05 | 0,05 | 0,05 |
| Angle | ° | 60,06 | 60,06 | 60,06 | 60,06 |
| Area (A) | $m^2$ | 2,03 | 2,95 | 2,03 | 0,89 |
| Wet Perimeter (P) | m | 3,77 | 4,56 | 3,77 | 2,50 |
| Radius Hidrolic (R) | m | 0,54 | 0,65 | 0,54 | 0,36 |
| Velocity (v) | m/sec | 4,23 | 4,77 | 4,23 | 3,22 |
| **Discharge (Q)** | **$m^3$/sec** | **8,58** | **14,06** | **8,58** | **2,87** |

Tabel VIII-3 Rekomendasi mínimum dimensi dari saluran drainage dstf-14

| DIMENSI | SATUAN | DSTF-14 | | | |
|---|---|---|---|---|---|
| | | Perimeter Drainage | | | Collection |
| | | C-PER01_14 | C-PER02_14 | C-PER03_14 | C04c_14 |
| Discharge Design (Qc) | $m^3$/sec | 4,98 | 3,19 | 1,82 | 1,90 |
| Bottom Width (b) | m | 1,00 | 1,00 | 1,00 | 1,00 |
| Top Width (T) | m | 2,04 | 1,81 | 1,58 | 1,69 |
| Height (y) | m | 0,90 | 0,70 | 0,50 | 0,60 |
| Slope Ratio (z) | m | 0,58 | 0,58 | 0,58 | 0,58 |
| Manning coeff.(n) | | 0,04 | 0,04 | 0,04 | 0,04 |
| Drainage slope (s) | | 0,05 | 0,05 | 0,05 | 0,05 |
| Angle | ° | 60,06 | 60,06 | 60,06 | 60,06 |
| Area (A) | $m^2$ | 1,37 | 0,98 | 0,64 | 0,81 |
| Wet Perimeter (P) | m | 3,08 | 2,62 | 2,15 | 2,38 |
| Radius Hidrolic (R) | m | 0,44 | 0,38 | 0,30 | 0,34 |
| Velocity (v) | m/sec | 3,72 | 3,33 | 2,86 | 3,10 |
| **Discharge (Q)** | **$m^3$/sec** | **5,08** | **3,27** | **1,84** | **2,51** |

## VIII.2 Kolam Pengumpul Lindi (*Collection Pond*)

Kolam pengumpul lindi merupakan kolam yang dibangun untuk menampung air dari limpasan tailing (air kontak). Kapasitan kolam dihitung agar dapat menampung curah hujan tertinggi yang terjadi dalam 1 minggu sepanjang data pengamatan hujan sesuai dengan kriteria yang tercantum di dalam Permen LHK 6/2021 pasal 187 ayat 5. Perhitungan volume kebutuhan kolam pada masing-masing catchment telah dihitung pada sub-bab sebelumnya dengan data hasil perhitungan ditunjukkan pada **Tabel IV-15**. Selanjutnya, dimensi kolam dibuat dengan volume tidak melebihi kapasitas tampung yang telah dihitung.

Berdasarkan hasil perhitungan, didapatkan kebutuhan volume kolam yang harus dibangun yaitu sebesar 29727 hingga 375546 $m^3$ pada masing-masing catchment area DSTF. Besarnya volume tampungan yang dibutuhkan berimplikasi pada kebutuhan lahan yang cukup luas untuk konstruksi kolam. Mengingat terbatasnya area untuk pembangunan kolam, maka sebagai alternative sebagian air akan dipompa menuju kolam IPAL. Besarnya volume air yang dipompakan dihitung berdasarkan maksimum rata-rata debit bulanan dari perhitungan dengan metode *rainfall-runoff* yang telah dibahas pada sub-bab sebelumnya dengan rangkuman data pada masing-masing area dapat dilihat pada **Tabel IV-17**. Dengan asumsi pompa beroperasi selama 22 jam dalam 7 hari didapatkan total volume air yang terpompa pada **Tabel VIII-4**. Selanjutnya, volume kolam akhir yang akan dikonstruksi merupakan

volume final yang telah dikurangi dengan volume air yang terpompa dengan detail perhitungan ditunjukkan pada tabel dibawah.

Rekomendasi minimun dimensi kolam pengumpul lindi diperlihatkan pada **Tabel VIII-5** untuk DSTF-04 dan **Tabel VIII-6** untuk DSTF-08, DSTF-14 dengan tipikal desain kolam ditunjukkan pada **Gambar VIII-1**.

Tabel VIII-4 Perhitungan volume kolam pengumpul lindi

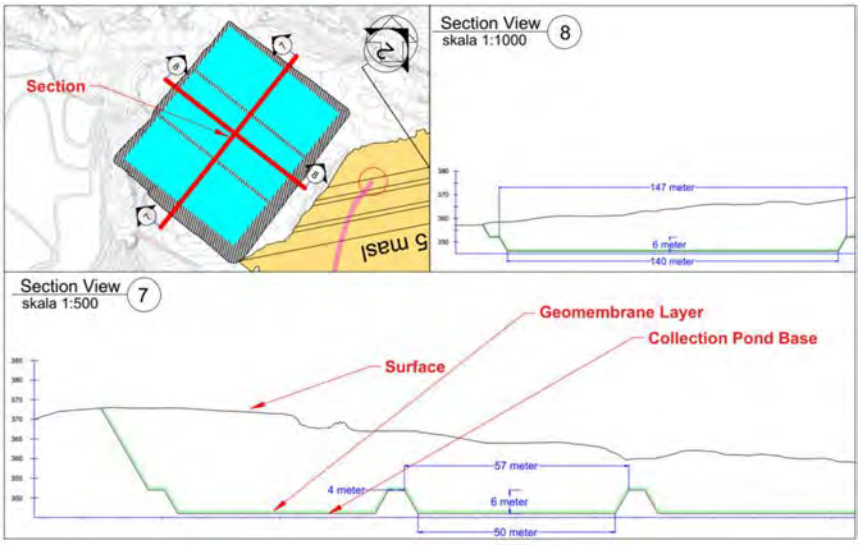
| Name | Volume (akumulasi hujan 7 hari) | Debit Pompa (max. rata-rata bulana) | Volume Air terpompa (22 jam x 7 hari) | Volume Final | Dalam Kolam | Luas Area |
|---|---|---|---|---|---|---|
| | $m^3$ | L/s | $m^3$ | $m^3$ | m | m |
| C01_04 | 45.680 | 23,51 | 13.031 | 32.648 | 6 | 5.441 |
| C02_04 | 119.917 | 61,71 | 34.210 | 85.707 | 6 | 14.285 |
| C03_04 | 56.326 | 28,98 | 16.069 | 40.257 | 6 | 6.709 |
| C04_04 | 198.166 | 101,97 | 56.531 | 141.636 | 6 | 23.606 |
| C01_08 | 76.038 | 39,13 | 21.692 | 54.346 | 6 | 9.058 |
| C02_08 | 203.600 | 104,76 | 58.081 | 145.518 | 6 | 24.253 |
| C01_14 | 49.028 | 25,23 | 13.986 | 35.042 | 6 | 5.840 |
| C02_14 | 29.727 | 15,30 | 8.480 | 21.247 | 6 | 3.541 |
| C03_14 | 88.895 | 45,74 | 25.360 | 63.535 | 6 | 10.589 |
| C04_14 | 375.546 | 193,24 | 107.134 | 268.412 | 6 | 44.735 |
| C05_14 | 36.297 | 18,68 | 10.355 | 25.942 | 6 | 4.324 |

Tabel VIII-5 Rekomendasi minimum dimensi kolam pengumpul lindi area DSTF-04 dan DSTF-08

| Sediment Pond Dimension | | unit | Catchment Area Pond | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | C01_04 | C02_04 | C03_04 | C04_04 | C01_08 | C02_08 |
| *Catchment Area* | | | 14.46 | 37.96 | 17.83 | 62.73 | 24.07 | 64.45 |
| *Slope of sides* | | | 1:1.0 | 1:1.0 | 1:1.0 | 1:1.0 | 1:1.0 | 1:1.0 |
| *Number of pond* | | | 3 | 6 | 3 | 6 | 3 | 6 |
| *Width at floor of pond* | L | m | 18 | 20 | 19 | 30 | 25 | 31 |
| *Water depth during operation* | P | m | 6 | 6 | 6 | 6 | 6 | 6 |
| *Width of water surface* | W | m | 30.00 | 32.00 | 31.00 | 42.00 | 37.00 | 43.00 |
| *Length of sediment pond* | l | m | 76 | 92 | 90 | 110 | 100 | 110 |
| *Pond volume (per compartment)* | | $m^3$ | 10,944 | 14,352 | 13,500 | 23,760 | 18,600 | 24,420 |
| *Total pond volume design* | | $m^3$ | 32,832 | 86,112 | 40,500 | 142,560 | 55,800 | 146,520 |

Tabel VIII-6 Rekomendasi minimum dimensi kolam pengumpul lindi area DSTF-14

| Sediment Pond Dimension | | unit | Catchment Area Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | C01_14 | C02_14 | C03_14 | C04_14 | C05_14 |
| *Catchment Area* | | | 15.52 | 9.41 | 28.14 | 118.88 | 11.49 |
| *Slope of sides* | | | 1:1.0 | 1:1.0 | 1:1.0 | 1:1.0 | 1:1.0 |
| *Number of pond* | | | 3 | 3 | 3 | 6 | 3 |
| *Width at floor of pond* | L | m | 18 | 12 | 26 | 45 | 15 |
| *Water depth during operation* | P | m | 6 | 6 | 6 | 6 | 6 |
| *Width of water surface* | W | m | 30.00 | 24.00 | 38.00 | 57.00 | 27.00 |
| *Length of sediment pond* | l | m | 82 | 66 | 111 | 147 | 70 |
| *Pond volume (per compartment)* | | $m^3$ | 11,808 | 7,128 | 21,312 | 44,982 | 8,820 |
| *Total pond volume design* | | $m^3$ | 35,424 | 21,384 | 63,936 | 269,892 | 26,460 |




Gambar VIII-1 Tipikal Desain Kolam Pengumpul Lindi

## VIII.3 Kolam Sedimen

Kolam sedimen adalah suatu penyaliran berbentuk kolam yang berfungsi sebagai kolam pengendapan yang menampung air non-kontak yang berasal dari saluran perimeter. Sediment pond dibuat pada hilir dari masing-masing daerah tangkapan air masing-masing area catchment.

Sebelum menghitung kebutuhan *sediment pond*, dibutuhkan perhitungan kecepatan pengendapan sediment (*Fall Velocity*) yang mengacu pada Stoke's Law dengan persamaan sebagai berikut.

$$Vp = \frac{[g\ (\rho p - \rho e)\ d^2]}{(18\ h)}$$

Dimana:

*Vp = vertical fall velocity of particles (m/s)*

*g = gravitational acceleration (9.81 m/s$^2$)*

*ρp = soil particle density (kg/m$^3$)*

*ρe = mass density of water (1000 kg/m$^3$)*

*d = diameter of particles for sedimentation (m)*

*h = dynamic viscosity of water at 4°C (1.569 x 10$^{-3}$ kg/m.s)*

Debit puncak yang digunakan pada rancangan sedimen pond menggunakan periode ulang 25 tahun. Data ukuran butir menggunakan estimasi dari studi literatur, dengan target ukuran partikel yang akan diendapkan adalah *coarse silt*, dengan diameter 0.075 mm. Berdasarkan perhitungan kecepatan pengendapan (Vp) yaitu 0,0032 m/s. Waktu yang dibutuhkan oleh partikel untuk mengendap dengan kecepatan (Vp) dengan kedalam kolam (H) dihitung dengan:

Tv = $\frac{H}{Vp}$ detik

dimana:

Tv = waktu pengendapan (s)

Vp = kecepatan pengendapan partikel (m/s)

H = kedalam kolam (5 m)

Selain itu dihitung juga kebutuhan luas permukaan pond dengan persamaan:

$$As = \frac{\Theta\ Q}{Vp}$$

As = minimum water area in basin (m$^2$)

Q = discharge rate (m$^3$/s)

Θ = adjustment factor related to turbulence (Θ takes the value of 1, 1.2, or 1.5 depending on the degree of turbulence in the sedimentation basin)

Vp = sedimentation velocity (m/s)

Berdasarkan perhitungan waktu pengendapan (Tv) yaitu 1549 detik. Sedangkan volume air yang masuk ke kolam sedimen selama waktu pengendapan dihitung dengan persamaan berikut:

V = Tv x Q

dimana:

V = Volume sedimen terendapkan ($m^3$)

Tv = Waktu pengendapan (s)

Q = Debit puncak periode ulang 25 tahun ($m^3/s$)

Rangkuman perhitungan berupa waktu retensi partikel, minimal kedalaman dan volume kolam sedimen untuk mengendapkan partikel *coarse silt* ini ditunjukkan pada **Tabel VIII-7** dan **Tabel VIII-8**. Selanjutnya, setelah diketahui minimun luas area dan volume dari kolam sedimen, maka dapat dihitung jumlah dan dimensi dari kolam. Kolam direkomendasikan berbentuk trapezium dengan tipikal desain ditunjukkan pada **Gambar VIII-2** dan detail dimensi masing-masing kolam ditunjukkan pada **Tabel VIII-9** dan **Tabel VIII-10**.

Selanjutnya, perkiraan partikel sedimen yang akan terendapkan pada kolam dihitung dengan menggunakan persamaan *Universal Soil Loss Equation* (USLE), yaitu:

$$A = R\,K\,LS\,C\,P$$

dimana:

A = *annual soil loss due erosion*

R = *rainfall erosion index*

K = *soil erodibility factor*

LS = *length and slope factor*

C = *cover factor*

P = *erosion control measure factor*

Faktor R (*rainfall erosion index*) atau index erosivitas hujan merupakan pengukur kemampuan suatu hujan yang dapat menimbulkan erosi. Perhitungan nilai erosivitas hujan menggunakan persamaan yang dikembangkan oleh Bols (1978) yaitu:

$$R = \frac{2.5P^2}{100(0.073P + 0.73)}$$

dimana P = Presipitasi hujan tahunan (mm) dan R = faktor erosi ($MJha^{-1}hr^{-1}yr^{-1}$).

Kondisi kemiringan (*slope*), panjang lereng, dan bentuk lereng dalam suatu wilayah basin akan mempengaruhi energi terjadinya erosi pada wilayah tersebut. Kemiringan dan panjang lereng didapatkan dari hasil deliniasi catchment. Faktor panjang dan kemiringan lereng (LS) dihitung dengan menggunakan persamaan:

$$LS = (0.065 + 0.045S + 0.0065S^2)\ x\ \sqrt{\frac{L}{22.13}}$$

Dimana L = Panjang lereng ; S = Kemiringan Lereng

Sedangkan, untuk parameter lainnya dihitung berdasarkan referensi dengan nilai dari masing-masing parameter diperlihatkan pada **Tabel VIII-11**.

Dengan menggunakan USLE, maka dapat diprediksi jumlah sedimen yang terendapkan tiap tahunnya. Berdasarkan perhitungan, dengan partikel *medium silt* memiliki density 2650 kg/m$^3$, didapatkan jumlah sedimen yang terendapkan per-tahun yaitu dari 428 ton atau 161 m$^3$ hingga 4855ton atau 1832 m$^3$ pada masing-masing kolam sedimen. Jumlah minimum sedimen yang terendapkan tiap tahun pada masing-masing sediment pond ditunjukkan pada **Tabel VIII-11** dan **Tabel VIII-12**. Berdasarkan KEPMEN 1827/K/No.1827 Tentang Pengelolaan Air Tambang, Pengendalian isi fasilitas penampungan dan pengelolaan air tambang dilakukan apabila telah terisis 80% atau lebih dari kapasitas penampungan.

Tabel VIII-7 Perhitungan kebutuhan volume kolam sediment berdasarkan persamaan *fall velocity*

| Parameter | | Unit | DSTF-04 | | |
|---|---|---|---|---|---|
| | | | C-PER01_04 | C-PER02_04 | C-PER03_04 |
| *Watershed area* | A | ha | 14,87 | 7,40 | 11,45 |
| *Peak Flow* | $Q_5$ | m$^3$/s | 6,27 | 2,60 | 4,70 |
| *Particle size (coarse silt)* | d | m | 7,50E-05 | 7,50E-05 | 7,50E-05 |
| *Soil particle density* | pp | kg/m$^3$ | 2650 | 2650 | 2650 |
| *Water density* | pe | kg/m$^3$ | 1000 | 1000 | 1000 |
| *Adjustment factor related to turbulence* | Θ | | 1 | 1 | 1 |
| *Fall velocity* | Vp | m/s | 0,0032 | 3,23E-03 | 3,23E-03 |
| *Depth of Pond* | | m | 5 | 5 | 5 |
| *Time of Retention* | | s | 1549 | 1549 | 1549 |
| *Minimum area of sediment pond* | | | 1942 | 804 | 1455 |
| *Volume Settling Pond* | | m$^3$ | 9709,10 | 4021,83 | 7275,24 |

Tabel VIII-8 Perhitungan kebutuhan volume kolam sediment berdasarkan persamaan *fall velocity*

| Parameter | | Unit | DSTF-14 | | |
|---|---|---|---|---|---|
| | | | C-PER01_14 | C-PER02_14 | C-PER03_14 |
| *Watershed area* | A | ha | 32,72 | 7,63 | 4,25 |
| *Peak Flow* | $Q_5$ | $m^3/s$ | 6,98 | 4,47 | 2,55 |
| *Particle size (coarse silt)* | d | m | 7,50E-05 | 7,50E-05 | 7,50E-05 |
| *Soil particle density* | pp | $kg/m^3$ | 2650 | 2650 | 2650 |
| *Water density* | pe | $kg/m^3$ | 1000 | 1000 | 1000 |
| *Adjustment factor related to turbulence* | ϴ | | 1 | 1 | 1 |
| *Fall velocity* | Vp | m/s | 3,23E-03 | 3,23E-03 | 3,23E-03 |
| *Depth of Pond* | | m | 5 | 5 | 5 |
| *Time of Retention* | | s | 1549 | 1549 | 1549 |
| *Minimum area of sediment pond* | | | 2162 | 1383 | 790 |
| *Volume Settling Pond* | | $m^3$ | 10807,51 | 6917,36 | 3950,57 |

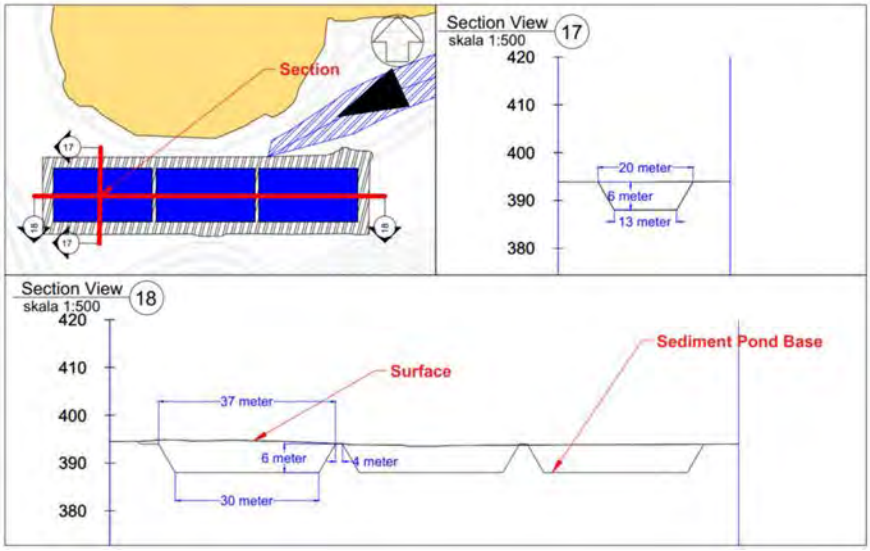
Tabel VIII-9 Rekomendasi jumlah dan minimum dimensi kolam sedimen DSTF-04

| Parameter | | Unit | DSTF-04 | | |
|---|---|---|---|---|---|
| | | | C-PER01_04 | C-PER02_04 | C-PER03_04 |
| Slope of sides | | | 1:1,0 | 1:1,0 | 1:1,0 |
| Number of sediment pond | | | 3 | 3 | 3 |
| Width at floor of sediment pond | L | m | 25 | 20 | 18 |
| Water depth during operation | P | m | 6 | 6 | 6 |
| Width of water surface | W | m | 37 | 32 | 30 |
| Length of sediment pond | l | m | 18 | 9 | 17 |
| Sediment pond volume (per compartment) | | $m^3$ | 3348 | 1404 | 2448 |
| Total sediment pond volume | | $m^3$ | 10.044 | 4.212 | 7.344 |

Tabel VIII-10 Rekomendasi jumlah dan minimum dimensi kolam sedimen DSTF-14

| Parameter | | Unit | DSTF-14 | | |
|---|---|---|---|---|---|
| | | | C-PER01_14 | C-PER01_14 | C-PER01_14 |
| Slope of sides | | | 1:1,0 | 1:1,0 | 1:1,0 |
| Number of sediment pond | | | 3 | 3 | 3 |
| Width at floor of sediment pond | L | m | 25 | 18 | 19 |
| Water depth during operation | P | m | 6 | 6 | 6 |
| Width of water surface | W | m | 37 | 30 | 31 |

| Parameter | | Unit | DSTF-14 | | |
|---|---|---|---|---|---|
| | | | C-PER01_14 | C-PER01_14 | C-PER01_14 |
| Length of sediment pond | l | m | 20 | 16 | 9 |
| Sediment pond volume (per compartment) | | $m^3$ | 3720 | 2304 | 1350 |
| Total sediment pond volume | | $m^3$ | 11.160 | 6.912 | 4.050 |




Gambar VIII-2 Tipikal desain kolam sedimen

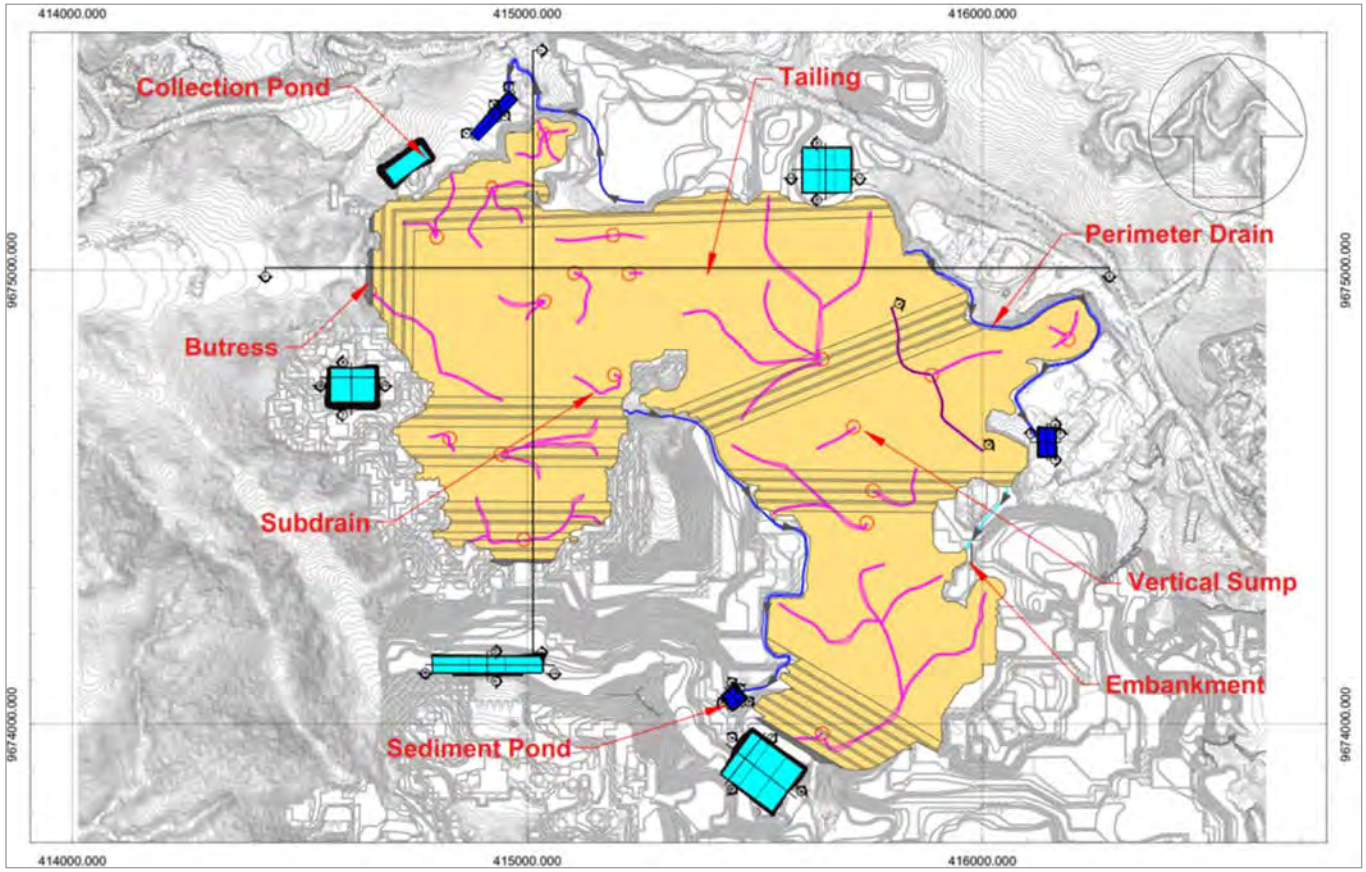
Tabel VIII-11 Perhitungan jumlah sedimen terendapkan pada kolam sedimen DSTF-04

| Parameter | | Unit | DSTF-04 | | |
|---|---|---|---|---|---|
| | | | C-PER01_04 | C-PER01_04 | C-PER01_04 |
| *Rainfall erosion index* | R | | 1162 | 1162 | 1162 |
| *Soil erodibility factor (medium silt)* | K | | 0,6 | 0,6 | 0,6 |
| *Slope steepness* | BS | m/m | 0,18 | 0,17 | 0,30 |
| *Slope length* | L | m | 716 | 508 | 912 |
| *The length and slope factor (gradient)* | LS | | 0,15 | 0,14 | 0,17 |
| *Cover factor (bare soil)* | C | | 1,00 | 1,00 | 1,00 |
| *Erosion control measure factor (bare soil)* | P | | 1,00 | 1,00 | 1,00 |

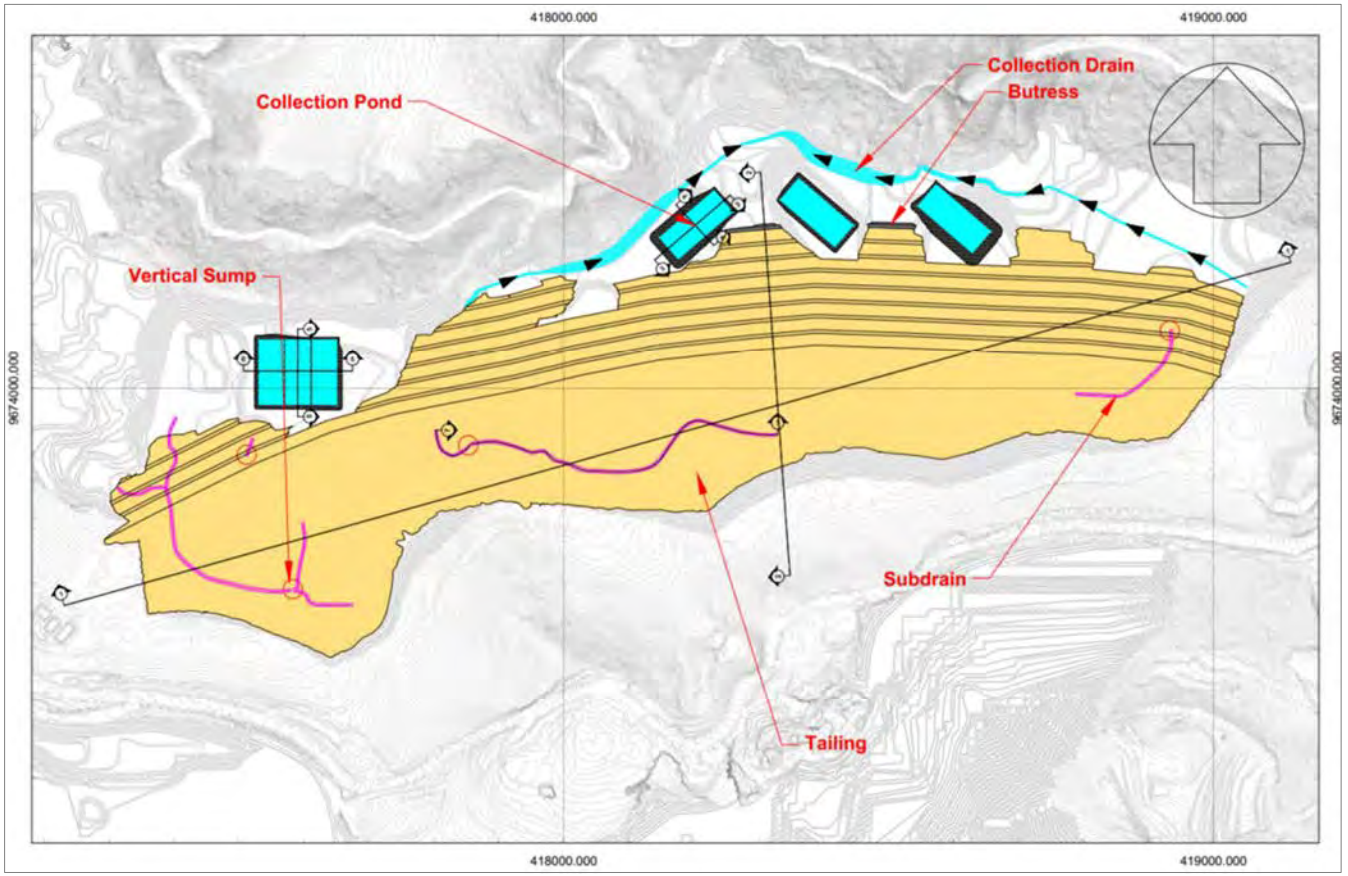
| Parameter | | Unit | DSTF-04 | | |
|---|---|---|---|---|---|
| | | | C-PER01_04 | C-PER01_04 | C-PER01_04 |
| *Annual soil loss due to erosion* | A | tonnes/hectar / year | 103 | 95 | 116 |
| *Total tons deposited per year* | tonnes | | 1530 | 707 | 1333 |
| | ton | | 1686 | 779 | 1470 |
| *Sediment volume per year* | $m^3$ | | 636 | 294 | 555 |

Tabel VIII-12 Perhitungan jumlah sedimen terendapkan pada kolam sedimen DSTF-14

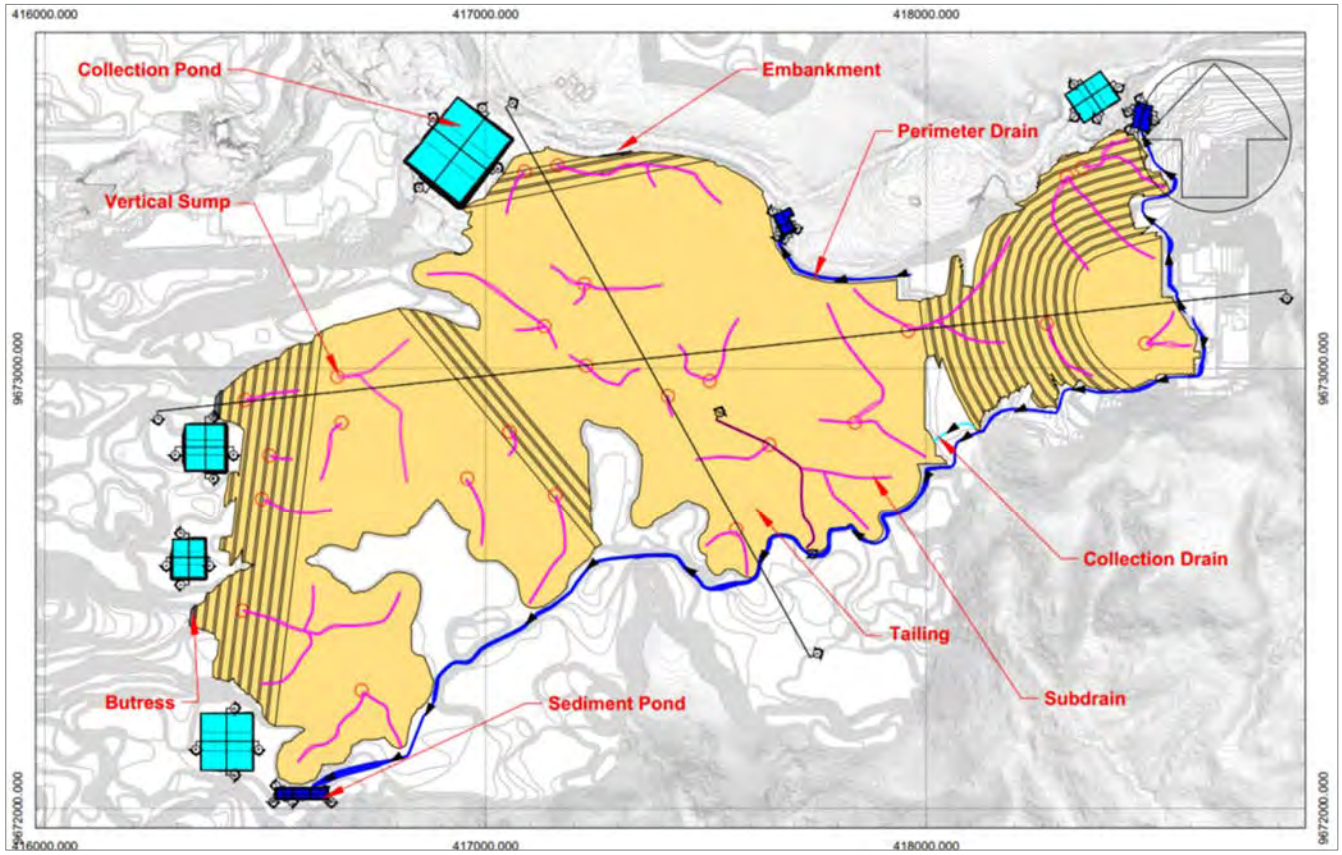
| Parameter | | Unit | DSTF-14 | | |
|---|---|---|---|---|---|
| | | | C-PER01_14 | C-PER01_14 | C-PER01_14 |
| *Rainfall erosion index* | R | | 1162 | 1162 | 1162 |
| *Soil erodibility factor (medium silt)* | K | | 0,6 | 0,6 | 0,6 |
| *Slope steepness* | BS | m/m | 0,20 | 0,37 | 0,20 |
| *Slope length* | L | m | 2571 | 476 | 370 |
| *The length and slope factor (gradient)* | LS | | 0,19 | 0,15 | 0,13 |
| *Cover factor (bare soil)* | C | | 1,00 | 1,00 | 1,00 |
| *Erosion control measure factor (bare soil)* | P | | 1,00 | 1,00 | 1,00 |
| *Annual soil loss due to erosion* | A | tonnes/hectare /year | 135 | 107 | 91 |
| *Total tons deposited per year* | tonnes | | 4405 | 813 | 388 |
| | ton | | 4855 | 897 | 428 |
| *Sediment volume per year* | $m^3$ | | 1832 | 338 | 161 |




Gambar VIII-3 Rekomendasi rencana drainase, kolam lindi dan sedimen area DSTF-04




Gambar VIII-4 Rekomendasi rencana drainase, kolam lindi dan sedimen area DSTF-08




Gambar VIII-5 Rekomendasi rencana drainase, kolam lindi dan sedimen area DSTF-14

## VIII.4 Kebutuhan Pompa

Pompa akan digunakan untuk menyalurkan air dari kolam pengumpul lindi menuju ke WWTP, selain itu juga digunakan untuk mencegah air meluap. Penjagaan kapasitas kolam lindi agar dapat selalu menahan total limpasan air perlu dilakukan dengan memilih pompa dengan kemampuan yang tepat. Secara teknis, pemilihan pompa didasarkan pada dua faktor yaitu kemampuan dorong pompa (head) dan jumlah air yang dipompa (volume/waktu). Untuk menghilangkan risiko kegagalan maka diperlukan spesifikasi pompa dorong yang mampu mendorong air naik dari dari kolam ke permukaan lalu ke WWTP.

Penentuan kebutuhan debit pompa tiap liter per satuan detik (L/s) telah dilakukan pada perhitungan sebelumnya (**Tabel VIII-4**). Berdasarkan persamaan Darcy-Weisbach, head total dapat dihitung dari dua faktor yaitu head statis dan head friksi.

$$H\ total = H\ statis + H\ friksi$$

Head statis adalah komponen yang menggambarkan perbedaan ketinggian fluida yang harus dilawan oleh pompa. Besarnya head statis dipengaruhi oleh ketinggian air yang dihisap oleh sungai (head hisap) dan perbedaan ketinggian antara pompa dengan titik pembuangan (head outlet). Nilai head hisap dapat bernilai negatif jika air yang dipompa berada di ketinggian yang lebih tinggi daripada pompa. Nilai head outlet pun dapat bernilai negatif jika ketinggian titik pembuangan lebih rendah daripada pompa. Hasil perhitungan head statis ditunjukkan pada **Tabel VIII-13**. Ketika head statis bernilai negatif, artinya air dapat dialirkan tanpa hambatan, gaya gravitasi sudah cukup untuk mengalirkan air menuju ke outlet.

$$H\ statis = H\ hisap + H\ outlet$$

$$H\ hisap = Elevasi\ pompa - Elevasi\ air$$

$$H\ outlet = Elevasi\ outlet - Elevasi\ pompa$$

Tabel VIII-13 Perhitungan Head Statis untuk masing-masing Kolam Lindi

| Pond | Elevasi Pompa (m) | Elevasi Outlet (m) | Head Hisap (m) | Head Outlet (m) | Head Statis (m) |
|---|---|---|---|---|---|
| C01_04 | 346 | 285 | 4 | -61 | -57 |
| C02_04 | 419 | 285 | 4 | -134 | -130 |
| C03_04 | 421 | 285 | 4 | -136 | -132 |
| C04_04 | 336 | 285 | 4 | -51 | -47 |
| C01_08 | 334 | 285 | 4 | -49 | -45 |
| C02_08 | 303 | 285 | 4 | -18 | -14 |
| C01_14 | 286 | 285 | 4 | -1 | 3 |

| Pond | Elevasi Pompa (m) | Elevasi Outlet (m) | Head Hisap (m) | Head Outlet (m) | Head Statis (m) |
|---|---|---|---|---|---|
| C02_14 | 287 | 285 | 4 | -2 | 2 |
| C03_14 | 391 | 285 | 4 | -106 | -102 |
| C04_14 | 352 | 285 | 4 | -67 | -63 |
| C05_14 | 401 | 285 | 4 | -116 | -112 |

Head friksi mengacu pada hilangnya energi pompa yang terjadi ketika fluida bergerak melalui fluida akibat adanya gesekan antara fluida dengan permukaan bagian dalam pipa. Faktor gesekan, panjang pipa, diametter pipa, kecepatan aliran, serta gravitasi akan berpengaruh terhadap besarnya head friksi.

$$H\ friksi = f \cdot \frac{L}{D} \cdot \frac{v^2}{2g}$$

$f$ = faktor gesekan (tergantung material pipa)

L= panjang pipa (m)

D = diameter pipa (m)

v = kecepatan aliran (m/s)

g= gravitasi (9.81 $m/s^2$)

Diameter pipa yang digunakan akan bervariasi tergantung besar debit dan kecepatan air yang dialirkan melalui pipa. Jika diasumsikan pipa yang digunakan merupakan pipa HDPE, maka kecepatan aliran yang direkomendasikan adalah 0.3-3 m/s. Kecepatan di bawah 0.3 m/s akan menyebabkan terjadinya pengendapan, sedangkan kecepatan di atas 3 m/s dapat berpotensi untuk merusak pipa.

Pipa HDPE memiliki koefisien gesek sebesar 0.015 dan diasumsikan kecepatan air yang akan dialirkan melalui pipa menuju WWTP adalah 2 m/s. Maka diameter pipa akan dihitung sebagai berikut,

$$Q = A \cdot v$$

Di mana:

Q = Debit ($m^3/s$)

A = Luas penampang pipa ($m^2$)

v = Kecepatan aliran (m/s)

Luas penampang pipa dapat dihitung menggunakan rumus luas lingkaran yaitu:

$$A = \pi \, . r^2$$

$$A = \pi \, . \frac{D^2}{4}$$

Substitusikan rumus tersebut untuk mendapatkan diameter pipa, maka didapat:

$$D = \sqrt{\frac{4 \, . Q}{\pi \, . v}}$$

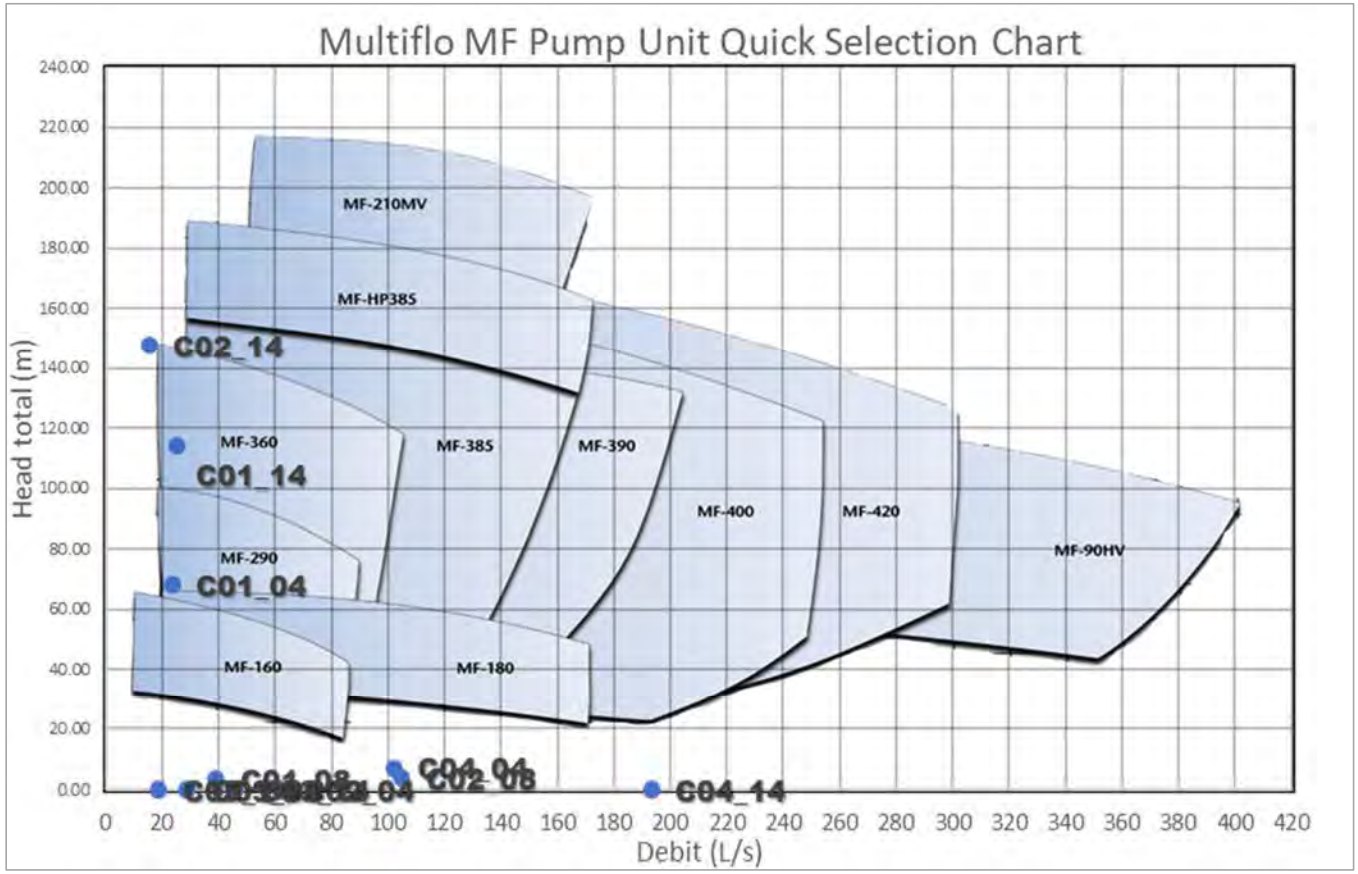
Tabel VIII-14 Perhitungan diameter dan panjang pipa serta total head pada masing-masing lokasi

| Pond | Debit pompa | Diameter Pipa | Panjang Pipa | Diameter Pipa | Head Statis | Head Friksi | Head Total |
|---|---|---|---|---|---|---|---|
| | L/s | m | m | m | m | m | m |
| C01_04 | 23.51 | 0.12 | 5000 | 0.12 | -57 | 125.11 | 68.11 |
| C02_04 | 61.71 | 0.2 | 6000 | 0.2 | -130 | 92.67 | -37.33 |
| C03_04 | 28.98 | 0.14 | 5000 | 0.14 | -132 | 112.69 | -19.31 |
| C04_04 | 101.97 | 0.25 | 4500 | 0.25 | -47 | 54.07 | 7.07 |
| C01_08 | 39.13 | 0.16 | 2500 | 0.16 | -45 | 48.49 | 3.49 |
| C02_08 | 104.76 | 0.26 | 1500 | 0.26 | -14 | 17.78 | 3.78 |
| C01_14 | 25.23 | 0.13 | 4600 | 0.13 | 3 | 111.11 | 114.11 |
| C02_14 | 15.3 | 0.1 | 4700 | 0.1 | 2 | 145.78 | 147.78 |
| C03_14 | 45.74 | 0.17 | 4900 | 0.17 | -102 | 87.9 | -14.1 |
| C04_14 | 193.24 | 0.35 | 3000 | 0.35 | -63 | 26.18 | -36.82 |
| C05_14 | 18.68 | 0.11 | 1500 | 0.11 | -112 | 42.11 | -69.89 |

Pompa yang dipilih adalah pompa tipe MF dari Multiflo. Resume hasil perhitungan head total, jarak, debit, dan tipe pompa yang dipilih dapat dilihat pada **Tabel VIII-15** dengan grafik yang memperlihatkan spesifikasi head total dan debit ditampilkan pada **Gambar VIII-6** serta lokasi masing-masing *collection pond* terhadap WWTP diperlihatkan pada **Gambar VIII-7**.

Tabel VIII-15 Rekomendasi pompa untuk masing-masing kolam lindi

| Kode | Jarak ke WTP (km) | Debit Pompa (L/s) | Head Total (m) | Tipe Pompa |
|---|---|---|---|---|
| C01_04 | 5 | 23.51 | 68.11 | MF-180 |
| C02_04 | 6 | 61.71 | -37.33 | MF-160 |
| C03_04 | 5 | 28.98 | -19.31 | MF-160 |
| C04_04 | 4.5 | 101.97 | 7.07 | Mf-180 |
| C01_08 | 2.5 | 39.13 | 3.49 | MF-160 |
| C02_08 | 1.5 | 104.76 | 3.78 | MF-180 |
| C01_14 | 4.6 | 25.23 | 114.11 | MF-360 |
| C02_14 | 4.7 | 15.3 | 147.78 | MF-360 |
| C03_14 | 4.9 | 45.74 | -14.10 | MF-160 |
| C04_14 | 3 | 193.24 | -36.82 | MF-400 |
| C05_14 | 1.5 | 18.68 | -69.89 | MF-160 |




Gambar VIII-6 Grafik Kapasitas Pompa dan Head Multiflo MF




Gambar VIII-7 Lokasi Collection Pond terhadap WWTP

# IX. KONSTRUKSI

## IX.1 Metode Konstruksi

### IX.1.1 Fondasi DSTF

Persiapan fondasi dan penyangga untuk DSTF merupakan fase kritis pada tahap konstruksi, tingkat ketelitian pelaksanaan akan terlihat pada kinerja operasional dari struktur. Pekerjaan tersebut dimaksudkan untuk memastikan bahwa fondasi dan penyangga diletakkan cukup dalam untuk menghilangkan material lunak, organik, retakan, lapukan, atau material lain yang tidak diinginkan.

Area fondasi DSTF akan didrainase menggunakan saluran perimeter pengalihan dan saluran internal untuk memastikan fondasi terdrainasi sehingga sesuai untuk penempatan material pengisi. Aliran air permukaan, jika ada selama konstruksi, akan dialihkan oleh saluran di hulu dan dikumpulkan pada sumuran kemudian dipompa ke sisi hilir DSTF untuk diendapkan sebelum dibuang ke perairan umum. Tapak DSTF akan dibersihkan dari semua bahan organik, material lepas dan lunak lalu dipadatkan dengan pemadat rol bergetar kelas 10 ton sebanyak 5 lintasan.

### IX.1.2 Buttress Tailing

**Pemilihan Material**

Bahan untuk buttress tailing harus bebas dari tumbuhan dan material pengganggu lainnya yang dapat mempengaruhi kinerja buttress selama masa pakainya. Batuan, pasir, lempung, dan bahan-bahan seperti abu, klinker, atau limbah industri lainnya, dapat digunakan sepanjang bisa berfungsi dan menghasilkan buttress yang stabil yang dapat menopang pembuangan tailing tanpa deformasi yang berlebihan. Material yang mengalami perubahan volume yang besar akibat variasi kadar air, seperti lempung ekspansif, umumnya tidak dianjurkan untuk digunakan. Bahan yang mudah tererosi dan/atau dispersif juga tidak direkomendasikan.

Bahan urugan biasanya diperoleh dari penggalian yang berdekatan dengan dasar pemindahan tanah yang seimbang pada garis ketinggian. Setidaknya terdapat dua cara agar konsep tersebut dapat diimplementasikan. Cara konvensional adalah bahwa volume akhir galian dan timbunan harus sama. Artinya bahwa biaya akhir dari galian dan timbunan harus diminimalkan, tentu saja dengan batasan standar geometrik yang sama. Agar lebih efektif, perlu keyakinan terhadap sifat asli dan luasan material pada tahap awal proses desain, namun hal ini mungkin akan menimbulkan beberapa masalah dalam penyusunan program. Jika hal ini tidak memungkinkan karena kualitas, ekonomi, atau alasan lainnya, penggalian pada lokasi lain (borrow pit) dapat digunakan.

Bahan yang digali dari borrow pit atau dari prisma jalan dapat diklasifikasikan sesuai untuk maksud tertentu dalam urugan dan dapat ditimbun sementara sebelum ditempatkan pada posisi akhir, misalnya batu dari lapisan yang lebih rendah dari galian mungkin diperlukan untuk ditempatkan di bagian bawah buttress yang berdekatan. Jika ini dilakukan, pengaturan pengangkutan massa perlu dilakukan dengan sangat hati-hati untuk meminimalisasi penanganan ganda pada urugan.

**Peletakan dan Ketebalan Lapisan**

Material urugan harus ditempatkan secara sistematis dan pada lapisan yang seragam dengan lebar dan sisi lereng yang tepat sehingga memudahkan pengaturan. Dibutuhkan kehati-hatian untuk memastikan material ditempatkan dengan benar untuk menghindari terjadinya material lepas, bagian tepi yang tidak terkompaksi, dan tumpahan dari kelebihan atau tambahan material karena lebar yang tidak mencukupi.

Lapisan ditempatkan pada kemiringan (camber) atau kemiringan melintang (crossfall) yang sesuai agar air dapat keluar bebas dari permukaan. Kejenuhan material pengisi harus dihindari dan direkomendasikan membuat sistem drainase sementara jika diperlukan. Secara konvensional, ketebalan lapisan yang dipadatkan seperti tanah, pasir, lempung, dan kerikil adalah 150 mm. Namun, lapisan dengan ketebalan 200 mm hingga 300 mm (atau lebih tebal pada batuan dan material berbatu) lebih sesuai dengan kondisi saat ini.

Ketebalan lapisan tergantung pada ukuran maksimum partikel dari material dan efisiensi dari peralatan pemadatan. Jika lapisan lebih tebal daripada hasil pemadatan konvensional yang dipertimbangkan, direkomendasikan dilakukan uji penggilasan (proof rolling) untuk mendapatkan ketebalan lapisan optimum yang sesuai dengan kondisi material dan lapangan.

***Urugan Batu***

Material berbatu harus ditempatkan dalam lapisan dengan menghamparkan secara merata hingga ketebalan lapisan yang telah ditentukan. Batuan harus dihamparkan dengan dozer ke posisi yang tepat untuk menghindari adanya material urugan yang bergelombang. Secara umum disarankan agar urugan batu tidak boleh melebihi dimensi maksimum dua pertiga dari ketebalan lapisan. Ketika material berbatu ditempatkan bersama dengan material halus (karena hasil dari tambang galian atau dengan tambahan material halus) atau ketika material batuan tersebut dapat terlapukkan dengan cepat, dapat digunakan material seperti batu lumpur dan batu sedimen tillites tertentu untuk meminimalisasi rongga pada urugan.

**Commented [AN1]:** Menyesuaikan dengan kondisi di site

Bahan yang mudah hancur atau sudah lapuk harus digilas dengan grid-roller agar diperoleh ukuran yang diinginkan, karena jika tidak dapat menyebabkan terbentuknya zona tidak padat di dalam lapisan. Batuan padat dan tidak mudah lapuk, seperti batuan beku dan beberapa batupasir (setelah peledakan) kemungkinan tidak memiliki material halus yang dapat mengisi rongga. Jenis batu ini dapat ditempatkan tanpa penambahan material yang lebih halus untuk

mengisi celah. Lapisan penutup yang berasal dari material berukuran partikel yang lebih kecil direkomendasikan diletakkan di atas area buttress dengan ketebalan sekitar 0,5 m.

Jika bahan in-situ bersifat lunak, diperlukan lapisan penutup serupa yang diletakkan di bawah buttress untuk mencegah penetrasi batu ke lapisan bawah tanah. Sebagai alternatif, dapat menggunakan karpet fiber buatan. Bagian atas (1m) dari setiap batuan kasar pengisi atas sub-grade (tepat di bawah lapisan sub-base) harus ditempatkan material halus yang cukup untuk membentuk lapisan padat agar mencegah masuknya material ke dalam celah lapisan bawah. Disarankan melakukan pemadatan dengan vibrating roller dan/atau grid rolling, namun penebaran material halus ke dalam urugan umumnya tidak dibutuhkan.

### IX.1.3 Perimeter Drainase

**Penggalian untuk Saluran *U-Ditch***

Tanah yang diperoleh dari hasil pemangkasan lereng akan digunakan sebagai material isian. Kemiringan tanah yang dibuat harus sesuai dengan persyaratan pada ketinggian penampang melintang. Kesalahan penggalian yang tidak sesuai dengan syarat ketinggian pada penampang akan menyebabkan genangan air sehingga mengganggu aliran air. Penurunan awal lereng harus mempertimbangkan penurunan muka air di bawah tanah karena berfungsi untuk menstabilkan tanah di bawah saluran air. Setelah menyelesaikan penggalian, disarankan untuk membuat lapisan penahan agar tanah tidak jatuh ke area penggalian sehingga ketinggian penampang menjadi tidak sesuai. Pemadatan area kemudian dilakukan setelah penggalian selesai dan ketinggian penampang yang direncanakan tercapai.

**Pemasangan *U-Ditch***

Pada tahap ini proses pemasangan harus dilakukan dengan benar. Pemasangan parit-u dapat dilakukan secara manual menggunakan crane atau ekskavator tergantung berat dari parit itu sendiri. Sambungan antar beton harus dihubungkan dengan melakukan pengelasan pada pelat penghubung kemudian sambungan di-nat menggunakan semen. Pekerjaan biasanya dibagi menjadi beberapa titik kerja agar tetap sejalan sehingga dapat mempertahankan persyaratan elevasi pada saluran. Hal ini dilakukan untuk menjaga ketinggian sesuai dengan rencana.

**Pemadatan Area Kerja U- Ditch dan Penjaminan**

Setelah *u-ditch* dipasang dan telah terhubung dengan benar, langkah selanjutnya adalah pemadatan area kerja dan pemuatan di setiap sisi u-ditch. Parit dijaga agar tidak bergeser karena akan menyebabkan perubahan pada level ketinggian. Selain itu, perlu juga dipertimbangkan untuk memasang penutup di area yang berpotensi terjadinya penumpukan sampah. Hal tersebut di atas merupakan langkah-langkah sederhana dalam melakukan instalasi parit, mulai dari tahap persiapan hingga penyelesaian.

## IX.2 Peralatan dan Teknik Pemadatan

Pemadatan tanah didefinisikan sebagai metode peningkatan densitas tanah secara mekanis. Tingkat pemadatan yang tinggi akan meningkatkan densitas tanah dengan menyatukan partikel-partikel tanah dan menghilangkan rongga udara. Pemadatan tanah dengan meningkatkan sifat-sifat tanah sangat penting untuk mencapai stabilitas tanggul. Sifat fisik dan mekanik yang berubah akibat proses pemadatan tanah adalah sebagai berikut:

- Ketebalan lapisan akan berkurang disertai dengan peningkatan berat unit yang sesuai
- Kekuatan geser dan daya dukung akan meningkat
- Kekakuan akan berkurang dengan menurunkan kompresibilitas
- Permeabilitas akan berkurang seiring menurunnya porositas

Ada beberapa faktor yang perlu dipertimbangkan ketika mempersiapkan dan melaksanakan kegiatan di lapangan sehingga hasil dari proses pemadatan tanah sesuai dengan rencana. Faktor-faktor yang perlu diperhatikan diuraikan di bawah ini.

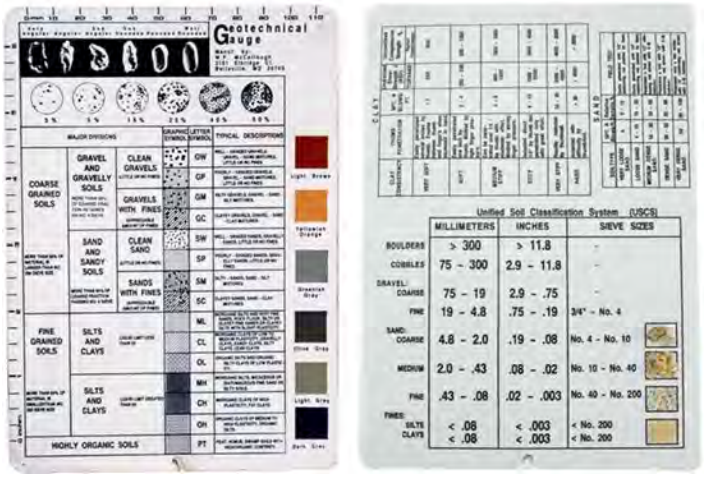
### IX.2.1 Tipe Material

Jenis tanah memiliki pengaruh besar pada karakteristik pemadatan. Umumnya tanah yang bersifat lempung padat, lempung dan lanau memiliki ketahanan yang lebih tinggi terhadap pemadatan sehingga sulit untuk dipadatkan, sedangkan tanah berpasir dan tanah berbutir kasar atau kerikil dapat dipadatkan dengan lebih mudah. Tanah granular bergradasi baik dapat mencapai densitas kering yang besar dan biasanya lebih mudah dipadatkan. Tanah berbutir kasar memiliki densitas yang lebih tinggi dibandingkan dengan tanah lempungan. Tanah kohesif mengandung rongga udara dalam jumlah besar sehingga dibutuhkan lebih banyak air untuk mengurangi rongga udara karenanya kadar air optimum pada jenis tanah ini tinggi. Penambahan air menyebabkan tanah bersifat plastis sehingga proses pemadatan akan semakin sulit.

Pemeriksaan jenis dan ukuran tanah secara teratur penting untuk dilakukan agar keseragaman tanah dapat dipastikan terutama pada tahap konstruksi. Secara praktis pemantauan lapangan dapat dilakukan dengan mengambil sampel tanah untuk kemudian dilakukan klasifikasi tanah dengan bantuan skala pengukur geoteknik seperti yang ditunjukkan pada Gambar IX-1.

Berdasarkan hasil uji lab untuk material Tailing di IUP PT HM, berdasarkan Sistem Klasifikasi Tanah Terpadu (USCS), ditampilkan dalam Tabel III-4 Klasifikasi Material Tanah PT FMI-HMTabel III-4 , yang menggambarkan grafik distribusi jenis tanah berdasarkan klasifikasi ASTM D4318 di setiap lokasi sample tailing. Tailing menunjukkan klasifikasi ML (Silt) untuk semua pengujian Grain Size dan Atterberg Limit.

| Hole ID | Sample Type | Grain Size & Double Hydrometer | | | | Atterberg Limit | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Non-Sodium | | | | (Atterberg Limits) | | | |
| | | Gravel | Sand | Silt | Clay | WL | Wp | Ip | Class |
| | | (%) | (%) | (%) | (%) | (%) | (%) | (%) | |
| T1, T2, T4 | Bulk | 0.00 | 2.00 | 28.00 | 70.00 | 47.00 | 31.00 | 16.00 | ML |
| T5, T7, T8 | Bulk | 0.00 | 2.00 | 30.00 | 68.00 | 42.00 | 30.00 | 12.00 | ML |
| T9, T11, T12 | Bulk | 0.00 | 2.00 | 24.00 | 74.00 | 42.00 | 31.00 | 11.00 | ML |




Gambar IX-1 McCullugh Geo Card & Geotechnical Gauge, panduan praktis klasifikasi tanah untuk pemantauan lapangan

### IX.2.2 Pemilihan jenis pemadat

Dengan kondisi klasifikasi tailing yang ada di IUP PT HM dengan mengacu kepada Gambar V-2, maka jenis peralatan yang cocok digunakan adalah mesin kompaksi *Sheepsfoot roller*. *Sheepsfoot/padfoot roller* adalah contoh peralatan yang menerapkan gaya vertikal statis. Gaya getaran vertikal bergetar diaplikasikan dengan sistem yang digerakkan mesin dengan bobot eksentrik yang berputar atau mekanisme pegas/piston yang memberikan serangkaian pukulan cepat ke permukaan tanah. Tanah dipadatkan oleh tekanan dan penataan ulang struktur tanah akibat dampak tumbukan dan getaran yang ditimbulkan.

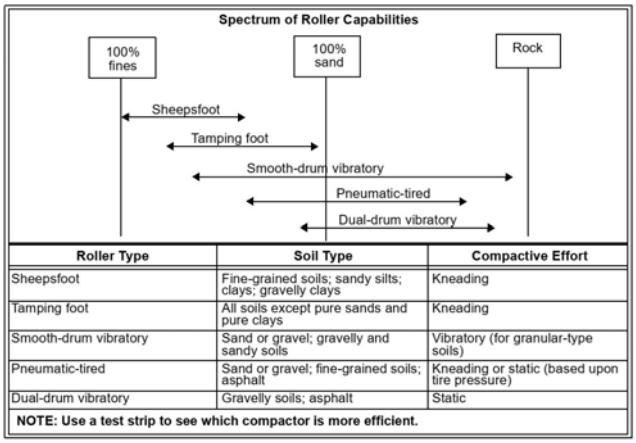


Gambar IX-4 Illustrasi Mesin Sheepsfoot Roller (Budhu, M., 2000)

Penentuan jenis peralatan pemadatan tergantung pada jenis tanah yang perlu dipadatkan, kepadatan yang diinginkan, penempatan ketebalan lapisan, volume pekerjaan dan peralatan pemadatan yang tersedia. Referensi jenis peralatan dan kemampuan berdasarkan berbagai jenis tanah dapat dilihat pada Gambar IX-2 dan Gambar IX-3.

| | | Compaction type | | | | |
|---|---|---|---|---|---|---|
| | | Static | | Dynamic | | |
| | | Pressure with kneading | Kneading with pressure | Vibration | Impact | |
| Material | Lift thickness (mm) | Static sheeps-foot grid roller; scraper | Scraper; rubber-tired roller; loader; grid roller | Vibrating plate compactor; vibrating roller; vibrating sheepsfoot roller | Vibrating sheepsfoot rammer | Compactability |
| Gravel | 300+ | Not applicable | Very good | Good | Poor | Very easy |
| Sand | 250± | Not applicable | Good | Excellent | Poor | Easy |
| Silt | 150± | Good | Excellent | Poor | Good | Difficult |
| Clay | 150± | Very good | Good | No | Excellent | Very difficult |

Gambar IX-2 Perbandingan kompaksi lapangan untuk berbagai jenis tipe tanah (Budhu, M., 2000)




| Roller Type | Soil Type | Compactive Effort |
|---|---|---|
| Sheepsfoot | Fine-grained soils; sandy silts; clays; gravelly clays | Kneading |
| Tamping foot | All soils except pure sands and pure clays | Kneading |
| Smooth-drum vibratory | Sand or gravel; gravelly and sandy soils | Vibratory (for granular-type soils) |
| Pneumatic-tired | Sand or gravel; fine-grained soils; asphalt | Kneading or static (based upon tire pressure) |
| Dual-drum vibratory | Gravelly soils; asphalt | Static |
| **NOTE: Use a test strip to see which compactor is more efficient.** | | |

Gambar IX-3 Kemampuan peralatan pemadatan (US Army, Field Manual, 2000)

Karena kegunaan beberapa jenis peralatan pemadatan tumpang tindih, sebaiknya menggunakan uji strip untuk menentukan jenis pemadat dan prosedur pemadatan yang paling efisien. Uji strip diletakan berdekatan dengan lokasi pekerjaan. Uji strip memberikan evaluasi/validasi terhadap prosedur konstruksi yang diusulkan. Informasi yang diperoleh dari tes strip meliputi:

- Jenis peralatan pemadatan yang paling efektif
- Ketebalan lapisan optimal
- Kecepatan pemadat optimal
- Jumlah *pass* yang diperlukan
- Jumlah pemberat yang dibutuhkan
- Frekuensi getaran yang diperlukan

Untuk melakukan pemilihan awal terhadap alat pemadatan, letakkan lapisan material sedalam 6 inci atau 150 mm (kedalaman yang tidak dikompaksi) kemudian jalankan setiap peralatan melalui dengan panjang *strip* dan jumlah lintasan yang telah ditentukan sebelumnya (biasanya tiga). Setelah pemadatan material selesai, lakukan uji densitas untuk menentukan rol mana yang memberikan hasil terbaik. Setelah jenis peralatan yang paling efektif ditentukan, gunakan uji strip tambahan untuk menentukan ketebalan lapisan yang paling tepat dan jumlah lintasan yang diperlukan, kecepatan pemadat yang optimal dan frekuensi resonansi (jika menggunakan vibrating rollers).

Tabel IX-1 Persyaratan pemadatan rata-rata (US Army, Field Manual, 2000)

| | | Soil Classification Symbol | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GW | GP | GM | GC | SW | SP | SM | SC | ML | CL | OL | MH | CH | OH |
| Sheeps-foot, Standard With Ballast (Towed by Dozer) | Lift Thickness Compacted (Inches) | * | * | * | 6 | * | * | * | 6 (Best) | 6 | 6 (Best) | 6 | 6 | 6 (Best) | 6 |
| | Rolling Speed (mph) | NA | NA | NA | 3 | NA | NA | NA | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| | Number of Passes | NA | NA | NA | 10 | NA | NA | NA | 10 | 10 | 12 | 12 | 12 | 14 | 14 |
| Self-Propelled Vibratory Roller | Lift Thickness Compacted (Inches) | 18 (Best) | 18 (Best) | 12 | 12 | 18 (Best) | 18 (Best) | 12 | 12 | 8 | 8 | * | * | * | * |
| | Rolling Speed (mph/vpm) | 4/1,400 or more | 4/1,400 or more | 4/ 1,100 | 4/700 to none | 4/1,400 or more | 4/1,400 or more | 4/ 1,100 | 3/700 to none | 3/700 to none | 3/700 to none | NA | NA | NA | NA |
| | Number of Passes | 8 | 8 | 6 | 6 | 8 | 8 | 6 | 7 | 7 | 7 | NA | NA | NA | NA |
| Tamping-Foot Roller, Self-Propelled (Not Recommended for Finishing Grade) | Lift Thickness Compacted (Inches) | 12 | 12 | 9 | 9 | 12 | 12 | 9 | 9 | 6 | 6 | 6 | 6 | 6 | 6 |
| | Rolling Speed (mph) | 10 | 10 | 10 | 8 | 10 | 10 | 10 | 8 | 8 | 4 | 4 | 4 | 3 | 3 |
| | Number of Passes | 5 | 5 | 6 | 7 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 6 |
| 13-Wheel Pneumatic Compactor with Ballast (Wheel Towed), 100 psi | Lift Thickness Compacted (Inches) | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| | Rolling Speed (mph) | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| | Number of Passes | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 12 | 7 | 7 | 7 | 8 | 9 | 9 |
| 9-Wheel Pneumatic, Self-Propelled with Ballast, 100 psi | Lift Thickness Compacted (Inches) | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| | Rolling Speed (mph) | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 |
| | Number of Passes | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 6 | 6 | 6 | 6 | 6 | 6 |
| Smooth-Drum Vibratory Roller | Lift Thickness Compacted (Inches) | 12 | 12 | 9 | 9 | 12 | 12 | 9 | 9 | 6 | 6 | * | * | * | * |
| | Rolling Speed (mph/vpm) | 4/1,400 or more | 4/1,400 or more | 4/ 1,100 | 4/700 to none | 4/1,400 or more | 4/1,400 or more | 4/ 1,100 | 3/700 to none | 3/700 to none | 3/700 to none | NA | NA | NA | NA |
| | Number of Passes | 8 | 8 | 8 | 9 | 8 | 8 | 8 | 10 | 10 | 10 | NA | NA | NA | NA |

NOTES:
This chart should be used as a planning guide when a test strip cannot be performed.
The above symbols are based on the United Soil Classification System (USCS).
*Not recommended.

### IX.2.3 Kandungan Kelembaban

Pengontrolan kadar air di dalam tanah diperlukan untuk mencapai densitas yang diinginkan. Densitas maksimum dengan upaya pemadatan minimum dapat dicapai pada pemadatan tanah yang memiliki kadar air mendekati optimumnya. Jika kandungan air pada tanah kurang dari kadar air optimal, harus dilakukan penambahan volum air sejumlah yang terhitung. Penambahan air ini dapat dilakukan menggunakan *sprinkler* yang menempel pada truk air dan dicampur dengan tanah oleh motor *grader* agar diperoleh kadar air yang seragam. Jika tanah memiliki kadar kelembaban yang terlalu tinggi, sebaiknya dilakukan pengeringan dengan aerasi untuk mencapai kadar air yang optimal.

### IX.2.4 Ketebalan Lapisan

Massa tanah dipadatkan dalam lapisan yang disebut *lift*. Tingkat pemadatan tanah pada prinsipnya berbanding terbalik dengan ketebalan lift. Pemadatan tanah dengan menggunakan energi tertentu pada lapisan yang lebih tebal akan menyebabkan lapisan tersebut menjadi kurang padat dibandingkan dengan lapisan tipis. Hal ini dikarenakan energi yang digunakan pada tanah yang lebih tebal per satuan berat lebih kecil jika dibandingkan dengan lapisan yang lebih tipis.

Penentuan ketebalan lapisan tanah sangat penting dilakukan agar tercapai densitas tanah yang diinginkan. Ketebalan lapisan tergantung pada beberapa faktor lain seperti jenis tanah, jenis *roller*, berat *roller* dan tekanan kontak *drum*.

Secara umum, ketebalan *lift* jarang melebihi 300 mm seperti yang ditunjukkan pada Gambar IX-2. Tanah berbutir kasar dipadatkan dalam *lift* antara 250 mm dan 300 mm sementara tanah berbutir halus dipadatkan dalam *lift* berkisar antara 100 mm dan 150 mm. Tekanan yang diberikan oleh *compactor*, terutama *compactor* statis, akan berkurang seiring dengan bertambahnya kedalaman *lift*. Akibatnya, bagian atas *lift* mendapatkan tekanan lebih besar daripada bagian bawah sehingga pemadatan yang terjadi lebih intensif. Ketebalan lift yang lebih tipis lebih disarankan untuk hasil pemadatan yang seragam.

### IX.2.5 Jumlah Lintasan Roller dan Kecepatan Roller

Densitas tanah akan mengalami peningkatan seiring dengan peningkatan jumlah lintasan *roller*. Meskipun demikian, terdapat dua hal penting yang harus diperhatikan, yaitu:

- Pertama, peningkatan densitas tidak akan terjadi lagi setelah dilewati sejumlah lintasan *roller*
- Peningkatan penggunaan jumlah lintasan *roller* akan menyebabkan peningkatan biaya

Penentuan jumlah lintasan *roller* sangat penting untuk semua jenis tanah pada kadar air optimal. Uji strip lapangan dilakukan untuk menghemat aspek pemadatan pekerjaan tanah, sekaligus mencapai tingkat kepadatan yang diinginkan. Jika uji strip tidak dapat dilakukan, maka dapat menggunakan referensi untuk memperkirakan jumlah lintasan *roller* seperti dapat dilihat pada Tabel IX-1.

Kecepatan *rolling* memiliki hubungan yang sangat penting terhadap hasil yang diperoleh dari proses *roller*. Terdapat dua hal penting yang perlu diperhatikan, yaitu:

- Pertama, semakin besar kecepatan *rolling*, maka semakin panjang timbunan yang dapat dipadatkan dalam satu hari
- Kedua, pada kecepatan yang lebih besar kemungkinan tidak ada cukup waktu untuk mendapatkan deformasi yang diinginkan dan akan membutuhkan lebih banyak lintasan *roller* untuk mencapai tingkat pemadatan yang diperlukan

Kecepatan semua roller dibatasi sekitar 3 km/jam dengan 10 trip untuk setiap lintasan. Kecepatan *rolling* merupakan faktor yang signifikan pada penggunaan *sheepsfoot roller* karena material halus tidak memiliki banyak pori yang menyebabkan sejumlah partikel dapat menyatu dengan padu sehingga dibutuhkan lintasan yang lebih banyak dengan kecepatan yang lebih lambat. Hal ini ditujukan untuk material tailing menerima beban roller lebih banyak dan lama demi mencapai nilai pemadatan yang lebih diharapkan.

Kecepatan *rolling* optimal diperoleh dari uji strip di lapangan. Jika uji strip tidak dapat dilakukan, maka dapat digunakan referensi untuk memperkirakan kecepatan *rolling* seperti dapat dilihat padaTabel IX-2.

Tabel IX-2 Kecepatan operasi standar peralatan *compactor* (US Army, 2000)

| Compactor | Speed (mph) |
|---|---|
| Sheepsfoot, crawler, towed | 3-5 |
| Sheepsfoot, wheel-tractor, towed | 5-10 |
| Tamping foot:<br>First two or three passes<br>Walking out | <br>3-5<br>8-10 |
| Heavy pneumatic | 3-5 |
| Multitired pneumatic | 5-15 |
| Dual-drum vibratory | 2-4 |
| Smooth-drum vibratory | 2-4 |
| Vibratory:<br>Plate<br>Roller | <br>0.6-1.2<br>1 |

### IX.2.6 Pemantauan Hasil Pemadatan (Kompaksi)

Kontrol pemadatan dilakukan dengan mengukur densitas kering dan kadar air tanah yang dipadatkan di lapangan. Kecuali ditentukan lain, semua tanggul dipadatkan hingga setidaknya 95% dari densitas kering maksimumnya. Berdasarkan hasil uji laboratorium, densitas kering maksimum tailing adalah 1,637 t/m$^3$ (satu koma enam tiga tujuh ton permetrik). Dengan konstanta tersebut, maka target nilai densitas kering maksimum timbunan tailing setelah dipadatkan menggunakan metode diatas adalah 1,555 t/m$^3$ (satu koma lima lima lima ton permetrik). Angka inilah yang menjadi nilai acuan keberhasilan dari proses kompaksi tailing pada DSTF.

Untuk memantau nilai densitas kering, tenaga teknis lapangan perlu memeriksa bahwa pemadatan lapangan yang dilakukan memenuhi spesifikasi dengan mengukur derajat pemadatan (degree of compaction - DC), dimana DC merupakan rasio berat unit kering yang diukur dengan berat unit kering yang diinginkan. DC dapat dihitung dengan menggunakan rumus berikut:

$$DC = \frac{Measured\ dry\ unit\ weight}{Desired\ dry\ unit\ weight}$$

Selama konstruksi, untuk mendapat distribusi densitas material secara merata, diperlukan pengukuran DC pada interval 100 meter untuk masing-masing peningkatan ketinggian sebesar 2 meter.

Berbagai metode tersedia untuk memeriksa jumlah kompaksi yang dicapai di lapangan. Tiga metode yang umumnya dipakai adalah *sand cone*, *the balloon* dan *nuclear density maters*. Perbandingan ketiga metode ini diperlihatkan pada Tabel IX-3.

Tabel IX-3 Perbandingan uji kontrol kualitas pemadatan/kompaksi

| Material | Sand cone | Balloon | Nuclear density meter |
|---|---|---|---|
| Advantages | • Low cost<br>• Accurate<br>• Large sample | • Low to moderate cost<br>• Fewer computational steps compared to sand cone<br>• Large sample | • Quick<br>• Direct measurement of unit weight and water content |
| Disadvantages | • Slow; many steps required<br>• Standard sand in hole has to be retrieved<br>• Unit weight has to be computed<br>• Difficult to control density of sand in hole<br>• Possible void space under plate<br>• Hole can reduce in size through soil movement<br>• Hole can cave in (granular materials) | • Slow<br>• Extra care needed to prevent damage to balloon, especially in gravelly materials<br>• Unit weight has to be computed<br>• Difficult to obtain accurate hole size<br>• Possible void space under plate<br>• Hole can reduce in size through soil movement<br>• Hole can cave in (granular materials) | • High cost<br>• Radiation certification required for operation<br>• Water content error can be significant<br>• Surface preparation needed<br>• Radiation backscatter can be hazardous |

Uji *sand cone* direkomendasikan untuk digunakan pada uji lapangan karena memiliki akurasi yang baik dan harga yang relatif murah. Alat uji *sand cone* ditunjukkan pada Gambar IX-4 dan prosedur untuk uji *sand cone* adalah sebagai berikut:

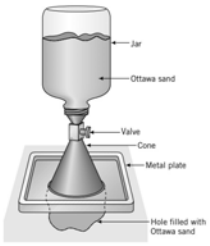
a) Isi tabung dengan pasir standar (pasir dengan densitas yang diketahui) dan tentukan berat peralatan *sand cone* dengan tabung yang diisi pasir (W1). American Society for Testing and Materials (ASTM) merekomendasikan pasir Ottawa untuk digunakan sebagai standar.
b) Tentukan berat pasir untuk mengisi *cone* (W2)
c) Gali lubang kecil di tanah dan tentukan berat tanah yang digali ($W_3$)
d) Tentukan kandungan air dari tanah yang digali (w)
e) Isi lubang dengan pasir standar dengan membalikkan aparatus *sand cone* di atas lubang dan buka katup.
f) Tentukan berat apparatus *sand cone* dengan sisa pasir di dalam tempatnya ($W_4$)
g) Hitung satuan berat tanah sebagai berikut:

Weight of sand to fill hole = $W_s = W_1 - (W_2 + W_4)$

Volume of hole = $V = \dfrac{W_s}{(\gamma_d)_{Ottawa\ sand}}$

Weight of dry soil = $W_d = \dfrac{W_3}{1 + w}$

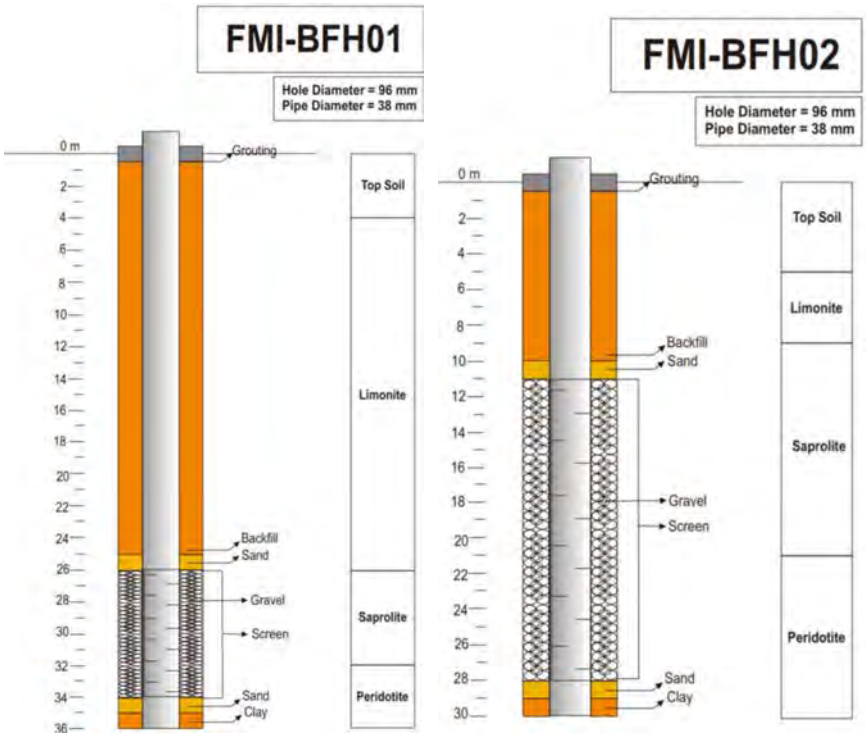
Dry unit weight = $\gamma_d = \dfrac{W_d}{V}$

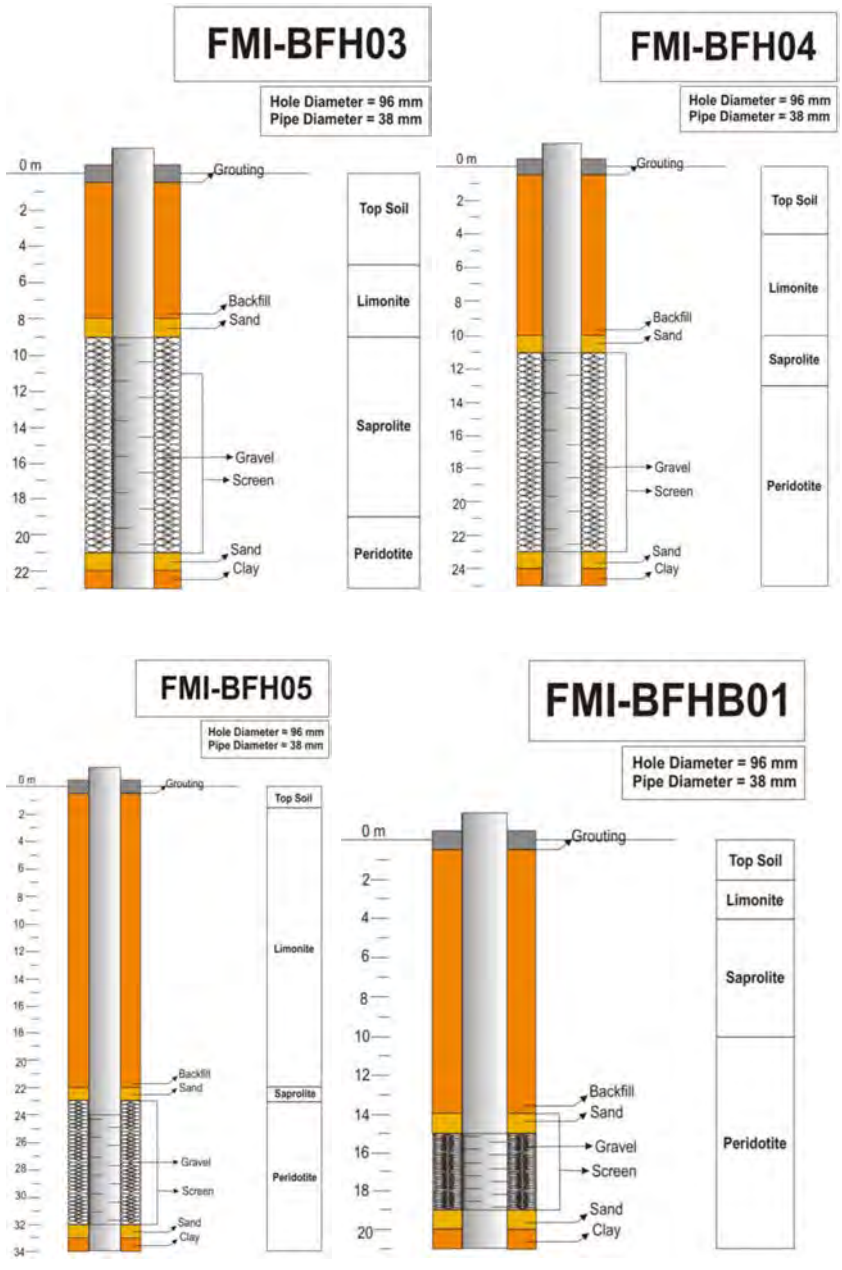


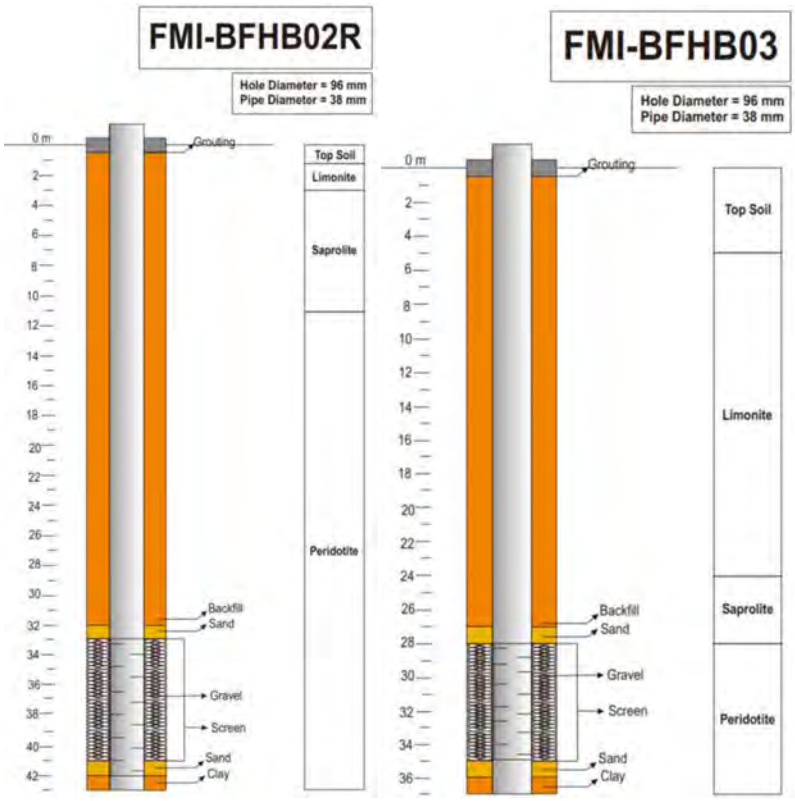

Gambar IX-4 Perlengkapan uji *sand cone*

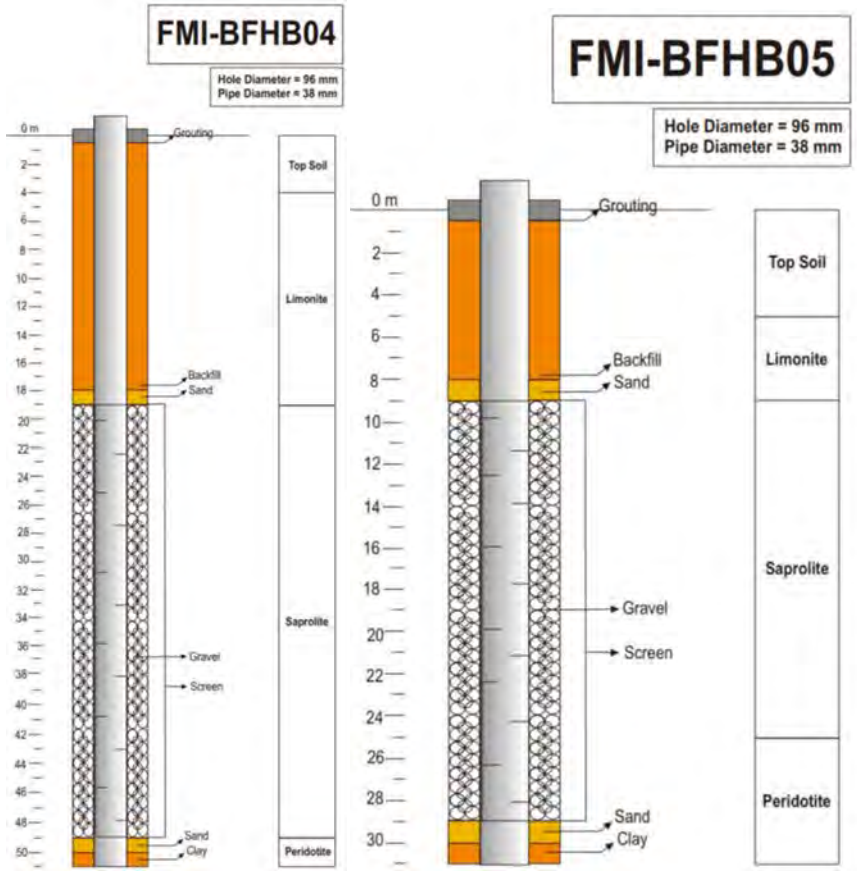
# X. LAMPIRAN

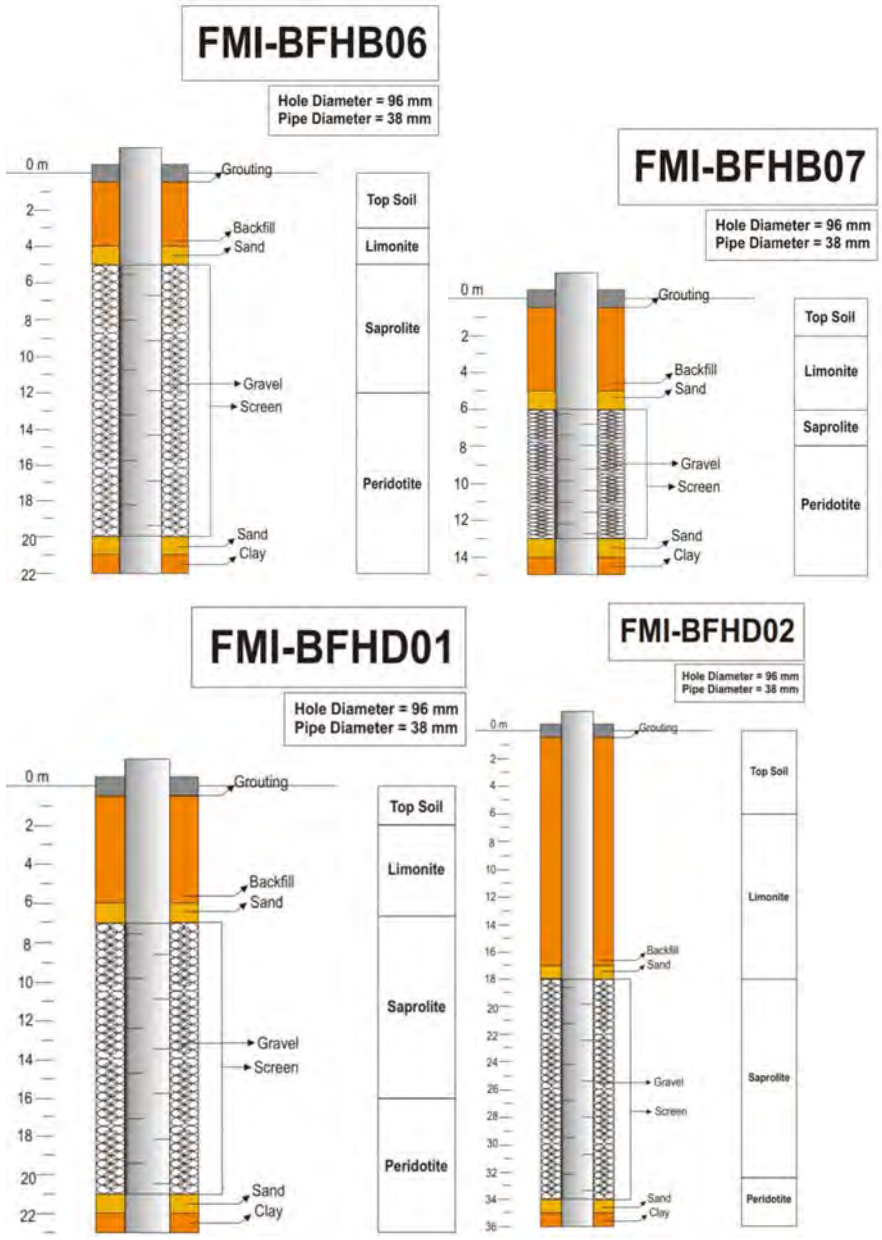
## X.1 Desain Konstruksi Sumur Pantau

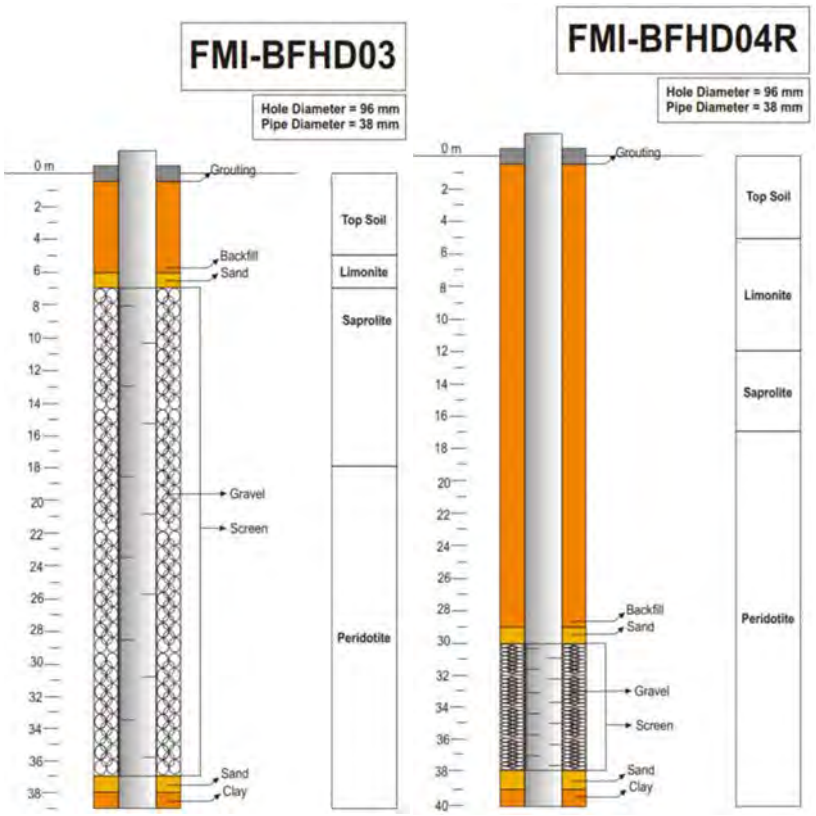



FMI-BFH03
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFH04
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFH05
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHB01
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite


FMI-BFHB02R
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHB03
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite


FMI-BFHB04
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHB05
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite


FMI-BFHB06
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
2
4
6
8
10
12
14
16
18
20
22
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHB07
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
2
4
6
8
10
12
14
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHD01
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
2
4
6
8
10
12
14
16
18
20
22
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHD02
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite


FMI-BFHD03
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite
FMI-BFHD04R
Hole Diameter = 96 mm
Pipe Diameter = 38 mm
0 m
Grouting
Backfill
Sand
Gravel
Screen
Sand
Clay
Top Soil
Limonite
Saprolite
Peridotite

# KAJIAN GEOTEKNIK DAN HIDROLOGI/HIDROGEOLOGI DEPOSIT NIKEL TAMBANG HENGJAYA MINERALINDO

PT. HENGJAYA MINERALINDO

Disiapkan Untuk

PT HENGJAYA MINERALINDO

Desember 2021

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

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# EXECUTIVE SUMMARY

PT Hengjaya Mineralindo ("HM") saat ini sedang melakukan pengkinian terhadap laporan Studi Kelayakan terkait dengan rencana untuk melakukan peningkatan kapasitas produksi nikel dan untuk pengembangan area tambang. Untuk mendukung pengkinian studi tersebut, salah satu aspek yang diidentifikasi memerlukan studi lanjutan adalah kajian yang terkait geoteknik dan hidrologi/hidrogeologi. Untuk keperluan tersebut HM telah meminta Geomine Mining and Geotechnical Consultant ("GEOMINE") untuk melakukan kajian geoteknik dan hidrologi/hidrogeologi. Laporan ini menampilkan data-data yang dikumpulkan, analisis dan hasil kajian geoteknik dan hidrologi/hidrogeologi, serta rekomendasi terkait kedua kajian tersebut.

## Kajian Hidrologi dan Hidrogeologi

Berdasarkan hasil interpretasi kondisi hidrogeologi di PT Hengjaya Mineralindo diketahui bahwa lapisan penyusun hidrostratigrafi sistem airtanah ini dibagi menjadi tiga, yaitu tanah laterit berukuran lempung (laterit atas), laterit bawah dan batuan ultramafik terkekarkan, serta batuan ultramafik tidak terkekarkan. Lapisan yang membentuk zona akuifer utama pada sistem airtanah ini adalah laterit bawah dan batuan ultramafik terkekarkan. Lapisan laterit bawah dan batuan ultramafik terkekarkan dikelompokkan menjadi satu zona akuifer utama dengan ketebalan berkisar 10-30 m. Tanah laterit berukuran lempung (limonit) berfungsi sebagai lapisan akuiklud. Lapisan batuan ultramafik yang tidak terkekarkan bertindak sebagai lapisan akuifug, diasumsikan kontinu hingga ketebalan lebih dari 100 meter.

Kebutuhan data untuk keperluan muka airtanah dan konduktivitas hidraulik dianggap telah memenuhi kebutuhan data minimal untuk analisis, data tersebut didapatkan dari pengukuran lapangan pada sembilan lubang bor geoteknik dan dari data-data yang dikumpulkan pada lubang eksplorasi dan sumber referensi lainnya untuk daerah tersebut.

Berdasarkan model prediksi, didapatkan hasil estimasi *groundwater inflow* pada tahun pertama sebesar 22.19 liter/detik dan berangsur turun menuju garis konstan (*steady*) di sekitar 19.00 liter/detik pada tahun-tahun berikutnya. Debit *groundwater inflow* secara umum cenderung kecil karena posisi muka airtanah yang relatif telah turun, sehingga sedikit yang berpotongan dengan bukaan tambang.

Rekomendasi teknis terkait rencana penyaliran meliputi desain saluran drainase, sump dan pemompaan, serta sediment pond telah diberikan di dalam laporan ini.

## Kajian Geoteknik

Pengumpulan data properties material HM dilakukan melalui logging geoteknik terhadap core-core dari sembilan lubang pengeboran geoteknik dan hasil pengujian sifat fisik dan mekanik. Validasi terhadap properties menggunakan geometri aktual dan analisis balik menggunakan indikasi ketidakstabilan dilakukan untuk menentukan properties yang merepresentasikan karakteristik domain geoteknik di area HM.

Analisis kestabilan lereng tunggal menunjukkan mayoritas geometri lereng tunggal memenuhi kriteria Faktor Keamanan minimum terutama untuk domain *saprolite* dan *bedrock*. Untuk domain *limonite* tinggi jenjang 3 meter dengan kondisi *saturated* memenuhi kriteria, namun untuk tinggi jenjang 5 meter perlu berada pada kondisi *dry* untuk dapat memenuhi kriteria.

Analisa kestabilan lereng keseluruhan menunjukkan *design* akhir *pit* PT Hengjaya Mineralindo telah memenuhi kriteria dan menunjukkan kondisi yang stabil dengan nilai Faktor Keamanan (FK) di atas 1.3 untuk kondisi statik dan di atas 1.05, kecuali pada Sec_KK' yang berlokasi di Central East. Hasil analisis pada Sec_KK' menunjukkan nilai FK dan PoF berada di bawah batas kriteria minimum dan menunjukkan kondisi *marginally stable*. Untuk membuat kondisi *stable* pada Sec_KK perlu dilakukan pelandaian sudut *overall* menjadi 29° atau penurunan muka air tanah sedalam 6 m dengan pemasangan *drain hole*.

Analisis kestabilan lereng juga dilakukan pada waste dump yang berlokasi di Bete-bete (titik bor geoteknik DHG-02). Berdasarkan kondisi *waste dump* aktual di area DHG-02 yang terpantau mengalami ketidakstabilan, dilakukan analisis balik untuk mendapatkan properties material *waste* yang sedekat mungkin untuk merepresentasikan kondisi aktual yang diamati dan dapat digunakan dalam analisis selanjutnya. Hasil analisis balik terhadap properties *waste* menghasilkan properties *waste* pada Tabel A. Dengan properties *waste* dari hasil analisis balik, untuk menjaga kestabilan lereng pada area *waste dump*, perlu dilakukan penurunan sudut *overall* sekitar 2° dari kondisi aktual untuk memperoleh nilai FK yang sesuai dengan ketentuan. Sudut *overall slope* yang menunjukkan nilai FK aman adalah sebesar 18° dengan tinggi 33 m.

**Tabel A** Properties Material Hasil Analisis Balik

| Litologi | *Unit Weight* (kN/m$^3$) | Mohr Coloumb | |
|---|---|---|---|
| | | C (KPa) | Phi (Degree) |
| Limonite | 18.77 | 11 | 27 |
| Saprolite | 20.21 | 61 | 18 |
| Bedrock | 26.71 | 217 | 35 |
| Waste | 21.9 | 9 | 20 |

Analisis kemampugalian dan kemampugaruan dilakukan pada masing-masing domain berdasarkan data parameter nilai kuat tekan batuan dan spasi kekar yang di-*plot* ke dalam grafik Pettifer-Fookes. Dari grafik dapat disimpulkan bahwa karakteristik setiap domain terdistribusi dalam kategori yang relatif homogen sehingga perlakuan penggalian atau penggaruan juga relatif sama untuk masing-masing domain tersebut seperti pada Tabel B.

**Tabel B** Kemampugalian dan Kemampugaruan per Litologi

| Litologi | Metode |
|---|---|
| *Limonite* | *Easy Digging* |
| *Saprolite* | *Hard Digging* |
| *Bedrock* | *Easy-Hard Ripping* |

# 1. PENDAHULUAN

## 1.1. Latar Belakang

PT Hengjaya Mineralindo ("HM") merupakan salah satu perusahaan yang bergerak di bidang usaha pertambangan nikel laterit di Morowali, Sulawesi Tengah. HM telah melakukan kegiatan penambangan nikel dengan sistem tambang terbuka (open pit mining) sejak tahun 2011.

Saat ini HM sedang melakukan pengkinian terhadap laporan Studi Kelayakan terkait dengan rencana untuk melakukan peningkatan kapasitas produksi nikel dan untuk pengembangan area tambang. Untuk mendukung pengkinian studi tersebut, salah satu aspek yang diidentifikasi memerlukan studi lanjutan adalah kajian yang terkait geoteknik dan hidrologi/hidrogeologi.

Untuk keperluan tersebut HM telah meminta Geomine Mining and Geotechnical Consultant ("GEOMINE") untuk melakukan kajian geoteknik dan hidrologi/hidrogeologi. Laporan ini menampilkan data-data yang dikumpulkan, analisis dan hasil kajian geoteknik dan hidrologi/hidrogeologi, serta rekomendasi terkait kedua kajian tersebut.

## 1.2. Lingkup Kerja

Ruang lingkup kerja adalah melakukan kajian geoteknik dan kajian hidrologi/hidrogeologi untuk deposit nikel PT Hengjaya Mineralindo.

## 1.3. Metode Kerja

### 1.3.1. Kajian Geoteknik

Keperluan kajian geoteknik ini adalah untuk melakukan karakterisasi terhadap massa batuan, melakukan analisa kestabilan terhadap lereng pit dan waste dump, mengidentifikasi resiko dan memberikan saran/rekomendasi terhadap desain tambang. Kajian geoteknik akan dilakukan melalui tahapan berikut:

- **Studi Literatur**

  Studi literatur dilakukan terhadap laporan-laporan dan data yang ada sebelumnya termasuk studi geologi, model geologi dan struktur, rencana tambang, dan data dari program pemboran yang sudah dilakukan.

- **Planning Pengeboran/Pengumpulan Data Lapangan untuk Karakterisasi Massa Batuan**

  Planning pengeboran geoteknik dan pengumpulan data lapangan akan dilakukan berdasarkan lokasi yang akan disepakati antara GEOMINE dan HM. Rekomendasi pengeboran geoteknik dilakukan di beberapa titik yang berlokasi di sekitar area rencana pit PT Hengjaya Mineralindo untuk mengetahui karakteristik material yang ada. Pemilihan titik bor tersebut disesuaikan dengan rencana pengeboran eksplorasi yang akan dilakukan oleh PT HM, rencana penambangan 5 tahun ke depan, lokasi *waste dump* dan area IPPKH tahap III, dengan pertimbangkan titik bor meng-cover domain dan seluruh area tambang.

- **Standard Penetration Test (SPT)**

  Standard Penetration Test (SPT) bertujuan untuk mendapatkan nilai N-SPT, yang dapat memberikan nilai densitas relatif dari granular material yang secara virtual sulit didapatkan dari sampel undisturbed. SPT perlu dilakukan apabila kondisi material pada waste dump terdiri dari kombinasi boulder dan rock. Apabila material waste dump cenderung kepada soil dan limonit, maka hanya perlu dilakukan pengambilan sampel untuk di uji laboratorium.

- **Uji Geoteknik di Laboratorium**

  Kebutuhan uji geoteknik terhadap sampel coring akan dipilih untuk memberikan gambaran yang cukup mengenai properti dari masing-masing domain. Domain dalam geoteknik didefinisikan sebagai batuan yang mempunyai karakter atau behavior yang sama. Umumnya di deposit nikel, domain ini dikontrol oleh tipe deposit limonit, saprolite, dan bedrock.

- **Analisa Kestabilan Pit dan Waste Dump**

  Analisa kestabilan dilakukan dengan mempertimbangkan properti dari masing-masing domain dan dilakukan terhadap existing pit dan waste dump plan dan geometri.

Nilai kekuatan *rockmass* dari masing-masing domain akan diestimasi berdasarkan (i) evaluasi hasil data uji laboratorium, (ii) evaluasi data karakterisasi dari lapangan dan (iii) analisa balik terhadap pit atau waste dump failure yang pernah terjadi. Analisa akan dilakukan mengacu kepada Kepmen ESDM No 1827.k/30/MEM/2018. Final rekomendasi untuk pit dan waste dump geometri akan dihasilkan.

### 1.3.2. Kajian Hidrologi/Hidrogeologi

Kajian hidrologi/hidrogeologi dilakukan dengan tujuan sebagai berikut:

- Merangkum pemahaman mengenai kondisi dan karakteristik hidrologi-hidrogeologi di lokasi studi, berdasarkan data-data studi terdahulu.
- Memprediksi potensi jumlah aliran air permukaan dan aliran air tanah yang masuk ke dalam tambang, serta yang mempengaruhi area sekitar tambang.
- Memprediksi perubahan sistem air permukaan dan airtanah yang disebabkan oleh proses penambangan.

**Perencanaan dan Pengumpulan Data**

Melakukan pengumpulan data-data yang dibutuhkan terkait studi, berdasarkan data dari penelitian sebelumnya dan data lain yang tersedia, dan melakukan analisis kesenjangan terhadap kebutuhan dan keterbatasan data. Jika terdapat kekurangan data utama yang diperlukan untuk analisis, rekomendasi pengambilan data dan atau pengujian akan disarankan.

**Analisis Hidrologi Air Permukaan**

- Mendeskripsikan kondisi dan karakteristik hidrologi daerah studi dan sekitarnya berdasarkan data-data studi terdahulu dan data lapangan.
- Melakukan analisis perubahan sistem dan pola air permukaan akibat kegiatan penambangan yang direncanakan.
- Melakukan analisis debit puncak air permukaan yang mungkin mempengaruhi rencana tambang, dan area sekitar tambang, serta dampak yang mungkin disebabkan.

**Analisis Hidrogeologi**

- Mendeskripsikan kondisi dan karakteristik hidrogeologi daerah studi dan sekitarnya berdasarkan data-data terdahulu dan data lapangan.

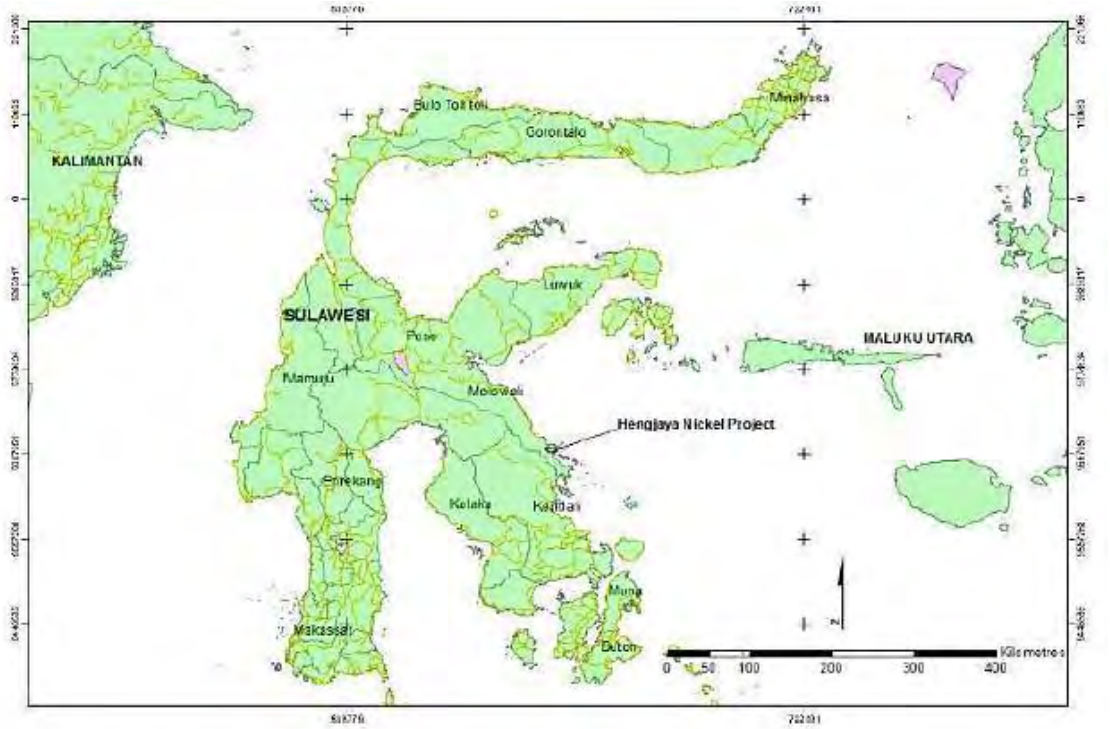
- Membuat model konseptual dan model numerik dari kondisi hidrogeologi dan aliran air tanah di sekitar lokasi studi.
- Melakukan analisis perubahan sistem dan pola airtanah akibat kegiatan penambangan yang direncanakan berdasarkan model hidrogeologi dan air tanah.
- Melakukan analisis debit maksimum airtanah yang mungkin masuk ke dalam tambang, dan area sekitar tambang berdasarkan model hidrogeologi dan air tanah.

**Penulisan Laporan dan Rekomendasi**

- Memberikan rekomendasi teknis terkait aspek hidrologi dan hidrogeologi berdasarkan hasil analisis yang dilakukan.

## 1.4. Kesampaian Lokasi

Area penambangan milik PT Hengjaya Mineralindo berada di Desa Tangofa Kecamatan Bungku Pesisir dan Desa Bete – Bete Kecamatan Bahodopi Kabupaten Morowali, Provinsi Sulawesi Tengah dimana untuk menuju lokasi konsesi ini di tempuh dengan menggunakan pesawat terbang dari Jakarta menuju Kota Kendari atau penerbangan dari Jakarta transit Makassar dan diteruskan ke Morowali. Kemudian diteruskan dengan perjalanan darat selama ± 6 jam melewati Kabupaten Konawe Utara (Asera) namun apabila melewati Morowali maka hanya dibutuhkan waktu ± 3 jam yang melintasi PT Bintang Delapan Mineral hingga menuju ke Desa Tangofa, Kecamatan Bungku Pesisir, Kabupaten Morowali, Provinsi Sulawesi Tengah.




**Gambar 1.1** Letak Konsesi PT Hengjaya Mineralindo

Untuk menuju ke lokasi kegiatan penambangan atau Lokasi Izin Usaha Pertambangan PT Hengjaya Mineralindo dari Desa Tangofa diperlukan waktu ± 30 menit dengan kendaraan roda empat (disarankan *double* gardan, 4 x 4). Sementara untuk lokasi dermaga yang digunakan sebagai *entry point* dimana kebutuhan alat berat akan masuk dan juga sebagai dermaga saat pengapalan material *ore* yang akan dikapalkan berada di Desa Tangofa yang terdapat di tepi pantai bagian timur laut wilayah IUP PT Hengjaya Mineralindo.

# 2. KONDISI GEOLOGI

## 2.1. Geologi Regional

Peta geologi regional yang digunakan dalam laporan ini adalah Peta Geologi Lembar Bungku, Sulawesi (Simandjuntak dkk., 1993). Morfologi di daerah Lembar Bungku dapat dibagi menjadi lima satuan, yaitu:

A. Dataran rendah

   Morfologi dataran rendah umumnya mempunyai ketinggian 0 – 50 mdpl.

B. Dataran menengah

   Morfologi dataran menengah menempati daerah sekitar Desa Tokolimbu dan Tosea, memiliki ketinggian 50 – 100 mdpl.

C. Perbukitan menggelombang

   Morfologi perbukitan menggelombang memiliki ketinggian 100 – 400 mdpl.

D. Karst

   Morfologi karst memiliki ketinggian 400 – 800 mdpl yang dicirikan oleh adanya perbukitan kasar, sungai bawah tanah, maupun dolina.

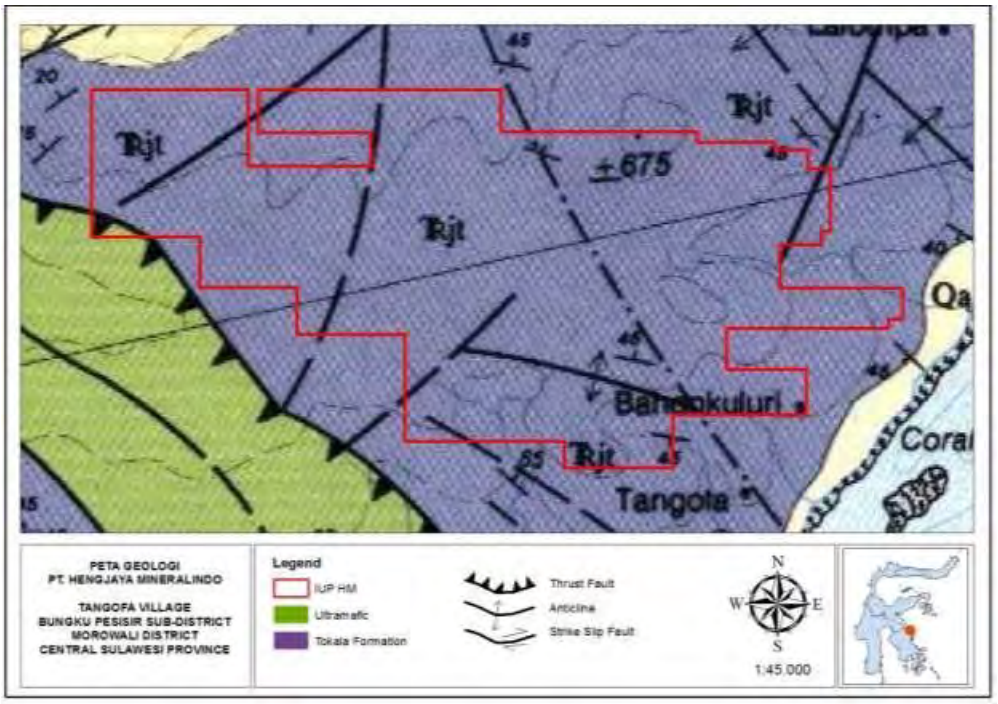
E. Pegunungan

F. Morfologi pegunungan memiliki ketinggian lebih dari 800 mdpl.

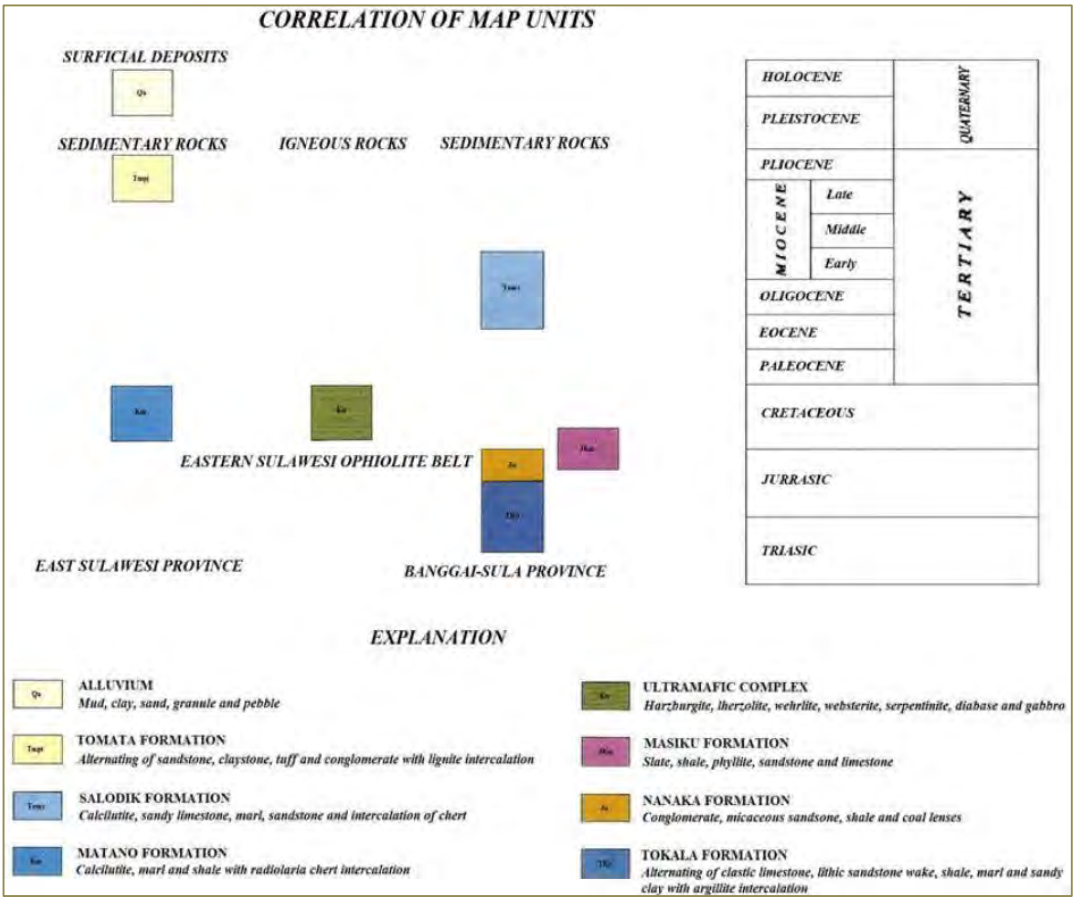
Satuan batuan di Peta Geologi Lembar Bungku (Simandjuntak dkk., 1993) (Gambar 2.1), satuan batuan dapat dikelompokkan dalam dua mandala geologi, yaitu Mandala Banggai-Sula dan Mandala Sulawesi Timur (Sukamto, 1975). Pembagian stratigrafinya berturut-turut dari muda ke tua adalah sebagai berikut (Gambar 2.2):

1. ALUVIUM (Qa) : lumpur, lempung, pasir, kerikil, serta kerakal.
2. FORMASI TOMATA (Tmpt) : perselingan batupasir konglomerat, batulempung, tufa dengan sisipan lignit.
3. FORMASI SALODIK (Tems) : kalsilutit, batugamping pasiran, napal, batupasir juga rijang.
4. FORMASI MATANO (Km) : kalsilutit, napal, serpih dan rijang. Kalsilutit, berbutir halus, berwarna kelabu, padat-keras, lapisannya baik, tebal lapisan berkisar antara 10 – 15 cm.

5. KOMPLEKS ULTRAMAFIK (Ku) : harzburgit, lherzolit, wehrlit, websterit, serpentinit, dunit, diabas dan batuan gabro.
6. FORMASI MASIKU (JKm) : batusabak, serpih, flit, batupasir, batugamping dengan buncak rijang. Batusabak, berwarna kelabu sampai coklat kehitaman, berlapis baik, padat.
7. FORMASI NANAKA (Jn) : konglomerat, batupasir mikaan, serpih dan lensa batubara.
8. FORMASI TOKALA (TRJt) : perselingan batugamping klastika, batu pasir sela, wake, serpih, napal, lempung pasiran dengan sisipan argilit.



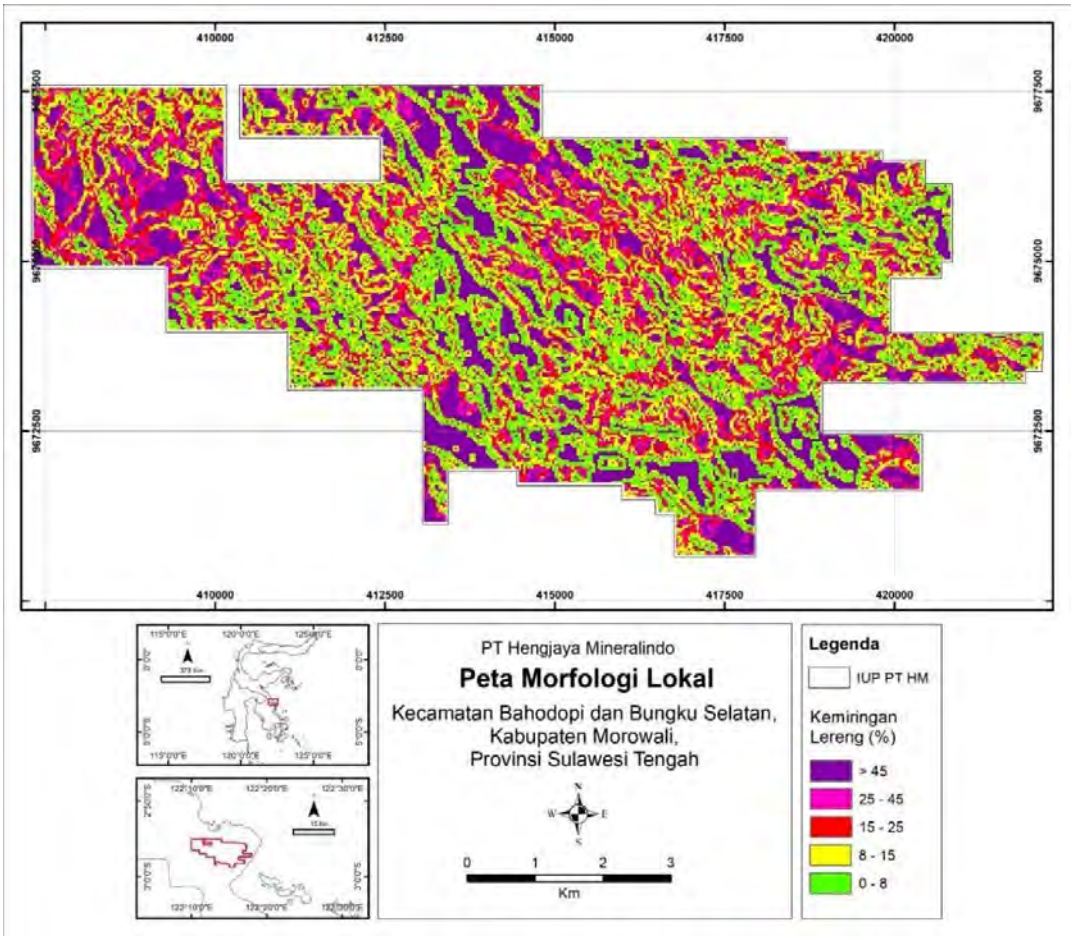

**Gambar 2.1** Peta geologi regional lembar Bungku, Sulawesi (Simandjuntak dkk., 1993) yang telah ditambahkan dengan batas IUP




**Gambar 2.2** Korelasi unit stratigrafi pada peta geologi lembar Bungku (Simandjuntak dkk., 1993)

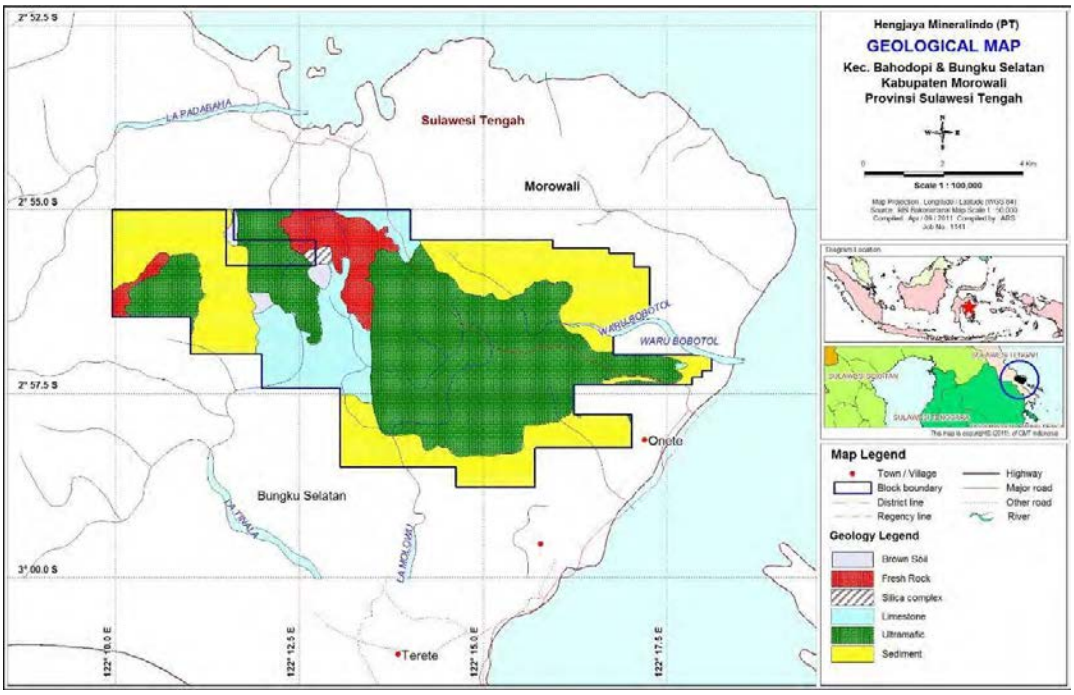
## 2.2. Geologi Lokal

Secara deskripsi kuantitatif/morfometri, morfologi masing-masing daerah wilayah penelitian dengan wilayah sekitarnya dapat dikelompokkan berdasarkan arah umum kemiringan lereng menjadi lima satuan morfologi, yaitu datar (0 – 8%) ditunjukkan dengan warna hijau, landai (8 – 15%) ditunjukkan dengan warna kuning, agak curam (15 – 25%) ditunjukkan dengan warna merah, curam (25 – 45%) ditunjukkan dengan warna merah muda, dan sangat curam (> 45%) ditunjukkan dengan warna ungu (Gambar 2.3).




**Gambar 2.3** Peta morfologi lokal

Peta geologi lokal yang digunakan dibuat oleh HM sebagai acuan untuk melihat kondisi geologi permukaan selama program eksplorasi berlangsung saat ini (Gambar 2.4). Reliabilitas data yang digunakan sudah dikonfirmasi pada Desember 2019 selama pemetaan yang dilakukan oleh ahli geologi PT Danmar Eksplorindo dalam pencarian batugamping dan agregat untuk pembangunan proyek jalan. Pada peta geologi lokal, terdapat perbedaan yang signifikan dengan Peta Geologi Regional Lembar Bungku (lihat Gambar 2.1) yang memperlihatkan wilayah konsesi HM seluruhnya disusun oleh Formasi Tokala. Faktanya, Kompleks Ultramafik adalah batuan penyusun dominan di kawasan HM dan menyebar lebih dari 60% wilayah konsesi. Formasi Tokala adalah batuan yang lebih tua dan secara stratigrafi terdapat di bawah Kompleks Ultramafik.




**Gambar 2.4** Peta geologi lokal

Lapisan yang kaya akan bijih nikel umumnya terdapat di bawah zona pelapukan dan di atas batuan dasar. Di bagian atas zona pelapukan ini umumnya ditumbuhi pepohonan (hutan) yang mengindikasikan bahwa lapisan tersebut cukup subur.

Pada daerah penelitian di wilayah IUP dari hasil pengamatan survei geologi banyak dijumpai blok-blok/spot area yang merupakan zona laterit, dengan ketebalan rata-rata ± 10 meter. Penampakan laterit secara visual terutama dari sisi warna permukaan memiliki perubahan-perubahan yang cukup drastis, hal ini sebagai akibat adanya perbedaan derajat serpentinisasi pada batuan ultramafik di wilayah tersebut. Sedangkan keberadaan mineral pembawa nikel seperti garnierit dan krisopras berada pada bongkah-bongkah dan membentuk zona serta jalur-jalur tertentu dalam satu zona *vein*. Kondisi ini menyebabkan tingginya kandungan silika ($SiO_2$). Kondisi ini dapat dilihat pada lereng sepanjang jalan Trans Sulawesi yang melintasi wilayah IUP Produksi PT Hengjaya Mineralindo.

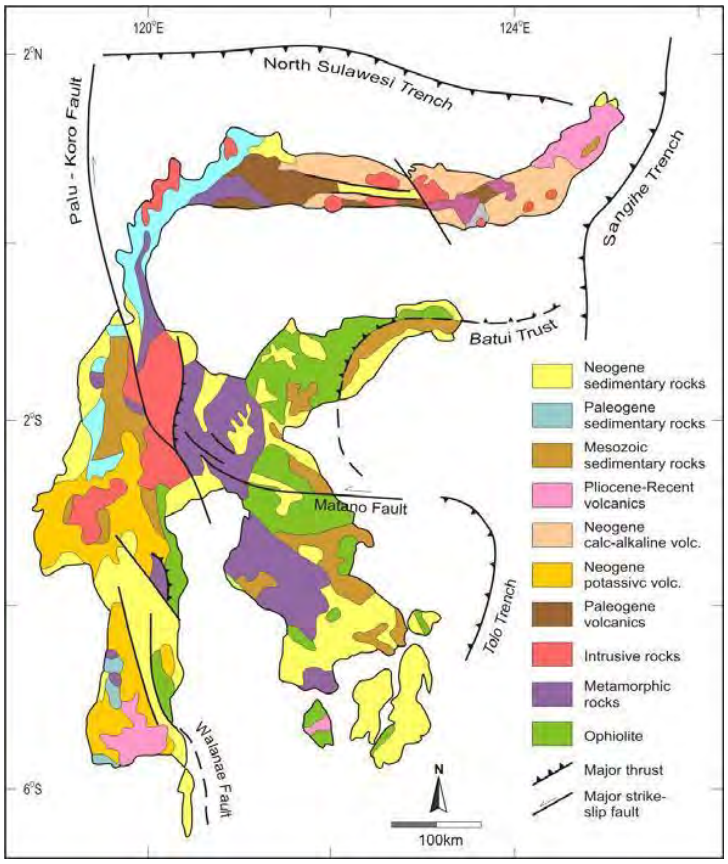
Pada blok-blok daerah penelitian di wilayah IUP sudah dilakukan pengeboran detail dengan *grid* 100 – 25 m, terdapat singkapan saprolit yang cukup meyakinkan, adanya indikasi mineral-mineral garnierit yang berkembang ke arah utara dan selebihnya perkembangan ke arah timur, terjadi perubahan kualitas menjadi batuan ultramafik (serpentinit) yang masih segar.

Beberapa bagian terutama di sisi utara-timurlaut dari konsesi wilayah IUP Produksi PT Hengjaya Mineralindo, terdapat zona serpentinisasi yang sangat dangkal lateritnya, namun kaya akan mineral garnierit yang terdapat pada rekahan batuannya, memungkinkan kandungan unsur nikel yang sangat tinggi dan memungkinkan bisa menjadi sebuah *injector* pada saat pengapalan dengan hasil penambangan yang memiliki kandungan kadar nikel yang rendah.

Berdasarkan hasil analisis singkapan endapan nikel dan korelasi terhadap penampang bor dangkal dan data sumur uji, tebal endapan bijih berkisar 1,20 – 20,00 m yang di bagian atasnya terkadang ditutupi oleh lapisan oksida besi atau goetit-aluminiun setebal 15 – 30 cm, atau disebut juga *iron capping*.

## 2.3. Struktur Geologi

Sulawesi secara tektonik merupakan wilayah yang disusun oleh benturan dua massa kerak benua, yaitu Sundaland yang menyusun Sulawesi Barat dan Australoid yang menyusun sebagian Sulawesi sebelah timur (Banggai-Sula) dan tenggara (Buton) (Gambar 2.5). Terjepit di tengahnya adalah kerak samudera yang kini menjadi ofiolit dan terangkat ke permukaan melalui mekanisme obduksi. Ofiolit yang naik ke permukaan tersebut menjadi sumber batuan utama penghasil mineral logam dasar nikel dan besi.




**Gambar 2.5** Peta geologi Sulawesi (Van Leeuwen dkk., 2011)

Pada periode 70 – 15 juta tahun yag lalu (Ma), hanya ada Sulawesi Barat yang masih menjadi bagian Sundaland dan tambahan massa kerak Bumi di sebelah timurnya. Sulawesi Barat kala itu adalah sebuah busur kepulauan/busur magmatik-vulkanik hasil subduksi kerak samudera terhadapnya yang menghasilkan beberapa periode magmatik dan volkanik di Sulawesi bagian barat. Perubahan-perubahan tektonik seperti pembukaan Selat Makassar, pembukaan Teluk Bone, pembukaan Teluk Tomini/Cekungan Gorontalo, subduksi Laut Sulawesi pada 50 – 15 Ma menyebabkan perubahan arah/polaritas busur magmatik dan subduksi Sulawesi dari cembung ke arah samudera menjadi agak lurus

Pada periode 15 – 5 Ma, Sulawesi mengalami collision dan docking dua mikrokontinen Australia ke arah Sulawesi dari sebelah tenggara (mikrokontinen Buton-Tukangbesi) dan dari sebelah timur (mikrokontinen Banggai-Sula). Pada periode ini diperkirakan terjadi pembalikan utama arah/polaritas busur-busur Sulawesi dari semula cembung ke arah samudera menjadi cekung ke arah samudera (ke arah timur pada kala ini).

Pembalikan polaritas busur-busur Sulawesi ini secara frontal adalah akibat benturan mikrokontinen d Banggai-Sula yang membenturnya di titik pusat Sulawesi. Yang mengakibatkan rotasi. Lengan Tenggara berotasi melawan arah jarum jam sehingga membuka melebarkan Teluk Bone di sebelah baratnya, Lengan Utara berotasi searah jarum jam sehingga menutup Cekungan Gorontalo.

Periode 5 – 0 Ma adalah finalisasi pembalikan busur-busur Sulawesi dan periode tectonic escape di Sulawesi. Setelah benturan Buton-Tukangbesi dan benturan Banggai-Sula, terjadilah tectonic escape berupa sesar-sesar mendatar besar yang meretakkan dan menggeser-geser Sulawesi. Sesar-sesar ini mengarah ke timur umumnya, yaitu ke arah free oceanic edge saat itu. Sesar-sesar mendatar besar Palu-Koro, Matano, Lawanopo, Kolaka, dan Balantak terjadi melalui mekanisme post-collision tectonic escape.

Namun faktanya, jika dilihat dari peta geologi lokal yang dibuat oleh HM (Gambar 2.4), struktur geologi tidak begitu berkembang seperti yang diinterpretasikan pada peta geologi regional. Hal tersebut kemungkinan karena wilayah IUP yang sudah mengalami pelapukan dan lateritisasi, sehingga sulit untuk menemukan bukti-bukti keberadaan jejak struktur geologi di lapangan.

# 3. KAJIAN HIDROLOGI DAN HIDROGEOLOGI

## 3.1. Akuisisi Data

Kebutuhan data terkait analisis hidrologi dan hidrogeologi sangat bergantung pada tujuan, ketersediaan data yang dimiliki, dan tingkat ketelitian hasil yang diharapkan. PT Hengjaya Mineralindo ("HM") memiliki beberapa data primer yang dibutuhkan untuk melakukan analisis dasar hidrologi dan hidrogeologi. Namun tidak semua data yang dimiliki HM cukup untuk memenuhi kebutuhan dasar analisis. *Gap* data analisis dilakukan terhadap ketersediaan data yang dimiliki HM. Hasil tersebut selanjutnya menentukan bagaimana kekurangan terhadap data dapat dipenuhi, dan pendekatan metode ilmiah yang digunakan sesuai dengan jumlah dan ketersediaan data.

### 3.1.1. Jenis, Jumlah, dan Sebaran Data

Tabel 3.1 memperlihatkan rekapitulasi ketersediaan data yang dimiliki HM terkait kebutuhan analisis hidrologi dan hidrogeologi, resume dari data gap, dan bagaimana pelengkapan terhadap gap data dipenuhi. Penjelasan rinci dari Tabel 3.1 mengenai jenis, jumlah, dan persebaran data yang dimiliki HM, serta pelengkapan data sekunder/literatur dibahas selanjutnya pada subbab 3.1.2 hingga subbab 3.1.4.

**Tabel 3.1** Jenis dan jumlah ketersediaan data PT HM, pelengkapan, dan data *gap* terkait analisis hidrologi dan hidrogeologi

| Jenis Data | Jumlah/Keterangan | Kelengkapan Data/ *Gap* Data Analisis | Pelengkapan *Gap* Data/ Keterangan |
|---|---|---|---|
| Data Hujan | Tidak ada data rekaman hujan yang diperoleh dari HM | Data curah hujan harian kontinu minimal 10 tahun diperlukan untuk menentukan persentil-95 (*95th percentile*) kejadian hujan pada suatu lokasi. | Pelengkapan data hujan menggunakan data sekunder dari stasiun terdekat milik BMKG atau PUSAIR. Pelengkapan data juga didekati dengan data hujan satelit (TRMM) |
| Data Topografi | Hasil Survei Topografi, HM 2021 | Data topografi terbatas pada area IUP HM. Kebutuhan analisis *catchment* mencakup area di luar konsesi HM | Data topografi di luar IUP HM menggunakan data DEM Nasional (Badan Informasi Geografis Indonesia) |

| Jenis Data | Jumlah/Keterangan | Kelengkapan Data/ *Gap* Data Analisis | Pelengkapan *Gap* Data/ Keterangan |
|---|---|---|---|
| Muka Airtanah | Data pengukuran lapangan pada 9 titik bor geoteknik tahun (Geomine, 2021) | Data pengukuran muka airtanah mencerminkan *total head* dari semua litologi yang hadir | Kebutuhan data muka airtanah dianggap telah memenuhi kebutuhan data minimal untuk analisis lanjutan. |
| Parameter Hidraulik | 1. Uji akuifer lapangan dilakukan pada 9 sumur bor geoteknik (Geomine, 2021)<br>2. Uji permeabilitas laboratorium pada 6 sampel batuan dari hasil core pengeboran (Geomine, 2021) | Data konduktivitas hidraulik dianggap telah memenuhi kebutuhan data untuk analisis lanjutan, di mana nilai konduktivitas hidraulik didapatkan pada masing-masing litologi | Selain data konduktivitas hidraulik, data parameter hidraulik lainnya, seperti storativitas dan porositas dibutuhkan untuk kepentingan analisis selanjutnya.<br>Pelengkapan data nilai stortativitas dan porositas menggunakan data literatur pada litologi sejenis. |
| Data Kondisi Umum Hidrologi dan Hidrogeologi | Kondisi umum hidrologi dan hidrogeologi, seperti: batas DAS, jaringan sungai, batas Cekungan Airtanah, Peta hidrogeologi regional | Pengambilan Data Sekunder dari instansi terkait | Untuk mendapatkan gambaran umum kondisi hidrologi dan hidrogeologi daerah studi data sekunder diambil dari instansi terkait, seperti:<br>- Batas DAS regional: Sistem Informasi Pengelolaan DAS KLHK<br>- Peta jaringan sungai: Badan Informasi Geografis (BIG)<br>- Peta Batas CAT |

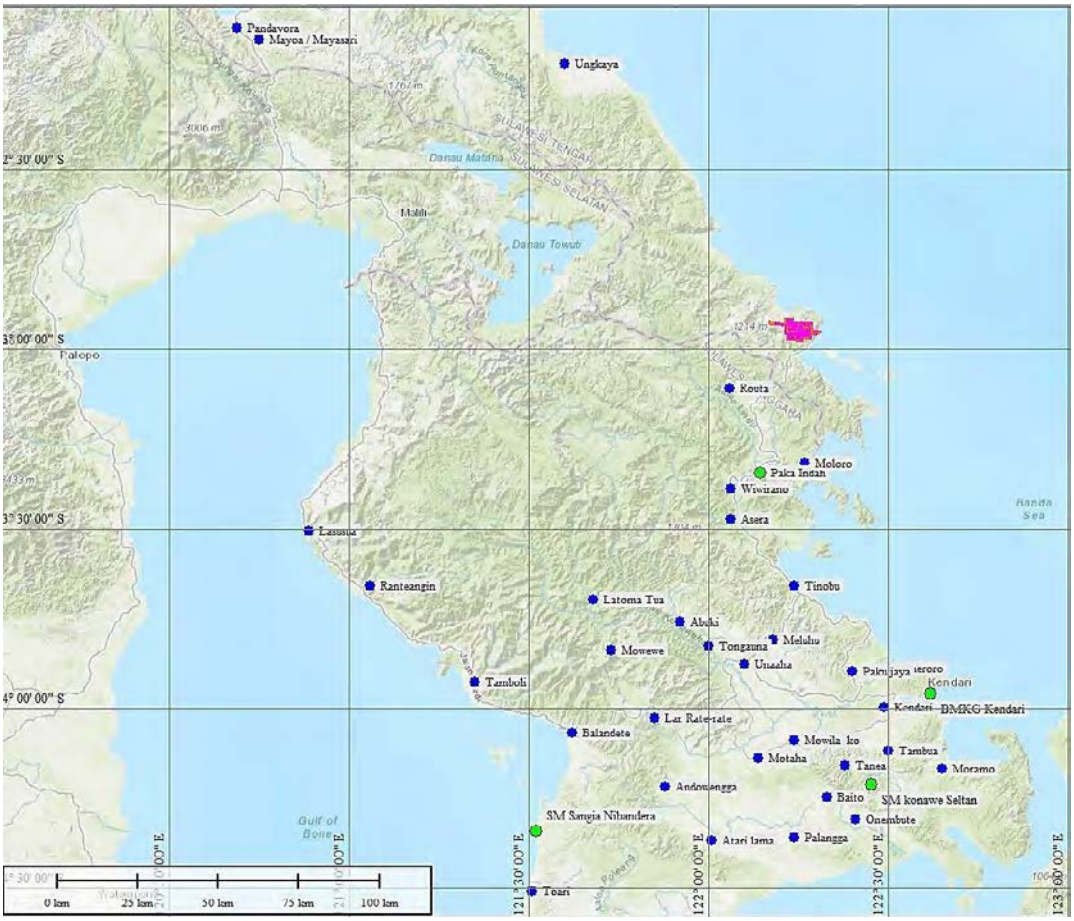
### 3.1.2. Data Hujan

Tidak ada data pencatatan hujan yang dimiliki HM. Data curah hujan yang panjang, yaitu minimal data 10 tahun kontinu diperlukan untuk menentukan persentil-95 (95th percentile) kejadian hujan pada suatu lokasi. Data pemantauan tiga puluh tahun atau lebih sangat diharapkan untuk melakukan analisis statistik yang tidak bias (US EPA, Technical Guidance on Implementing the Stormwater Runoff Requirements, 2009). Untuk melengkapi data hujan yang akan digunakan dalam analisis selanjutnya, pengambilan data dilakukan melalui Badan Meteorologi Klimatologi dan Geofisika (BMKG) serta Badan Penelitian dan Pengembangan Sumber Daya Air (PUSAIR).

Evaluasi ketersediaan data stasiun BMKG dan PUSAIR di sekitar area lokasi studi ditunjukkan pada Tabel 3.2. Peta lokasi stasiun klimatologi di sekitar wilayah studi dapat dilihat pada Gambar 3.1.

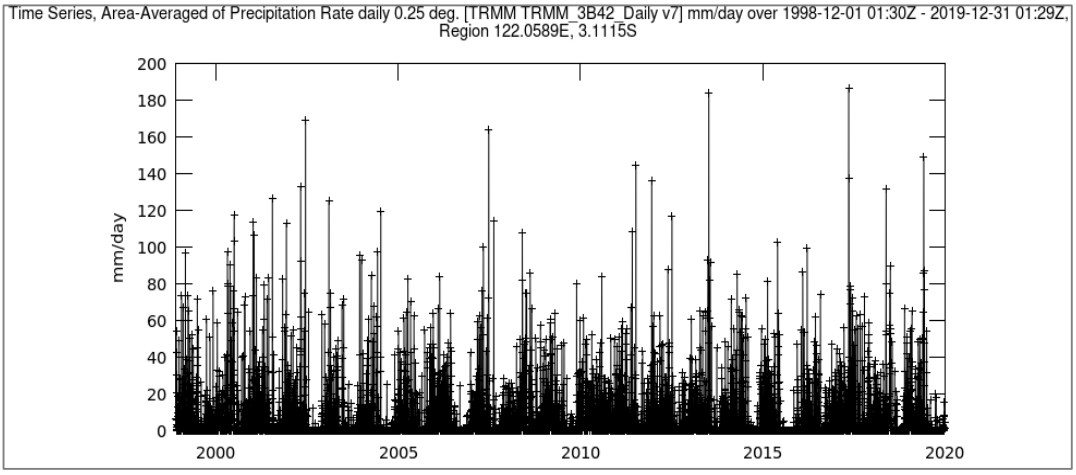
**Tabel 3.2** Evaluasi ketersediaan data dari stasiun klimatologi terdekat dan stasiun hujan di sekitar lokasi studi (data BMKG dan PUSAIR)

| No. | Nama Stasiun | Periode Observasi | Periode Data Lengkap | Jarak | Data Tersedia | Sumber |
|---|---|---|---|---|---|---|
| 1 | Routa | 2014-2019 | 6 tahun | 27 Km | Hujan Harian | PUSAIR |
| 2 | Moloro | 2018-2019 | 2 tahun | 35 Km | Hujan Harian | PUSAIR |
| 3 | Paka Indah | 1991-2019 | 2 tahun | 45 Km | Klimatologi Harian | PUSAIR |
| 4 | Wiwirano | 2010-2019 | 10 tahun | 53 Km | Hujan Harian | PUSAIR |
| 5 | Asera | 1995-2019 | 12 tahun | 62 Km | Hujan Harian | PUSAIR |
| 6 | Ungkaya | 2007-2017 | 11 tahun | 109 Km | Hujan Harian | PUSAIR |



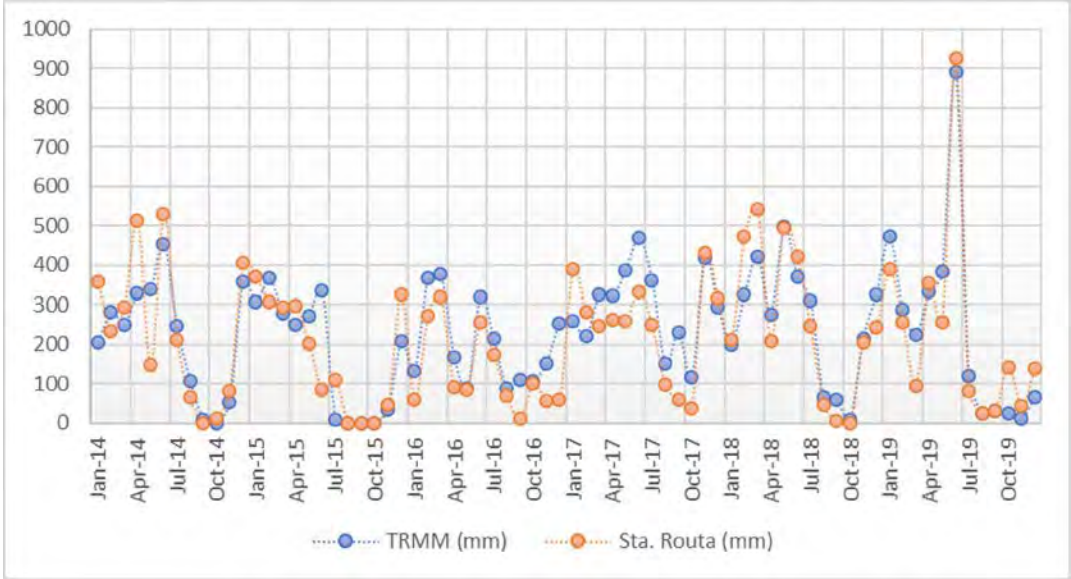

**Gambar 3.1** Peta distribusi ketersediaan stasiun hujan di sekitar IUP HM

Berdasarkan data yang tersedia dari BMKG dan PUSAIR, stasiun terdekat dengan lokasi studi adalah Stasiun Routa. Namun seperti dapat dilihat pada Tabel 3.2, data hujan pada stasiun Routa hanya meliputi data untuk 6 tahun periode (2014-2019). Untuk melengkapi data hujan lebih panjang, pengambilan data hujan satelit dilakukan. Data curah hujan satelit diperoleh dari produk penelitian Tropical Rainfall Measuring Mission (TRMM) yang diambil dari produk opensource NASA, GES DISC. Data curah hujan dari TRMM yang diperoleh merupakan data hujan harian (versi 3B42), dengan grid resolusi spasial 0,25°, dan tersedia sepanjang periode 1999-2019 (Gambar 3.2).

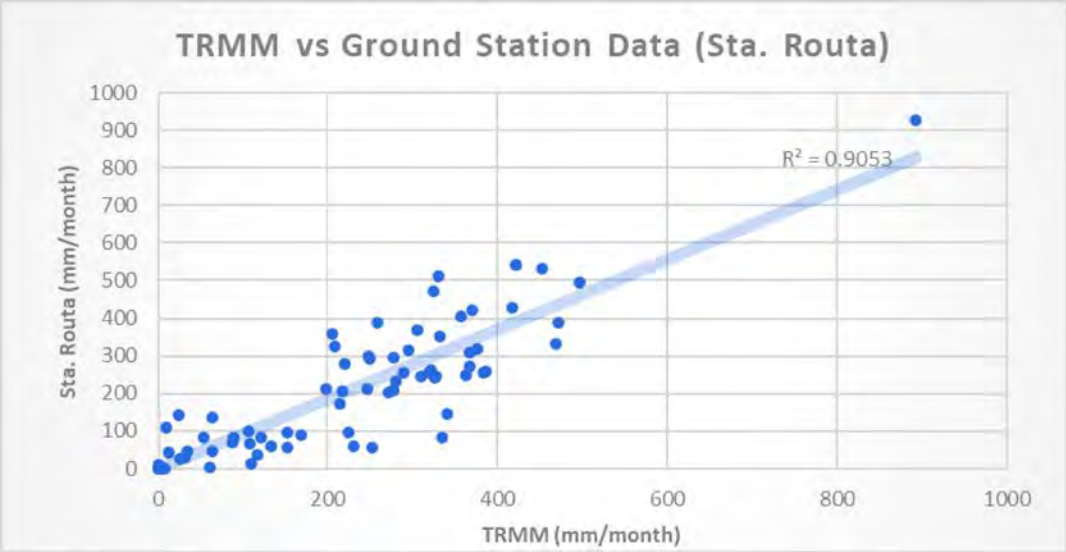



**Gambar 3.2** Data produk hujan Satelit TRMM versi 3B42 pada titik Stasiun Routa

Untuk memverifikasi keakuratan data curah hujan satelit, dilakukan uji komparasi antara data satelit dan data Stasiun Routa pada tahun yang sama. Perbandingan data hujan bulanan antara Stasiun Routa dan data satelit pada *time series* dan *scatter plot* ditunjukkan pada **Error! Reference source not found.** dan **Error! Reference source not found.**. Berdasarkan hasil komparasi dapat terlihat bahwa pola *series* grafik hujan bulanan dari Satelit TRMM memiliki keseragaman dengan data hujan stasiun Routa (**Error! Reference source not found.**). Selain itu nilai hasil perbandingan memperlihatkan koefisien korelasi antara data curah hujan satelit dan data Stasiun Routa memiliki nilai sebesar 0.9 (**Error! Reference source not found.**). Hasil ini menunjukkan data curah hujan produk satelit berkorelasi sangat baik dengan data hujan Stasiun Routa, sehingga dapat digunakan untuk kepentingan analisis selanjutnya.

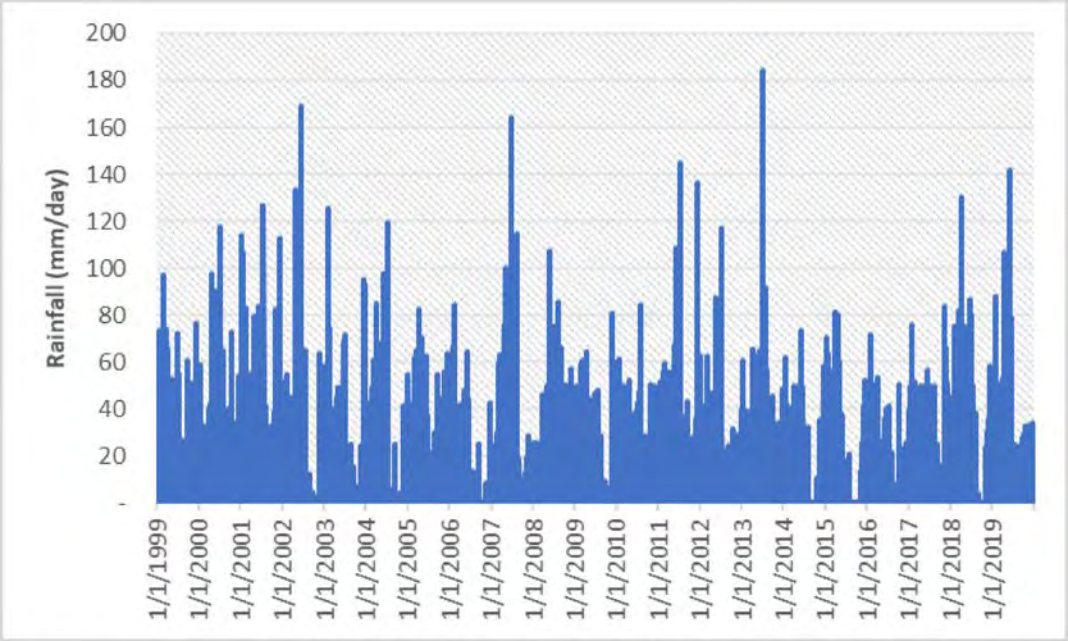



**Gambar 3.3** Perbandingan *time series* antara hujan Stasiun Routa dan hujan satelit (TRMM)



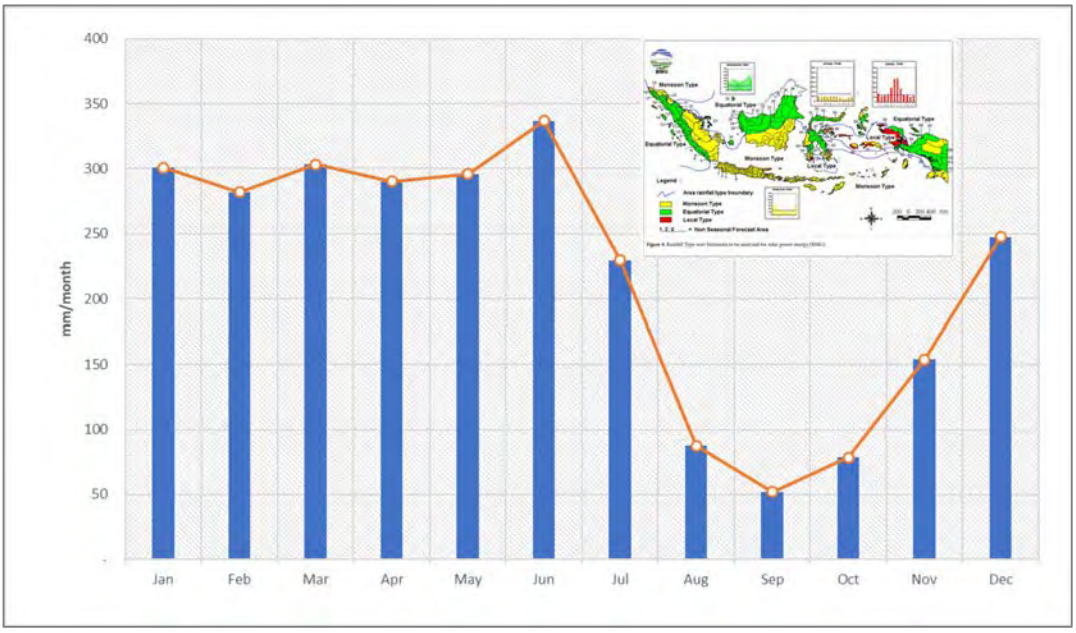

**Gambar 3.4** Diagram *scatter* dari data hujan Stasiun Routa dan hujan satelit (TRMM)

Setelah data ter-verifikasi dan dinyatakan berkorelasi dengan baik, selanjutnya data curah hujan satelit akan digunakan untuk mengisi kekosongan data pada stasiun darat tersedia. Sehingga data hujan selanjutnya menggunakan data Satelit TRMM untuk periode tahun 1999-2013 dan rata-rata data Stasiun Routa untuk periode tahun 2004-2019. Plot data hujan harian dari stasiun PUSAIR dikombinasikan dengan data hujan produk satelit TRMM dapat dilihat pada Gambar 3.5.




**Gambar 3.5** Rekapitulasi hujan bulanan wilayah studi (kombinasi data Stasiun Routa dengan data hujan produk Satelit TRMM)

Berdasarkan data akuisisi diketahui jumlah rata-rata curah hujan tahunan daerah studi selama periode tahun 1999-2019 (20 tahun) adalah sebesar 2658 mm/tahun. Curah hujan harian rata-rata selama 20 tahun (1999-2019) adalah 7,27 mm dengan curah hujan harian maksimum selama 20 tahun adalah 184 mm yang terjadi pada 10 Juli 2013. Berdasarkan pola data hujan klasifikasi BMKG, jenis pola hujan di daerah studi masuk dalam tipe lokal. Tipe Lokal umumnya merupakan kebalikan dari pola hujan monsun, yaitu jika di daerah dengan pola monsun mengalami musim hujan maka daerah dengan pola lokal mengalami musim kemarau atau sebaliknya. Grafik rata-rata hujan bulanan daerah studi selama 20 tahun (1999-2009) dapat dilihat pada Gambar 3.6 yang memperlihatkan tipe pola hujan di daerah studi.




**Gambar 3.6** Grafik rata-rata curah hujan bulanan daerah studi

### 3.1.3. Data Level Muka Airtanah

Pengukuran kedalaman muka air tanah dilakukan pada 9 lokasi lubang bor geoteknik yang tersebar pada lokasi rencana pengembangan tambang HM. Berdasarkan hasil pengukuran lapangan, diketahui kedalaman muka airtanah di lokasi penambangan HM berkisar antara 6,15 s/d 23,78 meter di bawah permukaan, dengan rata-rata sebesar 16 meter kedalaman di bawah permukaan. Data hasil pengamatan kedalaman muka air tanah hasil investigasi lapangan tahun 2021 dapat dilihat pada Tabel 3.3, dengan sebaran data pengukuran yang dapat dilihat pada Gambar 3.8.

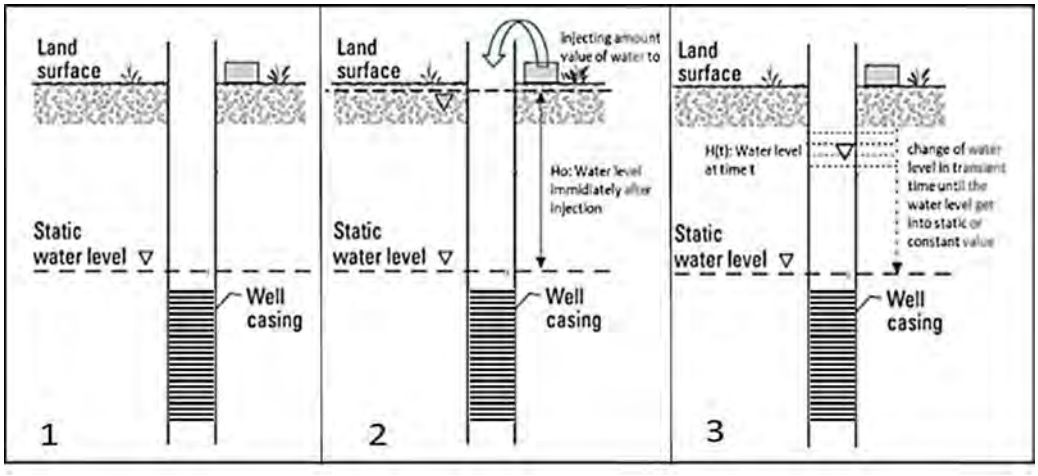
**Tabel 3.3** Hasil pengukuran kedalaman muka airtanah

| Hole ID | Easting | Northing | Elevation (m RL) | Total Depth (m) | GWL Depth (m) | GWL Elevation (m RL) |
|---|---|---|---|---|---|---|
| DHG-01 | 413455 | 9675637 | 380.127 | 17 | 13 | 367.127 |
| DHG-02 | 414147 | 9675839 | 519 | 14 | 8.58 | 510.42 |
| DHG-03 | 415011 | 9675627 | 445.292 | 31 | 6.15 | 439.142 |
| DHG-04 | 414243 | 9674697 | 402.991 | 35 | 27 | 375.991 |
| DHG-05 | 415969 | 9674988 | 433.43 | 23 | 8.7 | 424.73 |
| DHG-06 | 415447 | 9673487 | 329 | 35 | 23.78 | 305.22 |
| DHG-07 | 416755 | 9674354 | 407.194 | 15 | 14.2 | 392.994 |

| Hole ID | Easting | Northing | Elevation (m RL) | Total Depth (m) | GWL Depth (m) | GWL Elevation (m RL) |
|---|---|---|---|---|---|---|
| DHG-08 | 417317 | 9673539 | 358.125 | 20 | 19.2 | 338.925 |
| DHG-09 | 418482.3 | 9673633 | 411.148 | 30 | 23.2 | 387.948 |

### 3.1.4. Data Konduktivitas Hidraulik

Data konduktivitas hidraulik didapatkan dari hasil pengujian langsung di lapangan dan hasil uji laboratorium yang diambil dari lubang pengeboran. Uji akuifer di lapangan dilakukan pada 8 sumur bor menggunakan metode *slug test* (*falling head*). *Slug test* (dalam Bouwer dan Rice, 1976) diterapkan untuk menentukan konduktivitas hidraulik dari tes sumur tunggal menggunakan metode *falling head*. Dalam metode ini, level airtanah statis di dalam sumur diukur sebelum pengujian. Sejumlah air kemudian dimasukkan ke dalam sumur. Pengukuran level air dilakukan secara berkala oleh *level logger* dan setiap perubahan level air dicatat sampai level air mencapai nilai statis/konstan kembali. Ilustrasi *slug test* menggunakan metode *falling head* dapat dilihat pada Gambar 3.7.



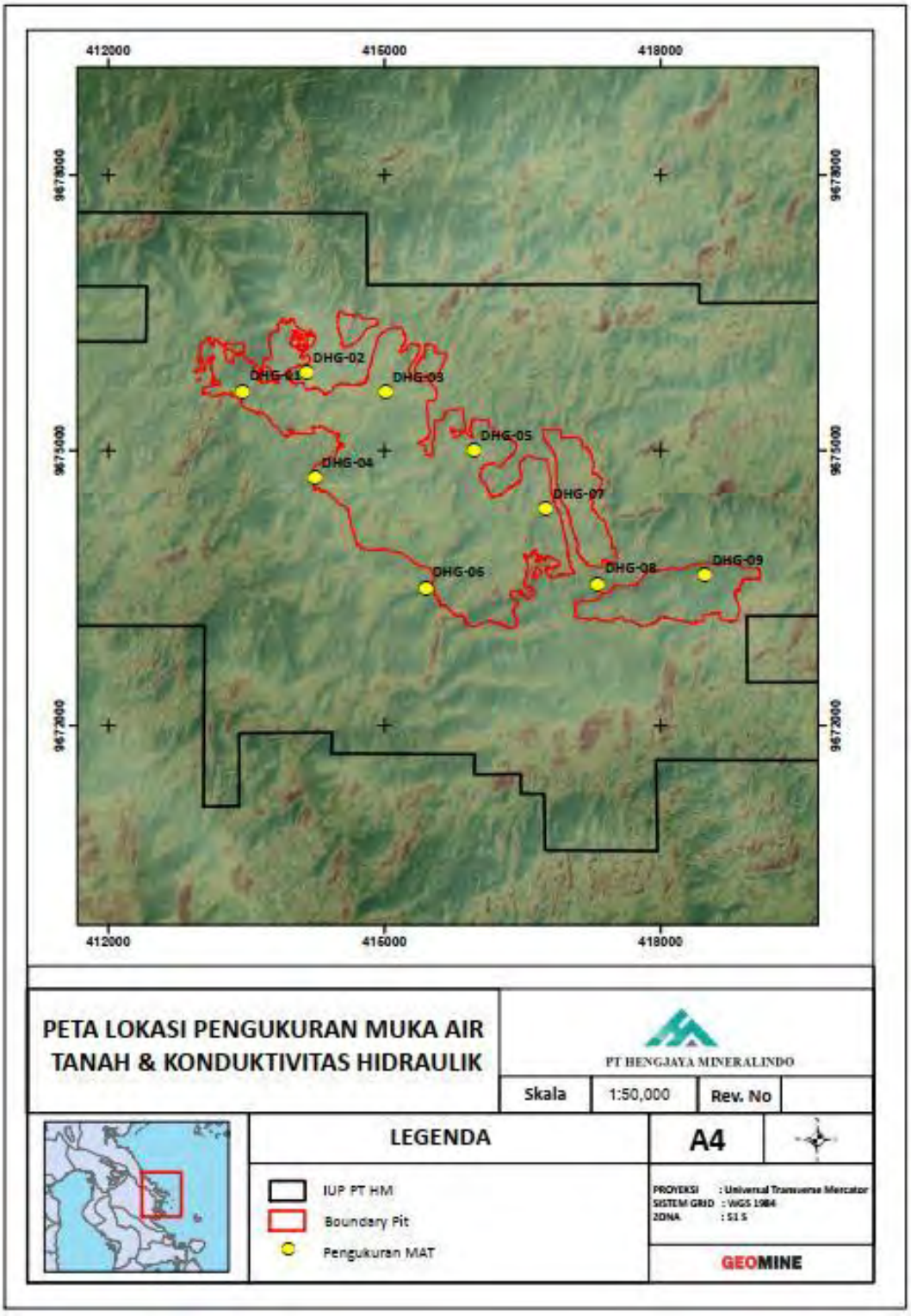

**Gambar 3.7** Praktik lapangan *slug test* menggunakan metode *falling head*

Data dari hasil uji lapangan selanjutnya diproses untuk mendapatkan parameter konduktivitas hidraulik menggunakan metode Hvorslev. Resume nilai konduktivitas hidraulik hasil slug test dapat dilihat pada Tabel 3.4, dengan sebaran titik data yang dapat dilihat pada Gambar 3.8.

Selain itu untuk melengkapi data konduktivitas hidraulik, pengujian laboratorium juga dilakukan pada beberapa sampel tanah dan litologi batuan yang hadir. Uji konduktivitas hidraulik laboratorium dilakukan di laboratorium hidrogeologi dan hidrogeokimia Institut Teknologi Bandung, menggunakan vacuum permeameter constant head, dengan standar pengujian mengacu pada ASTM D 5084. Rekapitulasi hasil uji konduktivitas hidraulik laboratorium dapat dilihat pada Tabel 3.4.

**Tabel 3.4** Resume nilai konduktivitas hidraulik hasil uji lapangan dan uji laboratorium

| Method | Hole ID / Sample ID | Coordinate | | Hydraulic Conductivity (m/s) | Lithology |
|---|---|---|---|---|---|
| | | UTM 51S | | | |
| | | Easting | Northing | | |
| Uji Lapangan-Slug test | DHG-01 | 413400.4 | 9675826 | 2.52E-05 | Saprolit |
| | DHG-02 | 414146 | 9675839 | 9.50E-05 | Saprolit |
| | DHG-03 | 415097.6 | 9675904 | 4.48E-06 | Saprolit |
| | DHG-04 | 414286.9 | 9674645 | 1.15E-05 | Saprolit |
| | DHG-05 | 415735.3 | 9674946 | 4.35E-06 | Saprolit |
| | DHG-06 | 415097 | 9673413 | 1.26E-04 | Saprolit |
| | DHG-07 | 416875.6 | 9674311 | 3.33E-05 | Saprolit |
| | DHG-08 | 417733 | 9673383 | 2.82E-05 | Saprolit |
| Laboratorium Permeability Test | DHG-01 | 413400.4 | 9675826 | 1.06E-06 | Saprolit |
| | DHG-05 | 415735.3 | 9674946 | 7.18E-04 | Saprolit |
| | DHG-06 | 415097 | 9673413 | 1.83E-05 | Saprolit |
| | DHG-08 | 417733 | 9673383 | <1.00E-12 | Dunit |



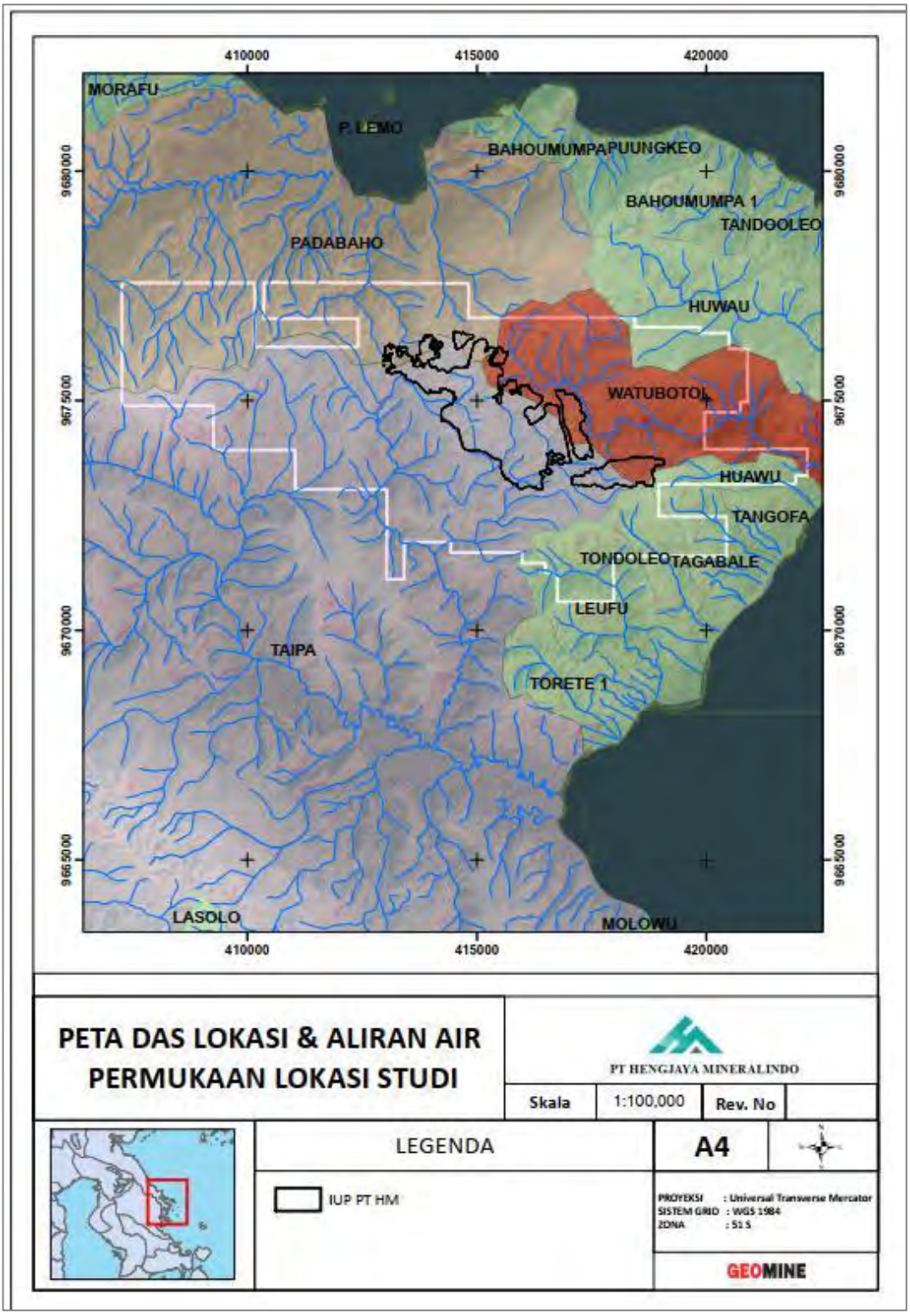

**Gambar 3.8** Peta distribusi lokasi pengukuran muka airtanah dan titik pengujian konduktivitas hidraulik lapangan

## 3.1.5. Kondisi Hidrologi dan Hidrogeologi Umum

### 3.1.5.1. Daerah Aliran Sungai

Berdasarkan data Sistem Informasi Pengelolaan DAS Kementerian Lingkungan Hidup dan Kehutanan, lokasi rencana pengembangan tambang HM masuk ke dalam 2 Daerah Aliran Sungai (DAS), yaitu DAS Taipa (Kode DAS= DAS530815) dan DAS Watubotol (Kode DAS= DAS 510808). Luas DAS Taipa adalah sebesar 204,37 Km2, dengan aliran sungai utama yang mengalir pada DAS ini adalah Sungai La Tinala. Luas DAS Taipa adalah sebesar 18,24 Km2, dengan aliran sungai utama yang mengalir pada DAS ini adalah Sungai La Watubotol.

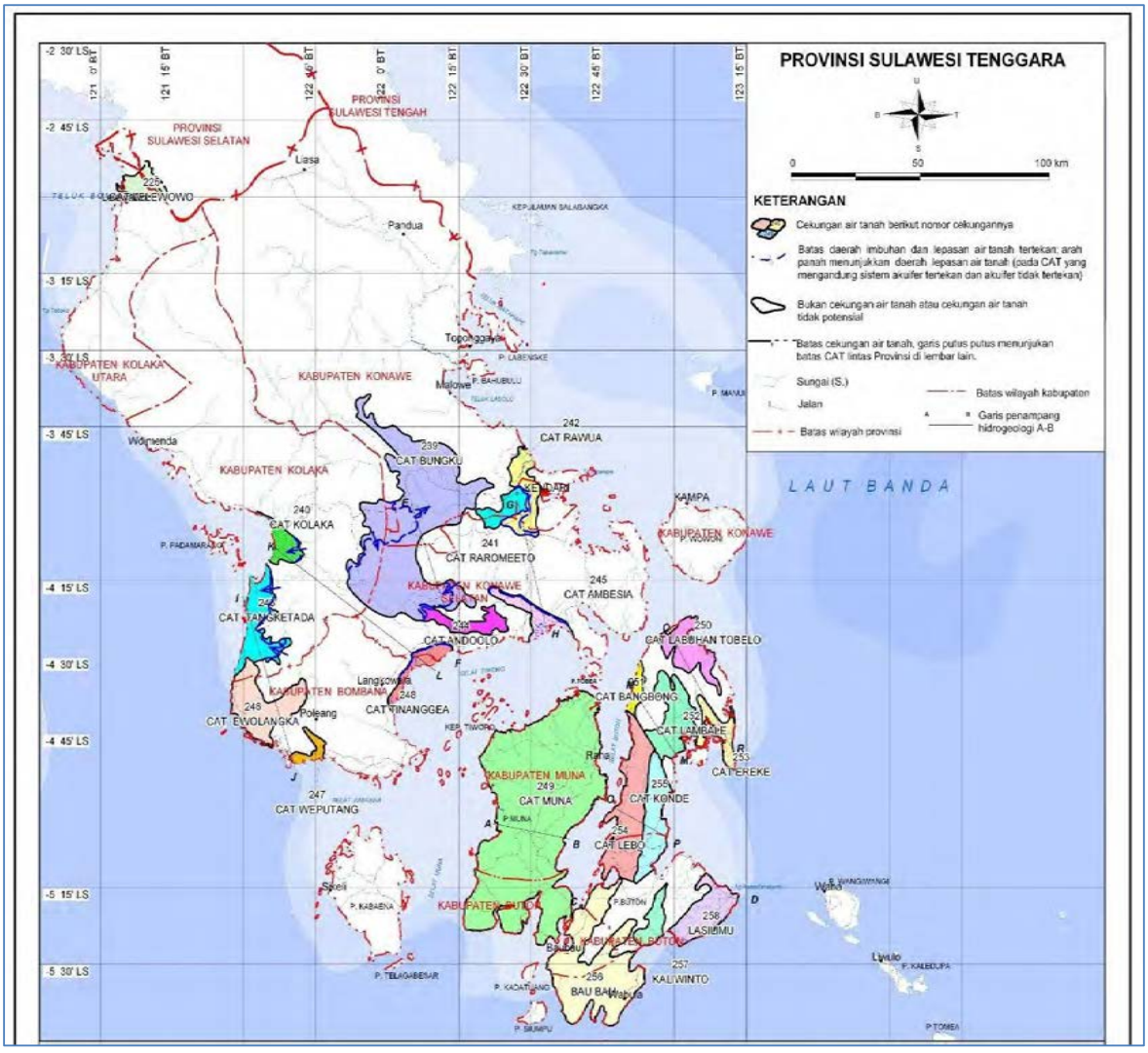
Secara posisi, rencana lokasi pengembangan tambang HM terletak pada bagian paling hulu dari salah satu lembah DAS Taipa dan DAS Watubotol. Lokasi aliran sungai terdekat dan terkait rencana pengembangan tambang HM antara lain anak sungai Molowu yang merupakan anak-anak sungai Tinala, serta La Watubotol. Peta batas DAS dan aliran air permukaan daerah studi dapat dilihat pada Gambar 3.9.




**Gambar 3.9** Peta daerah aliran sungai dan aliran air permukaan regional daerah studi

### 3.1.5.2. Hidrogeologi Umum

Cekungan Air Tanah (CAT) diartikan sebagai suatu wilayah yang dibatasi oleh batas hidrogeologi di mana semua kejadian hidrogeologi seperti terjadinya proses pengimbuhan, pengaliran, dan pelepasan airtanah berlangsung. CAT mempunyai batas yang secara langsung dikontrol oleh kondisi geologi dan hidraulik, CAT mempunyai daerah imbuhan airtanah dan daerah lepasan airtanah serta memiliki satu kesatuan sistem akuifer berdasarkan peta cekungan air tanah daerah Sulawesi Tenggara. Daerah lokasi studi berada pada daerah yang bukan merupakan cekungan air tanah atau cekungan air tanah yang tidak potensial (Gambar 3.10).




**Gambar 3.10** Peta cekungan air tanah regional lokasi studi

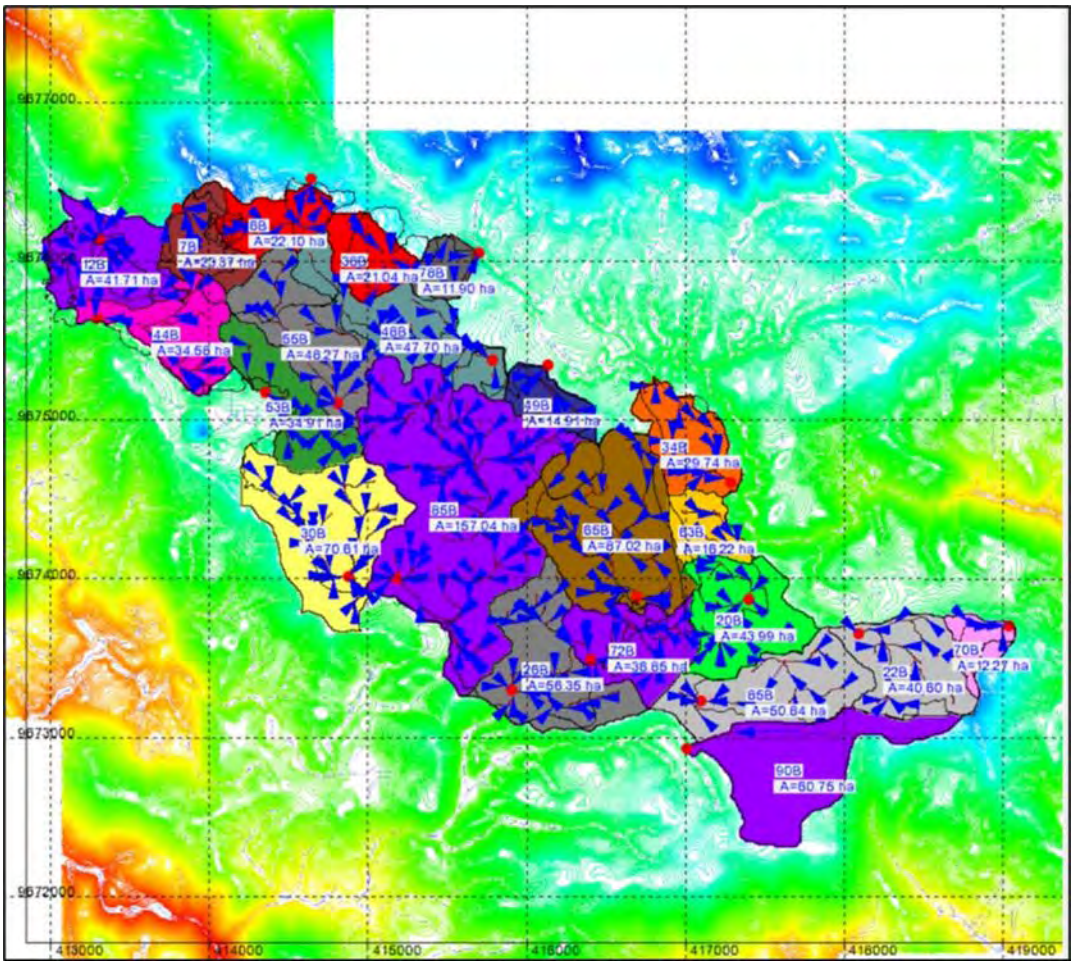
## 3.2. Analisis Hidrologi

### 3.2.1. Analisis *Catchment*

#### 3.2.1.1. *Catchment Area* Rencana Tambang

Perubahan morfologi akibat bukaan tambang akan mengubah aliran air permukaan alami khususnya pada lokasi rencana bukaan tambang. Pada kondisi tambang, air permukaan secara dominan mengalir menuju titik terendah menuju lubang bukaan tambang, dengan terdapat sebagian kecil aliran air permukaan yang tetap mengalir mengikuti aliran alaminya. Delineasi *catchment* rencana bukaan tambang dilakukan menggunakan desain bukaan tambang kondisi akhir. Pada kondisi aktualnya, perubahan *sub-catchment* perlu disesuaikan mengikuti *sequence* dari kemajuan tambang.

*Catchment area* yang terbentuk dari rencana bukaan tambang HM dapat dilihat pada Gambar 3.11. Berdasarkan hasil delineasi, aliran air permukaan pada rencana bukaan tambang HM dapat dibagi menjadi 18 *sub-catchment*. Beberapa *sub-catchment* memiliki aliran yang cukup besar dari luar pit, sehingga perimeter *drainage* dibutuhkan pada beberapa area untuk mencegah aliran dan mengurangi jumlah air permukaan yang masuk ke dalam pit. Luas masing-masing *sub-catchment* dan karakteristik fisik aliran dari rencana bukaan tambang HM dapat dilihat pada Tabel 3.5.




**Gambar 3.11** *Sub-catchment* area rencana tambang HM

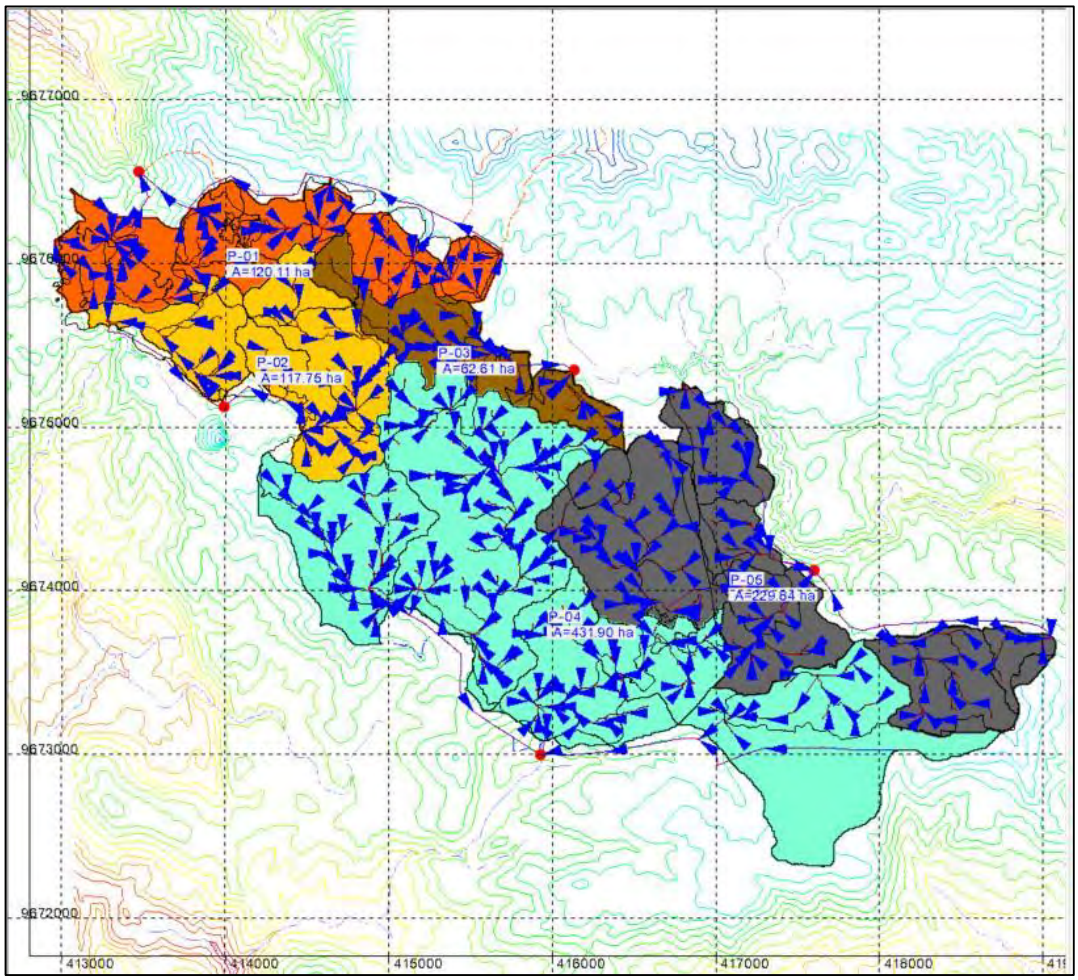
**Tabel 3.5** Luas dan karakteristik fisik *sub-catchment area* rencana bukaan tambang

| Sub-Catch | Basin Area (A) | Basin Slope (BS) | Basin Length (L) | Basin Perimeter (P) | Maximum Flow Disctance (MFD) | Maximum Flow Slope (MFS) |
|---|---|---|---|---|---|---|
| | Ha | m/m | m | m | m | m |
| **90B** | 60.75 | 0.1677 | 1763.837 | 5831.0201 | 1922.19 | 0.0638 |
| **72B** | 36.85 | 0.2684 | 767.7083 | 4031.4898 | 1139.84 | 0.0474 |
| **70B** | 12.27 | 0.3989 | 496.3386 | 2194.1339 | 856.8 | 0.171 |
| **65B** | 87.02 | 0.2605 | 1067.7 | 5507.2013 | 1687.2 | 0.0744 |
| **63B** | 16.22 | 0.2826 | 572.8804 | 2494.0209 | 719.72 | 0.1265 |
| **55B** | 48.27 | 0.2162 | 1081.961 | 4704.3886 | 1765.09 | 0.0646 |
| **53B** | 34.91 | 0.2321 | 724.6296 | 4291.2807 | 981.7 | 0.0451 |
| **49B** | 14.91 | 0.2277 | 612.6794 | 2438.9548 | 709.53 | 0.0791 |
| **48B** | 47.7 | 0.1976 | 1401.445 | 5854.7629 | 1801.59 | 0.0677 |
| **44B** | 34.58 | 0.3007 | 910.1121 | 4516.9167 | 1170.39 | 0.1251 |

| Sub-Catch | Basin Area (A) | Basin Slope (BS) | Basin Length (L) | Basin Perimeter (P) | Maximum Flow Disctance (MFD) | Maximum Flow Slope (MFS) |
|---|---|---|---|---|---|---|
| | Ha | m/m | m | m | m | m |
| **38B** | 21.04 | 0.1707 | 458.1703 | 2473.4198 | 794.25 | 0.0733 |
| **34B** | 29.74 | 0.2517 | 846.7632 | 3370.16 | 1362.28 | 0.0521 |
| **78B** | 11.9 | 0.1932 | 478.2803 | 1784.6887 | 723.36 | 0.0484 |
| **30B** | 70.61 | 0.2994 | 1036.378 | 5122.3505 | 1272.68 | 0.0966 |
| **26B** | 56.35 | 0.256 | 879.6818 | 5425.3145 | 1426.41 | 0.0736 |
| **22B** | 40.6 | 0.3551 | 873.1552 | 3794.3871 | 1062.01 | 0.1411 |
| **20B** | 43.99 | 0.1977 | 620.8768 | 4111.5782 | 948.35 | 0.059 |
| **12B** | 41.71 | 0.3281 | 645.6748 | 4117.9297 | 1021.62 | 0.1496 |
| **7B** | 23.37 | 0.2437 | 636.088 | 3190.1908 | 1143.23 | 0.0701 |
| **6B** | 22.1 | 0.1827 | 680.2941 | 3150.7921 | 1179.8 | 0.0695 |
| **85B** | 50.84 | 0.3086 | 1108.52 | 4602.3301 | 1556.96 | 0.0556 |
| **85B** | 157.04 | 0.2427 | 1504.766 | 9670.0309 | 3120.85 | 0.0423 |

### 3.2.1.2. Catchment Area Rencana Pond

*Catchment area* dari *settling pond* dihitung sebagai titik akhir penyaliran dari lokasi tambang (pit dan *disposal*) sebelum dibuang ke perairan bebas. Secara umum konsep rencana *settling pond* terdiri dari lima lokasi utama, seperti dapat dilihat pada Gambar 3.12. Hasil delineasi luas masing-masing *sub-catchment* dan karakteristik fisik dari rencana *pond* dapat dilihat pada Tabel 3.6.




**Gambar 3.12** *Sub-catchment area* rencana *settling pond*

**Tabel 3.6** Luas dan karakteristik fisik *sub-catchment area* rencana *settling pond*

| Sub-Catch | Basin Area (A) | Basin Slope (BS) | Basin Length (L) | Basin Perimeter (P) | Maximum Flow Disctance (MFD) | Maximum Stream Slope (MSS) |
|---|---|---|---|---|---|---|
| | Ha | m/m | m | m | m | m |
| **P-01** | 120.11 | 0.2437 | 2307.6915 | 14708.4894 | 3352.18 | 0.1353 |
| **P-02** | 117.75 | 0.2455 | 1117.2108 | 13507.1236 | 2903.71 | 0.1739 |
| **P-03** | 62.61 | 0.2048 | 1724.464 | 8289.3021 | 2160.32 | 0.0543 |
| **P-04** | 431.9 | 0.2532 | 2820.4794 | 31951.1715 | 4548.61 | 0.0972 |
| **P-05** | 229.84 | 0.2726 | 1690.3491 | 21418.362 | 2971.23 | 0.1507 |

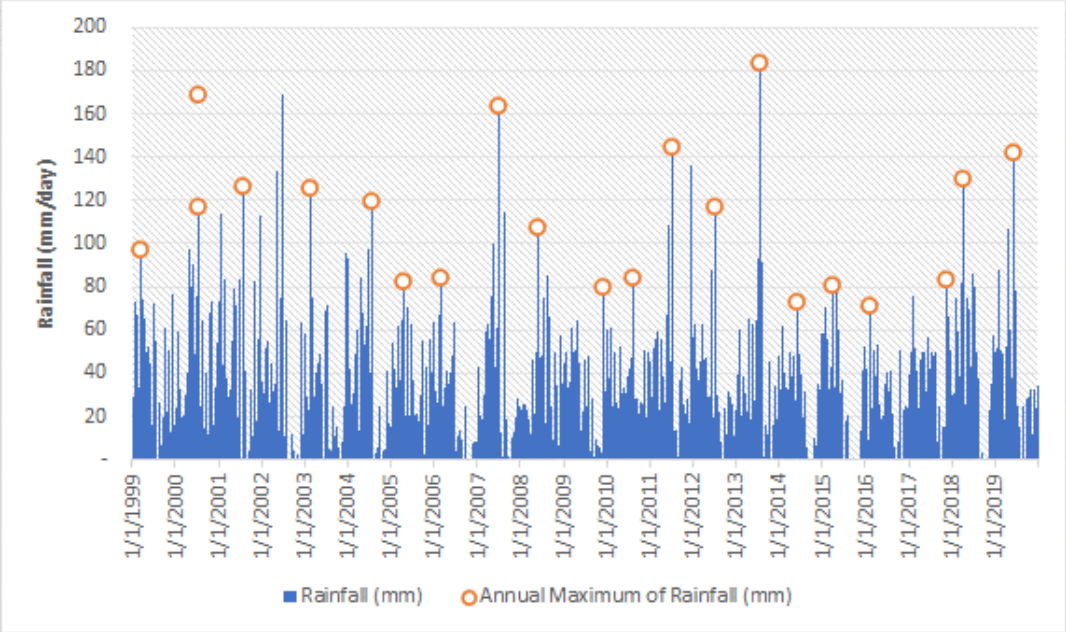
### 3.2.2. Desain Hujan Puncak

Desain hujan puncak diprediksi melalui analisis frekuensi. Analisis frekuensi bertujuan untuk mencari hubungan antara besarnya suatu kejadian (maksimum atau minimum) dan frekuensinya berdasarkan distribusi probabilitas. Hubungan antara besarnya kejadian dan frekuensinya, atau peluang kejadiannya adalah berbanding terbalik. Pengambilan seri data untuk tujuan analisis frekuensi dilakukan terhadap data maksimum tahunan (*annual maximum series*).

Data hujan maksimum tahunan diambil dari hasil data akuisisi yang diambil satu data maksimum untuk setiap tahunnya. Tabel 3.7 dan Gambar 3.13 memaparkan nilai curah hujan harian maksimum tahunan (*annual maximum*) untuk lokasi studi.

**Tabel 3.7** Nilai hujan maksimum harian (*annual maximum*) lokasi studi

| Tahun | Annual Maximum of Rainfall (mm) | Tanggal Kejadian |
|---|---|---|
| 1999 | 97.05 | 4-Mar-99 |
| 2000 | 117.38 | 4-Jul-00 |
| 2001 | 126.76 | 22-Jul-01 |
| 2002 | 168.87 | 5-Jul-00 |
| 2003 | 125.50 | 8-Feb-03 |
| 2004 | 119.67 | 12-Jul-04 |
| 2005 | 82.65 | 9-Apr-05 |
| 2006 | 83.98 | 22-Feb-06 |
| 2007 | 164.11 | 28-Jun-07 |
| 2008 | 107.55 | 29-May-08 |
| 2009 | 80.34 | 24-Nov-09 |
| 2010 | 84.21 | 3-Aug-10 |
| 2011 | 144.88 | 11-Jul-11 |
| 2012 | 117.06 | 6-Jul-12 |
| 2013 | 184.07 | 10-Jul-13 |
| 2014 | 73.30 | 4-Jun-14 |
| 2015 | 81.10 | 31-Mar-15 |
| 2016 | 71.70 | 6-Feb-16 |
| 2017 | 83.50 | 15-Nov-17 |
| 2018 | 130.00 | 10-Apr-18 |
| 2019 | 142.00 | 7-Jun-19 |




**Gambar 3.13** Grafik hujan maksimum harian (*annual maximum*) lokasi studi.

Frekuensi data hujan dapat diartikan sebagai suatu cara untuk memprediksi suatu besaran curah hujan di masa yang akan datang dengan menggunakan data curah hujan di masa yang lalu berdasarkan distribusi frekuensi. Dalam studi ini fungsi distribusi yang dianalisis menggunakan fungsi distribusi normal, distribusi log-normal, distribusi log Pearson III, dan distribusi Gumbel. Untuk mendapatkan fungsi distribusi yang sesuai digunakan, uji kompatibilitas dilakukan dengan metode Kolmogorov Smirnov dan Chi-Square. Hasil uji kesesuaian distribusi ditunjukkan pada Tabel 3.8. Hasil analisis distribusi yang paling mendekati adalah distribusi Normal.

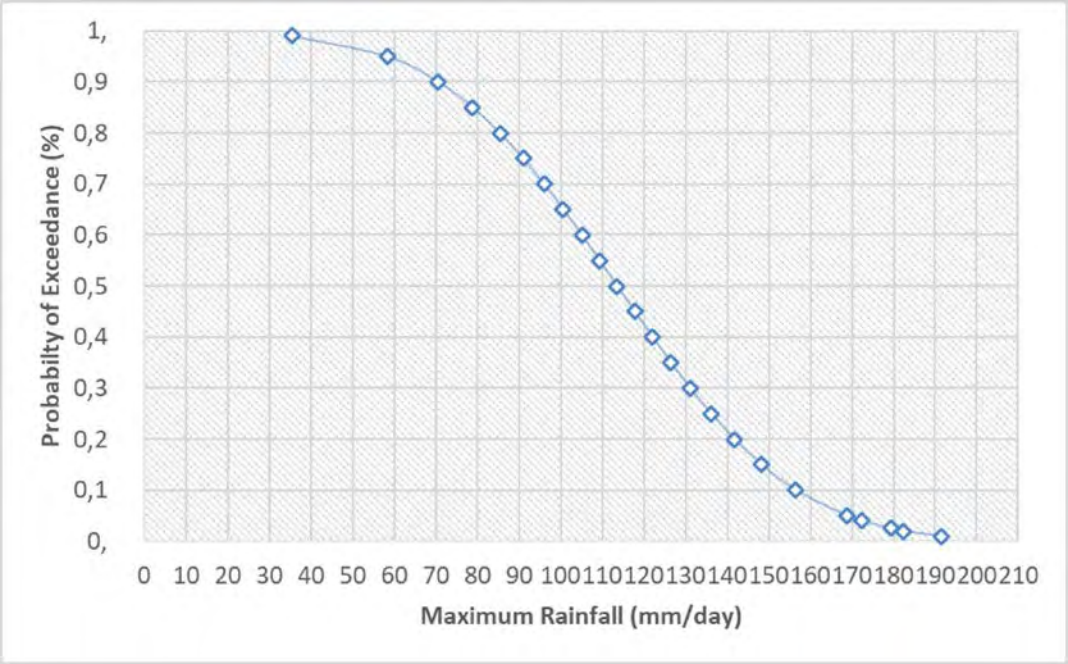
**Tabel 3.8** Hasil uji kecocokan distribusi data hujan maksimum

| Kolmogorov-Smirnov Test | Normal | Log Normal | Gumbel | Log Pearson III |
|---|---|---|---|---|
| D-value | 0.173 | 0.177 | 0.186 | 0.176 |
| D-Critical | 0.284 | 0.284 | 0.284 | 0.284 |
| **Chi-Square Test** | **Normal** | **Log Normal** | **Gumbel** | **Log Pearson III** |
| Chi-square (Observed value) | 4.667 | 7.333 | 4.667 | 7.333 |
| Derajat Kebebasan | 4 | 4 | 4 | 3 |
| Chi-square (Critical value) | 9.448 | 9.448 | 9.448 | 7.815 |

Selanjutnya perhitungan hujan rencana (hujan puncak) dihitung dengan menggunakan fungsi distribusi Normal. Resume hasil perhitungan hujan puncak dengan probabilitas atau periode ulang tertentu dapat dilihat pada Tabel 3.9 dan Gambar 3.14.

**Tabel 3.9** Hasil perhitungan hujan puncak pada periode ulang tertentu

| P(x >= Xm) Probabilitas | Tahun Kala-Ulang | Hujan Puncak (mm/hari) |
|---|---|---|
| 0.99 | 1 | 35.644 |
| 0.5 | 2 | 113.604 |
| 0.2 | 5 | 141.809 |
| 0.1 | 10 | 156.552 |
| 0.05 | 20 | 168.727 |
| 0.04 | 25 | 172.273 |
| 0.025 | 40 | 179.287 |
| 0.02 | 50 | 182.429 |
| 0.01 | 100 | 191.565 |




**Gambar 3.14** Grafik probabilitas analisis hujan rencana (hujan puncak).

**Intensitas Hujan Maksimum**

Hasil yang didapatkan dari analisis frekuensi hujan masih berupa curah hujan harian (akumulasi selama 24 jam). Selanjutnya data hujan harian perlu diubah terlebih dahulu menjadi data intensitas. Intensitas hujan dapat dikatakan sebagai ketinggian atau kederasan hujan per satuan waktu, biasanya dinyatakan dalam satuan yang lebih pendek (mm/jam). Jika volume hujan adalah tetap, maka intensitas hujan akan makin tinggi seiring dengan durasi hujan yang makin singkat, sebaliknya intensitas hujan makin rendah seiring dengan durasi hujan yang makin lama. Nilai intensitas hujan dapat dinyatakan sebagai intensitas pada satu titik, yang dinyatakan melalui kurva IDF (*Intensity Duration Frequency*) atau hujan yang terdistribusi dalam hujan jam-jaman.

Jika data hujan jangka pendek tidak tersedia dan data hujan harian tersedia, maka persamaan regresi kurva IDF diturunkan dengan persamaan:

$$I = \frac{R_{24}}{24}\left(\frac{24}{t}\right)^{m}$$

$R_{24}$ = curah hujan untuk satu hari

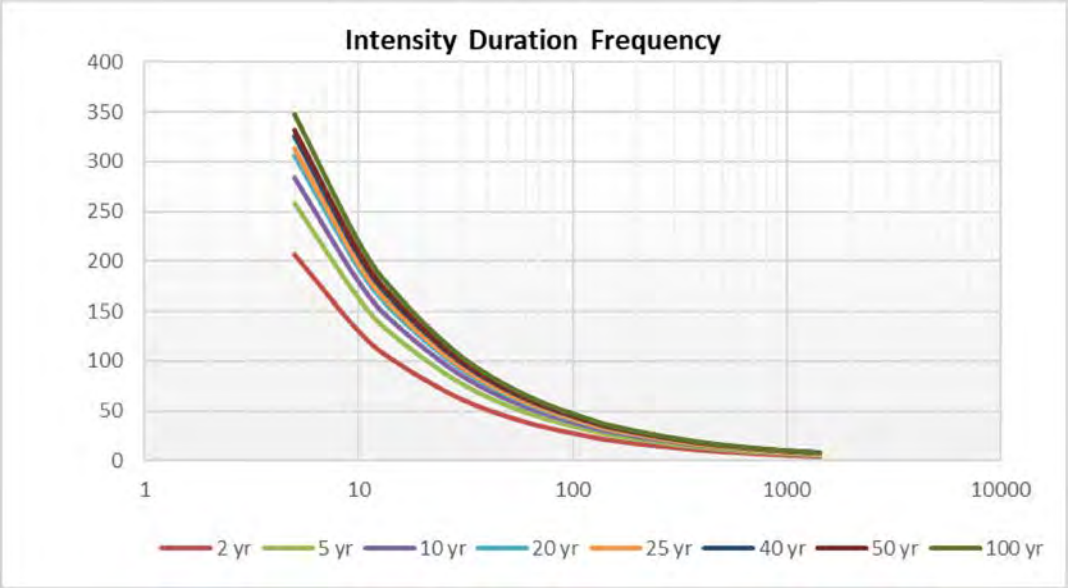
t = periode ulang (2, 5, 10, 15, 20, 25, 40, 50, dan 100 tahun)

m = koefisien hujan

Hasil perhitungan intensitas hujan periode ulang tertentu (*Intensity Duration Frequency*) dapat dilihat pada Tabel 3.10 dan Gambar 3.15.

**Tabel 3.10** Hasil perhitungan intensitas periode ulang hujan (*Intensity Duration Frequency*) lokasi rencana tambang HM

| Duration (minutes) | Rainfall Intensity (mm/hour) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2 yr | 5 yr | 10 yr | 20 yr | 25 yr | 50 yr | 100 yr |
| 5 | 210.56 | 266.31 | 302.97 | 338.13 | 349.31 | 383.97 | 418.84 |
| 10 | 132.64 | 167.76 | 190.86 | 213.01 | 220.05 | 241.89 | 263.85 |
| 15 | 101.23 | 128.03 | 145.65 | 162.55 | 167.93 | 184.60 | 201.36 |
| 30 | 63.77 | 80.65 | 91.76 | 102.40 | 105.79 | 116.29 | 126.85 |
| 60 | 40.17 | 50.81 | 57.80 | 64.51 | 66.64 | 73.26 | 79.91 |
| 120 | 25.31 | 32.01 | 36.41 | 40.64 | 41.98 | 46.15 | 50.34 |
| 180 | 19.31 | 24.43 | 27.79 | 31.01 | 32.04 | 35.22 | 38.42 |
| 360 | 12.17 | 15.39 | 17.51 | 19.54 | 20.18 | 22.19 | 24.20 |
| 720 | 7.66 | 9.69 | 11.03 | 12.31 | 12.71 | 13.98 | 15.25 |
| 1440 | 4.83 | 6.11 | 6.95 | 7.75 | 8.01 | 8.80 | 9.60 |




**Gambar 3.15** Kurva *Intensity Duration Frequency* (IDF) lokasi rencana tambang HM

### 3.2.3. Koefisien Limpasan

Koefisien limpasan adalah persentase jumlah air yang dapat melalui permukaan tanah dari keseluruhan air hujan yang jatuh pada suatu daerah. Semakin kedap suatu permukaan, maka semakin tinggi nilai koefisien pengalirannya. Nilai koefisien pengaliran (C) berkisar antara 0 – 1. Nilai C= 0 menunjukkan bahwa semua air hujan terintersepsi dan terinfiltrasi ke dalam tanah, sebaliknya untuk nilai C= 1 menunjukkan bahwa air hujan mengalir sebagai aliran permukaan.

Penentuan nilai faktor C dihitung dengan mengintegrasikan beberapa faktor yang mempengaruhi, yaitu: topografi, kapasitas infiltrasi, tutupan lahan, dan *surface storage*. Nilai koefisien C merupakan kombinasi dari beberapa faktor tersebut, dihitung berdasarkan referensi yang dapat dilihat pada Tabel 3.11 (*Hydraulic Design Manual*, TxDOT, 2016). Hasil perhitungan koefisien pengaliran (C) untuk masing-masing *sub-catchment* yang mempengaruhi tambang HM dapat dilihat pada Tabel 3.12.

**Tabel 3.11** Kurva perhitungan koefisien limpasan (*Hydraulic Design Manual*, TxDOT, 2016)

| Watershed characteristic | Extreme | High | Normal | Low |
|---|---|---|---|---|
| Relief - $C_r$ | 0.28-0.36 | 0.20-0.28 | 0.14-0.20 | 0.08-0.14 |
| | Steep, rugged terrain with average slopes above 30% | Hilly, with average slopes of 10-30% | Rolling, with average slopes of 5-10% | *Relatif*ly flat land, with average slopes of 0-5% |
| Soil infiltration - $C_i$ | 0.12-0.16 | 0.08-0.12 | 0.06-0.08 | 0.04-0.06 |
| | No effective soil cover; either rock or thin soil mantle of negligible infiltration capacity | Slow to take up water, clay or shallow loam soils of low infiltration capacity or poorly drained | Normal; well drained light or medium textured soils, sandy loams | Deep sand or other soil that takes up water readily; very light, well-drained soils |
| Vegetal cover - $C_v$ | 0.12-0.16 | 0.08-0.12 | 0.06-0.08 | 0.04-0.06 |
| | No effective plant cover, bare or very sparse cover | Poor to fair; clean cultivation, crops or poor natural cover, less than 20% of drainage area has good cover | Fair to good; about 50% of area in good grassland or woodland, not more than 50% of area in crops | Good to excellent; about 90% of drainage area in good grassland, woodland |
| Surface Storage - $C_s$ | 0.10-0.12 | 0.08-0.10 | 0.06-0.08 | 0.04-0.06 |
| | Negligible; surface depressions few and shallow, no marshes | Well-defined system of small drainage ways, no ponds or marshes | Normal; considerable surfacedepression, e.g., storage lakes and ponds | Much surface storage, large number of ponds or marshes |

**Tabel 3.12** Estimasi nilai koefisien limpasan pada *catchment* tambang HM

| Parameter | Bukaan Tambang | Rencana Pond |
|---|---|---|
| Relief - Cr | 0.32 | 0.28 |
| Soil infiltration - Ci | 0.16 | 0.14 |
| Vegetal cover - Cv | 0.16 | 0.16 |
| Surface Storage - Cs | 0.12 | 0.12 |
| **Total** | **0.76** | **0.70** |

### 3.2.4. Debit Puncak Air Permukaan

Estimasi debit puncak air permukaan dihitung untuk kepentingan rencana penyaliran tambang. Secara umum debit puncak dihitung untuk kepentingan:

1. Desain *sump* atau sumuran pit pada bukaan tambang
2. Desain saluran
3. Desain *setlling pond*

Berdasarkan data yang diterima, desain tambang merupakan desain pada kondisi tambang akhir, sehingga estimasi debit puncak menghitung kondisi maksimum. Analisis debit puncak air permukaan dihitung dengan menggunakan metode rasional. Berdasarkan SNI 2415:2016 metode rasional dapat digunakan untuk luas DAS yang relatif kecil. Metode rasional adalah metode empiris dari hubungan sederhana antara intensitas curah hujan dengan debit puncak. Persamaan pada metode rasional adalah sebagai berikut:

$$Q = C.I.A$$

Q = debit banjir maksimum ($m^3$/dtk)

C = koefisien pengaliran/limpasan

I = intensitas curah hujan rata-rata (mm/jam)

A = luas daerah pengaliran ($m^2$)

Metode rasional pada prinsipnya menggunakan beberapa dasar asumsi, sebagai berikut:

- Curah hujan didistribusikan secara merata ke seluruh area drainase dan konstan sepanjang waktu
- Estimasi debit puncak memiliki probabilitas kejadian yang sama (periode ulang) seperti yang digunakan pada distribusi intensitas hujan (I)
- Estimasi debit puncak dapat direpresentasikan oleh intensitas curah hujan rata-rata selama periode waktu yang sama dengan waktu konsentrasi (Tc)
- Koefisien pengaliran dianggap konstan

Penentuan intensitas hujan yang digunakan mengacu kepada asumsi bahwa hujan terdistribusi merata dengan intensitas hujan terjadi selama periode waktu yang sama dengan waktu konsentrasi.

Dalam hal ini perhitungan waktu konsentrasi menggunakan metode Kirpich dengan persamaan:

$$tc = 0.0195\ L^{0.77}\ S^{-0.385}$$

tc = waktu konsentrasi

L = panjang *basin* (m)

S = *slope* rata-rata *catchment*

**Debit Puncak Rencana Bukaan Tambang**

Hasil estimasi debit puncak air permukaan dengan metode rasional pada rencana bukaan tambang HM dapat dilihat pada Tabel 3.13. Hasil tersebut merupakan estimasi debit puncak menggunakan periode ulang 25 tahun.

**Tabel 3.13** Estimasi debit dan volume maksimum aliran air permukaan pada masing-masing *sub-catchment* rencana bukaan tambang HM

| Sub-Catchment | Runoff Coefficient (C) | Rainfall Intensity (mm/hour) | Catchment Area (A) (Ha) | Time of Concentration (minutes) | Peak Flow Rate (m3/sec) |
|---|---|---|---|---|---|
| 90B | 0.76 | 31.12 | 60.75 | 159.39 | 3.99 |
| 72B | 0.76 | 37.71 | 36.85 | 119.51 | 2.93 |
| 70B | 0.76 | 60.69 | 12.27 | 58.52 | 1.57 |
| 65B | 0.76 | 34.63 | 87.02 | 135.82 | 6.36 |
| 63B | 0.76 | 61.43 | 16.22 | 57.47 | 2.10 |
| 55B | 0.76 | 32.62 | 48.27 | 148.52 | 3.32 |
| 53B | 0.76 | 40.21 | 34.91 | 108.52 | 2.96 |
| 49B | 0.76 | 54.85 | 14.91 | 68.11 | 1.73 |
| 48B | 0.76 | 32.68 | 47.70 | 148.16 | 3.29 |
| 44B | 0.76 | 47.73 | 34.58 | 83.93 | 3.48 |
| 38B | 0.76 | 50.77 | 21.04 | 76.50 | 2.25 |
| 34B | 0.76 | 35.27 | 29.74 | 132.15 | 2.21 |
| 78B | 0.76 | 47.88 | 11.90 | 83.53 | 1.20 |
| 30B | 0.76 | 42.79 | 70.61 | 98.86 | 6.38 |
| 26B | 0.76 | 0.00 | 56.35 | 119.86 | 0.00 |
| 22B | 0.76 | 51.74 | 40.60 | 74.35 | 4.43 |
| 20B | 0.76 | 43.85 | 43.99 | 95.29 | 4.07 |
| 12B | 0.76 | 53.59 | 41.71 | 70.54 | 4.72 |
| 7B | 0.76 | 41.63 | 23.37 | 103.02 | 2.05 |
| 6B | 0.76 | 40.87 | 22.10 | 105.90 | 1.91 |
| 85B | 0.76 | 30.56 | 50.84 | 150.76 | 3.28 |

**Debit Puncak Rencana *Pond***

Hasil estimasi debit puncak air permukaan dengan metode rasional pada rencana *pond* dapat dilihat pada Tabel 3.14. Hasil tersebut merupakan estimasi debit puncak dengan periode ulang 100 tahun.

**Tabel 3.14** Estimasi debit dan volume maksimum aliran air permukaan pada masing-masing *sub-catchment* rencana *settling pond*

| Sub-Catchment | Runoff Coefficient | Rainfall Intensity | Catchment Area (A) | Time of Concentration | Peak Flow Rate |
|---|---|---|---|---|---|
| | (C) | (mm/hour) | (Ha) | (minutes) | (m3/sec) |
| P-01 | 0.7 | 31.45 | 120.11 | 135.56 | 7.34 |
| P-02 | 0.7 | 36.12 | 117.75 | 240.27 | 8.27 |
| P-03 | 0.7 | 31.17 | 62.61 | 91.89 | 3.79 |
| P-04 | 0.7 | 24.67 | 431.90 | 69.02 | 20.72 |
| P-05 | 0.7 | 34.40 | 229.84 | 63.96 | 15.37 |

## 3.3. Analisis Hidrogeologi

### 3.3.1. Latar Belakang Geologi

Lokasi rencana penambangan HM secara keseluruhan terbentuk oleh Kompleks Ultramafik yang terdiri dari litologi peridotit, harzburgit, Iherzolit, wherkit, serpentinit, dan dunit. Unit stratigrafi ini berumur Kapur hingga Oligosen (Simandjuntak dkk., 1991). Pada bagian permukaan, pelapukan batuan ultrabasa di lokasi IUP HM menghasilkan bijih nikel yang dikenal sebagai nikel laterit. Secara umum profil endapan laterit pada lokasi HM adalah sebagai berikut:

1. Lapisan Penutup

   Lapisan ini berwarna coklat kemerahan, merupakan kumpulan massa goetit, hematit, dan limonit, mempunyai kadar besi yang tinggi tetapi kandungan nikel yang relatif rendah.

2. Lapisan Limonit

   Lapisan ini berbutir halus, berwarna coklat muda sampai kekuningan dengan komposisi mineral terdiri dari goetit, limonit, hematit, magnetit, kromit, dan kuarsa sekunder. Kadang-kadang juga dijumpai mineral talk, tremolit, kuarsa, dan maghemit. Pada mineral goetit terikat nikel, krom, kobalt, vanadium, dan aluminium. Lapisan ini umumnya tipis pada daerah yang terjal hingga hilang karena erosi.

3. Zona Saprolit

Lapisan ini umumnya berwarna coklat kekuningan sampai kehijauan, merupakan lapisan batuan dasar yang sudah lapuk. Struktur dan tekstur batuan asal masih bisa terlihat. Perubahan geokimia zona ini yang terletak di atas bantuan asal tidak banyak $H_2O$ dan nikel bertambah, sedangkan magnesium dan silika hanya sedikit yang hilang terlindi, zona ini terdiri dari campuran sisa-sisa batuan asal, butiran halus limonit, urat garnierit, kuarsa, mangan, dan kadang-kadang terdapat silika *boxwork*.

4. Zona batuan dasar (*bedrock*)

   Merupakan bagian terbawah dari profil laterit, tersusun dari bongkah-bongkah yang lebih besar dari 75 cm dan blok batuan dasar. Umumnya zona ini berwarna abu-abu kehijauan dan tidak mengandung mineral ekonomis. Kadar mineral logam mendekati atau sama dengan batuan asal.

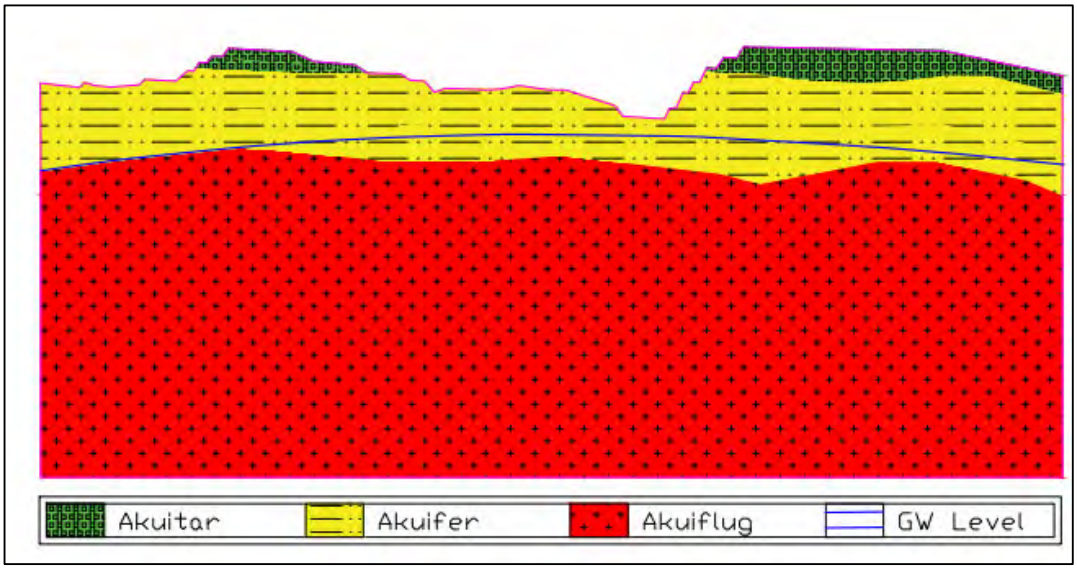
### 3.3.2. Sistem Hidrogeologi

Sistem airtanah laterit dan ultramafik terkekarkan hadir pada Formasi Ultrabasa, di mana lokasi rencana tambang HM terletak pada sistem airtanah ini. Berdasarkan hasil interpretasi diketahui bahwa lapisan penyusun hidrostratigrafi sistem airtanah ini dibagi menjadi tiga, yaitu tanah laterit berukuran lempung (laterit atas), laterit bawah dan batuan ultramafik terkekarkan, serta batuan ultramafik tidak terkekarkan. Lapisan yang membentuk zona akuifer utama pada sistem airtanah ini adalah laterit bawah dan batuan ultramafik terkekarkan. Lapisan laterit bawah dan batuan ultramafik terkekarkan dikelompokkan menjadi satu zona akuifer utama. Tanah laterit berukuran lempung (limonit) berfungsi sebagai lapisan akuiklud, sedangkan lapisan batuan ultramafik yang tidak terkekarkan bertindak sebagai lapisan akuifug (Gambar 3.16). Ketebalan lapisan akuifer sangat bervariasi yaitu berkisar antara 10-30 m dan lapisan akuifug (batuan dasar yang tidak terkekarkan) diasumsikan kontinu hingga ketebalan lebih dari 100 meter.




**Gambar 3.16** Konseptual sistem hidrogeologi lokasi IUP HM

Berdasarkan interpolasi data pengeboran geoteknik, selanjutnya interpretasi hidrostratigrafi di lokasi rencana tambang HM dibuat dengan representatif penampang seperti dapat dilihat pada Gambar 3.17. Lapisan limonit yang berada pada bagian paling atas sangat dipengaruhi oleh aktivitas permukaan yang kuat. Hal ini mengakibatkan lapisan limonit secara umum memiliki ukuran butir yang halus (lempung-lanau) yang membuat lapisan ini diklasifikasikan sebagai akuiklud. Lapisan saprolit atau yang merupakan zona bijih tersusun atas fragmen-fragmen batuan induk yang ter-alterasi, namun pengaruh aktivitas permukaan cenderung minimal. Akibat hasil tersebut maka ukuran butir pada lapisan ini cenderung sangat heterogen, namun berdasarkan hasil uji lapangan lapisan saprolit masuk dalam klasifikasi akuifer. Lapisan terbawah dari nikel laterit merupakan *bedrock*.

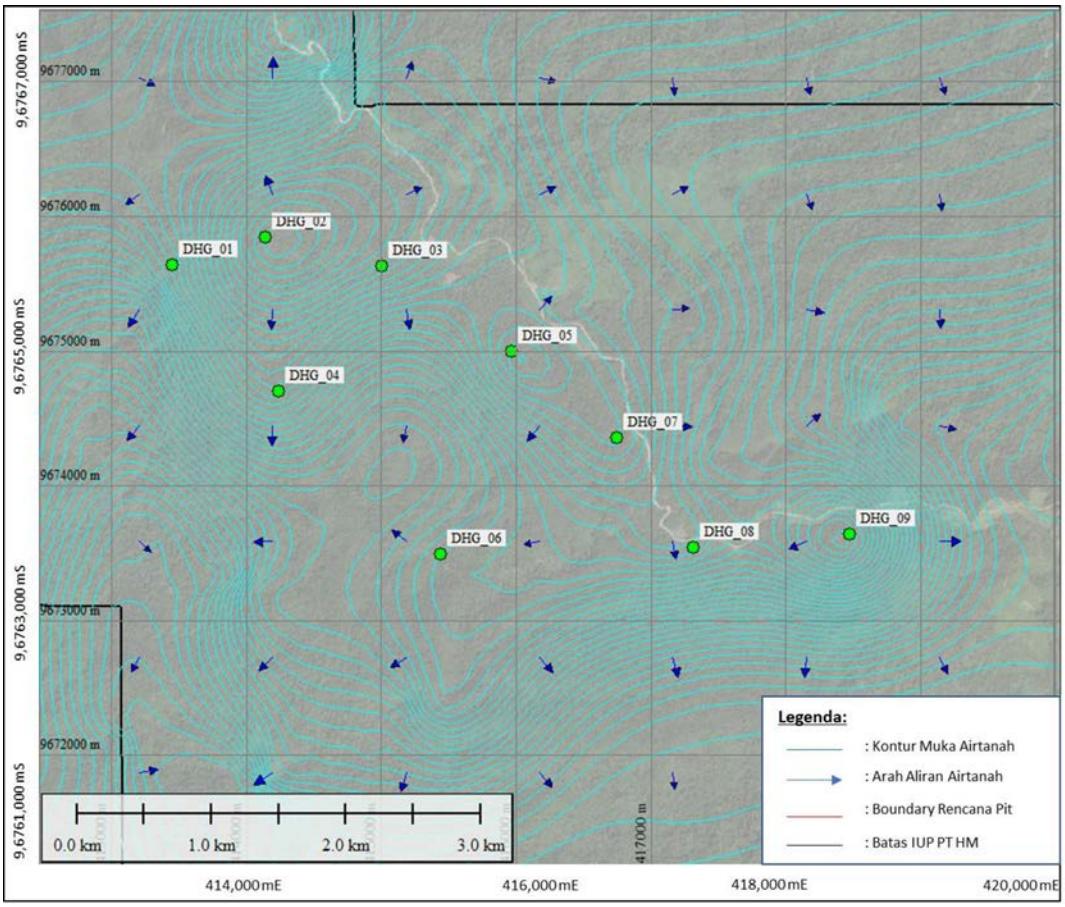



**Gambar 3.17** Representatif penampang hidrostratigrafi lokasi IUP HM

Secara umum, berdasarkan hasil pengamatan lapangan, *bedrock* dapat dibagi menjadi dua bagian, yaitu *fractured bedrock* dan *unfractured bedrock*. *Fractured bedrock* hadir dominan pada bagian atas dari *bedrock* yang hadir dengan ketebalan variatif. Kondisi batuan dasar yang terkekarkan membuat zona ini menjadi potensial sebagai zona akuifer dengan medium sistem rekahan. Zona *unfractured bedrock* terletak pada bagian bawah merupakan batuan yang masih segar dan tidak terkekarkan. Zona *unfractured bedrock* diklasifikasikan sebagai akuifug.

### 3.3.3. Pola Aliran dan Muka Airtanah

Berdasarkan data hasil pengukuran level muka airtanah, interpolasi kontur muka airtanah dilakukan untuk mengetahui gambaran umum pola dan aliran airtanah pada kondisi yang ada saat ini. Selain data muka airtanah, interpretasi juga dibangun berdasarkan fitur hidrologi lainnya, seperti batas sungai dan batas laut. Peta kontur muka airtanah dan interpretasi alirannya dapat dilihat pada Gambar 3.18.




**Gambar 3.18** Pola umum aliran airtanah lokasi studi

Berdasarkan hasil interpretasi dapat terlihat bahwa kondisi aliran airtanah saat ini telah terpengaruh oleh aktivitas penambangan yang telah berjalan. Pada area tambang kontur airtanah berada lebih rendah dari daerah sekitarnya dan aliran airtanah cenderung mengarah pada area bukaan tambang. Penurunan atau perubahan aliran airtanah akibat aktivitas tambang berjalan saat ini relatif bersifat lokal, yaitu perubahan tidak memengaruhi aliran secara regional. Airtanah mengalir cenderung dari arah baratlaut menuju tenggara.

## 3.3.4. Model Hidrogeologi

Model hidrogeologi dibuat untuk dapat memahami kondisi airtanah pada lokasi tambang HM, memprediksi pola perubahan airtanah, serta memprediksi *inflow* airtanah pada kondisi penambangan selanjutnya.

**Metode, Pendekatan, dan Asumsi**

Pemodelan aliran airtanah (*flow model*) bertujuan untuk mendapatkan gambaran perubahan pola aliran tanah antara kondisi *existing* dan penambangan. Beberapa pendekatan dan asumsi yang digunakan dalam model aliran antara lain:

- Simulasi menggunakan metode *finite difference.*
- Airtanah dianggap sebagai satu sistem besar dengan koneksi hidraulik melalui semua litologi yang hadir.
- *Input* awal parameter hidraulik (K) menggunakan data hasil pengujian lapangan dan penyesuaian nilai parameter hidraulik (K) dilakukan selama proses kalibrasi model.
- Parameter hidraulik lainnya (storativitas, porositas efektif, dan laju infiltrasi aktual) diasumsikan berdasarkan literatur dan merupakan bentuk ketidakpastian.
- *Initial head* menggunakan hasil interpretasi kontur muka airtanah yang telah dijelaskan pada sub-bab sebelumnya.
- Kalibrasi model dilakukan pada kondisi tunak (*steady state*), menggunakan data elevasi airtanah hasil pengukuran lapangan kondisi *existing*.

Model kondisi tunak dijalankan untuk memverifikasi model secara fisik. Model kondisi transien yang dikalibrasi perlu dibangun selanjutnya menggunakan data pemantauan airtanah yang dikumpulkan selanjutnya untuk memberikan hasil yang lebih akurat.

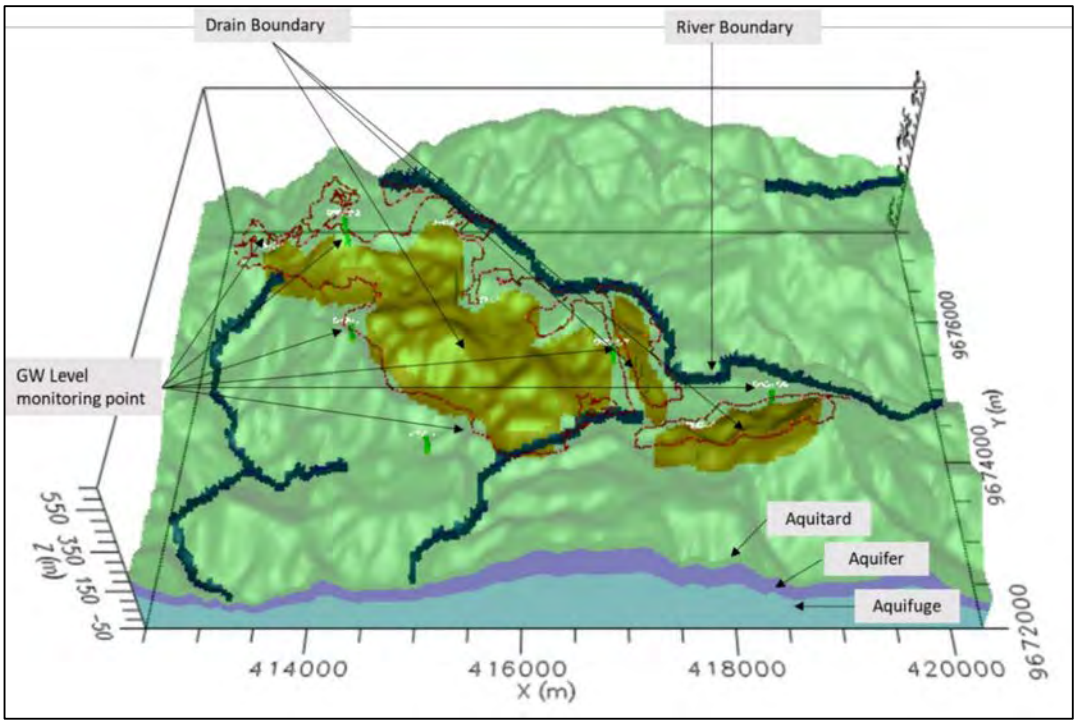
**Dimensi Model Fisik**

Model hidrogeologi dibangun dengan dimensi 7,8 km pada arah barat-timur dan 5,5 km pada arah utara-selatan dengan luas model sekitar 42,9 km$^2$. Model dibuat lebih luas dari area *interest* untuk dapat melihat pola perubahan aliran airtanah secara lebih luas. Model ini menggunakan ukuran *grid* berukuran 50 m x 50 m dengan total jumlah sel sebanyak 51.480. Batas dimensi serta ukuran *grid* dari model fisik dapat dilihat pada Tabel 3.15.

**Tabel 3.15** Dimensi dan ukuran *grid* dari model fisik hidrogeologi

| Dimensi Model | | | Jarak (m) | Ukuran Grid (m) | Jumlah Grid/Layer |
|---|---|---|---|---|---|
| *Easting (column)* | Min | 412500 | 7800 | 50 | 156 |
| | Max | 420300 | | | |
| *Northing (row)* | Min | 9672000 | 5500 | 50 | 110 |
| | Max | 9677500 | | | |
| Elevasi | Min | -50 | 550 | - | 3 |
| | Max | 500 | | | |

Aliran airtanah dimodelkan berdasarkan pendekatan hidrostratigrafi, sehingga layer dibentuk dengan mengikuti hidrostratigrafi berdasarkan interpretasi data bor, atau dengan kata lain masing-masing layer yang terbentuk akan memuat nilai parameter hidraulik tertentu. Selanjutnya data topografi digunakan sebagai batas permukaan dalam pemodelan, sedangkan batas bawah dibatasi pada elevasi -50 mdpl yang diklasifikasikan sebagai lapisan akuifug. Gambaran model fisik hidrogeologi dapat dilihat pada **Error! Reference source not found.**.




**Gambar 3.19** Gambaran model hidrogeologi pada bidang tiga dimensi

***Initial Head***

Distribusi *initial head* airtanah dimodelkan secara spasial berdasarkan pengukuran air tanah yang dilakukan pada tahun 2021. Secara umum, aliran airtanah pada kondisi awal mengalir cenderung berarah barat-timur (lihat Gambar 3.18).

**Parameter Hidraulik**

Data parameter hidraulik dibuat berdasarkan model konseptual yang telah dijelaskan sebelumnya. Penyesuaian nilai parameter hidraulik dilakukan selama pembuatan model *steady-state*. Data kondisi parameter hidraulik yang digunakan dalam pemodelan dapat dilihat pada Tabel 3.16.

**Tabel 3.16** *Input* parameter hidraulik untuk model airtanah

| Layer | Litologi | Hidrostratigrafi | K | S | | | |
|---|---|---|---|---|---|---|---|
| | | | (m/s) | Ss | Sy | Eff. Por. | Tot. Por. |
| 1 | Limonit | Akuiklud | 1.40E-09 | 3.00E-04 | 0.12 | 0.21 | 0.41 |
| 2 | Saprolit | Akuifer | 5.00E-06 | 4.90E-03 | 0.30 | 0.26 | 0.53 |
| 3 | Bedrock | Akuifug | 1.00E-12 | 3.00E-07 | 0.08 | 0.03 | 0.35 |

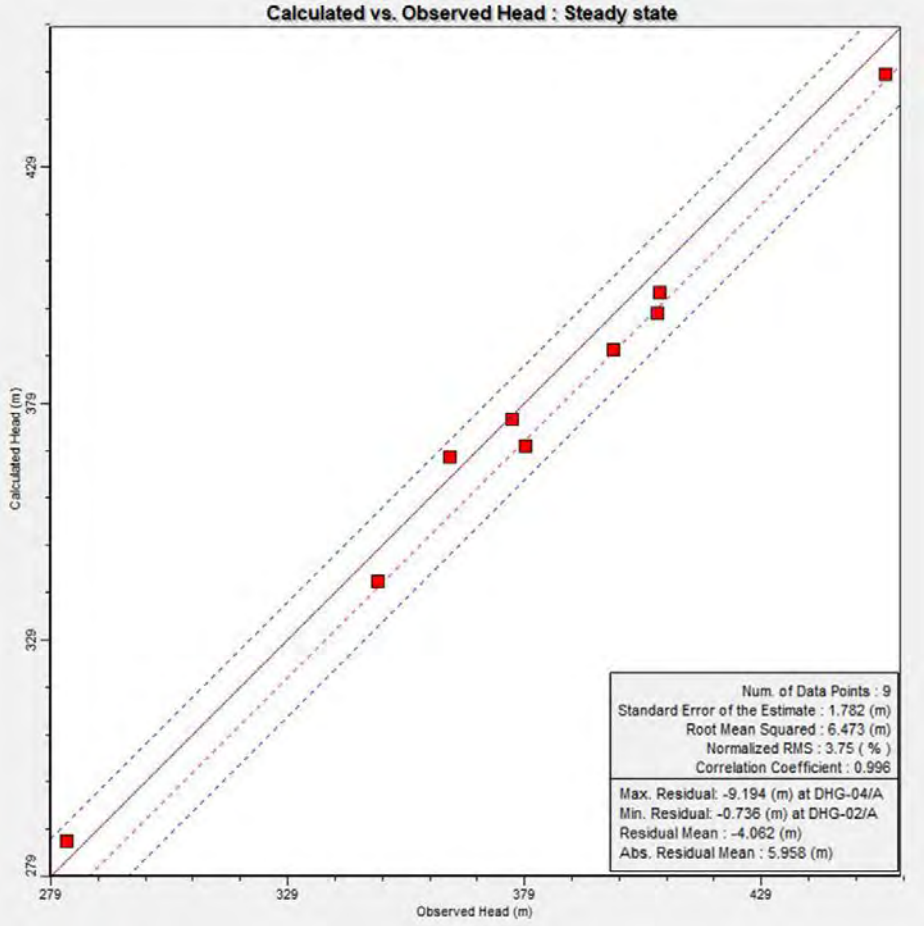
**Kondisi Batas**

Beberapa penyesuaian ilmiah seperti kondisi batas digunakan pada pembuatan model. Sungai menjadi kondisi batas aliran (*river boundary*) di permukaan dan memiliki hubungan hidraulik dengan akuifer. Untuk "mengisi" kekosongan data muka airtanah, maka digunakan kondisi batas *general head* di bagian tepi model. Rencana bukaan pit yang dibentuk penggalian tambang digunakan sebagai kondisi batas *drain*. Pada batas kedalaman tertentu (-50 mbgs), diasumsikan tidak ada aliran (*no flow boundary*). Skema kondisi batas untuk model aliran airtanah dapat dilihat pada Gambar 3.19.

### 3.3.4.1. Model Kalibrasi (Steady State)

Kalibrasi model diperlukan untuk memastikan bahwa properti, asumsi, dan metodologi yang digunakan telah mendekati kondisi sebenarnya. Kalibrasi model dalam maknanya yang paling sederhana adalah modifikasi data *input* model untuk tujuan memastikan model lebih sesuai dengan nilai yang diamati (misal *head* dan *flow*). Model pada awalnya dikalibrasi berdasarkan kondisi *steady* yang menggambarkan tatanan/*setting* pemodelan hidrogeologi pada kondisi awal. Kondisi *steady* adalah suatu kondisi di mana jumlah airtanah yang masuk (*recharge*) adalah sama dengan jumlah airtanah yang keluar (*discharge*). Simulasi pada kondisi ini bertujuan untuk mendapatkan gambaran model fisik telah mendekati dengan kondisi sebenarnya.

Grafik kalibrasi antara model dan data yang diukur ditunjukkan pada Gambar 3.20, yang merupakan grafik kalibrasi model pada kondisi *steady state*. Grafik tersebut membandingkan antara kondisi model (*calculated*) dengan kondisi lapangan (*observed*). Model kalibrasi menunjukkan koefisien korelasi sebesar 0,996 dengan *standard error of the estimate* sebesar 1,782 m. Berdasarkan hal tersebut model dianggap sudah mendekati kondisi lapangan dan dapat digunakan untuk memprediksi perubahan *head* dalam kondisi transien dengan perubahan aliran airtanah.




**Gambar 3.20** Kalibrasi model kondisi *steady state*, perbandingan *head* airtanah model dengan data observasi lapangan

### 3.3.4.2. Model Prediksi Rencana Pengembangan Tambang

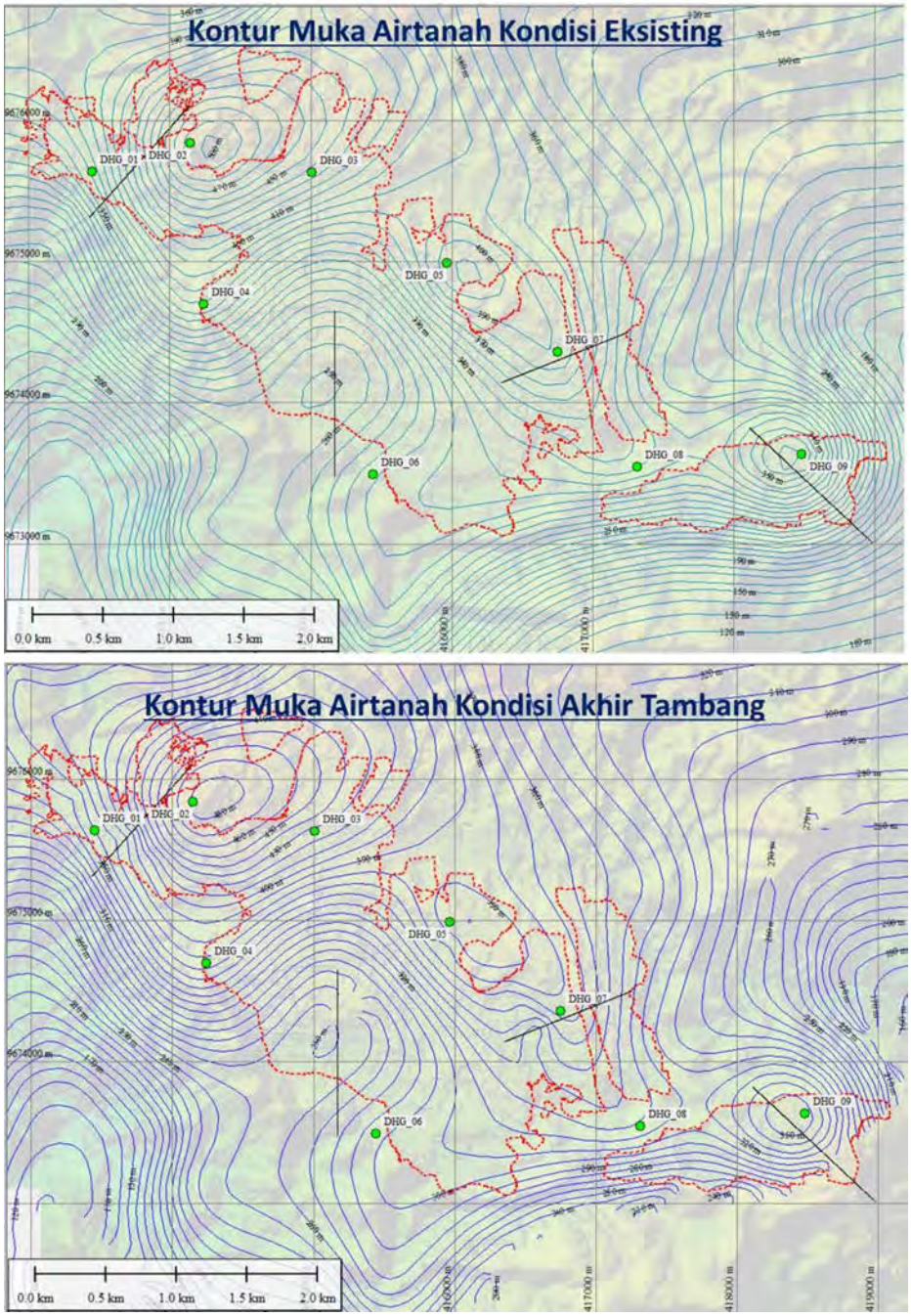
Setelah didapatkan kalibrasi yang diharapkan, dibuat model untuk memprediksi aliran airtanah berdasarkan rencana pit yang diberikan oleh PT HM. Hasil pemodelan airtanah kondisi *steady* akan menjadi dasar model prediksi. *Head* airtanah akan digunakan sebagai *initial head* untuk model transien. Secara umum, asumsi dan parameter yang digunakan pada model prediksi adalah sebagai berikut:

- *Initial head* awal model prediksi adalah *head* airtanah hasil pemodelan *steady state.*
- Air yang keluar melalui dinding bukaan tambang dianggap akan dikeringkan, dalam hal ini kondisi batas *drain* (*drain boundary*) dibuat pada lantai dan dinding tambang dari rencana *open* pit.
- Perubahan morfologi menggunakan data desain bukaan tambang akhir PT HM.

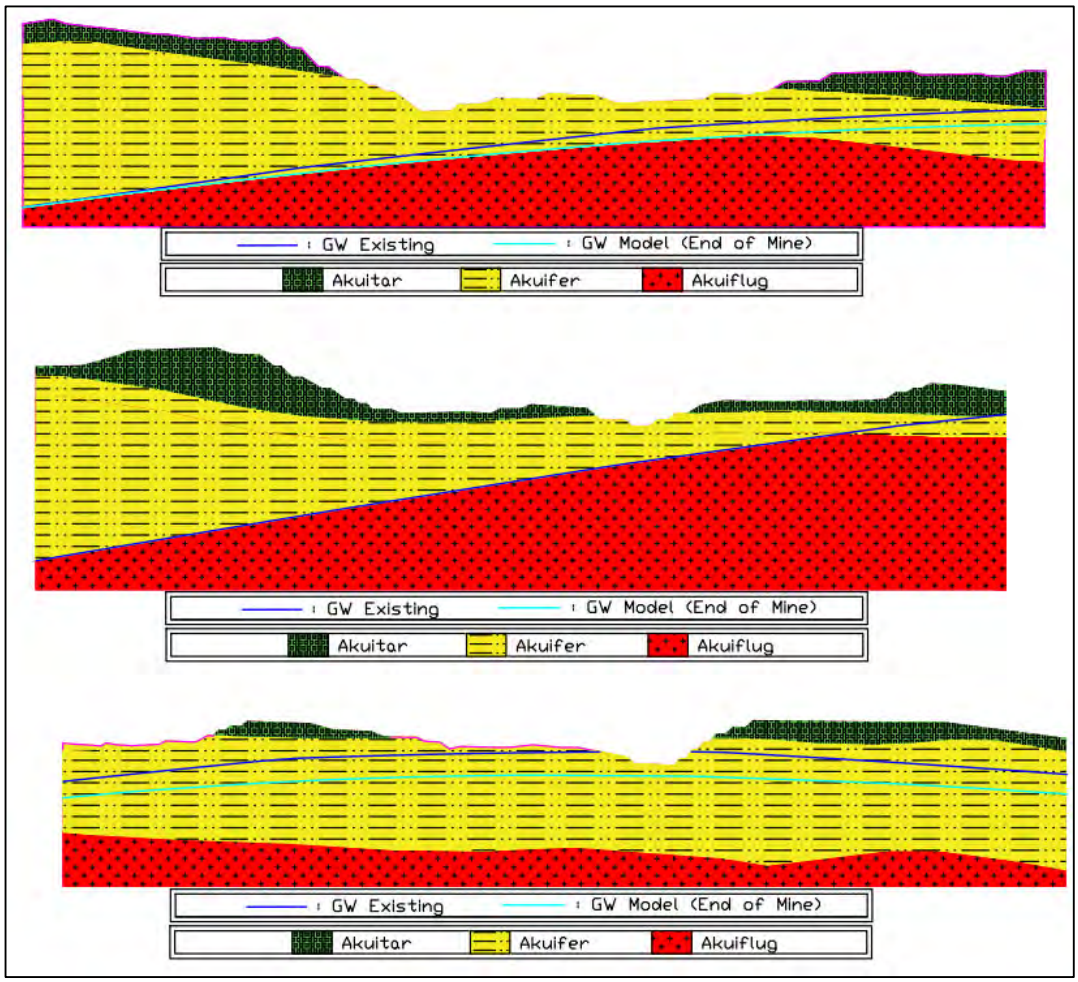
**Pola Perubahan *Head* Airtanah**

Secara umum, kemajuan penambangan akan berpotensi mengubah pola aliran airtanah, karena operasi penambangan dapat memotong lapisan airtanah alami yang memungkinkan adanya aliran airtanah ke dalam bukaan tambang sehingga menyebabkan terjadinya *drawdown* (penurunan *head* airtanah).

Hasil pemodelan transien menunjukkan bahwa tidak ada perubahan pola aliran airtanah secara regional, namun tampak bahwa ada perubahan kontur airtanah terutama pada daerah-daerah bukaan tambang dengan radius yang terbatas (< 500 meter) (Gambar 3.21). Perubahan muka airtanah pada kondisi akhir tambang dengan kondisi *existing* tidak jauh berbeda secara signifikan, di mana diketahui posisi muka airtanah saat ini sudah relatif mengikuti pola bukaan tambang berjalan. Penampang tipikal perubahan airtanah kondisi *existing* dan kondisi akhir tambang dapat dilihat pada Gambar 3.22.




**Gambar 3.21** Pola aliran *head* airtanah *existing* (atas) dan akhir tambang (bawah)



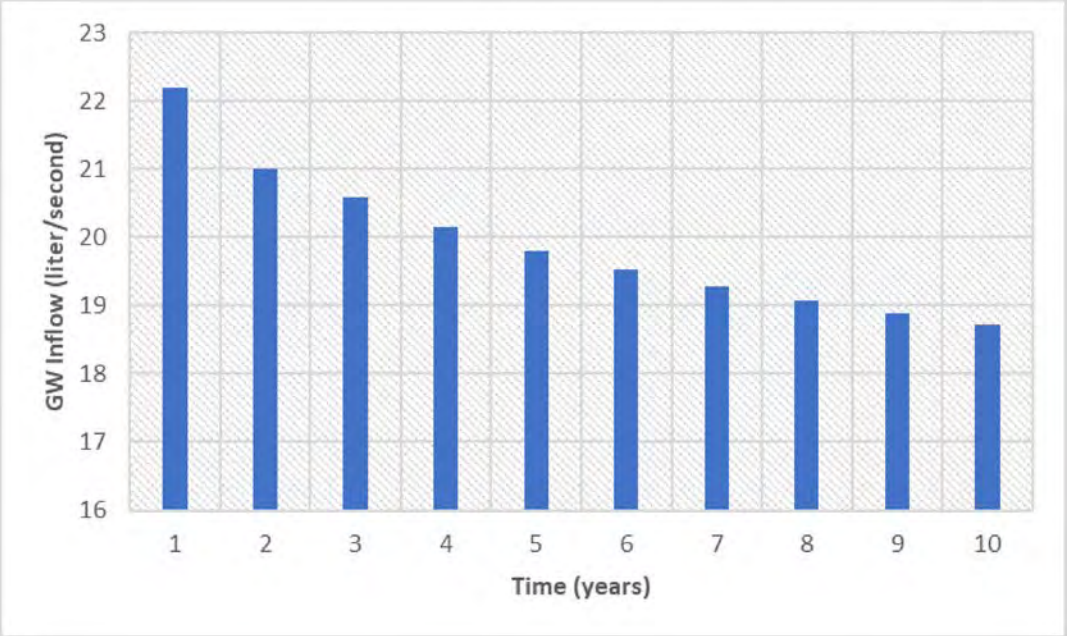

**Gambar 3.22** Representatif penampang airtanah kondisi *existing* dan akhir tambang

## Estimasi *Groundwater Inflow*

Estimasi debit airtanah yang masuk ke dalam bukaan tambang berdasarkan model prediksi/transien dapat dilihat pada Tabel 3.17 dan direpresentasikan pada grafik di Gambar 3.23. Dari hasil simulasi didapatkan bahwa debit *groundwater inflow* secara umum cenderung kecil. Hal ini disebabkan karena posisi muka airtanah yang relatif telah turun, sehingga sedikit yang berpotongan dengan bukaan tambang. Pola grafik pada Gambar 3.23 menunjukkan debit airtanah yang besar di tahun awal dan berangsur turun menuju garis konstan (*steady*). Pada kondisi aktualnya debit airtanah yang masuk ke dalam tambang dapat bersifat lebih rendah maupun lebih tinggi, menyesuaikan kemajuan tambang (luas dan kedalaman).

**Tabel 3.17** Estimasi *groundwater inflow*

| Time [years] | Rates [m^3/day] | GW Inflow (liter/second) |
|---|---|---|
| 1 | 1917.7 | 22.19 |
| 2 | 1814.4 | 21.45 |
| 3 | 1779.5 | 20.59 |
| 4 | 1740.2 | 20.14 |
| 5 | 1711.2 | 19.80 |
| 6 | 1686.8 | 19.52 |
| 7 | 1665.6 | 19.27 |
| 8 | 1646.8 | 19.06 |
| 9 | 1631.6 | 18.88 |
| 10 | 1616.4 | 18.70 |




**Gambar 3.23** Representasi grafis debit *groundwater inflow* ke dalam pit

## 3.4. Rekomendasi Teknis

### 3.4.1. Saluran Drainase

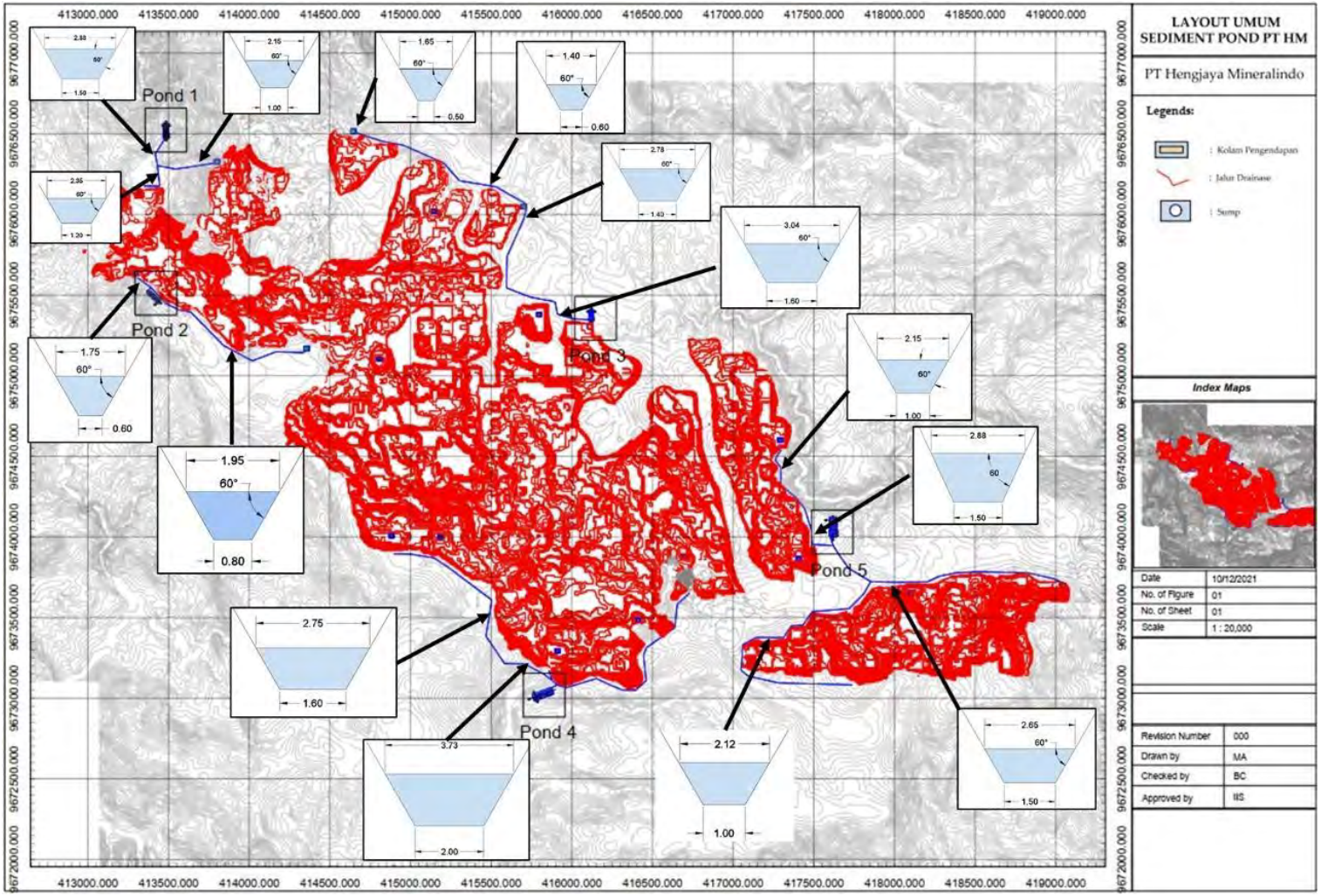
**Perimeter Drainase**

Saluran perimeter dibutuhkan khususnya pada bagian Selatan dari area pit *central east* (Gambar 3.24). Saluran ini dibuat untuk mencegah masuknya air permukaan yang cukup besar dari luar ke dalam pit.

Rekomendasi dimensi perimeter drainase ditentukan berdasarkan hasil analisis yang dilakukan pada debit rencana yang telah dihitung sebelumnya. Pembuatan perimeter drainase direkomendasikan dengan bentuk saluran berupa trapesium. Dimensi perimeter drainase untuk masing-masing lokasi dapat dilihat pada Tabel 3.18. *Layout* rekomendasi perimeter drainase, serta tipikal dimensi saluran dapat dilihat pada Gambar 3.24.

**Drainase Antara**

Saluran antara dari lokasi tambang menuju *pond* dibutuhkan untuk mengalirkan air tambang sebelum masuk dan diproses pada *settling pond*. Rekomendasi drainase antara ditentukan berdasarkan hasil analisis yang dilakukan pada debit rencana yang telah dihitung sebelumnya. Pembuatan drainase antara di rekomendasikan dengan bentuk saluran berupa trapesium. Dimensi drainase antara untuk masing-masing lokasi dapat dilihat pada Tabel 3.18. *Layout* rekomendasi perimeter drainase serta tipikal dimensi saluran dapat dilihat pada Gambar 3.24.




**Gambar 3.24** Rekomendasi sistem penyaliran rencana tambang PT HM

**Tabel 3.18** Rekomendasi dimensi drainase rencana tambang PT HM

| Design Parameter | Unit | CD-01 | CD-02 | CD-03 | CD-04 | CD-05 | CD-06 | CD-07 |
|---|---|---|---|---|---|---|---|---|
| Shape | | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium |
| Discharge Design (Qc) | $m^3$/sec | 4.72 | 3.96 | 8.68 | 2.25 | 1.20 | 7.78 | 9.51 |
| Bottom Width (b) | m | 1.20 | 1.00 | 1.50 | 0.50 | 0.60 | 1.40 | 1.60 |
| Top Width (T) | m | 2.35 | 2.15 | 2.88 | 1.65 | 1.41 | 2.78 | 3.04 |
| Height (y) | m | 1.00 | 1.00 | 1.20 | 1.00 | 0.70 | 1.20 | 1.25 |
| Slope Ratio (z) | m | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Manning coeff.(n) | | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| Drainage slope (s) | | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| Angle | ° | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Area (A) | m2 | 1.78 | 1.58 | 2.63 | 1.08 | 0.70 | 2.51 | 2.90 |
| Wet Perimeter (P) | m | 3.51 | 3.31 | 4.27 | 2.81 | 2.22 | 4.17 | 4.49 |
| Radius Hidrolic (R) | m | 0.51 | 0.48 | 0.62 | 0.38 | 0.32 | 0.60 | 0.65 |
| Velocity (v) | m/sec | 2.87 | 2.76 | 3.27 | 2.38 | 2.10 | 3.22 | 3.38 |
| Discharge (Q) | $m^3$/sec | 5.10 | 4.34 | 8.60 | 2.56 | 1.47 | 8.08 | 9.80 |

| Design Parameter | Unit | CD-01 | CD-02 | CD-03 | CD-04 | CD-05 | CD-06 | CD-07 |
|---|---|---|---|---|---|---|---|---|
| Shape | | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium |
| Discharge Design (Qc) | $m^3$/sec | 4.32 | 8.39 | 5.64 | 2.96 | 3.48 | 6.38 | 15.67 |
| Bottom Width (b) | m | 1.00 | 1.50 | 1.50 | 0.60 | 0.80 | 1.60 | 2.00 |
| Top Width (T) | m | 2.15 | 2.88 | 2.65 | 1.75 | 1.95 | 2.75 | 3.73 |
| Height (y) | m | 1.00 | 1.20 | 1.00 | 1.00 | 1.00 | 1.00 | 1.50 |
| Slope Ratio (z) | m | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |

| Design Parameter | Unit | CD-01 | CD-02 | CD-03 | CD-04 | CD-05 | CD-06 | CD-07 |
|---|---|---|---|---|---|---|---|---|
| Shape | | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium | Trapezium |
| Manning coeff.(n) | | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| Drainage slope (s) | | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| Angle | ° | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Area (A) | m2 | 1.58 | 2.63 | 2.08 | 1.18 | 1.38 | 2.18 | 4.30 |
| Wet Perimeter (P) | m | 3.31 | 4.27 | 3.81 | 2.91 | 3.11 | 3.91 | 5.46 |
| Radius Hidrolic (R) | m | 0.48 | 0.62 | 0.55 | 0.40 | 0.44 | 0.56 | 0.79 |
| Velocity (v) | m/sec | 2.76 | 3.27 | 3.01 | 2.47 | 2.62 | 3.06 | 3.85 |
| Discharge (Q) | $m^3$/sec | 4.34 | 8.60 | 6.26 | 2.91 | 3.61 | 6.65 | 16.54 |

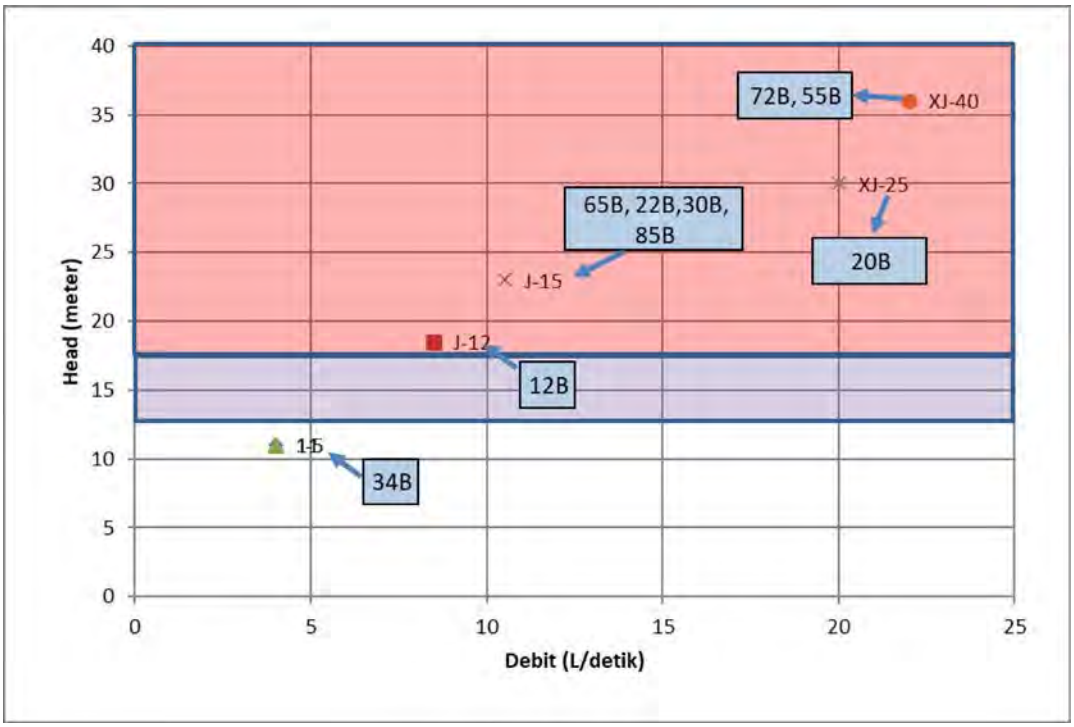
### 3.4.2. *Sump* dan Pemompaan

Penggunaan pompa di tambang terbuka adalah untuk menjaga agar kapasitas *sump* dapat selalu menahan total limpasan air (airtanah dan air permukaan) yang masuk ke dalam pit. Keseimbangan jumlah air masuk-keluar dilakukan dengan memilih pompa dengan kapasitas yang tepat. Secara teknis, pemilihan pompa dibuat berdasarkan dua faktor utama, yaitu kemampuan dorong pompa (*head*) dan jumlah air yang bisa dipompa (volume/waktu). Dengan mengasumsikan efisiensi *head* 85%, untuk menghilangkan risiko kegagalan maka diperlukan spesifikasi pompa dorong yang mampu mendorong air naik ke lereng dari *sump*. Parameter berikutnya yang harus dipertimbangkan dalam pemilihan pompa adalah kemampuan debit pompa untuk mengeluarkan air dari lokasi tambang. Diperlukan pompa yang mampu mengeringkan secepat mungkin, sehingga *sump* dapat digunakan secara reguler. Kapasitas *inflow* dan *head* maksimum dari masing-masing lokasi rencana pit PT HM dapat dilihat pada Tabel 3.19.

**Tabel 3.19** Kapasitas *inflow* maksimum dan *head* dari masing-masing rencana pit

| Sub-Catchment | Peak Flow Rate (m3/s) | Head (m) | Head Max (85% Efisiensi) (m) |
|---|---|---|---|
| 34B | 2.21 | 6 | 6.90 |
| 65B | 6.36 | 12 | 13.80 |
| 20B | 4.07 | 20 | 23.00 |
| 72B | 2.93 | 30 | 34.50 |
| 22B | 4.43 | 6 | 6.90 |
| 55B | 3.32 | 28 | 32.20 |
| 48B | 3.29 | 8 | 9.20 |
| 30B | 6.38 | 10 | 11.50 |
| 12B | 4.72 | 8 | 9.20 |
| 85B | 3.28 | 4 | 4.60 |

Penentuan pompa yang digunakan pada masing-masing pit dihitung berdasarkan potensi maksimum debit *inflow* dan kapasitas *head* maksimum masing-masing rencana pit setelah dikurangi efisiensi sebesar 85%. Gambar 3.25 memperlihatkan spesifikasi pompa yang umum digunakan pada tambang terbuka (contoh dalam produk Sultzer) dengan detail pada Tabel 3.20. Blok biru pada Gambar 3.25 memperlihatkan jenis pompa yang dapat digunakan pada lokasi tambang PT HM.




**Gambar 3.25** Spesifikasi pompa berdasarkan kemampuan *head* dan *discharge* (contoh dari produk Sultzer)

**Tabel 3.20** Rekomendasi spesifikasi jenis pompa (sejenis) untuk mengantisipasi aliran puncak pada tambang PT HM

| Catchment | Jenis Pompa | Discharge ($m^3/s$) | Head Pompa (m) | Inflow ($m^3/s$) | Head Max (m) | Ratio |
|---|---|---|---|---|---|---|
| 34B | J-5 | 4 | 11 | 2.21 | 6.90 | 0.55 |
| 65B | J-15 | 10.5 | 23 | 6.36 | 13.80 | 0.61 |
| 20B | XJ-25 | 20 | 30 | 4.07 | 23.00 | 0.39 |
| 72B | XJ-40 | 22 | 36 | 2.93 | 34.50 | 0.13 |
| 22B | J-15 | 10.5 | 23 | 4.43 | 6.90 | 0.42 |
| 55B | XJ-40 | 22 | 36 | 3.32 | 32.20 | 0.17 |
| 48B | J-12 | 8.5 | 18.5 | 4.72 | 9.20 | 0.56 |
| 30B | J-15 | 10.5 | 23 | 6.38 | 11.50 | 0.61 |
| 12B | J-12 | 8.5 | 18.5 | 4.72 | 9.20 | 0.56 |
| 85B | J-15 | 10.5 | 23 | 3.28 | 4.60 | 0.31 |

Infrastruktur lain yang dibutuhkan untuk penyaliran di dalam tambang adalah *sump*. *Sump* didefinisikan sebagai kolam untuk mengumpulkan air dan terletak di tingkat terendah level penambangan. Air yang mengalir ke *sump* harus dipompa keluar dari tambang ke kolam pengendapan. Ada dua jenis *sump*, yaitu permanen dan sementara.

*Sump* permanen dibangun dan digunakan selama kegiatan pertambangan berlangsung, sedangkan *sump* sementara hanya digunakan sementara dan dapat dibangun mengikuti perkembangan dan kebutuhan kegiatan penambangan.

Ukuran *sump* utama harus mampu mengakomodasi jumlah air tanah dan air permukaan yang mengalir ke lubang tambang dan idealnya terletak di titik terendah level penambangan. Ukurannya disesuaikan dengan kemampuan total pemompaan yang tersedia. *Sump* pada pit PT HM berjumlah sesuai dengan *sub-catchment* pada area pertambangan. Dari *sump*, air akan dipompa terlebih dahulu ke perimeter drainase, namun tidak semua *sump* membutuhkan pompa karena tidak memiliki *head* ke lokasi perimeter drainase terdekat. Beberapa *sump* yang membutuhkan pemompaan disajikan pada Tabel 3.21.

**Tabel 3.21** Karakteristik *sub-catchment* beserta besar *head* untuk dialirkan ke perimeter

| Sub-Catchment | Peak Flow Rate | Head | Head Max |
|---|---|---|---|
| 34B | 2.21 | 6 | 6.90 |
| 65B | 6.36 | 12 | 13.80 |
| 20B | 4.07 | 20 | 23.00 |
| 72B | 2.93 | 30 | 34.50 |
| 22B | 4.43 | 6 | 6.90 |
| 55B | 3.32 | 28 | 32.20 |
| 48B | 3.29 | 8 | 9.20 |
| 30B | 6.38 | 10 | 11.50 |
| 12B | 4.72 | 8 | 9.20 |
| 85B | 3.28 | 4 | 4.60 |

### 3.4.3. Sediment Pond

*Sediment Pond* adalah suatu penyaliran berbentuk kolam yang berfungsi sebagai kolam pengendapan semua air dari areal tambang, baik air tanah maupun air hujan dan bertujuan untuk menjernihkan air yang keluar ke perairan umum. Sebelum menghitung kebutuhan *settling pond*, dibutuhkan perhitungan kecepatan pengendapan sedimen (*Fall Velocity*) yang mengacu pada *Stoke's Law*. Persamaan untuk menghitung *Fall Velocity* adalah sebagai berikut:

$$Vp = \frac{[g\ (\rho p - \rho e)\ d^2]}{(18\ h)}$$

Keterangan:

Vp = *vertical fall velocity of particles* (m/s)

g = percepatan gravitasi (9.81 m/s$^2$)

ρp = densitas partikel tanah (kg/m$^3$)

ρe = densitas massa air (1000 kg/m$^3$)

d = diameter partikel untuk sedimentasi (m)

h = kekentalan dinamis air pada suhu 4°C (0.0016 Pa.s)

Selain itu dihitung juga kebutuhan luas permukaan *sediment pond* dengan persamaan:

$$As = \frac{\Theta\, Q}{Vp}$$

Keterangan:

As = minimum luas air pada cekungan (m$^2$)

Θ = faktor *adjustment* yang berkaitan dengan turbulen (Θ memiliki nilai 1, 1,2, atau 1,5 tergantung pada derajat turbulen pada cekungan sedimentasi)

Q = tingkat debit (m$^3$/s) sesuai dengan 5% dari aliran puncak (*peak flow*)

Vp = kecepatan sedimentasi (m/s)

Data ukuran butir yang digunakan pada perhitungan menggunakan hasil analisis laboratorium, yaitu ukuran butir dominan pada bagian permukaan di lokasi studi adalah partikel dengan ukuran medium *silt*. Resume perhitungan *Fall Velocity* dan luas permukaan *sediment pond* dapat dilihat pada Tabel 3.22. Perhitungan ini telah memasukkan faktor keselamatan (*factor of safety*) dengan mengalikan debit puncak sebesar 1.25 kali sesuai rekomendasi pada Kepmen 1827 tahun 2018.

**Tabel 3.22** Perhitungan *fall velocity* dan luas permukaan *sediment pond*

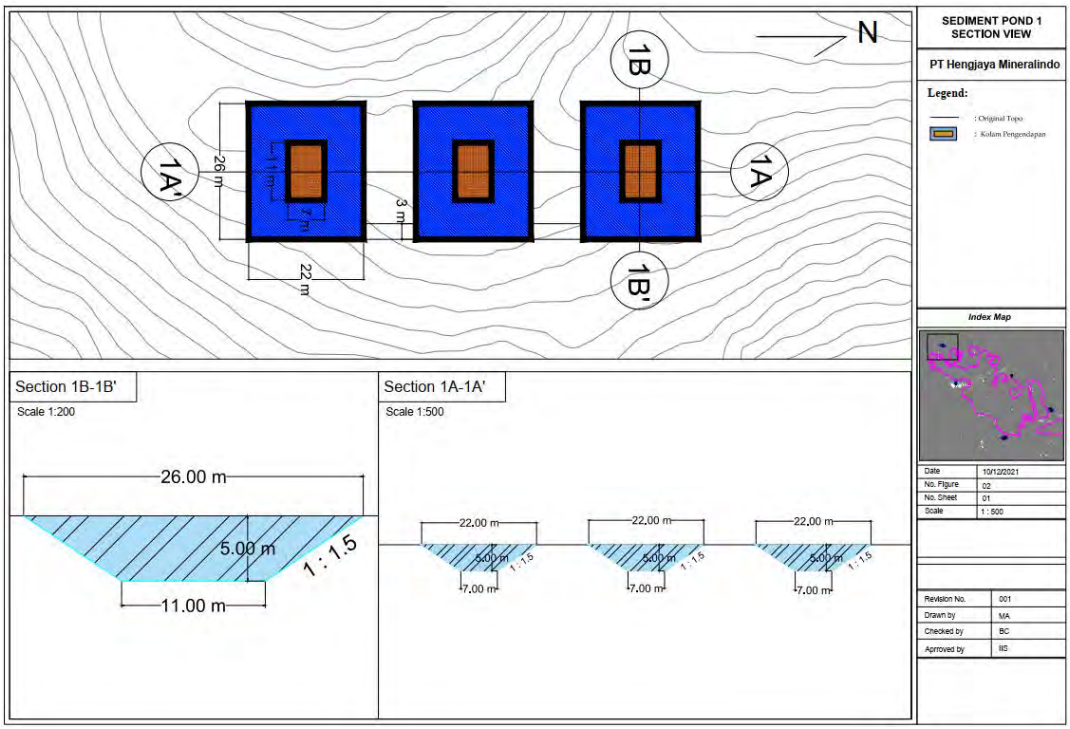
| Parameter | | Unit | Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 |
| Watershed area | A | ha | 120.11 | 117.75 | 62.61 | 431.9 | 229.84 |
| Peak flow (1,25 x Qp) | Qp | m$^3$/s | 9.175 | 10.3375 | 4.7375 | 25.9 | 19.2125 |
| Discharge Rate (5% x Qp) | Q | m$^3$/s | 0.37 | 0.41 | 0.19 | 1.04 | 0.77 |
| Particle size (medium silt) | d | m | 2.00E-05 | 2.00E-05 | 2.00E-05 | 2.00E-05 | 2.00E-05 |

| Parameter | | Unit | Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 |
| Soil particle density | pp | kg/m$^3$ | 2617 | 2617 | 2617 | 2617 | 2617 |
| Water density | pe | kg/m$^3$ | 1000 | 1000 | 1000 | 1000 | 1000 |
| Adjusment factor related to turbulence | Θ | | 1 | 1 | 1 | 1 | 1 |
| **Fall velocity** | **Vp** | **m/s** | **2.20E-04** | **2.20E-04** | **2.20E-04** | **2.20E-04** | **2.20E-04** |
| **Minimum area of sediment pond** | **As** | **m$^2$** | **1665.79** | **1876.85** | **860.13** | **4702.33** | **3488.17** |

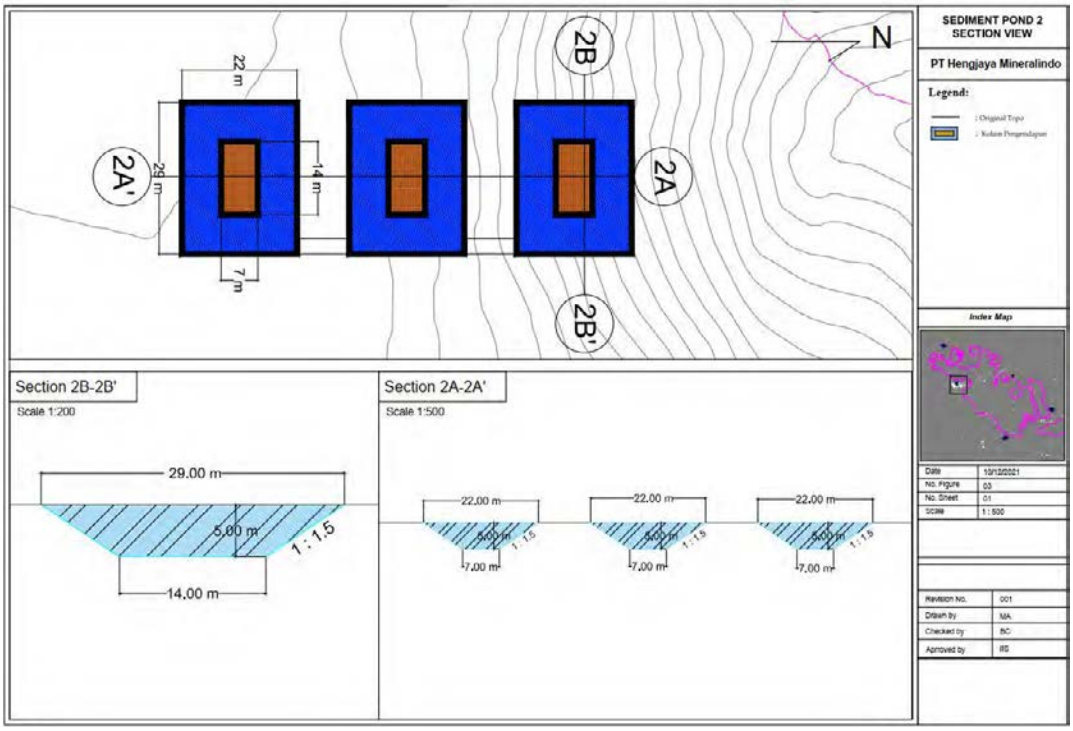
Dengan diketahuinya luas permukaan *sediment pond* yang dibutuhkan, maka dapat diperkirakan dimensi secara keseluruhan. Untuk menjaga kestabilan dinding *sediment pond*, maka kemiringannya dijaga pada angka 1:1.5. Perkiraan dimensi untuk *Pond* 1 hingga 5 dapat dilihat pada Tabel 3.23. Dari perhitungan yang dilakukan, *sediment pond* untuk masing-masing *catchment* (*Pond* 1 hingga *Pond* 5) dibagi menjadi 3 kompartemen, dengan estimasi volume tiap kompartemen berkisar antara 598.5 m$^3$ hingga 8448 m$^3$. Konsep desain rekomendasi masing-masing *settling pond* dapat dilihat pada Gambar 3.26 hingga Gambar 3.30.

**Tabel 3.23** Perhitungan jumlah dan dimensi *settling pond*

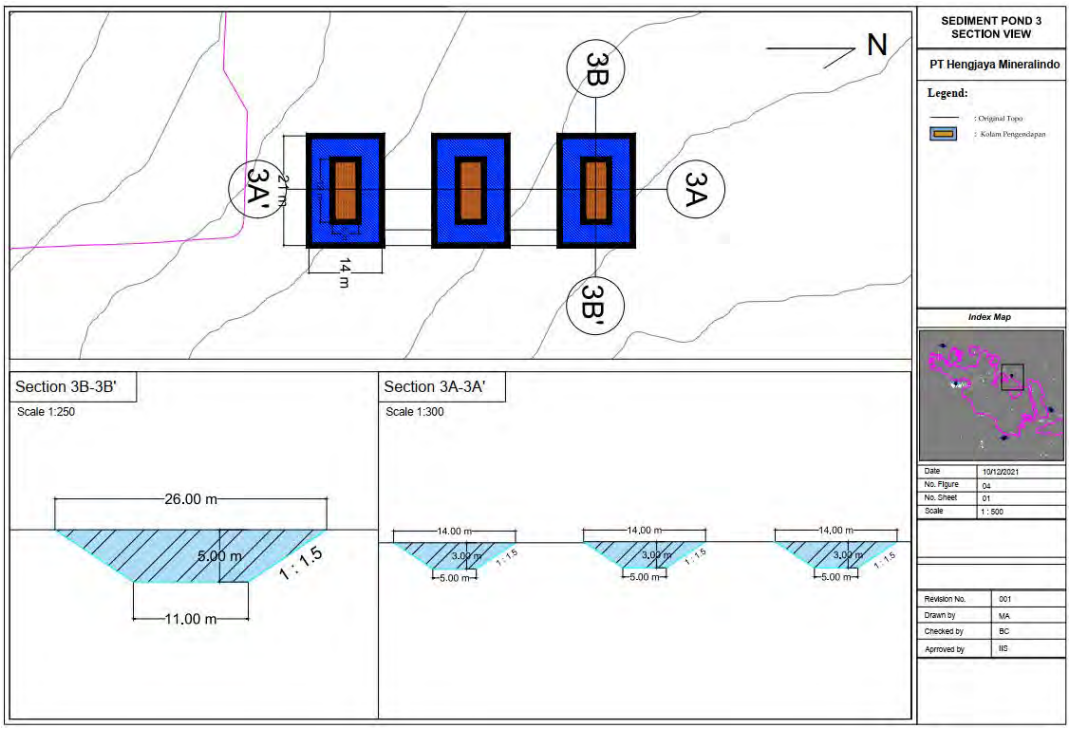
| Parameter | | Unit | Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 |
| **Sediment Pond Dimension** | | | | | | | |
| Slope of sides | | | 1:1.5 | 1:1.5 | 1:1.5 | 1:1.5 | 1:1.5 |
| Number of sediment pond | | | 3 | 3 | 3 | 3 | 3 |
| Width at floor of sediment pond | L | m | 7 | 7 | 5 | 12 | 10 |
| Water depth during operation | P | m | 5 | 5 | 3 | 8 | 7 |
| **Width of water surface** | **W** | **m** | **22** | **22** | **14** | **36** | **31** |
| **Length of sediment pond** | **l** | **m** | **26** | **29** | **21** | **44** | **38** |
| Sediment pond volume (per compartment) | | m$^3$ | 1885 | 2102.5 | 598.5 | 8448 | 5453 |
| Total sediment pond volume | | m$^3$ | 9425 | 10512.5 | 1795.5 | 67584 | 38171 |



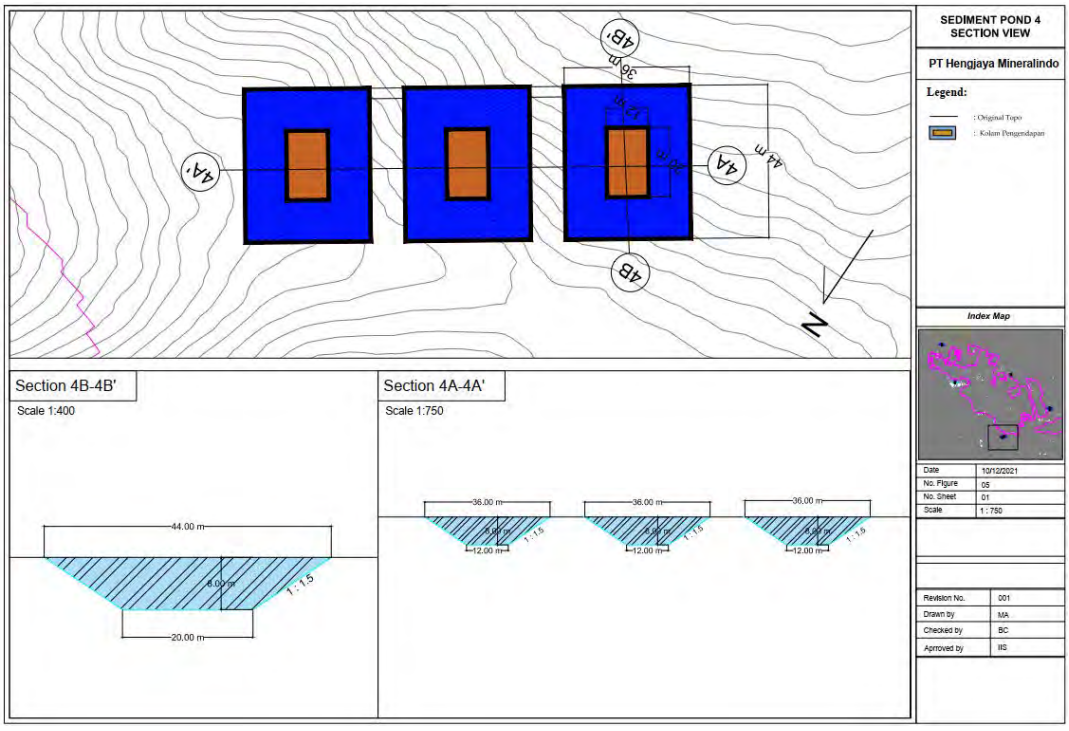

**Gambar 3.26** Tipikal rekomendasi *Sediment Pond-01*



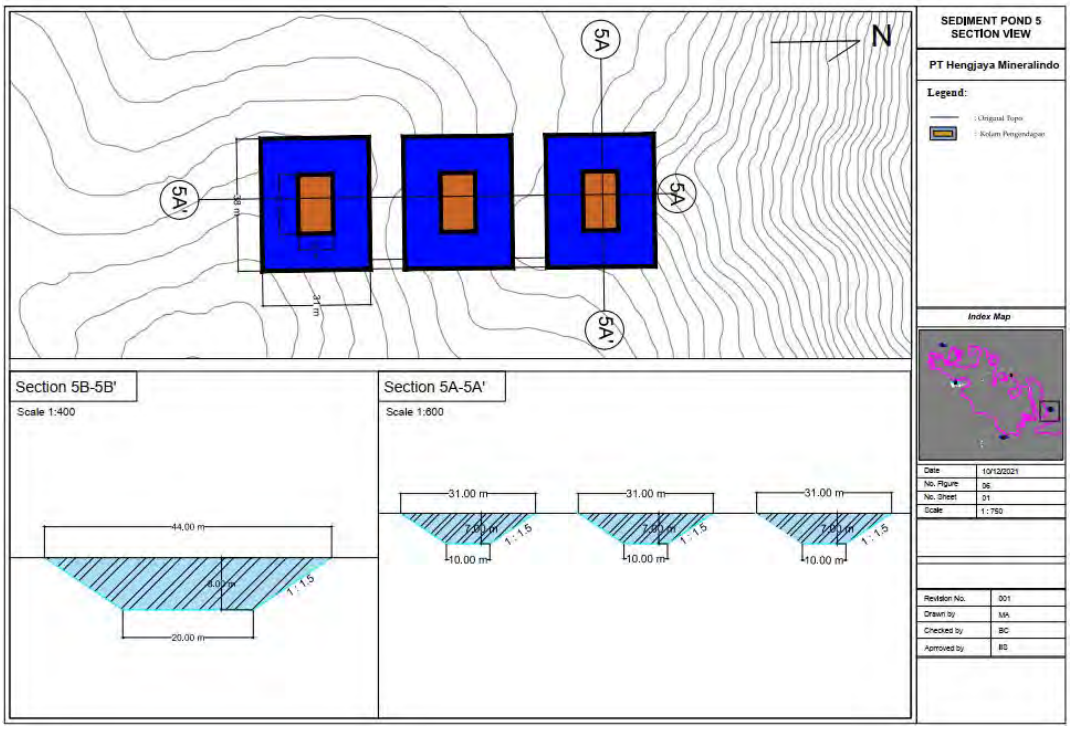

**Gambar 3.27** Tipikal rekomendasi *Sediment Pond*-02




**Gambar 3.28** Tipikal rekomendasi *Sediment Pond-03*




**Gambar 3.29** Tipikal rekomendasi *Sediment Pond-0*




**Gambar 3.30** Tipikal rekomendasi *Sediment Pond-05*

Perkiraan partikel yang akan terendapkan pada *sediment pond* dilakukan dengan menggunakan persamaan *Universal Soil Loss Equation* (USLE):

$$A = R\ K\ LS\ C\ P$$

Keterangan:

A = tanah hilang tahunan karena erosi (*annual soil loss due erosion*)

R = indeks erosi hujan

K = faktor kemampuan tanah tererosi

LS = faktor panjang dan *slope*

C = faktor penutup (*cover factor*)

P = faktor pengukuran kontrol erosi

Dengan menggunakan USLE, maka dapat diprediksi jumlah sedimen yang terendapkan tiap tahunnya (Tabel 3.24). Berdasarkan perhitungan ini, didapatkan bahwa massa sedimen yang terendapkan tiap tahun pada tiap *pond* berkisar pada 738 ton (282 $m^3$) hingga 5798.5 ton (2215.72 $m^3$).

Dengan asumsi bahwa perawatan atau pengambilan sedimen pada kolam harus dilakukan saat volume sedimen mencapai setengah dari volume kolam, maka perawatan rutin harus dilakukan tiap minimal 1 kali per tahun untuk tiap *pond*.

**Tabel 3.24** Perhitungan sedimen yang terendapkan tiap tahun

| Parameter | | Unit | Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 |
| **Annual Deposition Estimation** | | | | | | | |
| Rainfall erosion index | R | | 100 | 100 | 100 | 100 | 100 |
| Soil erodibility factor **(silt)** | K | | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Slope steepness | BS | m/m | 0.243 | 0.2455 | 0.2048 | 0.2532 | 0.2726 |
| Slope length | L | m | 2307.69 | 1117.21 | 1724.46 | 2820.48 | 1690.35 |
| The length and slope factor (gradient) | LS | | 0.19 | 0.17 | 0.18 | 0.20 | 0.19 |
| Cover factor **(bare soil)** | C | | 1 | 1 | 1 | 1 | 1 |
| Erosion control measure factor **(bare soil)** | P | | 1 | 1 | 1 | 1 | 1 |
| **Annual soil loss due to erosion** | **A** | **tonnes/ hectare/year** | **11.62** | **10.07** | **10.70** | **12.18** | **11.13** |
| Total tons deposited per year | | tonnes | 1396.25 | 1185.84 | 669.98 | 5260.36 | 2558.14 |
| | | ton | 1539.10 | 1307.17 | 738.53 | 5798.55 | 2819.86 |
| Sediment volume per year | | $m^3$ | 588.11 | 499.49 | 282.20 | 2215.72 | 1077.52 |

# 4. KAJIAN GEOTEKNIK

## 4.1. Data Geoteknik

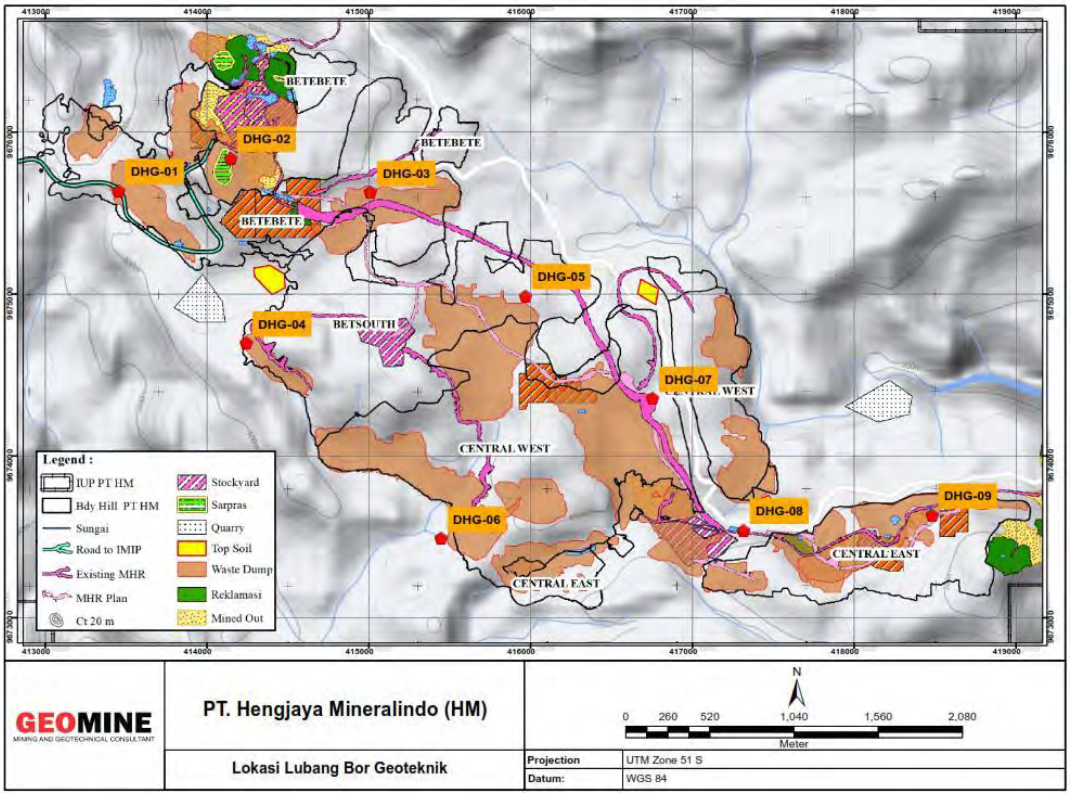
Pengumpulan data untuk kajian geoteknik di area penambangan PT. Hengjaya Mineralindo (HM) yang digunakan pada pembuatan laporan ini bersumber dari data yang diperoleh melalui pengeboran geoteknik, observasi di lapangan yang dilakukan oleh pihak PT. HM, serta dari data kajian yang telah dilakukan sebelumnya di sekitar area tersebut. Adanya kondisi pandemi Covid-19 melimitasi untuk dilakukan *site visit* dan pengambilan data secara langsung oleh pihak GEOMINE. Pengumpulan data ini dilakukan pada bulan September-Oktober 2021 dan data yang diperoleh tersebut adalah sebagai berikut.

- Hasil *logging* geoteknik terhadap *core-core* dari sembilan lubang pengeboran geoteknik yang dilakukan oleh pihak HM pada area rencana penambangan.
- Hasil *slug test* untuk mengetahui nilai hidraulik konduktivitas dan pengukuran muka air tanah pada sembilan lubang pengeboran geoteknik untuk keperluan kajian hidrogeologi.
- Hasil pengujian sifat fisik dan mekanik dari sampel-sampel lubang pengeboran yang dilakukan oleh Laboratorium GWL Bandung.

### 4.1.1. Pengeboran Geoteknik

Titik pengeboran lubang geoteknik pada area IUP milik PT HM dilakukan berdasarkan memo rekomendasi pengambilan data yang diberikan oleh GEOMINE pada tanggal 2 September 2021. Rekomendasi pengeboran geoteknik ini bertujuan untuk mengumpulkan data dan sampel untuk keperluan kajian geoteknik dan hidrogeologi di area tambang HM.

Pengeboran dilakukan pada bulan September-Oktober 2021 yang terdiri dari sembilan titik lubang bor di sekitar area rencana *pit* dan *waste dump* PT HM. Pemilihan titik bor tersebut disesuaikan dengan rencana pengeboran eksplorasi, rencana penambangan ke depan dan lokasi *waste dump*, dengan pertimbangan titik bor meng-*cover* domain dan seluruh area tambang. Lokasi pengeboran geoteknik dan koordinat dari masing-masing lokasi dapat dilihat pada Gambar 4.1 dan Tabel 4.1 berikut ini.




**Gambar 4.1** Lokasi Lubang Bor Geoteknik PT HM

**Tabel 4.1** Lokasi dan Titik Koordinat Lubang Bor Geoteknik

| Titik Bor | Domain | Rencana Koordinat *Collar* | | | Aktual Koordinat *Collar* | | | *Dip* | *Depth* |
|---|---|---|---|---|---|---|---|---|---|
| | | *Easting* | *Northing* | *Elevation* | *Easting* | *Northing* | *Elevation* | | |
| | | (mE) | (mN) | (m) | (mE) | (mN) | (m) | (°) | (m) |
| DHG-01 | Bete Bete | 413400 | 9675826 | 376 | 413455 | 9675637 | 380 | 90 | 17 |
| DHG-02 | Bete Bete | 414146 | 9675839 | 385 | 414147 | 9675839 | 480 | 90 | 14 |
| DHG-03 | Bete Bete | 415097 | 9675903 | 461 | 415011 | 9675627 | 445 | 90 | 31 |
| DHG-04 | Bete South | 414286 | 9674645 | 406 | 414243 | 9674697 | 423 | 90 | 35 |
| DHG-05 | Bete South | 415735 | 9674945 | 416 | 415969 | 9674988 | 452 | 90 | 23 |
| DHG-06 | Central West | 415097 | 9673413 | 306 | 415447 | 9673487 | 332 | 90 | 35 |
| DHG-07 | Central West | 416875 | 9674311 | 421 | 416755 | 9674354 | 417 | 90 | 15 |
| DHG-08 | Central East | 417733 | 9673383 | 417 | 417317 | 9673539 | 361 | 90 | 20 |
| DHG-09 | Central East | 418394 | 9673864 | 371 | 418482.3 | 9673633 | 416 | 90 | 30 |

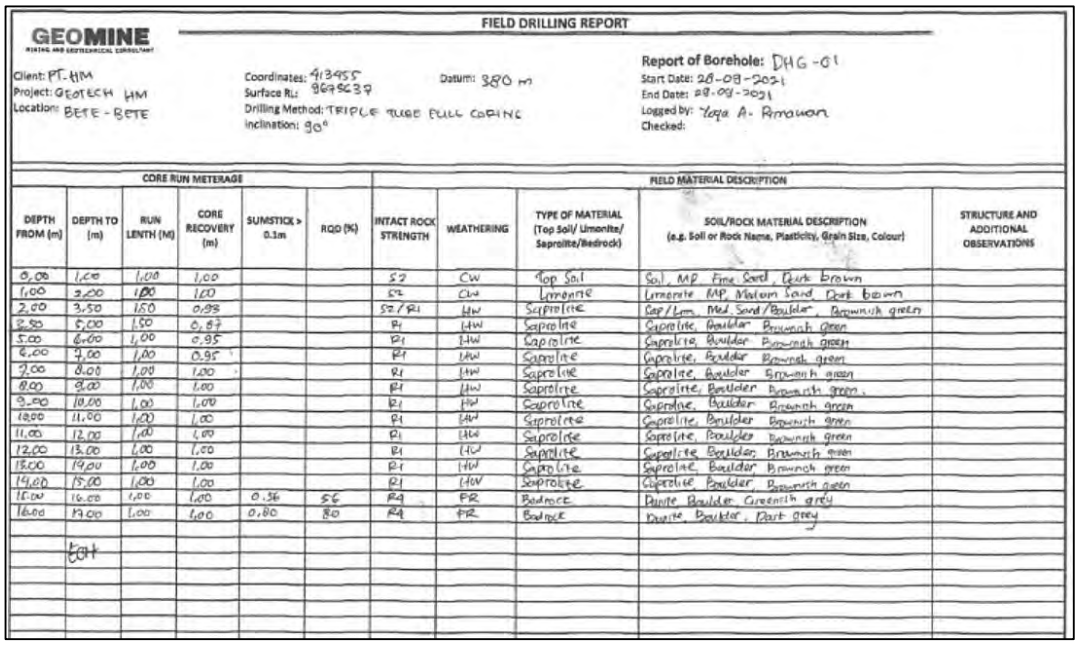
### 4.1.2. *Logging Geoteknik* dan *Foto Core*

Pengumpulan data *logging* geoteknik dan foto *core* ini bertujuan untuk karakterisasi geoteknik terhadap material *sub-surface* di PT HM.

Sebanyak delapan lubang bor dilakukan di area rencana pit penambangan dan satu lubang bor (DHG 02) yang ditempatkan di area aktual *wastedump*. Gambar 4.2 menampilkan contoh foto *core* yang diperoleh dari aktivitas pengeboran geoteknik dan Gambar 4.3 memperlihatkan contoh hasil *logging* geoteknik yang dilakukan pada core tersebut. Dari data *logging* geoteknik yang dikumpulkan meliputi: i) *depth from-to*, (ii) *core run length*, (iii) *core recovery*, (iv) *sumstick* (*core* dengan panjang lebih dari 10 cm), (v) RQD, (vi) *intact strength*, (vii) *weathering*, (viii) *type of material*, (ix) deskripsi material, dan (x) *structure* dan *additional observations*. Data hasil *logging* geoteknik dan foto *core* selengkapnya dapat ditemukan pada bagian Lampiran A.




**Gambar 4.2** Contoh Foto *Core* untuk Lubang Bor DHG-01



FIELD DRILLING REPORT

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

Client: PT. HM
Project: GEOTECH HM
Location: BETE - BETE

Coordinates: 413955
Surface RL: 9695039
Datum: 380 m
Drilling Method: TRIPLE TUBE PULL CORING
Inclination: 90°

Report of Borehole: DHG-01
Start Date: 28-08-2021
End Date: 28-08-2021
Logged by: Yoga A. Rimawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S2 | CW | Top Soil | Soil, MP. Fine Sand, Dark Brown | |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S2 | CW | Limonite | Limonite, MP, Medium Sand, Dark brown | |
| 2,00 | 3,50 | 1,50 | 0,98 | | | S2/R1 | HW | Saprolite | Sap/Lim, Med Sand/Boulder, Brownish green | |
| 3,50 | 5,00 | 1,50 | 0,87 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish Green | |
| 5,00 | 6,00 | 1,00 | 0,95 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 6,00 | 7,00 | 1,00 | 0,95 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 7,00 | 8,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 8,00 | 9,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green, | |
| 9,00 | 10,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 10,00 | 11,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 11,00 | 12,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 12,00 | 13,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 13,00 | 14,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 14,00 | 15,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 15,00 | 16,00 | 1,00 | 1,00 | 0,36 | 56 | R4 | FR | Bedrock | Pyrite Boulder, Greenish grey | |
| 16,00 | 17,00 | 1,00 | 1,00 | 0,80 | 80 | R4 | FR | Bedrock | Quartz, Boulder, Dark grey | |
| | EOH | | | | | | | | | |

**Gambar 4.3** Contoh *Logging* Geoteknik di Lubang Bor DHG-01

## 4.1.3. Pengujian Laboratorium

Pengujian sifat fisik dan mekanik material dilakukan oleh pihak Laboratorium GWL di Bandung. Jenis pengujian yang dilakukan adalah Uji Sifat Fisik Batuan/Tanah, Uji *Uniaxial Compressive Strength* (UCS), *Unconfined Compression Test* (UCT), *Triaxial* UU, *Triaxial* CU, dan Uji Permeabilitas. Jumlah sampel dan jenis pengujian yang diuji di laboratorium adalah sebagai berikut:

**Tabel 4.2** Rekapitulasi Jumlah Sampel Untuk Pengujian Sifat Fisik dan Mekanik

| No. | Tipe Pengujian | Jumlah Sampel Teruji |
|---|---|---|
| 1 | *Atterberg Limit* | 9 |
| 2 | *Falling Head* | 5 |
| 3 | *Moisture Content* | 7 |
| 4 | *Particle Size Distribution* | 9 |
| 5 | *Specific Gravity* | 9 |
| 6 | *Triaxial CU* | 1 |
| 7 | *Triaxial UU* | 9 |
| 8 | *UCS Poisson* | 10 |
| 9 | *UCT* | 5 |
| 10 | *Unit Weight* | 7 |

#### 4.1.3.1. Sifat Fisik Soil (Soil Physical Properties)

Pengujian sifat fisik *soil*/ tanah dilakukan pada masing-masing lubang bor geoteknik untuk material *Limonite*. Tujuan dari pengujian ini adalah untuk mengetahui karakteristik dari *soil* material *insitu*. Jenis pengujian yang dilakukan adalah pengukuran *moisture content*, batas plastis, *specific gravity*, dan uji saringan. Uji saringan dilakukan untuk mendapatkan data kuantitatif mengenai distribusi ukuran partikel di dalam tanah. Distribusi partikel lebih besar dari 75 mm (tertahan oleh ayakan nomor 200) dapat diketahui melalui analisa *screen*, sementara distribusi partikel yang lebih kecil dari 75 mm didapatkan melalui proses sedimentasi menggunakan *hydrometer. Hydrometer* dilakukan pada material yang berukuran lebih kecil dari pasir untuk mengetahui komposisi lempung dan lanau. *Summary* hasil pengujian untuk sifat fisik *soil* dapat dilihat pada Tabel 4.3.

**Tabel 4.3** *Summary* Pengujian Sifat Fisik *Limonite*

| Statistik | Classification | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MC (%) | Normal Density (kN/m³) | Dry Density (kN/m³) | Void Ratio | Porosity | Saturation | SG | LL | PL | PI | Gravel | Sand | Silt | Clay | Fines (#200) |
| Min | 46.08 | 17.40 | 11.20 | 1.53 | 0.61 | 100.00 | 2.67 | 50.80 | 16.80 | 18.30 | 0.00 | 4.07 | 41.44 | 23.20 | 78.00 |
| Q2 | 56.55 | 18.77 | 12.35 | 1.81 | 0.64 | 100.00 | 3.30 | 65.00 | 33.60 | 37.10 | 0.00 | 12.88 | 79.13 | 38.85 | 83.27 |
| Q3 | 62.46 | 19.55 | 12.40 | 2.06 | 0.67 | 100.00 | 3.54 | 78.80 | 41.00 | 44.70 | 0.00 | 20.64 | 83.27 | 46.67 | 87.84 |
| Max | 91.92 | 22.34 | 13.80 | 2.73 | 0.73 | 100.00 | 3.61 | 110.70 | 51.50 | 61.80 | 9.13 | 21.42 | 87.84 | 54.49 | 95.93 |
| Mean | 60.93 | 19.21 | 12.32 | 1.91 | 0.65 | 100.00 | 3.31 | 70.90 | 34.91 | 35.97 | 1.01 | 14.69 | 75.66 | 38.85 | 84.29 |
| Stdev | 14.90 | 1.58 | 0.86 | 0.43 | 0.05 | 0.00 | 0.30 | 20.66 | 10.90 | 13.71 | 3.04 | 5.76 | 14.31 | 22.13 | 6.19 |

Keterangan: Q2 = Kuartal 2, Q3 = Kuartal 3, Stdev= Standar Deviasi, MC = *Moisture Content*, SG = *Specific Gravity*, LL = *Liquid Limit*, PL = *Plastic Limit*, PI = *Plasticity Index*, #200 = Ayakan nomor 200

### 4.1.3.2. Uji Sifat Fisik Batuan (*Rock Physical Properties*)

Tujuan dari pengujian ini adalah untuk menentukan densitas, kandungan air, dan porositas sampel batuan. Hasil pengujian untuk sifat fisik batuan dapat dilihat pada Tabel 4.4 dan 4.5 berikut ini.

**Tabel 4.4** *Summary* Pengujian Sifat Fisik Batuan *Saprolite*

| Litologi | Statistik | Physical Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Natural Density (kN/m³) | Dry Density (kN/m³) | Saturated Density (kN/m3) | Spesific Gravity | Natural Moisture Content (%) | Absorption (%) | Saturation (%) | Porosity Rock | Void Ratio Rock |
| Saprolite | Min | 10.23 | 16.99 | 12.07 | 1.84 | 9.86 | 11.54 | 75.01 | 0.23 | 0.31 |
| | Q2 | 10.67 | 18.67 | 12.39 | 1.97 | 51.65 | 140.36 | 76.13 | 0.72 | 2.62 |
| | Q3 | 20.21 | 19.51 | 20.51 | 2.62 | 54.39 | 158.99 | 85.49 | 0.75 | 3.06 |
| | Max | 22.36 | 20.35 | 22.70 | 2.66 | 55.67 | 166.20 | 91.65 | 0.76 | 3.13 |
| | Mean | 14.78 | 18.67 | 16.00 | 2.19 | 38.10 | 99.55 | 80.76 | 0.56 | 1.93 |
| | Stdev | 5.99 | 2.37 | 5.17 | 0.41 | 21.92 | 76.83 | 7.46 | 0.25 | 1.39 |

Keterangan: Q2 = Kuartal 2, Q3 = Kuartal 3, Stdev= Standar Deviasi

**Tabel 4.5** *Summary* Pengujian Sifat Fisik Batuan *Bedrock*

| Litologi | Statistik | Physical Properties | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Natural Density (kN/m3) | Rock Dry Density (kN/m3) | Saturated Density (kN/m3) | Spesific Gravity | Natural Moisture Content (%) | Absorption (%) | Saturation (%) | Porosity Rock | Void Ratio Rock |
| Bedrock | Min | 22.60 | 21.19 | 23.00 | 2.41 | 0.46 | 1.70 | 24.92 | 0.05 | 0.06 |
| | Q2 | 27.35 | 26.98 | 27.72 | 2.78 | 3.01 | 4.36 | 63.74 | 0.11 | 0.12 |
| | Q3 | 28.73 | 28.60 | 29.13 | 2.99 | 6.16 | 7.88 | 78.16 | 0.17 | 0.20 |
| | Max | 30.90 | 30.75 | 31.27 | 3.25 | 66.21 | 84.01 | 78.81 | 0.67 | 2.03 |
| | Mean | 26.71 | 26.08 | 27.08 | 2.80 | 13.30 | 17.46 | 56.30 | 0.19 | 0.43 |
| | Stdev | 3.41 | 3.97 | 3.42 | 0.31 | 26.04 | 32.71 | 25.54 | 0.24 | 0.78 |

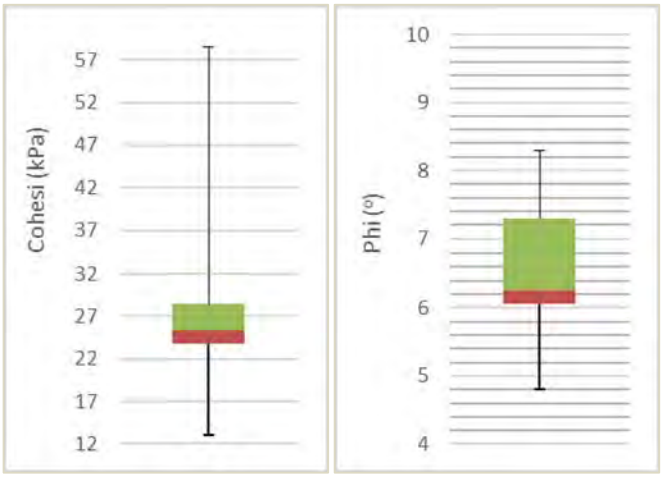
Keterangan: Q2 = Kuartal 2, Q3 = Kuartal 3, Stdev= Standar Deviasi

### 4.1.3.3. Uji Sifat Mekanik Tanah (*Limonite Mechanical Properties*)

Uji sifat mekanik dilakukan untuk mengetahui sifat mekanik dari tanah. Jenis pengujian yang dilakukan adalah *Triaxial* UU, dan *Triaxial* CU. Uji triaksial dengan cara *unconsolidated undrained*, atau *Triaxial* UU (tak terkonsolidasi-tak terdrainase), digunakan untuk menentukan kuat geser tanah pada kondisi aslinya (di dalam tanah), dimana angka pori benda uji pada permulaan pengujian tidak berubah dari nilai aslinya di dalam tanah. Uji *Triaxial* CU (*consolidated undrained*) digunakan untuk menentukan kuat geser material pada kondisi tak terdrainase (*undrained*), yaitu bila material angka porinya (e) telah berubah dari kondisi asli di lapangan oleh akibat konsolidasi. Rekapitulasi hasil pengujian sifat mekanik tanah/batuan dapat dilihat pada Tabel 4.6.

**Tabel 4.6** *Summary* Hasil Pengujian Sifat Mekanik *Limonite*

| Litologi | Statistik | Triaxial Test (UU) | | Triaxial Test (CU) | | | |
|---|---|---|---|---|---|---|---|
| | | C (kPa) | phi (degree) | C (kPa) | Phi (degree) | C' kPa) | phi' (degree) |
| Limonite | Min | 13.00 | 4.80 | 7.55 | 24.20 | 5.02 | 33.60 |
| | Q2 | 23.80 | 6.05 | | | | |
| | Q3 | 28.43 | 7.30 | | | | |
| | Max | 58.50 | 8.30 | | | | |
| | Mean | 26.95 | 6.45 | | | | |
| | Stdev | 14.10 | 1.21 | | | | |




**Gambar 4.4** Distribusi Statistik Pengujian *Trixial Test* (UU)

### 4.1.3.4. Uji Sifat Mekanik Batuan (Rock Mechanical Properties)

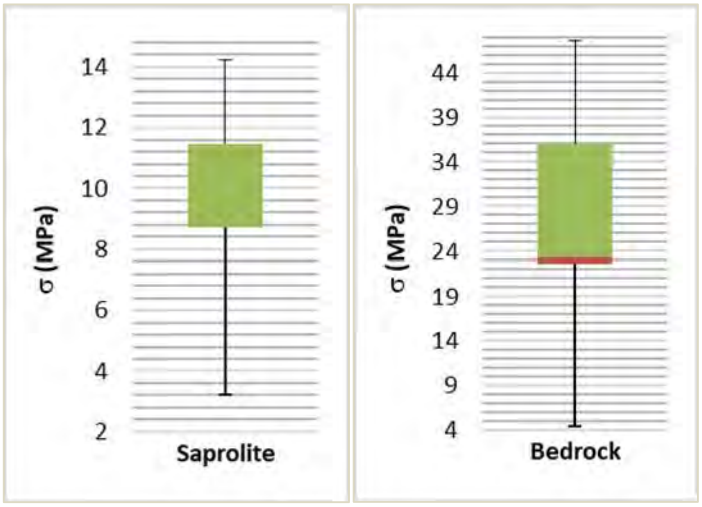
Uji sifat mekanik dilakukan untuk mengetahui sifat mekanik dari tanah. Jenis pengujian yang dilakukan adalah Uji *Uniaxial Compressive Strength* (UCS), *Unconfined Compression Test* (UCT). Uji kuat tekan bebas atau *Unconfined Compression Test* (UCT) merupakan cara yang dilakukan di laboratorium untuk mengukur seberapa besar kuat dukung material menerima kuat tekan yang diberikan sampai material tersebut terpisah dari butiran-butirannya dan juga regangan tanah akibat tekanan tersebut. Rekapitulasi hasil pengujian sifat mekanik tanah/batuan dapat dilihat pada Tabel 4.7 dan Tabel 4.8.

**Tabel 4.7** Rekapitulasi Hasil Pengujian Sifat Mekanik *Saprolite*

| Litologi | Statistik | UCS | | | UCT | | |
|---|---|---|---|---|---|---|---|
| | | s Max (MPa) | E (MPa) | v | c (kPa) | Sensivity | Ei (kPa) |
| Saprolite | Min | 3.23 | 444.60 | 0.21 | 8.00 | 1.24 | 530.00 |
| | Q2 | 8.73 | 1746.67 | 0.29 | 22.00 | 1.35 | 1464.00 |
| | Q3 | 11.48 | 2397.70 | 0.33 | 42.90 | 1.54 | 3382.00 |
| | Max | 14.23 | 3048.74 | 0.38 | 81.50 | 1.55 | 4284.00 |
| | Mean | 8.73 | 1746.67 | 0.29 | 32.70 | 1.39 | 2081.00 |
| | Stdev | 7.77 | 1841.40 | 0.12 | 30.69 | 0.15 | 1667.11 |

**Tabel 4.8** Rekapitulasi Hasil Pengujian Sifat Mekanik *Bedrock*

| Litologi | Statistik | UCS | | |
|---|---|---|---|---|
| | | σ Max (MPa) | E (MPa) | v |
| Bedrock | Min | 4.51 | 623.26 | 0.25 |
| | Q2 | 22.66 | 2637.74 | 0.42 |
| | Q3 | 36.00 | 4509.23 | 0.44 |
| | Max | 47.56 | 6030.54 | 0.46 |
| | Mean | 24.06 | 3170.16 | 0.38 |
| | Stdev | 16.71 | 1987.57 | 0.08 |




**Gambar 4.5** Distribusi Statistik Pengujian *Uniaxial Compressive Strength* (UCS)

## 4.2. Karakteristik Geoteknik

Karakteristik geoteknik ditentukan berdasarkan dari hasil dari pengeboran geoteknik yang telah dilakukan. Domain geoteknik didefisinikan sebagai unit yang mempunyai karakter dan perilaku yang sama secara geoteknik. Pembagian domain geoteknik pada PT HM dibagi berdasarkan jenis litologi dari batuan yang ada di lokasi tambang, meliputi: *limonite*, *saprolite*, dan *bedrock.*

### 4.2.1. *Limonite*

*Limonite* merupakan lapisan batuan yang mengandung mineral oksida besi dan terletak dibawah lapisan *top soil*, memiliki karakteristik seperti tanah dengan warna cokelat kemerahan hingga cokelat kekuningan, dengan ukuran butir lempung sampai dengan medium *silt*, dan kekuatan bervariasi dari S1 (*very soft clay*) hingga S5 (*very stiff clay*).




**Gambar 4.6** Contoh Material *Limonite*

### 4.2.2. *Saprolite*

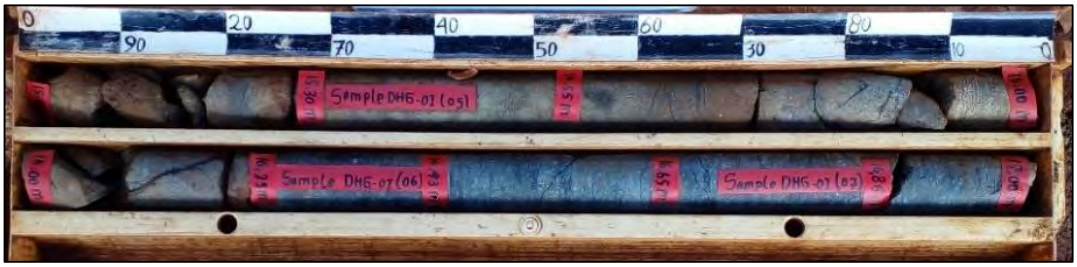
*Saprolite* merupakan lapisan zona pengkayaan unsur Ni, dicirikan oleh warna cokelat kehijauan hingga abu-abu kehijauan, memiliki ukuran butir pasir kasar hingga *boulder*, dan kekuatan bervariasi dari R1 (*very weak rock*) hingga R4 (*strong rock*).




**Gambar 4.7** Contoh Material *Saprolite*

### 4.2.3. *Bedrock*

*Bedrock* terdiri dari batuan beku *dunite* yang merupakan salah satu jenis batuan beku ultra basa dengan komposisi olivin hampir 100%. Lapisan batuan ini terletak paling dasar, dicirikan dengan tampilannya yang terlihat *fresh* berwarna abu-abu kehijauan hingga abu-abu gelap, dan memiliki kekuatan bervariasi dari R3 (*medium strong rock*) hingga R5 (*very strong rock*).




**Gambar 4.8** Contoh Material *Bedrock (Dunite)*

## 4.3. Evaluasi Properties Massa Batuan

Pada penentuan *properties* material domain yang akan digunakan dalam membangun model untuk estimasi kestabilan lereng, hal yang harus diperhatikan adalah mempertimbangkan *properties* atau sifat-sifat batuan *rock mass* dari setiap domain yang digunakan dan bukan *properties* batuan *intact*. Properties batuan *intact* diperoleh dari hasil pengujian di laboratorium dan nilai ini perlu disesuaikan dengan kondisi massa batuan dilapangan melalui pengumpulan data geoteknik. Dari pengujian di laboratorium dan pengumpulan data di lapangan tersebut, maka dapat diperoleh *properties* massa batuan di area pit PT HM.

Salah satu pendekatan umum yang dilakukan adalah dengan menggunakan kriteria *Hoek & Brown* atau kriteria *Mohr Coulomb*. Berdasarkan pertimbangan teknik dimana kondisi batuan relatif lemah dan merupakan jenis material *laterite*, analisis pada kajian ini menggunakan kriteria *Mohr Coulomb*. Tabel 4.9 menampilkan *properties* material yang akan digunakan untuk analisis kestabilan lereng pada PT Hengjaya Mineralindo.

**Tabel 4.9** *Properties* Massa Batuan PT. Hengjaya Mineralindo (PT HM)

| Litologi | *Unit Weight* (kN/m$^3$) | Mohr Coloumb | |
|---|---|---|---|
| | | C (kPa) | Phi (Degree) |
| Limonite | 18.77 | 11 | 27 |
| Saprolite | 20.21 | 61 | 18 |
| Bedrock | 26.71 | 217 | 35 |

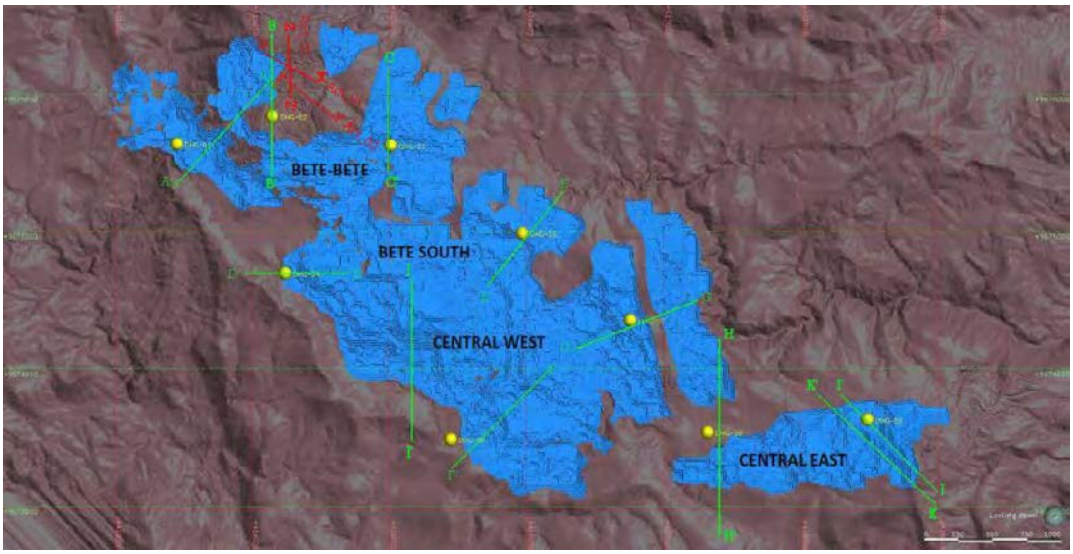
## 4.4. Model Litologi

Interpretasi model litologi yang digunakan untuk membantu analisis geoteknik, dilakukan dengan menggunakan data sembilan lubang bor geoteknik (DHG01 – DHG09) dan data pengeboran geologi serta akuisisi data GPR yang telah dilakukan sebelumnya. Data-data yang digunakan adalah sebagai berikut:

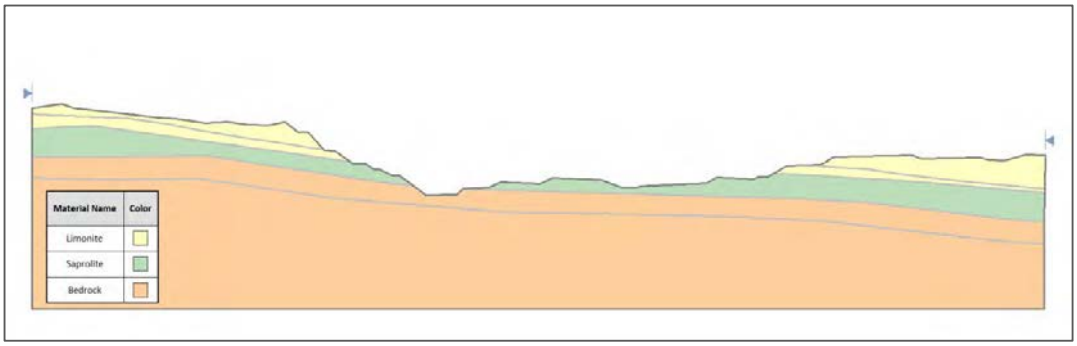
**Tabel 4.10** Data untuk Interpretasi dan validasi Model Litologi

| Data | Nama File | Type |
|---|---|---|
| Floor Bedrock | grd20m_all_floor_bedrock | dtm |
| Top Bedrock Contact | grd20m_all_top_bedrock | dtm |
| Top Saprolite Contact | grd20m_all_top_rockysap | dtm |
| Topo Situasi | topo_situapr20_cont2m_ldr_fltr | dtm |
| Log Bor Geoteknik | DHG01 – DHG09 | pdf |

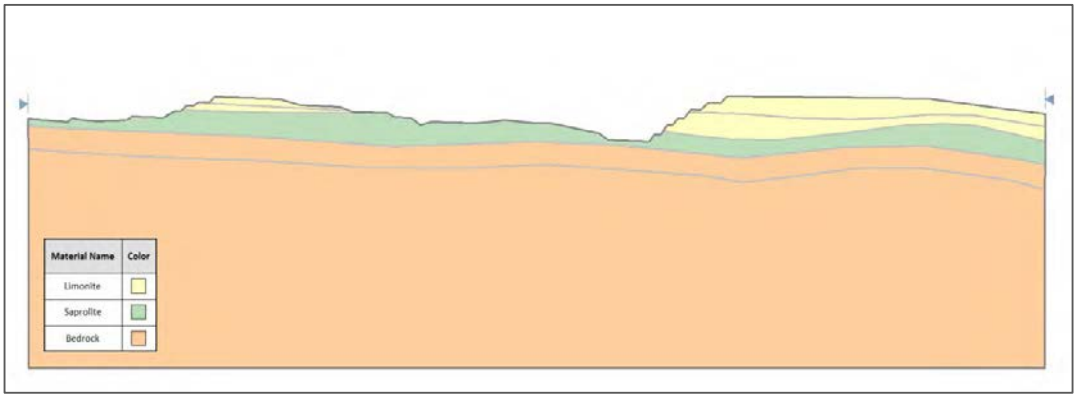
Dari hasil interpretasi tersebut ditentukan 14 *section* (Gambar 4.9) representatif yang terdiri dari 3 *section* dari kondisi aktual dan 11 *section* dari *design* pit untuk keperluan analisis kestabilan lereng. Penentuan *section* tersebut berdasarkan final *pit* terdalam dan jarak terdekat dari lokasi pengeboran geoteknik. Masing-masing *section* yang digunakan dalam analisis kestabilan lereng ditampilkan pada Gambar 4.10 – Gambar 4.23.



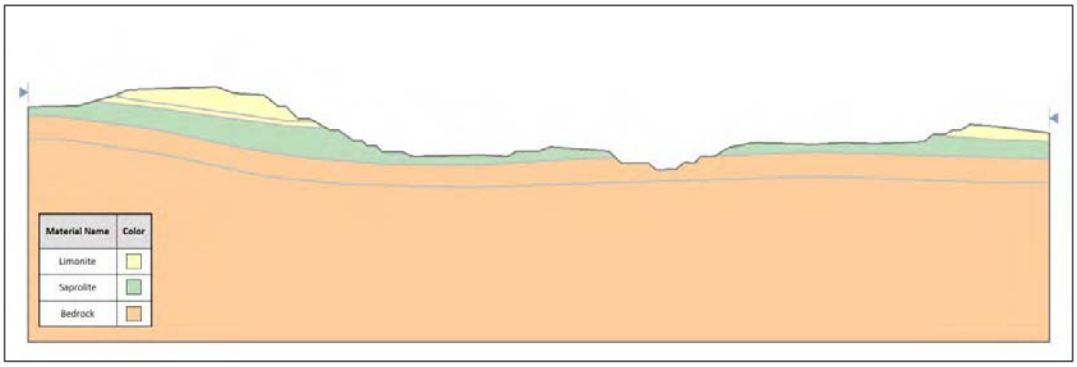

**Gambar 4.9** *Section Line* untuk Analisis Kestabilan Lereng



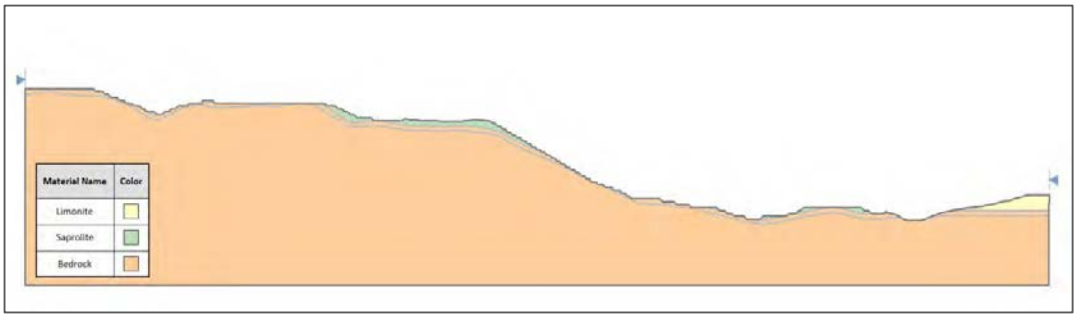

**Gambar 4.10** *Section Actual* 01



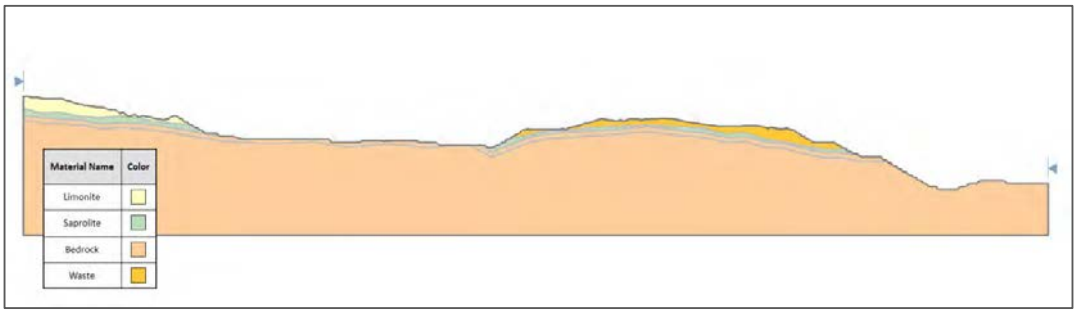

**Gambar 4.11** *Section Actual* 02



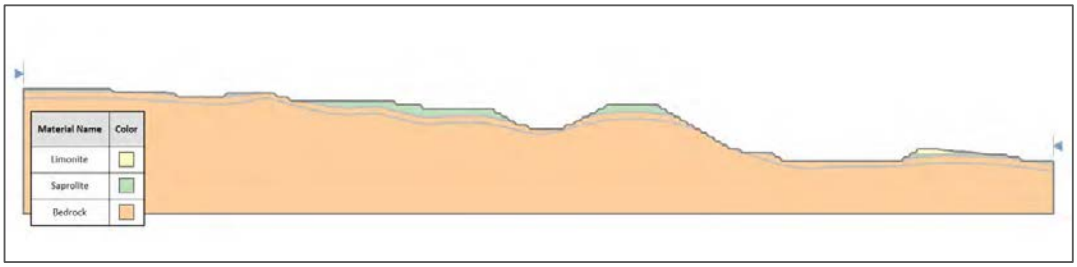

**Gambar 4.12** *Section Actual* 03



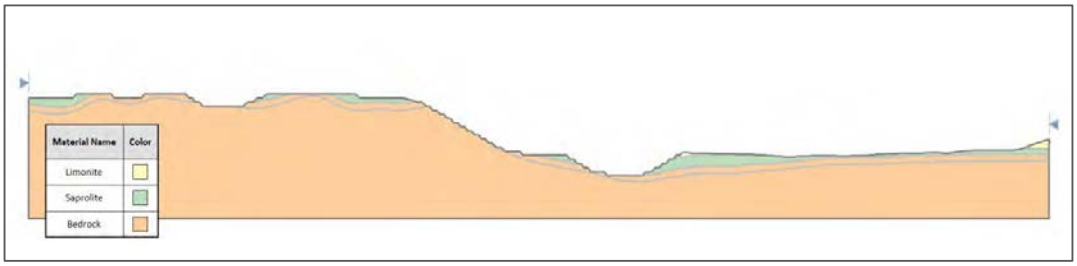

**Gambar 4.13** *Section* AA'



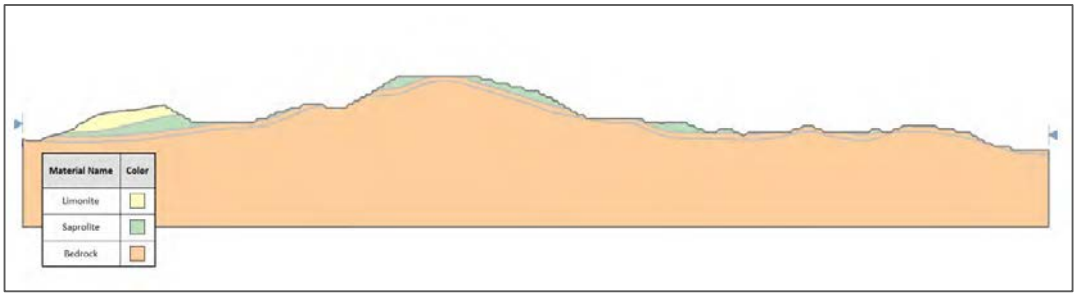

**Gambar 4.14** *Section* BB'



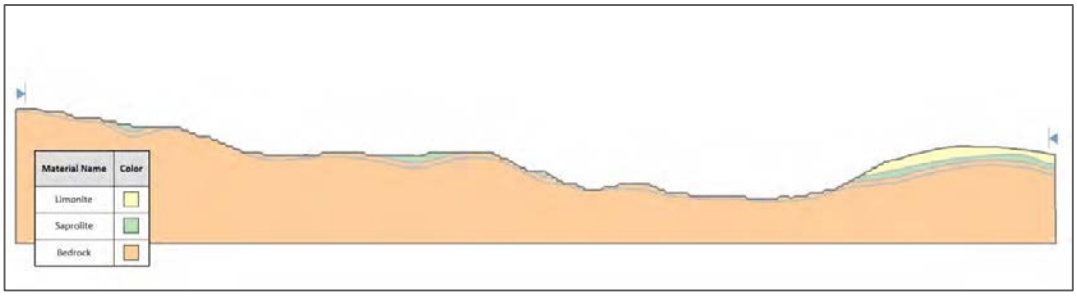

**Gambar 4.15** *Section* CC'



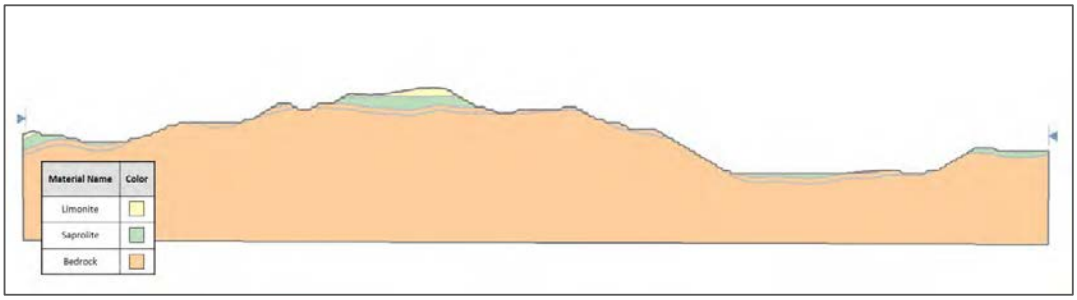

**Gambar 4.16** *Section* DD'



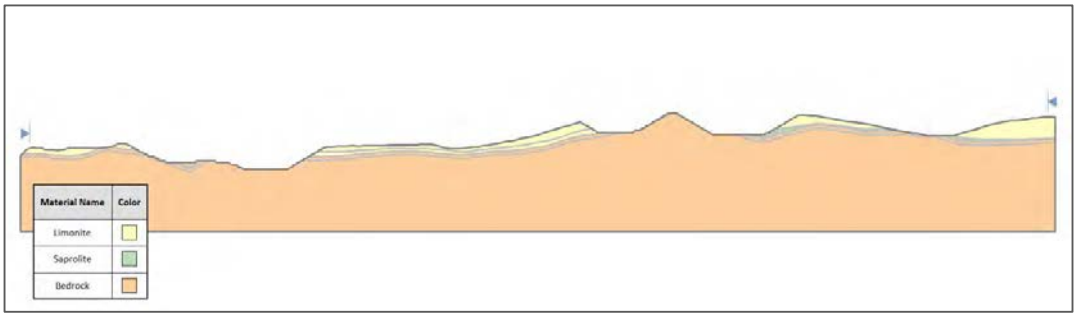

**Gambar 4.17** *Section* EE'



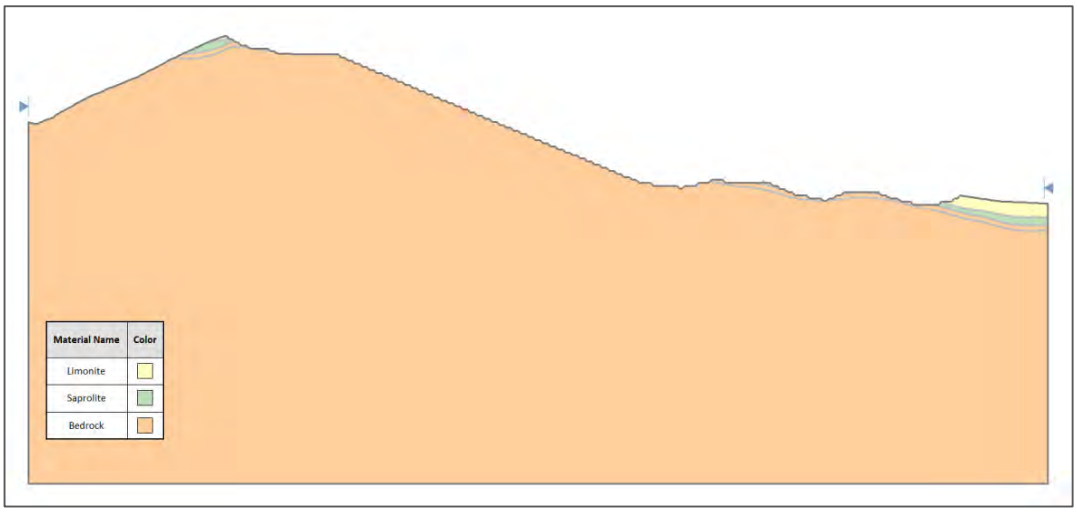

**Gambar 4.18** *Section* FF'



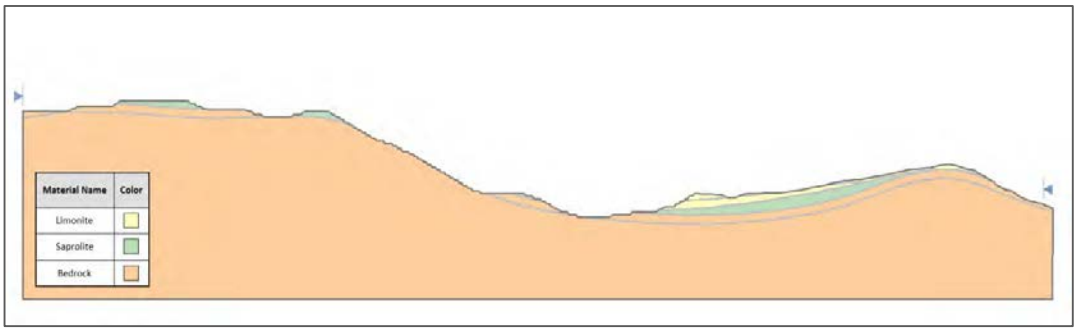

**Gambar 4.19** *Section* GG'



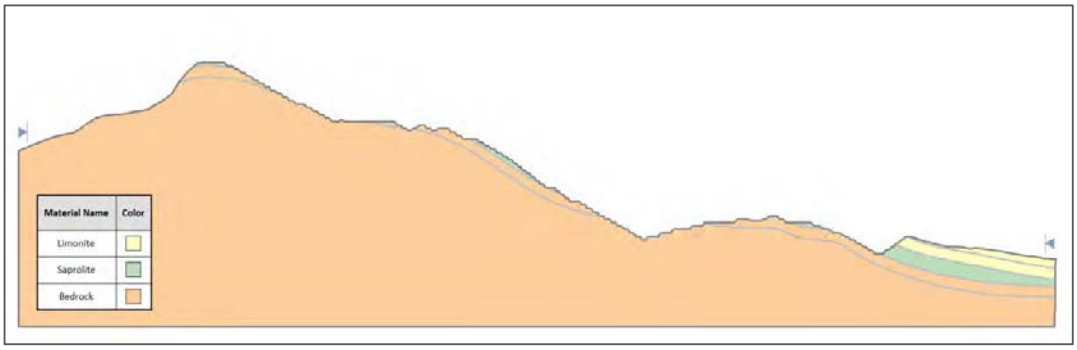

**Gambar 4.20** *Section* HH'




**Gambar 4.21** *Section* II'




**Gambar 4.22** *Section* JJ'




**Gambar 4.23** *Section* KK'

## 4.5. Metode Analisis Kestabilan Lereng

Analisis geoteknik dilakukan pada *section-section* dari model litologi yang dianggap representatif dan mempunyai kepastian data yang cukup baik untuk digunakan dalam analisis kestabilan lereng. Analisis kestabilan lereng dilakukan dengan menggunakan metode kesetimbangan batas (*limit equilibrium*) melalui perangkat lunak *Slide* dari *Rocscience*. Adapun beberapa parameter kondisi tambahan yang diperlukan dalam analisis menggunakan metode kesetimbangan batas dan kriteria kestabilan dijelaskan pada sub bab berikut ini:

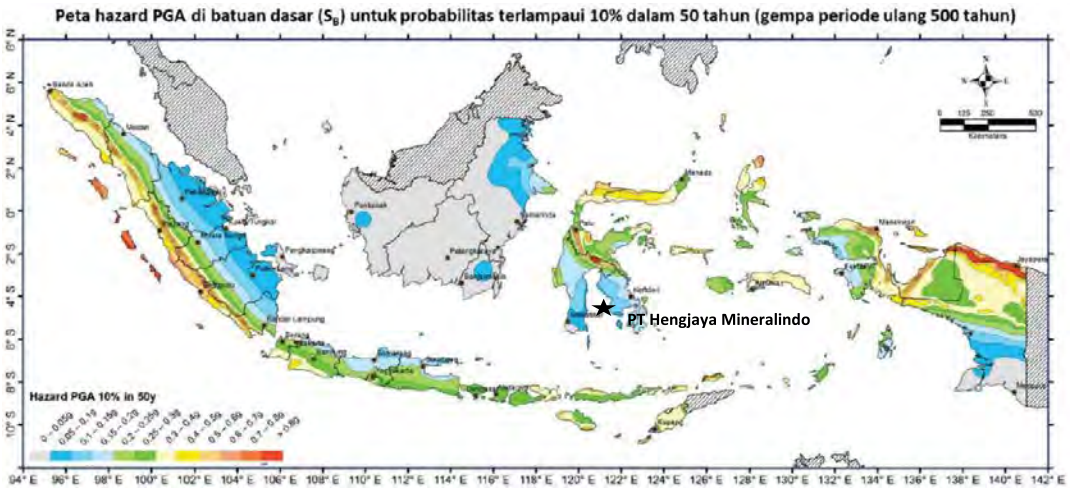
### 4.5.1. Kondisi Muka Air Tanah dalam Pemodelan

Kondisi muka air tanah merupakan salah satu faktor penting yang harus dipertimbangkan dalam analisis kestabilan lereng. Penentuan kondisi muka air tanah yang digunakan dalam analisis ini diperoleh dari hasil pemodelan muka air tanah berdasarkan dari uji *slug test* yang telah dijelaskan dalam Bab 3 Kajian Hidrologi dan Hidrogeologi.

### 4.5.2. Kondisi Beban Seismik

Beban seismik yang disebabkan oleh gempa dapat menyebabkan ketidakstabilan pada lereng tambang terbuka terutama pada area zona aktif gempa. Analisa pseudo static menggunakan limit equilibrium dengan horizontal seismic coefficient adalah pendekatan yang umum digunakan untuk mengkaji potensi impak dari beban seismic terhadap kestabilan lereng.

Penentuan pengaruh seismik pada kajian ini mengacu pada Peta Sumber dan Bahaya Gempa Indonesia Tahun 2017 dengan PGA (Peak Ground Acceleration) keterlampauan kejadian sebesar 10% dalam kurun waktu 50 tahun. Pada area IUP PT HM koefisien seismik kegempaan 0.1g berkorelasi dengan nilai PGA di area tersebut (Gambar 4.24).




**Gambar 4.24** Peta Sumber dan Bahaya Gempa Indonesia (Pusat Kajian Gempa Nasional, 2017)

## 4.5.3. Metode Kesetimbangan Batas (*Limit Equilibrium Method*)

Metode kesetimbangan batas untuk kestabilan lereng memagi massa bidang gelincir menjadi irisan-irisan kecil. Gaya-gaya geser yang bekerja pada "n" irisan diasumsikan mewakili seluruh bagian yang sama dari kuat geser batuan/tanah dimana gaya-gaya geser ini bekerja. Dalam analisis Limit Equilibrium, terdapat beberapa metode yang dapat digunakan yaitu Bishop, Fellenius, Janbu, Spencer, Sarma, dll. Dalam kajian geoteknik ini, metode yang digunakan adalah metode Spencer. Metode ini dipilih karena metode Spencer mempertimbangkan kesetimbangan yang lengkap (Tabel 4.11) dan memperhitungkan faktor gaya antar setiap irisan.

**Tabel 4.11** Perbandingan kondisi kesetimbangan dan asumsi metode *Limit Equilibrium* (Krahn, 2003)

| *Method* | *Moment Equilibrium* | *Horizontal Force Equilibrium* | *Interslice Normal Force* | *Interslice Shear Force* | *Inclination od Interslice Force* |
|---|---|---|---|---|---|
| *Fellenius* | *Yes* | *No* | *No* | *No* | *No Force* |
| *Bishop Simplified* | *Yes* | *No* | *Yes* | *No* | *Horizontal* |
| *Janbu Simplified* | *No* | *Yes* | *Yes* | *Yes* | *Horizontal* |
| *Spencer* | *Yes* | *Yes* | *Yes* | *Yes* | *Constant* |
| *Morgenstern Price* | *Yes* | *Yes* | *Yes* | *Yes* | *Variable* |

| *Method* | *Moment Equilibrium* | *Horizontal Force Equilibrium* | *Interslice Normal Force* | *Interslice Shear Force* | *Inclination od Interslice Force* |
|---|---|---|---|---|---|
| *Corps of Engin. 1* | *No* | *Yes* | *Yes* | *Yes* | *= Crest to Toe Average Dip* |
| *Corps of Engin. 2* | *No* | *Yes* | *Yes* | *Yes* | *= Slide Ground Surface Dip* |
| *Lowe-Karafiath* | *No* | *Yes* | *Yes* | *Yes* | *= Average of Surface and Base Dip* |

### 4.5.4. Kriteria Standar Faktor Keamanan (FK)

Untuk mengevaluasi kestabilan lereng, salah satu pendekatan yang paling sering dilakukan adalah menghitung nilai Faktor Keamanan (FK). Faktor Keamanan didefinisikan sebagai perbandingan gaya penahan terhadap gaya penggerak. Dalam analisis kesetimbangan batas (Limit Equilibrium), Faktor Keamanan dikalkulasikan sebagai perbandingan regangan geser terhadap tegangan geser sepanjang permukaan kritis (Diederichs, 2007).

Tabel 4.12 menunjukkan pedoman yang disarankan untuk kriteria Faktor Keamanan minimum dalam kajian geoteknik PT HM, yang mengacu pada Kepmen ESDM No. 1827 Tahun 2018 tentang pedoman pelaksanaan kaidah teknik pertambangan yang baik.

**Tabel 4.12** Kriteria Faktor Keamanan Minimum (Kepmen ESDM No. 1827 Tahun 2018)

| **Jenis Lereng** | **Keparahan Longsor** | **Kriteria dapat diterima** | | |
|---|---|---|---|---|
| | | **Faktor Keamanan (FK) Statis** | **Faktor Keamanan (FK) Dinamis** | **Probabilitas Longsor (PoF) FK ≤ 1** |
| Lereng tunggal | Rendah-Tinggi | 1.1 | N/A | 25-50% |
| Inter-ramp | Rendah | 1.15-1.2 | 1 | 25% |
| | Menengah | 1.2-1.3 | 1 | 20% |
| | Tinggi | 1.2-1.3 | 1.1 | 10% |
| Lereng keseluruhan | Rendah | 1.2-1.3 | 1 | 15-20% |
| | Menengah | 1.3 | 1.05 | 10% |
| | Tinggi | 1.3-1.5 | 1.1 | 5% |

Berdasarkan beberapa pertimbangan di atas, maka kriteria FK minimum yang digunakan pada kajian geoteknik ini adalah 1.3 untuk lereng keseluruhan *pit* pada kondisi statik dan 1.05 pada kondisi pseudostatik atau seismik, dengan acuan *Probability of Failure* (PoF) adalah < 10% untuk keparahan longsor menengah.

Pada lereng keseluruhan *waste dump* digunakan keparahan longsor rendah dengan nilai FK minimum 1.2-1.3 untuk kondisi statik dan nilai FK 1 untuk kondisi pseudostatik, dengan *Probability of Failure* (PoF) adalah 15% - 20%. Sedangkan untuk lereng tunggal, kriteria nilai FK minimum adalah 1.1.

### 4.5.5. Validasi Properties Material

Pada sub bab 4.3 telah didiskusikan mengenai properties awal material yang akan digunakan untuk menganalisis kestabilan lereng pit pada PT HM. Sebelum properties (Tabel 4.13) tersebut digunakan untuk analisis, validasi properties tersebut terhadap kondisi aktual pada pit perlu dilakukan.

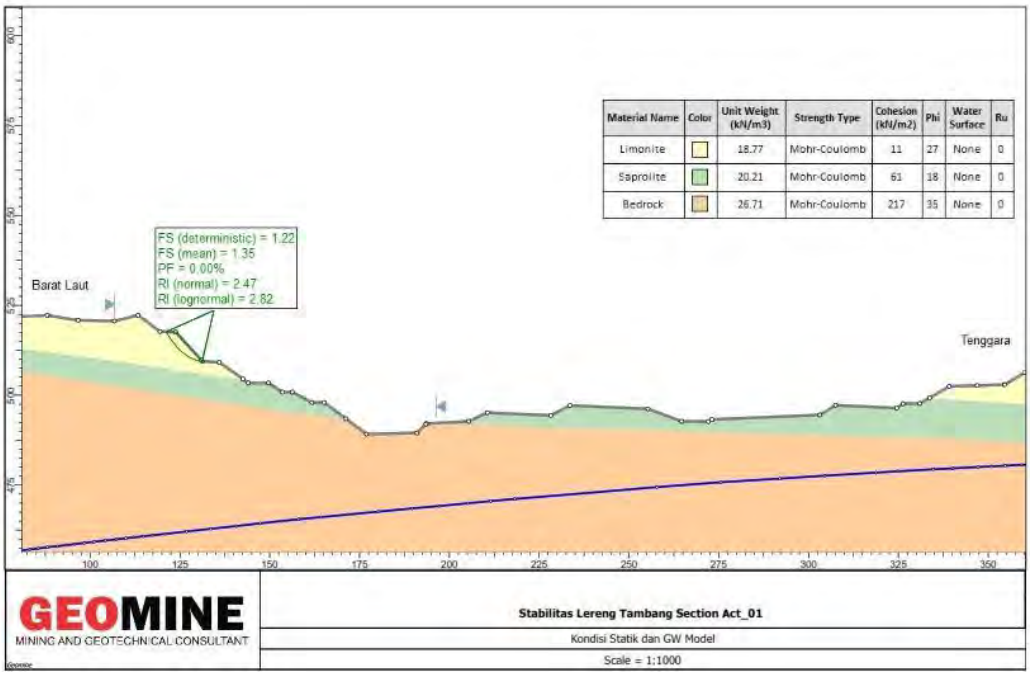
**Tabel 4.13** *Properties* Awal Massa Batuan PT. Hengjaya Mineralindo (PT HM)

| Litologi | *Unit Weight* (kN/m$^3$) | Mohr Coloumb | |
|---|---|---|---|
| | | C (kPa) | Phi (Degree) |
| Limonite | 18.77 | 11 | 27 |
| Saprolite | 20.21 | 61 | 18 |
| Bedrock | 26.71 | 217 | 35 |

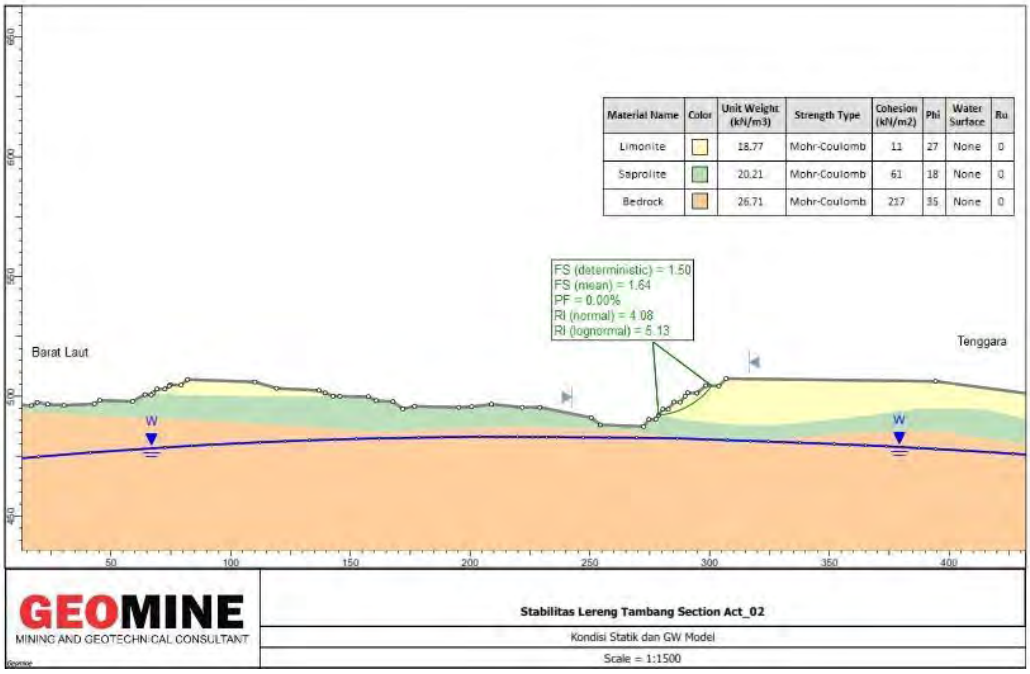
Dari hasil analisis yang dilakukan pada 3 section dari kondisi aktual, diperoleh bahwa kondisi aktual lereng pada 3 penampang tersebut berada pada keadaan *stable* sehingga berdasarkan hasil validasi properties material, properties awal ini akan digunakan pada analisis lebih lanjut (Tabel 4.14 dan Gambar 4.25 sampai 4.27).

**Tabel 4.14** Rekapitulasi Analisis Validasi Properties Material

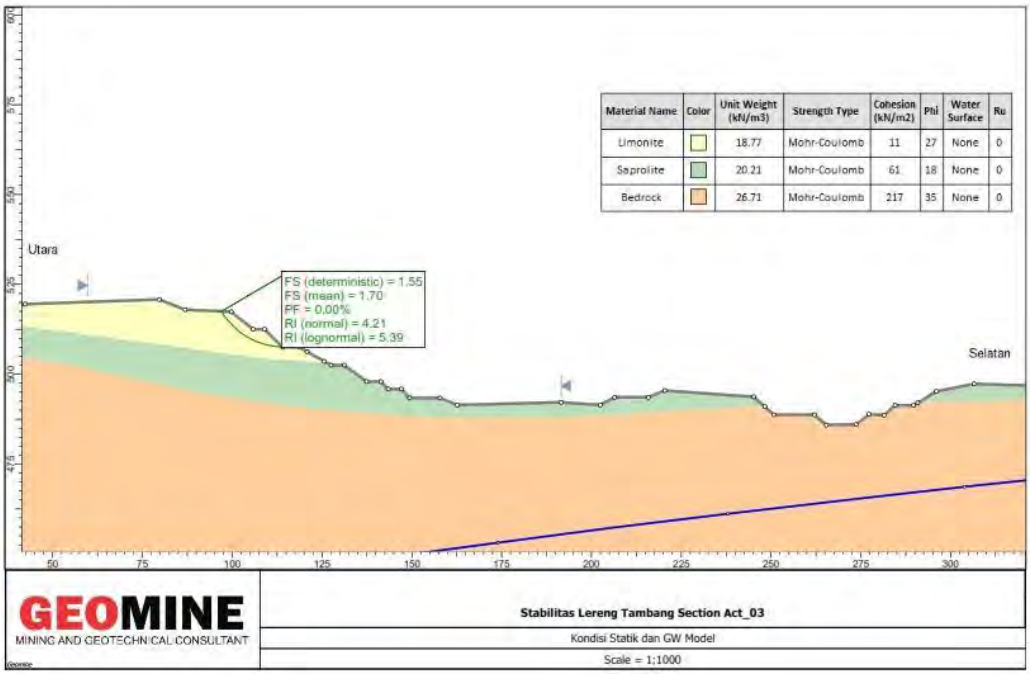
| No | Lokasi | Actual Section | FK Statik | POF Statik | FK Dinamik | POF Dinamik | Kondisi Aktual |
|---|---|---|---|---|---|---|---|
| 1 | Bete-Bete | Section_Actual_01 | 1.22 | 0.0% | 1.07 | 7.7% | *Stable* |
| 2 | Bete-Bete | Section_Actual_02 | 1.50 | 0.0% | 1.29 | 0.0% | *Stable* |
| 3 | Bete-Bete | Section_Actual_03 | 1.55 | 0.0% | 1.28 | 0.0% | *Stable* |




**Gambar 4.25** Hasil Validasi Properties pada *Section Actual* 01




**Gambar 4.26** Hasil Validasi Properties pada *Section Actual* 02




**Gambar 4.27** Hasil Validasi Properties pada *Section Actual* 03

## 4.5.6. Analisis Balik *Waste Dump*

Berdasarkan informasi yang diperoleh dari personal site PT Hengjaya Mineral, *waste dump* aktual di area DHG-02 terpantau mengalami ketidakstabilan. Penentuan properties material yang sesuai untuk *waste dump* merupakan tantangan yang lain. Material penyusun *waste dump* umumnya berasal dari campuran material-material *waste* yang tertambang sehingga karakteristiknya juga merupakan campuran daripada material-material penyusunnya. Selain itu kondisi material *waste* tidak lagi dalam kondisi insitu sehingga karakteristiknya akan berbeda dengan kondisi insitu. Dengan pertimbangan di atas, perlu dilakukan analisis balik untuk mendapatkan properties material *waste* yang sedekat mungkin merepresentasikan kondisi aktual yang diamati dan dapat digunakan dalam analisis selanjutnya.

Dalam analisis balik ini digunakan properties awal material *waste* seperti Tabel 4.15 dan kondisi muka air tanah sebagaimana hasil pengukuran muka air tanah (MAT) pada lubang bor DHG-02 yaitu 3.71 m.

**Tabel 4.15** *Properties* Awal *Waste* Material

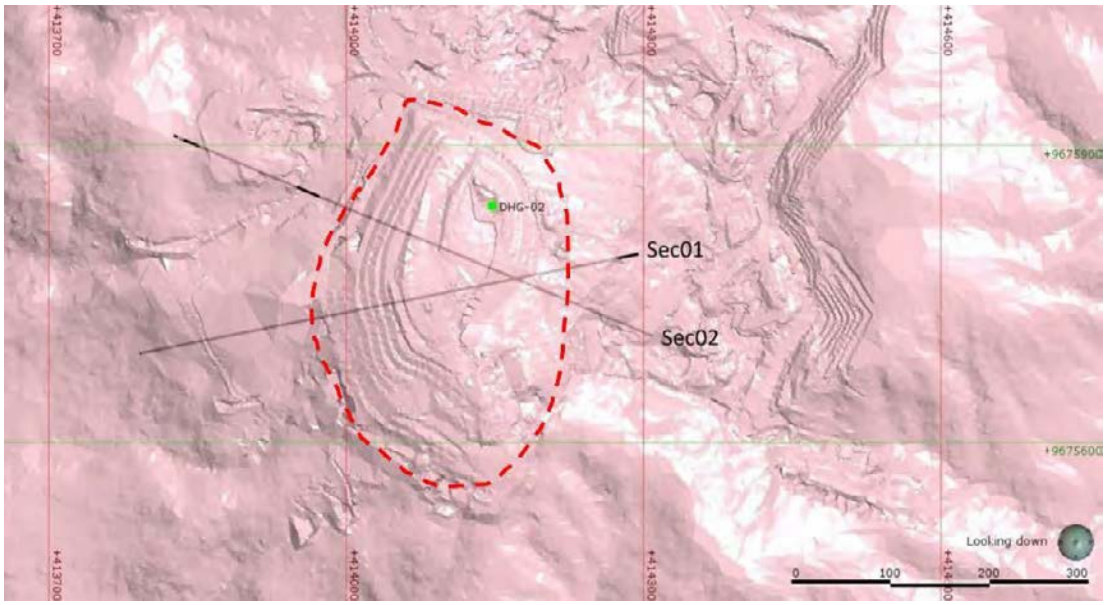
| Litologi | *Unit Weight* (kN/m$^3$) | Mohr Coloumb | |
|---|---|---|---|
| | | C (KPa) | Phi (Degree) |
| Waste | 21.9 | 10 | 37 |

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**Groundwater Level Measurement Form**

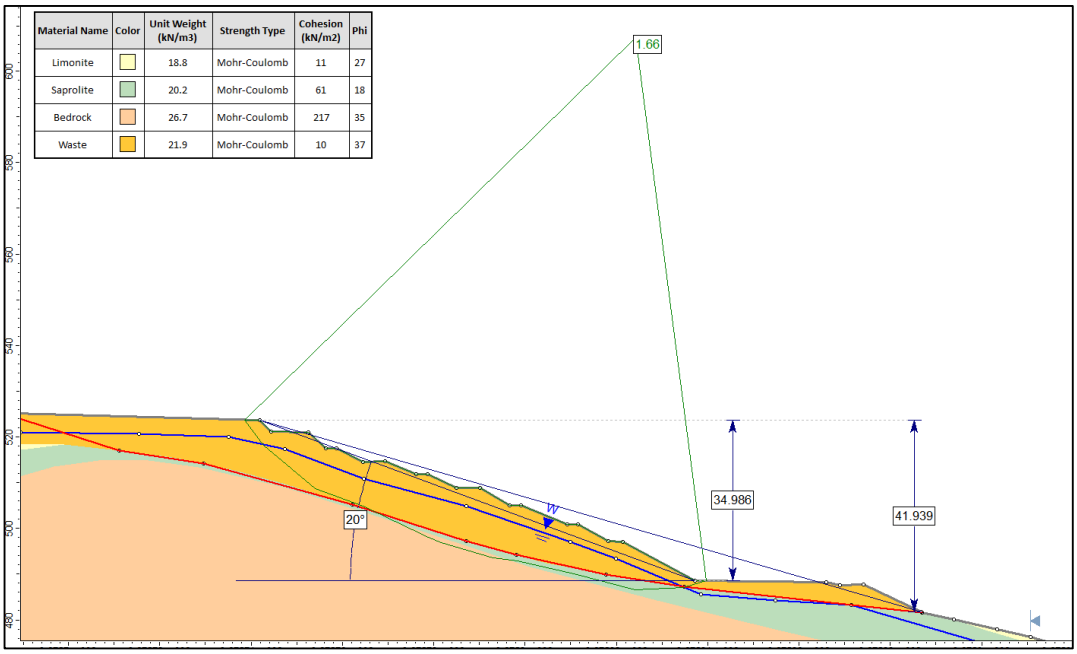
| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 28/09/2021 | 08.00 | 3,71 | YAR | DHG-02 |
| | 08.10 | 3,71 | YAR | DHG-02 |
| | 08.20 | 3,72 | YAR | DHG-02 |
| | | | | |
| 04/10/2021 | 14.00 | 8,58 | YAR | DHG-02 |
| | 14.05 | 8,58 | YAR | DHG-02 |
| | 1410 | 8.58 | YAR | DHG-02 |
| | | | | |

**Gambar 4.28** Hasil Pengukuran Muka Air Tanah DHG-02

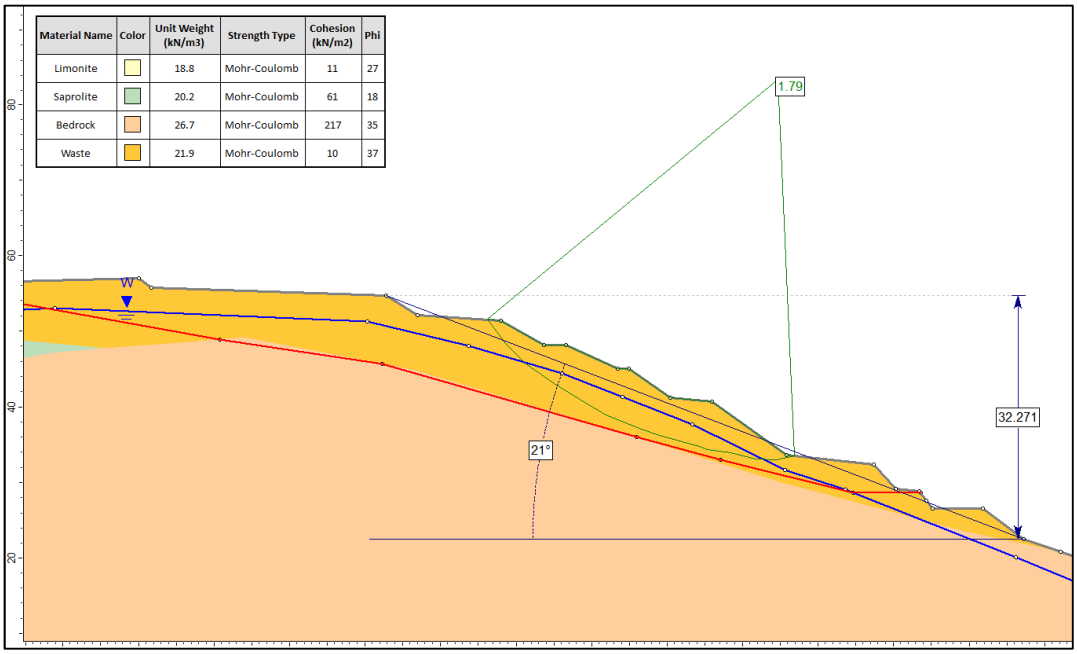



**Gambar 4.29** *Section Line Waste Dump* Aktual

Dari dua lokasi *section* pada *waste dump* aktual didapatkan sudut lereng keseluruhan adalah 20° pada *section* 1 dan 21° pada *section* 2, sedangkan tinggi lereng masing-masing adalah 35 m dan 32 m. Adapun hasil analisis berdasarkan properties awal material didapatkan masing-masing faktor keamanan 1.66 dan 1.79 (Gambar 4.30 dan Gambar 4.31).




**Gambar 4.30** Hasil analisis properties material awal pada *section* 1

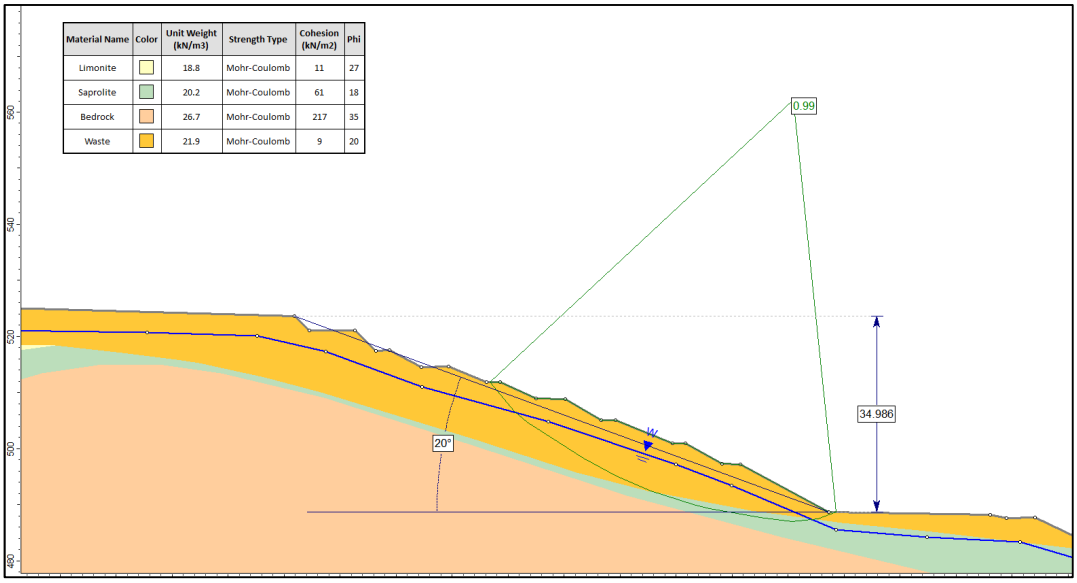



**Gambar 4.31** Hasil analisis properties material awal pada *section* 2

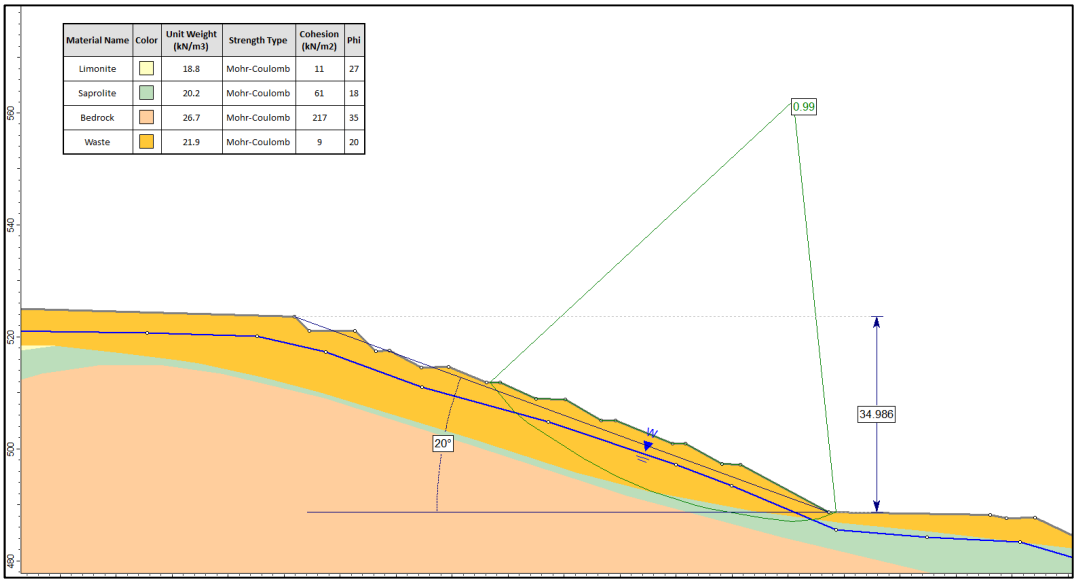
Hasil analisis menggunakan properties *waste* awal tersebut tidak mencerminkan kondisi ketidakstabilan sehingga perlu dilakukan penyesuaian properties material agar permodelan sesuai dengan kondisi aktual. Untuk itu Faktor Keamanan acuan dalam analisis balik ini adalah di sekitar 1.00 dengan pertimbangan material *waste dump* pada zona kritis. Hasil analisis balik terhadap properties *waste* menghasilkan properties *waste* pada Tabel 4.16.

**Tabel 4.16** Properties Material Analisis Balik

| Litologi | *Unit Weight* (kN/m³) | Mohr Coloumb | |
|---|---|---|---|
| | | C (KPa) | Phi (Degree) |
| Limonite | 18.77 | 11 | 27 |
| Saprolite | 20.21 | 61 | 18 |
| Bedrock | 26.71 | 217 | 35 |
| Waste | 21.9 | 9 | 20 |




**Gambar 4.32** Analisis Balik *Section* 1




**Gambar 4.33** Analisis Balik *Section* 2

## 4.6. Analisis Kestabilan Lereng

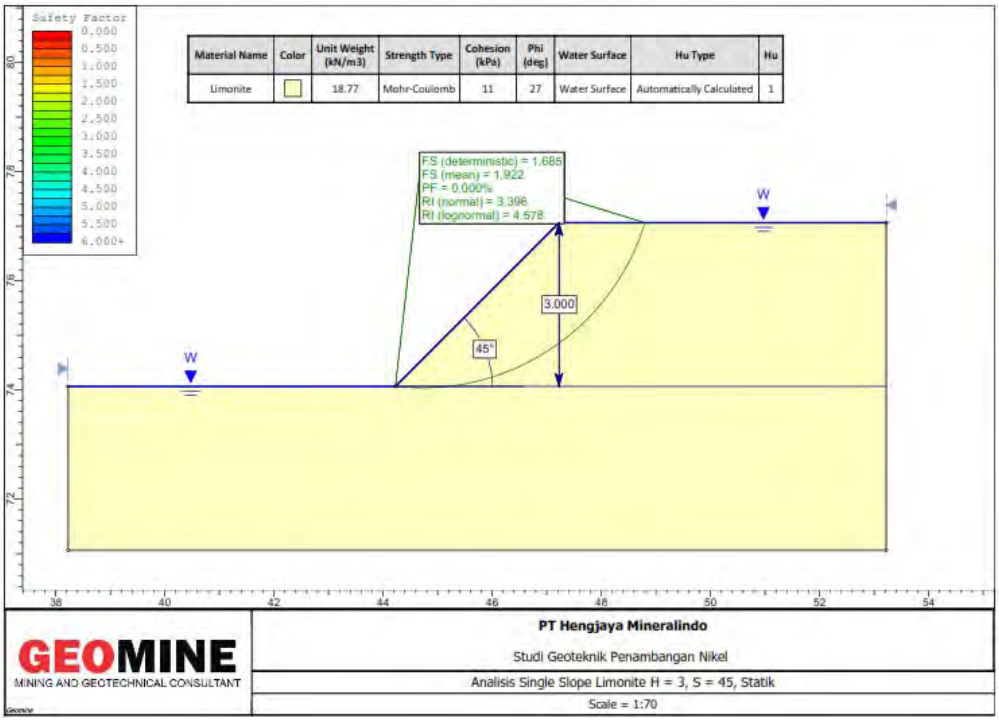
### 4.6.1. Analisa Kestabilan Lereng Tunggal (Bench Face Angle)

Analisis kestabilan lereng tunggal dilakukan untuk setiap domain, dengan menggunakan kondisi statik (tanpa beban seismik) dan pseudostatik (dengan beban seismik). Pada analisis awal diasumsikan lereng pada keadaan jenuh yang memberikan kondisi terburuk dari sisi pengaruh muka air tanah. Tinggi jenjang yang dianalisis adalah 3 m dan 5 m, dengan sudut *single slope* bervariasi dari 45° hingga sudut maksimum 60°. Hasil analisis kestabilan lereng tunggal ditampilkan pada Tabel 4.17. Dari hasil analisis ini mayoritas geometri lereng tunggal memenuhi kriteria terutama untuk domain *saprolite* dan *bedrock*. Untuk domain *limonite* tinggi jenjang 3 meter dengan kondisi *saturated* memenuhi kriteria namun untuk tinggi jenjang 5 meter perlu berada pada kondisi *dry* untuk dapat memenuhi kriteria.

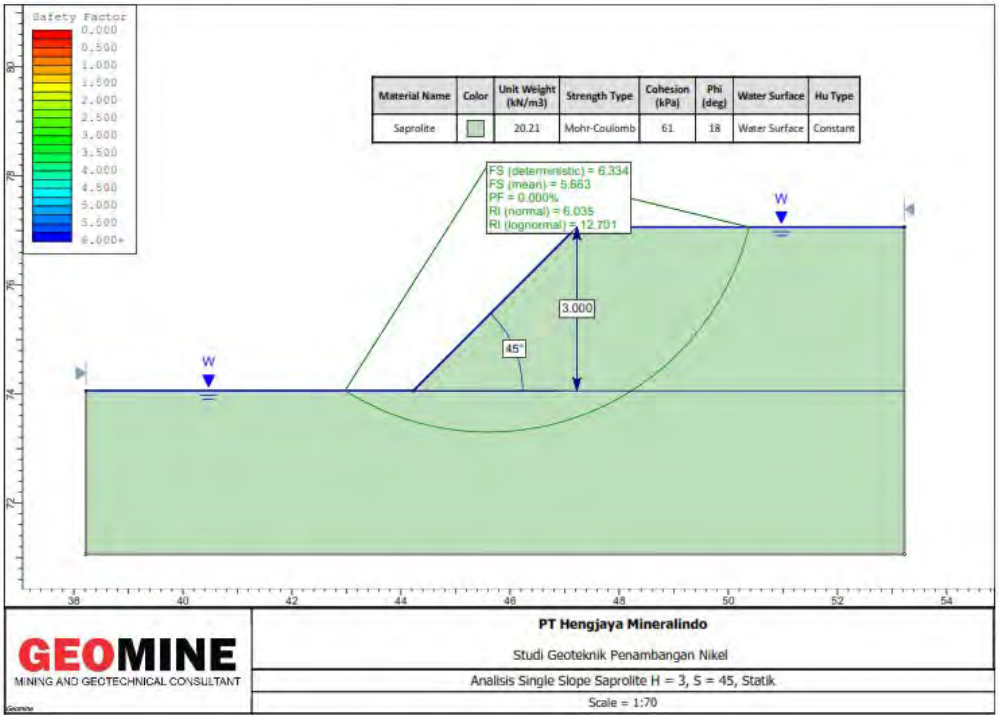
Contoh dari hasil analisis model untuk kestabilan lereng *single slope* ditampilkan Gambar 4.34 sampai 4.36, sementara hasil analisis secara keseluruhan dapat dilihat pada Lampiran D.

**Tabel 4.17** Hasil Analisis Kestabilan Lereng Tunggal

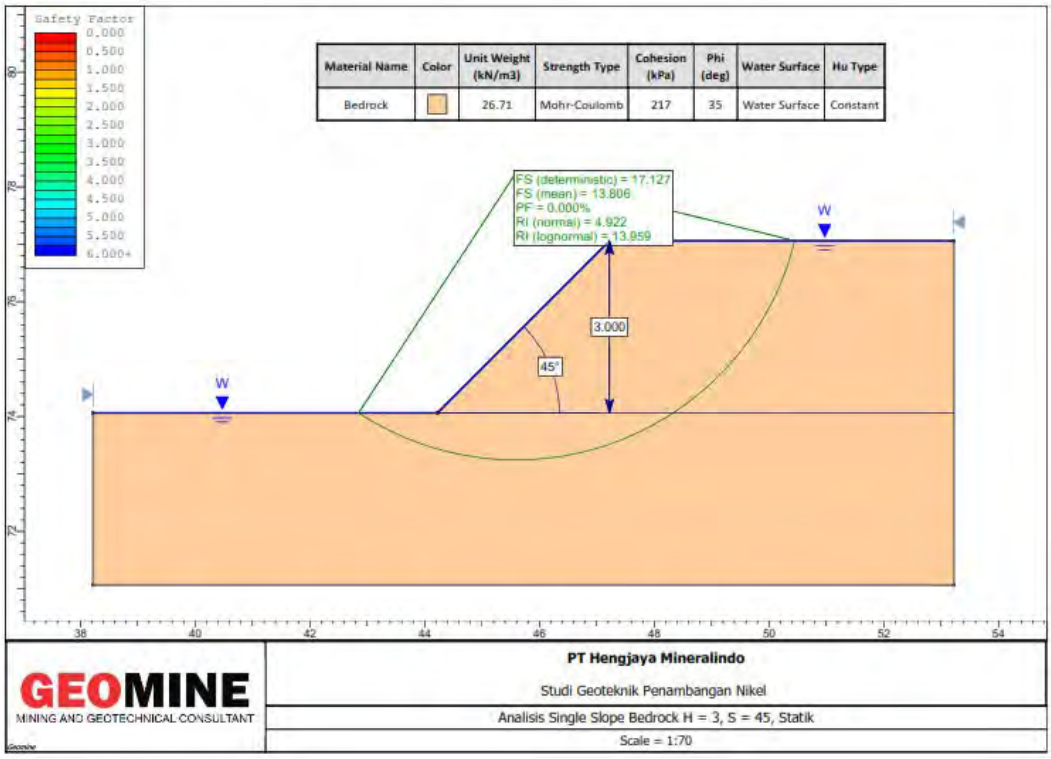
| Analisis Lereng Tunggal | | | | | | |
|---|---|---|---|---|---|---|
| **Domain** | **Tinggi (m)** | **Sudut (°)** | ***Full Saturated*** | | | |
| | | | **FK Statik** | **POF Statik** | **FK Dinamik** | **POF Dinamik** |
| *Limonite* | 3 | 45 | 1.68 | 0.0% | 1.44 | 0.0% |
| | | 50 | 1.58 | 0.0% | 1.36 | 0.0% |
| | | 55 | 1.46 | 0.0% | 1.28 | 0.0% |
| | | 60 | 1.35 | 0.0% | 1.19 | 0.0% |
| | 5 | 45 | 1.20 | 0.0% | 1.03 | 0.0% |
| | | 50 | 1.11 | 0.0% | 0.96 | 0.0% |
| | | 55 | 1.02 | 0.0% | 0.89 | 0.0% |
| | | 60 | 0.92 | 0.0% | 0.82 | 0.0% |
| *Saprolite* | 3 | 45 | 6.33 | 0.0% | 4.96 | 0.0% |
| | | 50 | 6.25 | 0.0% | 4.97 | 0.0% |
| | | 55 | 6.19 | 0.0% | 4.98 | 0.0% |
| | | 60 | 6.15 | 0.0% | 4.80 | 0.0% |
| | 5 | 45 | 3.91 | 0.0% | 3.23 | 0.0% |
| | | 50 | 3.82 | 0.0% | 3.11 | 0.0% |
| | | 55 | 3.80 | 0.0% | 3.04 | 0.0% |
| | | 60 | 3.77 | 0.0% | 2.92 | 0.0% |
| *Bedrock* | 3 | 45 | 17.13 | 0.0% | 13.39 | 0.0% |
| | | 50 | 16.91 | 0.0% | 13.41 | 0.0% |
| | | 55 | 16.76 | 0.0% | 13.45 | 0.0% |
| | | 60 | 16.65 | 0.0% | 12.97 | 0.0% |
| | 5 | 45 | 10.63 | 0.0% | 8.71 | 0.0% |
| | | 50 | 10.48 | 0.0% | 8.59 | 0.0% |
| | | 55 | 10.38 | 0.0% | 8.29 | 0.0% |
| | | 60 | 10.37 | 0.0% | 8.00 | 0.0% |
| **Domain** | **Tinggi (m)** | **Sudut (°)** | ***Dry*** | | | |
| | | | **FK Statik** | **POF Statik** | **FK Dinamik** | **POF Dinamik** |
| *Limonite* | 5 | 45 | 1.62 | 0.0% | 1.40 | 0.0% |
| | | 50 | 1.49 | 0.0% | 1.31 | 0.0% |
| | | 55 | 1.39 | 0.0% | 1.22 | 0.0% |
| | | 60 | 1.30 | 0.0% | 1.14 | 0.0% |




**Gambar 4.34** Hasil Analisis Kestabilan Lereng Tunggal pada Domain *Limonite*




**Gambar 4.35** Hasil Analisis Kestabilan Lereng Tunggal pada Domain *Saprolite*




**Gambar 4.36** Hasil Analisis Kestabilan Lereng Tunggal pada Domain *Bedrock*

## 4.6.2. Analisa Kestabilan Lereng Keseluruhan (Overall Slope Angle)

Analisis kestabilan lereng keseluruhan dilakukan pada beberapa lokasi di dalam IUP HM yang merepresentasikan desain *final pit*. Analisis dilakukan pada kondisi statik (tanpa menggunakan beban seismik) dan pada kondisi pseudostatik (menggunakan beban seismik), serta dianalisis dalam kondisi muka air tanah yang didapat dari hasil pemodelan *groundwater table*.

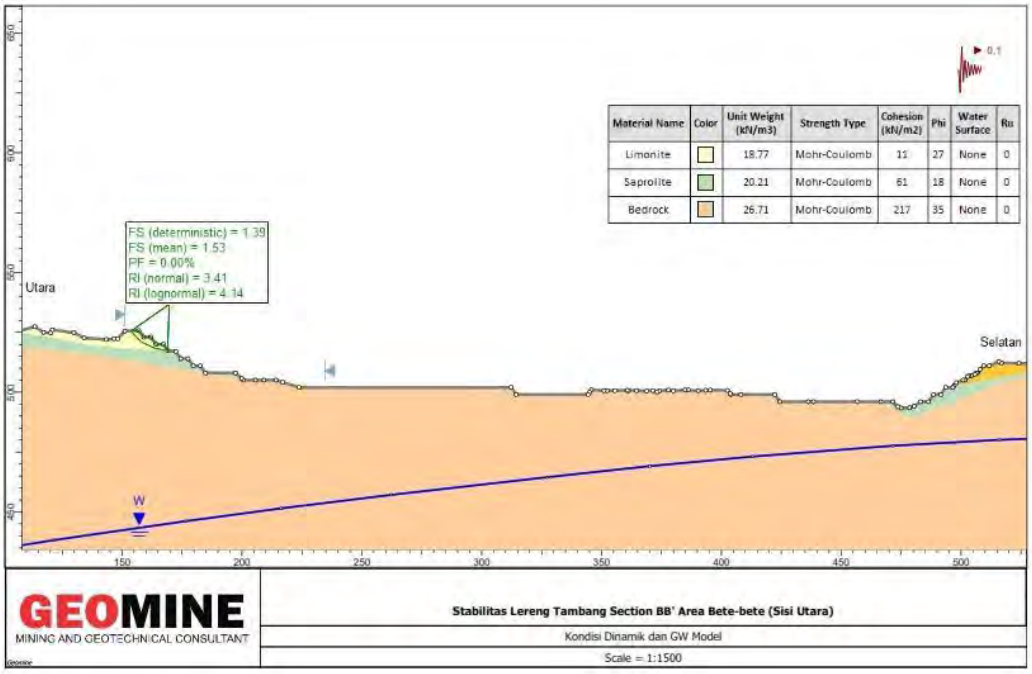
Hasil analisis kestabilan lereng keseluruhan ditampilkan pada Tabel 4.18. Pada setiap *section* yang dibuat terdapat dua lereng di masing-masing sisi (kiri dan kanan). Analisis dilakukan pada kedua lereng tersebut namun data Faktor Keamanan (FK) yang ditampilkan pada Tabel 4.18 merupakan nilai FK minimum dari keduanya.

Contoh dari hasil analisis model untuk kestabilan lereng ditampilkan Gambar 4.37 sampai 4.39, sementara hasil analisis secara keseluruhan dapat dilihat pada Lampiran D.

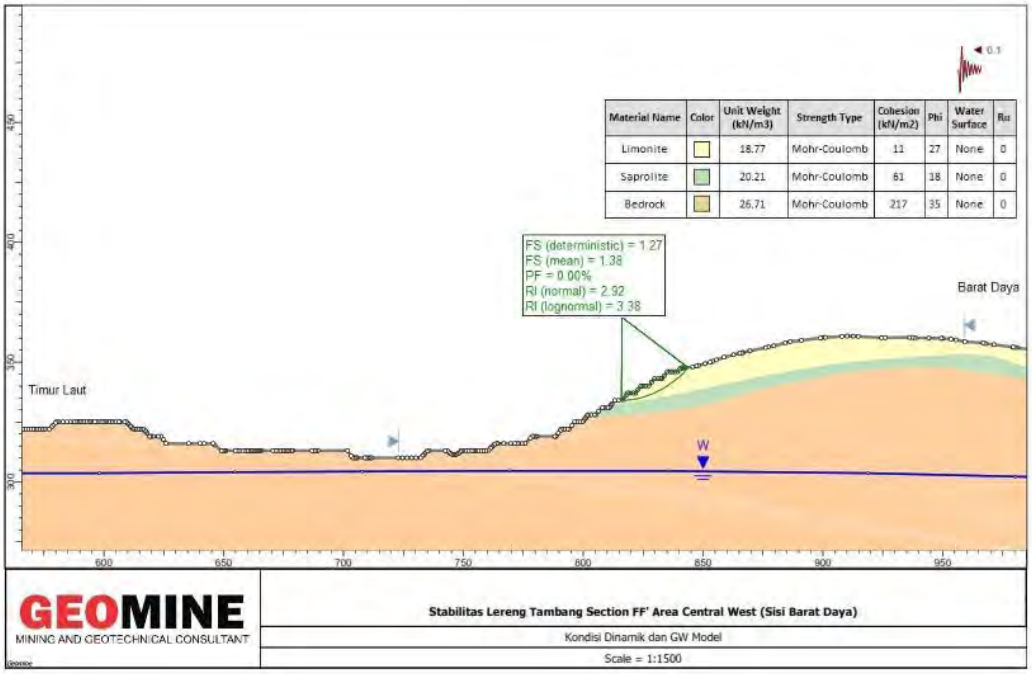
**Tabel 4.18** Hasil Analisis Kestabilan Lereng Keseluruhan

| No | Lokasi | *Section* | Lereng Keseluruhan | | FK Statik | POF Statik | FK Dinamik | POF Dinamik | Kondisi |
|---|---|---|---|---|---|---|---|---|---|
| | | | Tinggi (m) | Sudut (°) | | | | | |
| 1 | Bete-Bete | Sec_AA' | 80.09 | 29 | 2.24 | 0.0% | 1.80 | 0.0% | *Stable* |
| 2 | Bete-Bete | Sec_BB' | 17.76 | 33 | 1.68 | 0.0% | 1.39 | 0.0% | *Stable* |
| 3 | Bete-Bete | Sec_CC' | 9.00 | 36 | 1.87 | 0.0% | 1.61 | 0.0% | *Stable* |
| 4 | Bete South | Sec_DD' | 17.10 | 30 | 2.33 | 0.0% | 1.94 | 0.0% | *Stable* |
| 5 | Bete South | Sec_EE' | 14.63 | 33 | 1.75 | 0.0% | 1.44 | 0.0% | *Stable* |
| 6 | Central West | Sec_FF' | 28.54 | 29 | 1.56 | 0.0% | 1.27 | 0.0% | *Stable* |
| 7 | Central West | Sec_GG' | 22.62 | 25 | 1.96 | 0.0% | 1.60 | 0.0% | *Stable* |
| 8 | Central East | Sec_HH' | 31.25 | 31 | 1.45 | 0.0% | 1.20 | 0.0% | *Stable* |
| 9 | Central East | Sec_II' | 9.00 | 23 | 1.87 | 0.0% | 1.56 | 0.0% | *Stable* |
| 10 | Central West | Sec_JJ' | 15.00 | 34 | 1.38 | 0.0% | 1.14 | 0.6% | *Stable* |
| 11 | Central East | Sec_KK' | 14.73 | 37 | 1.11 | 2.4% | 0.92 | 42.7% | *Marginally Stable* |

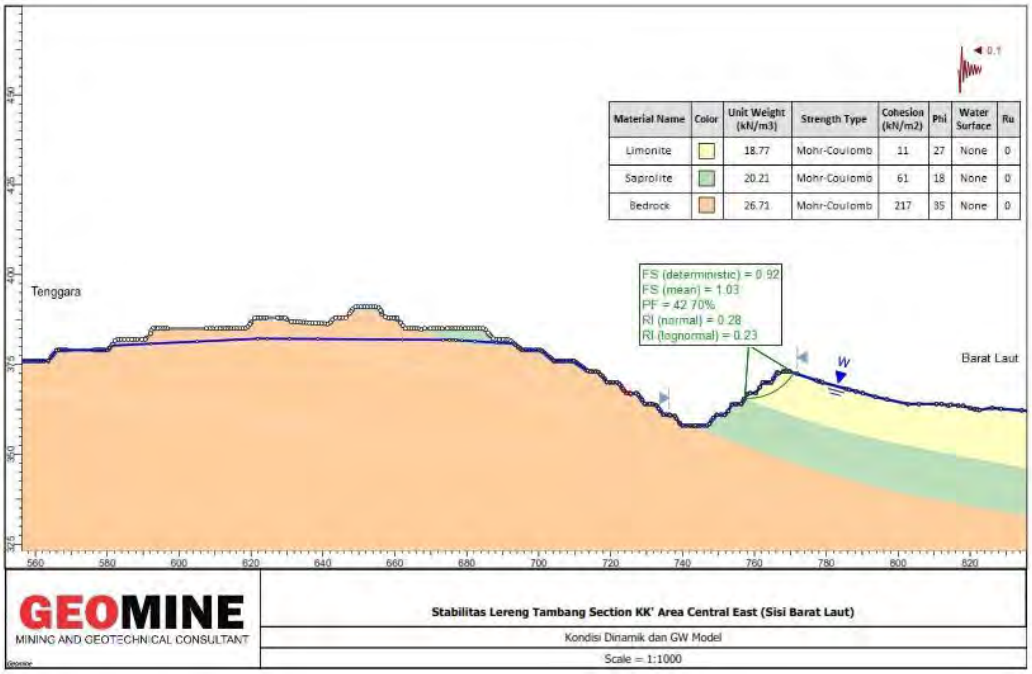
Secara keseluruhan, hasil analisis kestabilan design akhir *pit* PT Hengjaya Mineralindo telah memenuhi kriteria dan menunjukkan kondisi yang stabil dengan nilai Faktor Keamanan (FK) di atas 1.3 untuk kondisi statik dan di atas 1.05, kecuali pada Sec_KK' yang berlokasi di Central East. Hasil analisis pada Sec_KK' menunjukkan nilai FK dan PoF berada di bawah batas kriteria minimum dan menunjukkan kondisi *marginally stable*. Untuk dapat memenuhi kriteria maka ada beberapa rekomendasi yang dapat dilakukan dan dibahas pada Bab 5.




**Gambar 4.37** Hasil Analisis Kestabilan Lereng *Section* BB' Area Bete-Bete (Sisi Utara)




**Gambar 4.38** Hasil Analisis Kestabilan Lereng *Section* FF' Area Central West (Sisi Barat Daya)



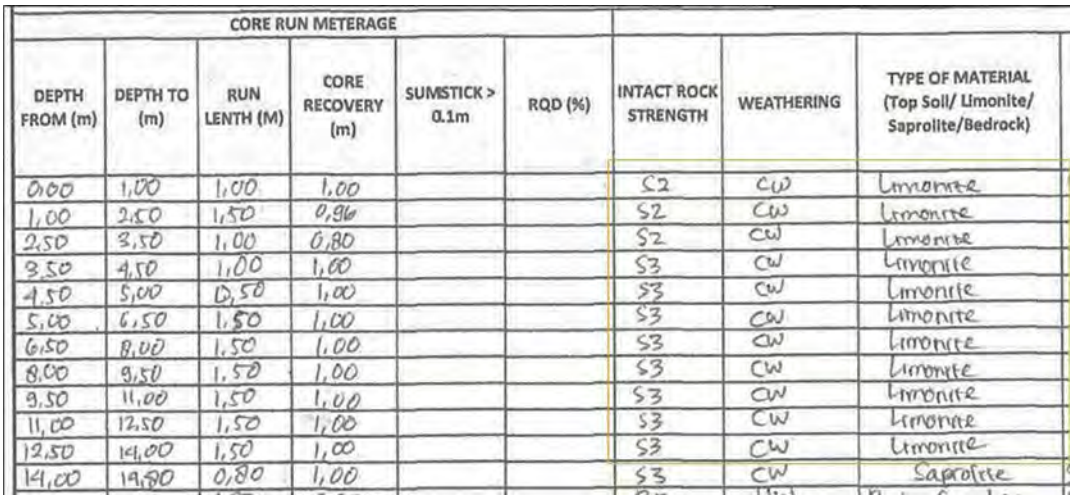

**Gambar 4.39** Hasil Analisis Kestabilan Lereng *Section* KK' Area Central East (Sisi Barat Daya)

## 4.7. Analisis Kemampugalian dan Kemampugaruan

Berbagai metode umum digunakan dalam penentuan kemampugalian dan kemampugaruan. Dalam analisa terkait material di area tambang Hengjaya Mineralindo, metode yang dipilih adalah metode yang diperkenalkan oleh Pettifer-Fookes (1994). Parameter utama yang dibutuhkan adalah kekuatan tekan batuan (*Uniaxial Compressive Strength* - UCS) dan spasi kekar batuan (*Discontinuity Spacing* - m). Data-data tersebut diperoleh dari pengeboran geoteknik yang telah dilakukan di beberapa lokasi seperti yang terlihat pada Gambar 4.1 di atas. Dari kegiatan pengeboran tersebut juga diambil sejumlah sampel uji laboratorium untuk mendapatkan properties material seperti yang ditampilkan pada Tabel 4.3 – Tabel 4.8.

### 4.7.1. Kekuatan Tekan Batuan (*Uniaxial Compressive Strength*)

Nilai UCS untuk batuan *Saprolite* dan *Bedrock* menggunakan data hasil uji laboratorium, sedangkan untuk *Limonite* dan *Soil* digunakan data *Intact Rock Strength* hasil logging geoteknik (contoh pada Gambar 4.40) yang dikonversi menggunakan metode ISRM 1981 (Tabel 4.19) menjadi estimated UCS.



| CORE RUN METERAGE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S2 | CW | Limonite |
| 1,00 | 2,50 | 1,50 | 0,96 | | | S2 | CW | Limonite |
| 2,50 | 3,50 | 1,00 | 0,80 | | | S2 | CW | Limonite |
| 3,50 | 4,50 | 1,00 | 1,00 | | | S3 | CW | Limonite |
| 4,50 | 5,00 | 0,50 | 1,00 | | | S3 | CW | Limonite |
| 5,00 | 6,50 | 1,50 | 1,00 | | | S3 | CW | Limonite |
| 6,50 | 8,00 | 1,50 | 1,00 | | | S3 | CW | Limonite |
| 8,00 | 9,50 | 1,50 | 1,00 | | | S3 | CW | Limonite |
| 9,50 | 11,00 | 1,50 | 1,00 | | | S3 | CW | Limonite |
| 11,00 | 12,50 | 1,50 | 1,00 | | | S3 | CW | Limonite |
| 12,50 | 14,00 | 1,50 | 1,00 | | | S3 | CW | Limonite |
| 14,00 | 14,80 | 0,80 | 1,00 | | | S3 | CW | Saprolite |

**Gambar 4.40** Contoh Data Logging Limonite

**Tabel 4.19** Estimasi Kekuatan *Soil* berdasarkan ISRM 1981

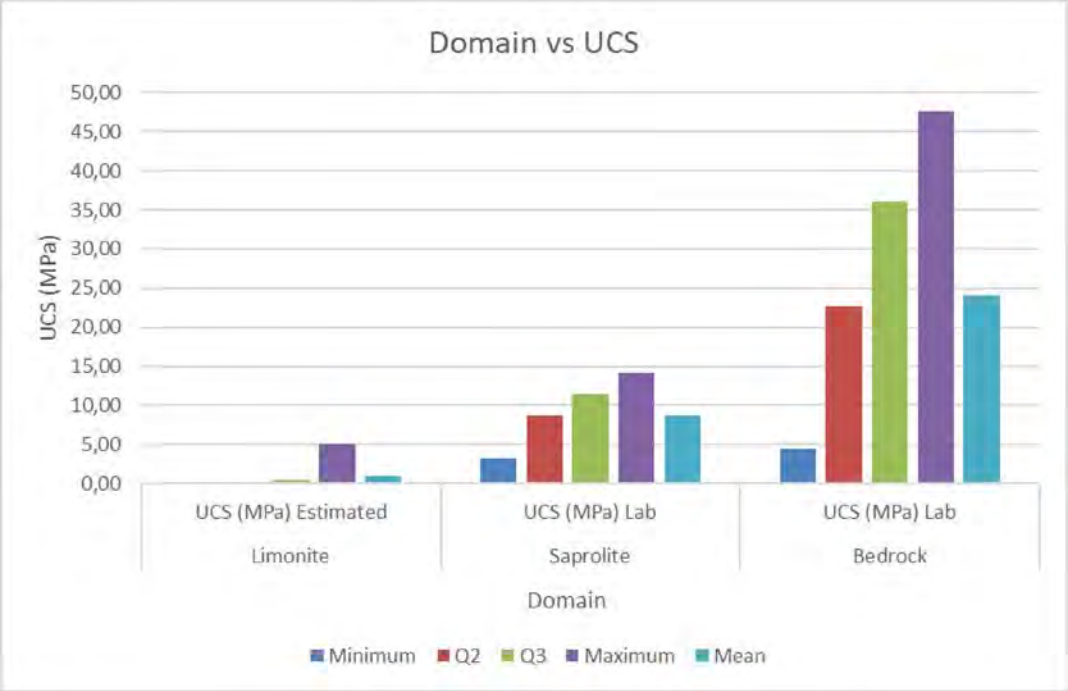
| ***Code* (ISRM, 1981*)*** | ***Description* (ISRM, 1981)** | ***UCS Estimation* (Mpa)** | ***Strength Estimation in the Field*** |
|---|---|---|---|
| G | *Granular Soil* | 0 | *Cohesionless, friable*, tanah granular, pasir<br>*Cohesionless, friable, granular soil, sand* |
| S1 | *Very Sft Clay* | < 0.025 | Mudah menembus beberapa sentimeter dengan kepalan tangan<br>*Easy penetrated several centimetres by fist* |
| S2 | *Soft Clay* | 0.025 - 0.05 | Mudah menembus beberapa sentimeter dengan ibu jari<br>*Easy penetrated several centimetres by thumb* |
| S3 | *Firm Clay* | 0.05 - 0.1 (< 1.0 on pocket penetrometer) | Dapat menembus beberapa sentimeter dengan ibu jari dengan usaha sedang. Hancur dengan sedikit tekanan dari kuku<br>*Can be penetrated several centimetres with thumb with moderate effort. Crumbles under light preassure from a nail* |
| S4 | *Stiff Clay* | 0.10 - 0.25 (1.0 - 2.5 on pocket penetrometer) | Mudah diidentifikasi dengan ibu jari tetapi hanya menembus dengan usaha keras. Hancur di bawah tekanan sedang dari kuku.<br>*Readily intended by thumb but penetrated only with great effort. Crumbles under moderate pressure from a nail.* |

| *Code* (ISRM, 1981*)* | *Description* (ISRM, 1981) | *UCS Estimation* (Mpa) | *Strength Estimation in the Field* |
|---|---|---|---|
| S5 | Very Stiff Clay | 0.25 - 0.50 | Mudah diidentifikasi oleh kuku ibu jari<br>*Readily intented by thumbnail* |
| S6 | Hard Clay | > 0.50 | Indentasi dengan kesulitan dengan kuku ibu jari<br>*Indented with difficulty by thumbnail* |

Tabel 4.20 dan Gambar 4.41 memperlihatkan distribusi nilai UCS untuk masing-masing domain HM.

**Tabel 4.20** Kuat Tekan Batuan masing-masing Domain

| Domain | Properties | Min | Q2 | Q3 | Max | Mean |
|---|---|---|---|---|---|---|
| | | (MPa) | (MPa) | (MPa) | (MPa) | (MPa) |
| Limonite | UCS Estimated | 0.1 | 0.2 | 0.4 | 5.0 | 1.0 |
| Saprolite | UCS Lab | 3.2 | 8.7 | 11.5 | 14.2 | 8.7 |
| Bedrock | UCS Lab | 4.5 | 22.7 | 36.0 | 47.6 | 24.1 |



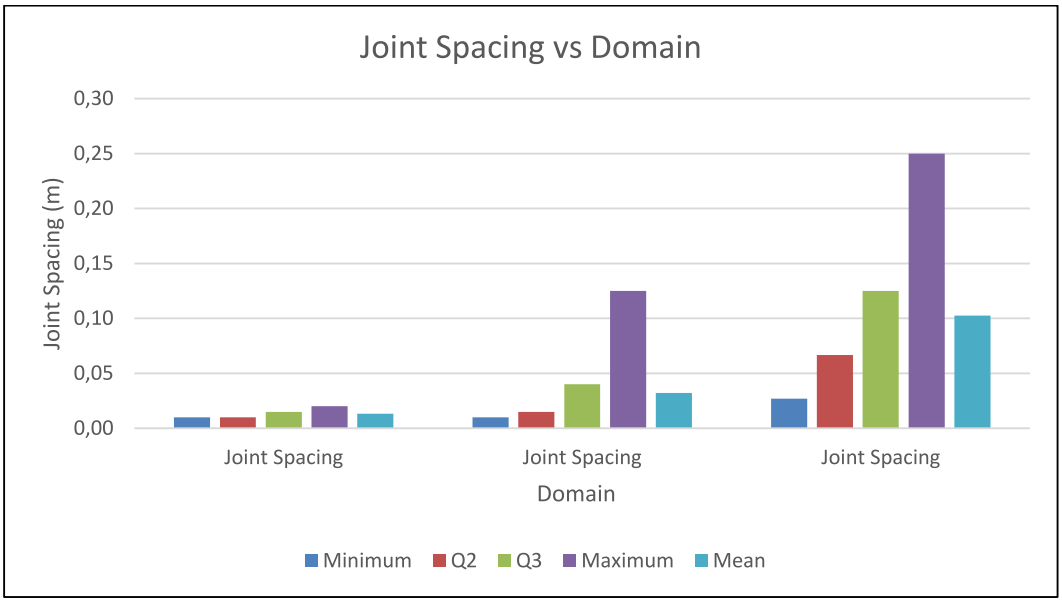

**Gambar 4.41** Hubungan Domain dengan Nilai UCS

## 4.7.2. Spasi Kekar (Discontinuity Spacing)

Nilai spasi kekar diestimasikan dari data logging jumlah kekar dalam satu run dan divalidasi dengan observasi langsung dari fisikal *core*. Sedangkan untuk *Limonite* sama seperti penentuan UCS diestimasi memiliki nilai sebesar 100 rekahan/m karenakan dalam limonite berada pada kondisi sangat lapuk (*completely weathered*) atau seperti tanah, sehingga spasi joint ≤ 0.02m.

**Tabel 4.21** Spasi Kekar masing-masing Domain

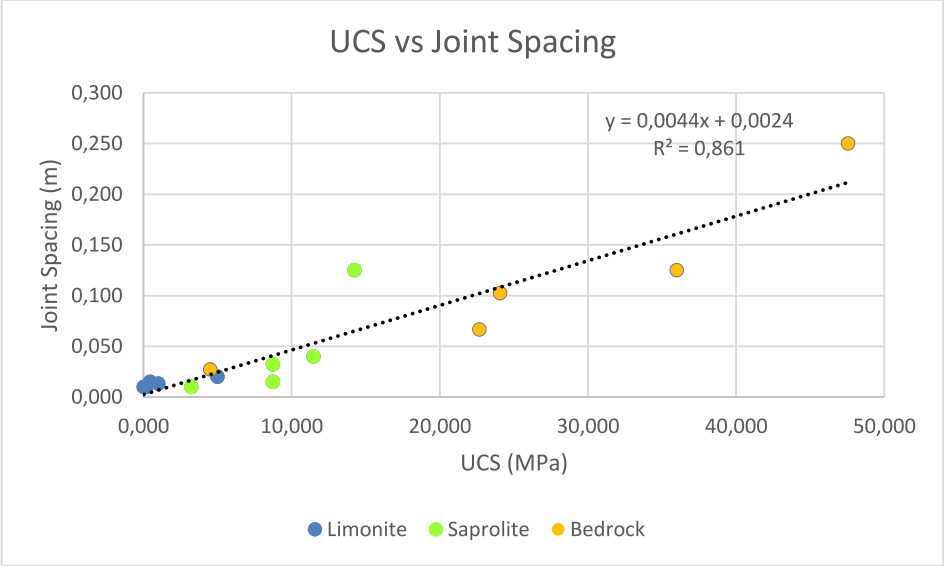
| Domain | Properties | Min | Q2 | Q3 | Max | Mean |
|---|---|---|---|---|---|---|
| | | (m) | (m) | (m) | (m) | (m) |
| Limonite | Joint Spacing | 0.010 | 0.010 | 0.015 | 0.020 | 0.013 |
| Saprolite | Joint Spacing | 0.010 | 0.015 | 0.040 | 0.125 | 0.032 |
| Bedrock | Joint Spacing | 0.027 | 0.067 | 0.125 | 0.250 | 0.103 |



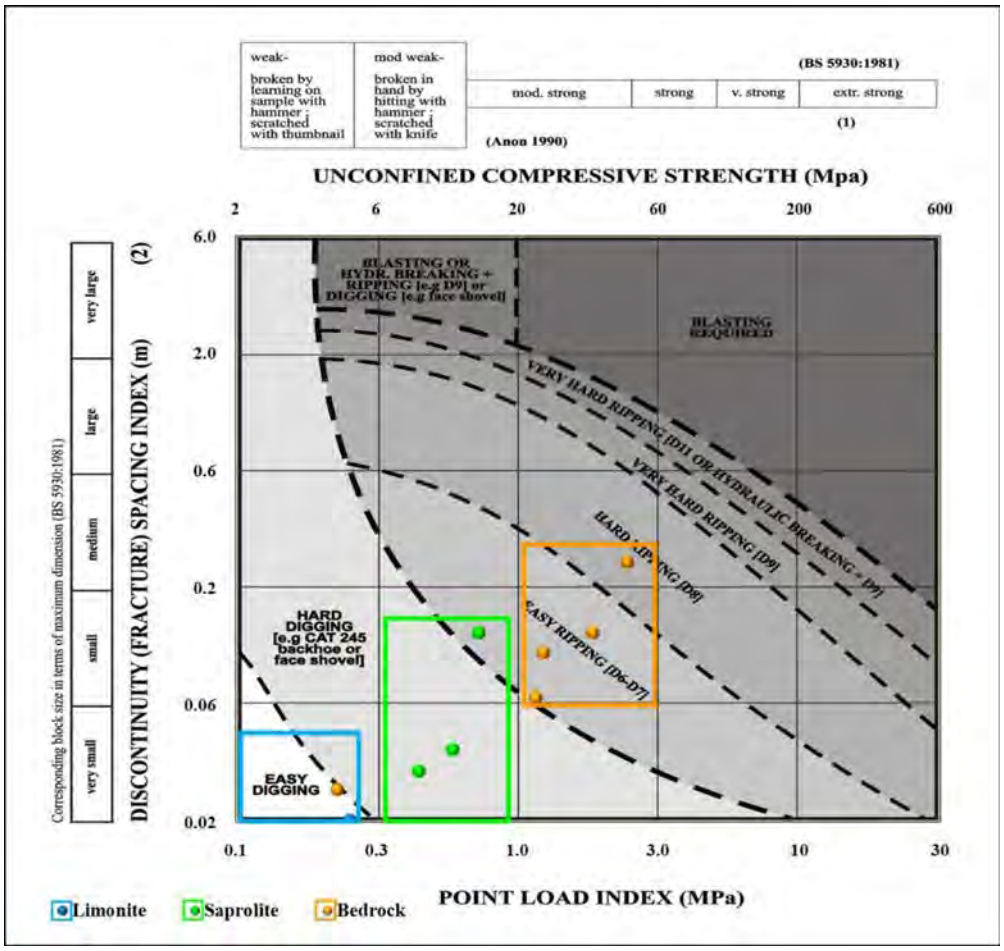

**Gambar 4.42** Hubungan Domain dengan Spasi Kekar

### 4.7.3. Hasil Analisis Kemampugalian dan Kemampugaruan

Data-data UCS dan Spasi Kekar kemudian diplot dalam grafik (Gambar 4.43) untuk melihat korelasi antara kedua parameter tersebut. Selanjutnya data-data tersebut diplot di dalam grafik Pettifer-Fookes untuk mengetahui kemampugalian dan kemampugaruan untuk setiap domain.




**Gambar 4.43** Hubungan Nilai Kuat Tekan Batuan dengan Spasi Kekar




**Gambar 4.44** Kemampugalian dan Kemampugaruan Berdasarkan Pettifer-Fookes

Dari grafik-grafik di atas terlihat bahwa karakteristik setiap domain terdistribusi dalam kategori yang relatif homogen sehingga perlakuan penggalian atau penggaruan juga relatif sama untuk masing-masing domain tersebut seperti tabel di bawah:

**Tabel 4.22** Kemampugalian dan Kemampugaruan per Litologi

| Litologi | Metode |
|---|---|
| *Limonite* | *Easy Digging* |
| *Saprolite* | *Hard Digging* |
| *Bedrock* | *Easy-Hard Ripping* |

# 5. KESIMPULAN DAN REKOMENDASI

## 5.1. Kesimpulan

### 5.1.1. Kesimpulan Kajian Hidrologi dan Hidrogeologi

Berdasarkan hasil kajian hidrologi dan hidrogeologi yang telah dilakukan, kesimpulan yang dapat diperoleh adalah sebagai berikut:

1. Kebutuhan data untuk keperluan muka airtanah dan konduktivitas hidraulik dianggap telah memenuhi kebutuhan data minimal untuk analisis, data tersebut didapatkan dari pengukuran lapangan pada sembilan lubang bor geoteknik.
2. Hasil estimasi debit puncak air permukaan dengan periode ulang 100 tahun dan metode rasional pada rencana pond berkisar antara 3.8 $m^3$/detik sampai 20.7 $m^3$/detik.
3. Lapisan yang membentuk zona akuifer utama pada sistem airtanah adalah laterit bawah dan batuan ultramafik terkekarkan, memiliki ketebalan berkisar antara 10-30 m. Tanah laterit berukuran lempung (*limonite*) berfungsi sebagai lapisan akuiklud. Batuan ultramafik yang tidak terkekarkan bertindak sebagai lapisan akuifug, diasumsikan kontinu hingga ketebalan lebih dari 100 meter.
4. Estimasi *groundwater inflow* pada tahun pertama sebesar 22.2 L/detik dan berangsur turun menuju garis konstan (*steady*) pada tahun-tahun berikutnya di sekitar 19 L/detik. Debit *groundwater inflow* secara umum cenderung kecil karena posisi muka airtanah yang relatif telah turun, sehingga sedikit yang berpotongan dengan bukaan tambang.

### 5.1.2. Kesimpulan Kajian Geoteknik

Berdasarkan hasil studi geoteknik yang dilakukan, kesimpulan yang dapat diperoleh adalah sebagai berikut:

1. Pengumpulan data properties material HM dilakukan melalui logging geoteknik terhadap core-core dari sembilan lubang pengeboran geoteknik dan hasil pengujian sifat fisik dan mekanik. Validasi terhadap properties menggunakan geometri aktual dan analisis balik menggunakan indikasi ketidakstabilan dilakukan untuk menentukan properties yang merepresentasikan karakteristik domain geoteknik di area HM.

2. Analisis kestabilan lereng tunggal dilakukan untuk setiap domain dan hasilnya ditampilkan pada Tabel 5.1. Dari hasil analisis menunjukkan mayoritas geometri lereng tunggal memenuhi kriteria terutama untuk domain *saprolite* dan *bedrock*. Untuk domain limonite tinggi jenjang 3 meter dengan kondisi *saturated* memenuhi kriteria namun untuk tinggi jenjang 5 meter perlu berada pada kondisi *dry* untuk dapat memenuhi kriteria.

**Tabel 5.1** Hasil Analisis Kestabilan Lereng Tunggal

| ***Analisis Lereng Tunggal*** | | | | | | |
|---|---|---|---|---|---|---|
| **Domain** | **Tinggi (m)** | **Sudut (°)** | ***Full Saturated*** | | | |
| | | | **FK Statik** | **POF Statik** | **FK Dinamik** | **POF Dinamik** |
| *Limonite* | 3 | 55 | 1.46 | 0.0% | 1.28 | 0.0% |
| | | 60 | 1.35 | 0.0% | 1.19 | 0.0% |
| | 5 | 55 | 1.02 | 0.0% | 0.89 | 0.0% |
| | | 60 | 0.92 | 0.0% | 0.82 | 0.0% |
| *Saprolite* | 3 | 55 | 6.19 | 0.0% | 4.98 | 0.0% |
| | | 60 | 6.15 | 0.0% | 4.80 | 0.0% |
| | 5 | 55 | 3.80 | 0.0% | 3.04 | 0.0% |
| | | 60 | 3.77 | 0.0% | 2.92 | 0.0% |
| *Bedrock* | 3 | 55 | 16.76 | 0.0% | 13.45 | 0.0% |
| | | 60 | 16.65 | 0.0% | 12.97 | 0.0% |
| | 5 | 55 | 10.38 | 0.0% | 8.29 | 0.0% |
| | | 60 | 10.37 | 0.0% | 8.00 | 0.0% |

3. Analisis kestabilan lereng keseluruhan dilakukan pada beberapa lokasi di dalam IUP HM yang merepresentasikan desain *final pit* dan hasilnya ditampilkan pada Tabel 5.2. Secara keseluruhan, hasil analisis kestabilan design akhir *pit* PT Hengjaya Mineralindo telah memenuhi kriteria dan menunjukkan kondisi yang stabil dengan nilai Faktor Keamanan (FK) di atas 1.3 untuk kondisi statik dan di atas 1.05, kecuali pada Sec_KK' yang berlokasi di Central East. Hasil analisis pada Sec_KK' menunjukkan nilai FK dan PoF berada di bawah batas kriteria minimum dan menunjukkan kondisi *marginally stable.*

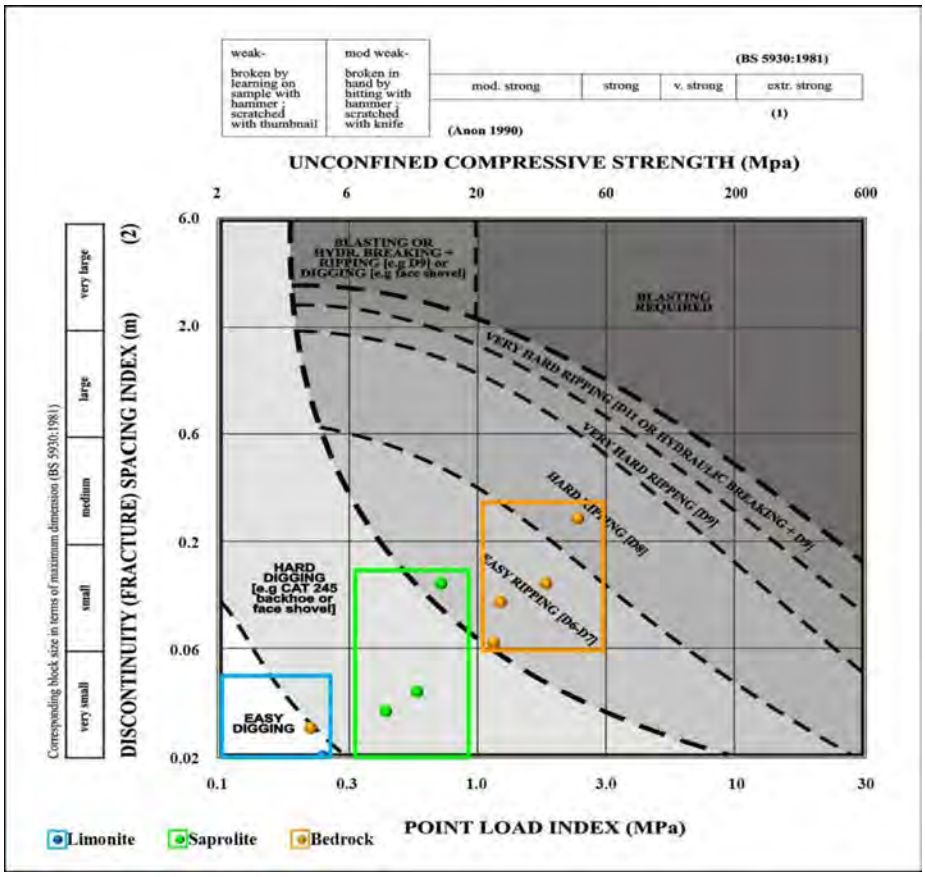
**Tabel 5.2** Hasil Analisis Kestabilan Lereng Keseluruhan

| Lokasi | *Section* | Lereng Keseluruhan | | FK Statik | POF Statik | FK Dinamik | POF Dinamik | Kondisi |
|---|---|---|---|---|---|---|---|---|
| | | Tinggi (m) | Sudut (°) | | | | | |
| Bete-Bete | Sec_AA' | 80 | 29 | 2.24 | 0.0% | 1.80 | 0.0% | *Stable* |
| Bete-Bete | Sec_BB' | 18 | 33 | 1.68 | 0.0% | 1.39 | 0.0% | *Stable* |
| Bete-Bete | Sec_CC' | 9 | 36 | 1.87 | 0.0% | 1.61 | 0.0% | *Stable* |
| Bete South | Sec_DD' | 17 | 30 | 2.33 | 0.0% | 1.94 | 0.0% | *Stable* |
| Bete South | Sec_EE' | 15 | 33 | 1.75 | 0.0% | 1.44 | 0.0% | *Stable* |
| Central West | Sec_FF' | 29 | 29 | 1.56 | 0.0% | 1.27 | 0.0% | *Stable* |
| Central West | Sec_GG' | 23 | 25 | 1.96 | 0.0% | 1.60 | 0.0% | *Stable* |
| Central East | Sec_HH' | 31 | 31 | 1.45 | 0.0% | 1.20 | 0.0% | *Stable* |
| Central East | Sec_II' | 9 | 23 | 1.87 | 0.0% | 1.56 | 0.0% | *Stable* |
| Central West | Sec_JJ' | 15 | 34 | 1.38 | 0.0% | 1.14 | 0.6% | *Stable* |
| Central East | Sec_KK' | 15 | 37 | 1.11 | 2.4% | 0.92 | 42.7% | *Marginally Stable* |

4. Analisis kemampugalian dan kemampugaruan dilakukan pada masing-masing litologi berdasarkan data parameter nilai kuat tekan batuan dan spasi rekahan yang di-plot ke dalam grafik Pettifer-Fookes (Gambar 5.1). Dari grafik dapat disimpulkan bahwa karakteristik setiap litologi terdistribusi dalam kategori yang relatif homogen sehingga perlakuan penggalian atau penggaruan juga relatif sama untuk masing-masing litologi tersebut seperti pada Tabel 5.3.

**Tabel 5.3** Kemampugalian dan Kemampugaruan per Litologi

| Litologi | Metode |
|---|---|
| *Limonite* | *Easy Digging* |
| *Saprolite* | *Hard Digging* |
| *Bedrock* | *Easy-Hard Ripping* |




**Gambar 5.1** Kemampugalian dan Kemampugaruan Berdasarkan Pettifer-Fookes

## 5.2. Rekomendasi

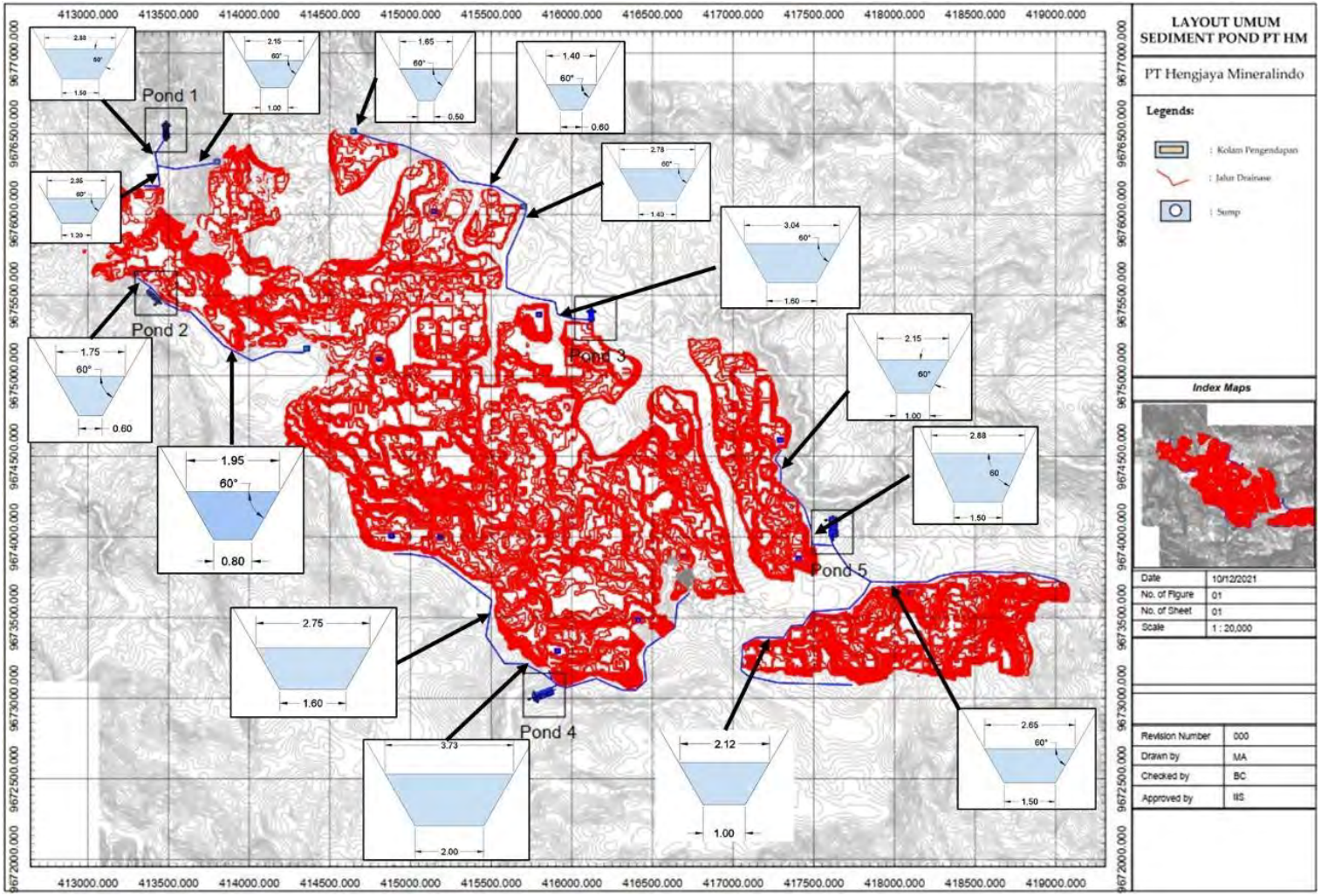
### 5.2.1. Rekomendasi Hidrologi dan Hidrogeologi

Dari hasil analisis didapatkan beberapa hal yang menjadi rekomendasi teknis terkait dimensi infrastruktur dan peralatan untuk penanganan penyaliran tambang meliputi:

1. **Saluran Drainase**

   Saluran perimeter dibutuhkan khususnya pada bagian Selatan dari area pit *central east* (Gambar 5.2). Saluran ini dibuat untuk mencegah masuknya air permukaan yang cukup besar dari luar ke dalam pit.

   Rekomendasi dimensi perimeter drainase ditentukan berdasarkan hasil analisis yang dilakukan pada debit rencana yang telah dihitung sebelumnya. Pembuatan perimeter drainase direkomendasikan dengan bentuk saluran berupa trapesium. *Layout* rekomendasi perimeter drainase, serta tipikal dimensi saluran dapat dilihat pada Gambar 5.2.




**Gambar 5.2** Rekomendasi sistem penyaliran rencana tambang PT HM

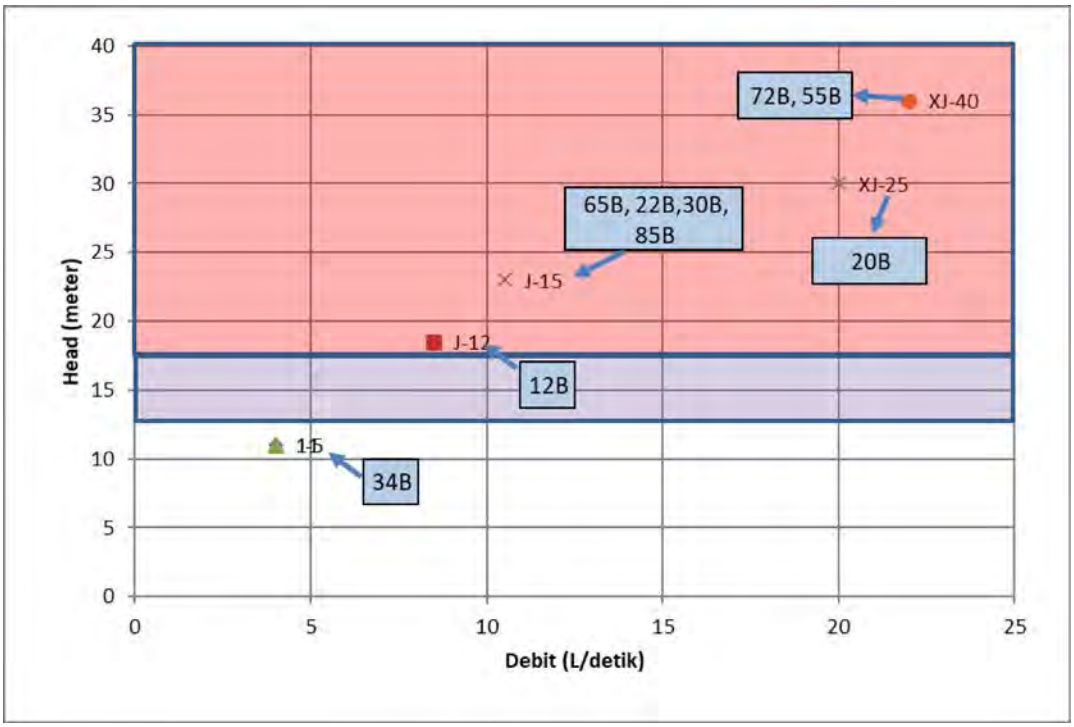
**2. *Sump* dan Pemompaan**

Penggunaan pompa di tambang terbuka adalah untuk menjaga agar kapasitas *sump* dapat selalu menahan total limpasan air (airtanah dan air permukaan) yang masuk ke dalam pit. Keseimbangan jumlah air masuk-keluar dilakukan dengan memilih pompa dengan kapasitas yang tepat. Secara teknis, pemilihan pompa dibuat berdasarkan dua faktor utama, yaitu kemampuan dorong pompa (*head*) dan jumlah air yang bisa dipompa (volume/waktu). Kapasitas *inflow* dan *head* maksimum dari masing-masing lokasi rencana pit PT HM dapat dilihat pada Tabel 5.4.

**Tabel 5.4** Kapasitas *inflow* maksimum dan *head* dari masing-masing rencana pit

| Sub-Catchment | Peak Flow Rate (m3/s) | Head (m) | Head Max (85% Efisiensi) (m) |
|---|---|---|---|
| 34B | 2.21 | 6 | 6.90 |
| 65B | 6.36 | 12 | 13.80 |
| 20B | 4.07 | 20 | 23.00 |
| 72B | 2.93 | 30 | 34.50 |
| 22B | 4.43 | 6 | 6.90 |
| 55B | 3.32 | 28 | 32.20 |
| 48B | 3.29 | 8 | 9.20 |
| 30B | 6.38 | 10 | 11.50 |
| 12B | 4.72 | 8 | 9.20 |
| 85B | 3.28 | 4 | 4.60 |

Penentuan pompa yang digunakan pada masing-masing pit dihitung berdasarkan potensi maksimum debit *inflow* dan kapasitas *head* maksimum masing-masing rencana pit setelah dikurangi efisiensi sebesar 85%. Gambar 5.3 memperlihatkan spesifikasi pompa yang umum digunakan pada tambang terbuka (contoh dalam produk Sultzer) dengan detail pada Tabel 5.5. Blok biru pada Gambar 5.3 memperlihatkan jenis pompa yang dapat digunakan pada lokasi tambang PT HM.




**Gambar 5.3** Spesifikasi pompa berdasarkan kemampuan *head* dan *discharge* (contoh dari produk Sultzer)

**Tabel 5.5** Rekomendasi spesifikasi jenis pompa (sejenis) untuk mengantisipasi aliran puncak pada tambang PT HM

| Catchment | Jenis Pompa | Discharge ($m^3/s$) | Head Pompa (m) | Inflow ($m^3/s$) | Head Max (m) | Ratio |
|---|---|---|---|---|---|---|
| 34B | J-5 | 4 | 11 | 2.21 | 6.90 | 0.55 |
| 65B | J-15 | 10.5 | 23 | 6.36 | 13.80 | 0.61 |
| 20B | XJ-25 | 20 | 30 | 4.07 | 23.00 | 0.39 |
| 72B | XJ-40 | 22 | 36 | 2.93 | 34.50 | 0.13 |
| 22B | J-15 | 10.5 | 23 | 4.43 | 6.90 | 0.42 |
| 55B | XJ-40 | 22 | 36 | 3.32 | 32.20 | 0.17 |
| 48B | J-12 | 8.5 | 18.5 | 4.72 | 9.20 | 0.56 |
| 30B | J-15 | 10.5 | 23 | 6.38 | 11.50 | 0.61 |
| 12B | J-12 | 8.5 | 18.5 | 4.72 | 9.20 | 0.56 |
| 85B | J-15 | 10.5 | 23 | 3.28 | 4.60 | 0.31 |

Infrastruktur lain yang dibutuhkan untuk penyaliran di dalam tambang adalah *sump*.. Ukuran *sump* utama harus mampu mengakomodasi jumlah air tanah dan air permukaan yang mengalir ke lubang tambang dan idealnya terletak di titik terendah level penambangan. Ukurannya disesuaikan dengan kemampuan total pemompaan yang tersedia. *Sump* pada pit PT HM berjumlah sesuai dengan *sub-catchment* pada area pertambangan. Dari *sump*, air akan dipompa terlebih dahulu ke perimeter drainase, namun tidak semua *sump* membutuhkan pompa karena tidak memiliki *head* ke lokasi perimeter drainase terdekat. Beberapa *sump* yang membutuhkan pemompaan disajikan pada Tabel 5.6.

**Tabel 5.6** Karakteristik *sub-catchment* beserta besar *head* untuk dialirkan ke perimeter

| Sub-Catchment | Peak Flow Rate ($m^3/s$) | Head (m) | Head Max (m) |
|---|---|---|---|
| 34B | 2.21 | 6 | 6.90 |
| 65B | 6.36 | 12 | 13.80 |
| 20B | 4.07 | 20 | 23.00 |
| 72B | 2.93 | 30 | 34.50 |
| 22B | 4.43 | 6 | 6.90 |
| 55B | 3.32 | 28 | 32.20 |
| 48B | 3.29 | 8 | 9.20 |
| 30B | 6.38 | 10 | 11.50 |
| 12B | 4.72 | 8 | 9.20 |
| 85B | 3.28 | 4 | 4.60 |

### 3. *Sediment Pond*

*Sediment Pond* adalah suatu penyaliran berbentuk kolam yang berfungsi sebagai kolam pengendapan semua air dari areal tambang, baik air tanah maupun air hujan dan bertujuan untuk menjernihkan air yang keluar ke perairan umum. Data ukuran butir yang digunakan pada perhitungan menggunakan hasil analisis laboratorium, yaitu ukuran butir dominan pada bagian permukaan di lokasi studi adalah partikel dengan ukuran medium *silt*. Resume perhitungan *Fall Velocity* dan luas permukaan *sediment pond* dapat dilihat pada Tabel 5.7. Perhitungan ini telah memasukkan faktor keselamatan (*factor of safety*) dengan mengalikan debit puncak sebesar 1.25 kali sesuai rekomendasi pada Kepmen 1827 tahun 2018.

**Tabel 5.7** Perhitungan *fall velocity* dan luas permukaan *sediment pond*

| Parameter | | Unit | Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 |
| Watershed area | A | ha | 120.11 | 117.75 | 62.61 | 431.9 | 229.84 |
| Peak flow (1,25 x Qp) | Qp | $m^3/s$ | 9.175 | 10.3375 | 4.7375 | 25.9 | 19.2125 |
| Discharge Rate (5% x Qp) | Q | $m^3/s$ | 0.37 | 0.41 | 0.19 | 1.04 | 0.77 |
| Particle size (medium silt) | d | m | 2.00E-05 | 2.00E-05 | 2.00E-05 | 2.00E-05 | 2.00E-05 |
| Soil particle density | pp | $kg/m^3$ | 2617 | 2617 | 2617 | 2617 | 2617 |
| Water density | pe | $kg/m^3$ | 1000 | 1000 | 1000 | 1000 | 1000 |
| Adjusment factor related to turbulence | Θ | | 1 | 1 | 1 | 1 | 1 |
| **Fall velocity** | **Vp** | **m/s** | **2.20E-04** | **2.20E-04** | **2.20E-04** | **2.20E-04** | **2.20E-04** |
| **Minimum area of sediment pond** | **As** | **$m^2$** | **1665.79** | **1876.85** | **860.13** | **4702.33** | **3488.17** |

Dengan diketahuinya luas permukaan *sediment pond* yang dibutuhkan, maka dapat diperkirakan dimensi secara keseluruhan. Untuk menjaga kestabilan dinding *sediment pond*, maka kemiringannya dijaga pada angka 1:1.5. Perkiraan dimensi untuk *Pond* 1 hingga 5 dapat dilihat pada Tabel 5.8. Dari perhitungan yang dilakukan, *sediment pond* untuk masing-masing *catchment* (*Pond* 1 hingga *Pond* 5) dibagi menjadi 3 kompartemen, dengan estimasi volume tiap kompartemen berkisar antara 598.5 $m^3$ hingga 8448 $m^3$.

**Tabel 5.8** Perhitungan jumlah dan dimensi *settling pond*

| Parameter | | Unit | Pond | | | | |
|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 |
| **Sediment Pond Dimension** | | | | | | | |
| Slope of sides | | | 1:1.5 | 1:1.5 | 1:1.5 | 1:1.5 | 1:1.5 |
| Number of sediment pond | | | 3 | 3 | 3 | 3 | 3 |
| Width at floor of sediment pond | L | m | 7 | 7 | 5 | 12 | 10 |
| Water depth during operation | P | m | 5 | 5 | 3 | 8 | 7 |
| **Width of water surface** | **W** | **m** | **22** | **22** | **14** | **36** | **31** |
| **Length of sediment pond** | **l** | **m** | **26** | **29** | **21** | **44** | **38** |
| Sediment pond volume (per compartment) | | $m^3$ | 1885 | 2102.5 | 598.5 | 8448 | 5453 |
| Total sediment pond volume | | $m^3$ | 9425 | 10512.5 | 1795.5 | 67584 | 38171 |

## 5.2.2. Rekomendasi Geoteknik

Dari hasil analisis didapatkan beberapa hal yang menjadi rekomendasi meliputi:

1. Sesuai dengan dimensi bench yang direncanakan oleh HM setinggi 3 meter, maka sudut lereng tunggal (*bench face angle*) yang direkomendasikan adalah 55°.

**Tabel 5.9** Rekomendasi Analisis Kestabilan Lereng Tunggal

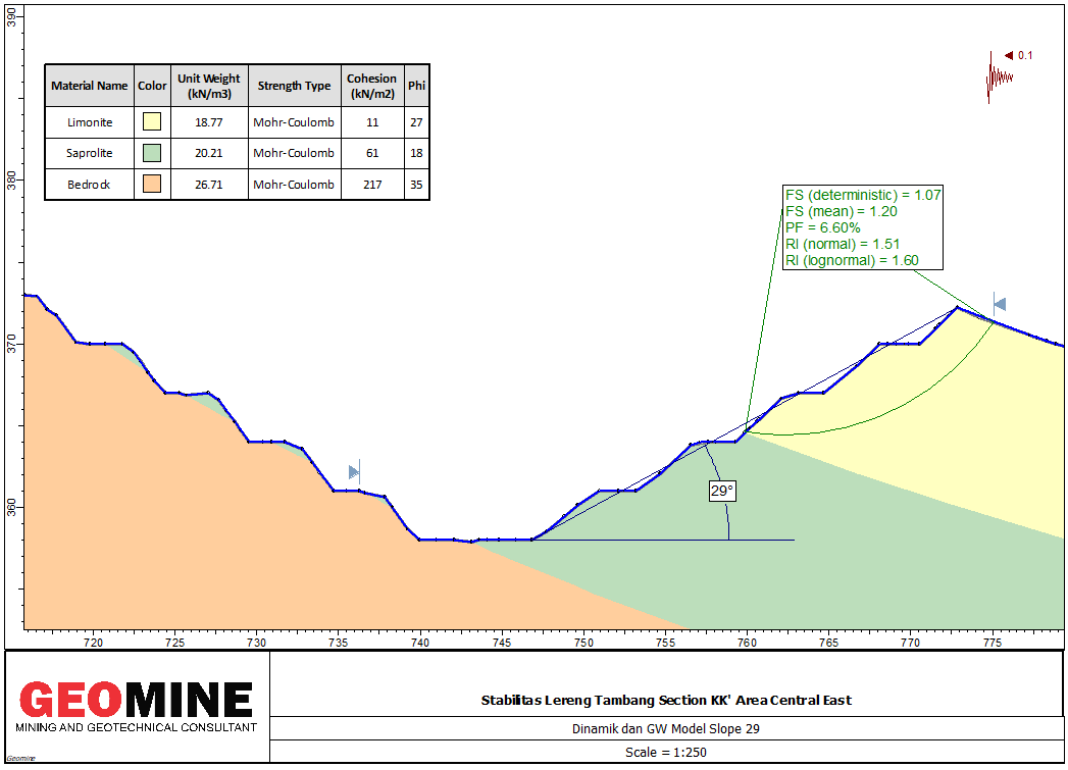
| Domain | Tinggi (m) | Sudut (°) | *Full Saturated* | | | |
|---|---|---|---|---|---|---|
| | | | FK Statik | POF Statik | FK Dinamik | POF Dinamik |
| *Limonite* | 3 | 55 | 1.46 | 0.0% | 1.28 | 0.0% |
| *Saprolite* | 3 | 55 | 6.19 | 0.0% | 4.98 | 0.0% |
| *Bedrock* | 3 | 55 | 16.76 | 0.0% | 13.45 | 0.0% |

2. Mitigasi risiko ketidakstabilan lereng Section KK'

   Analisis kestabilan lereng keseluruhan yang dilakukan terhadap Sec_KK' menunjukkan nilai FK dan PoF berada di bawah batas kriteria minimum dan menunjukkan kondisi *marginally stable.* Terdapat beberapa opsi yang direkomendasikan untuk memitigasi risiko tersebut.

*a.* Melandaikan sudut *overall slope*

Sudut *overall slope pit* harus diturunkan menjadi sekitar 29º untuk memperoleh nilai FK yang sesuai dengan ketentuan. Gambar 5.4 menunjukkan kondisi lereng setelah dilakukan pelandaian.

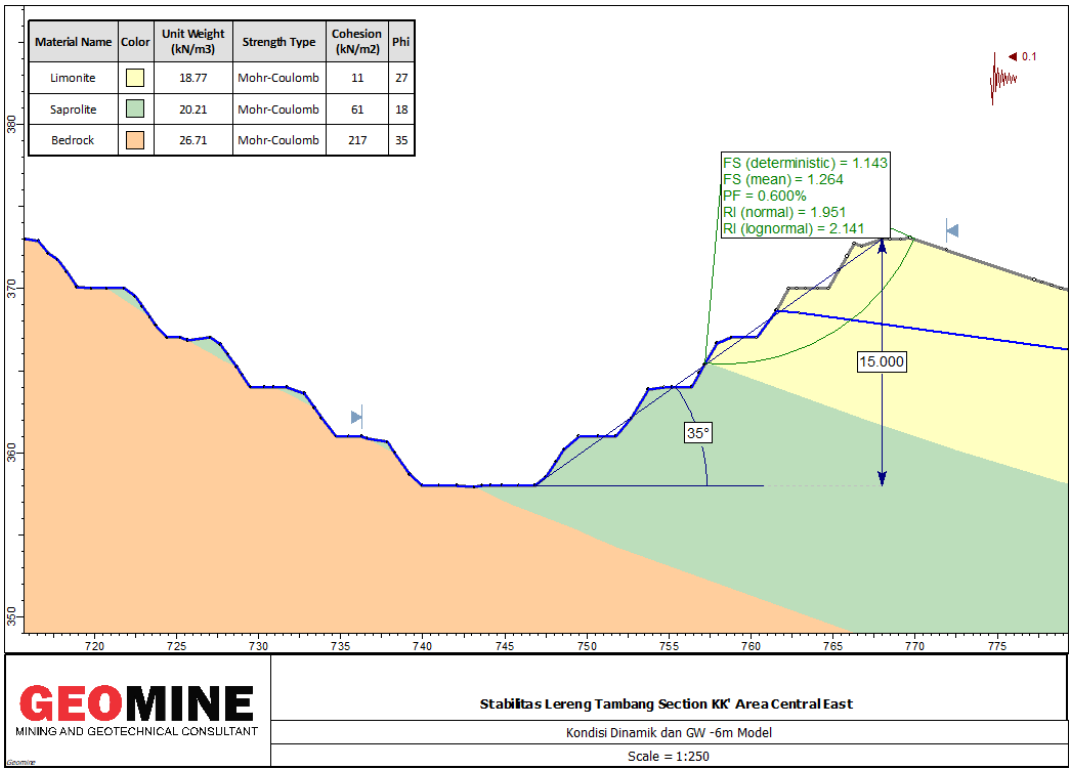



**Gambar 5.4** Hasil Analisis Kestabilan Lereng Section KK' Lereng B (*Overall Slope* 29º)

b. Menurunkan tinggi muka air tanah

Opsi mitigasi lainntya adalah menurunkan tinggi muka air tanah dengan salah satu nya dengan pemasangan *drain hole*. Gambar 5.5 menunjukkan kondisi lereng setelah dilakukan penurunan muka air tanah sedalam 6 m. Opsi lainnya adalah gabungan antara melandaikan sudut lereng dan menurunkan muka air tanah.

Opsi-opsi mitigasi ini perlu dilakukan bersamaan dengan pemantauan (monitoring) di lapangan dan disesuaikan dengan kemudahan implementasi di lapangan.




**Gambar 5.5** Hasil Analisis Kestabilan Lereng Section KK' Lereng B (GW -6m Model)

3. Sudut overall slope area waste dump harus diturunkan sekitar 2° dari kondisi aktual untuk memperoleh nilai FK yang sesuai dengan ketentuan. Sudut overall slope yang menunjukkan nilai FK aman adalah sebesar 18° atau ratio (1V : 3H). Hasil analisis menggunakan dimensi rekomendasi dapat dilihat pada Tabel 5.10.

**Tabel 5.10** Hasil Analisis Rekomendasi Kestabilan Lereng *Waste Dump*

| ***Case*** | ***Slope Geometry*** | ***Static*** | | ***Dynamic* (0.1g)** | |
|---|---|---|---|---|---|
| | ***Overall Slope* (°)** | **FoS** | **PoF** | **FoS** | **PoF** |
| Desain awal | 20 | 1.21 | 0 | 0.89 | 94.1 |
| Rekomendasi | 18 | 1.41 | 0 | 1.01 | 16.9 |

4. Dari hasil analisis kemampugalian dan kemampugaruan direkomendasikan pada material limonite dengan kekuatan batuan yang rendah dapat dilakukan free digging secara langsung, sedangkan pada material saprolite atau rocky saprolite perlu dilakukan ripping terlebih dahulu sebelum material di-digging dengan excavator.

# Lampiran A

## Field Drilling Report PT HM

**GEOMINE**
MINING AND GEOTECHNICAL CONSULTANT

## FIELD DRILLING REPORT

Client: PT-HM
Project: GEOTECH HM
Location: BETE-BETE

Coordinates: 413455
Surface RL: 9678637
Datum: 380 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-01
Start Date: 28-09-2021
End Date: 29-09-2021
Logged by: Yoga A. Permana
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S2 | CW | Top Soil | Soil, MP, Fine Sand, Dark brown | |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S2 | CW | Limonite | Limonite MP, Medium Sand, Dark bown | |
| 2,00 | 3,50 | 1,50 | 0,93 | | | S2/R1 | HW | Saprolite | Sap/Lim, Med. Sand/Boulder, Brownish green | |
| 3,50 | 5,00 | 1,50 | 0,87 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 5,00 | 6,00 | 1,00 | 0,95 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 6,00 | 7,00 | 1,00 | 0,95 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 7,00 | 8,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 8,00 | 9,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 9,00 | 10,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 10,00 | 11,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 11,00 | 12,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 12,00 | 13,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 13,00 | 14,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder Brownish green | |
| 14,00 | 15,00 | 1,00 | 1,00 | | | R1 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 15,00 | 16,00 | 1,00 | 1,00 | 0,56 | 56 | R4 | FR | Bedrock | Dunite, Boulder, Greenish grey | |
| 16,00 | 17,00 | 1,00 | 1,00 | 0,80 | 80 | R4 | FR | Bedrock | Dunite, Boulder, Dark grey | |
| | | | | | | | | | | |
| | EOH | | | | | | | | | |

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

## FORM SAMPLING

Client: PT.HM
Project: Geotech HM
Location: BETE-BETE

Coordinates: 413455 / 9675637
Surface RL: Datum: 380 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:**
Start Date: 28-09-2021
End Date: 29-09-2021
Sampling by: Yoga A. Rmawan
Checked:

**FIELD SAMPLING AND TESTING**

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 28/09/21 | Geotech | Core | 2.5" | 1.25 | 1.65 | 40 | DHG-01 (01) | Limonite, Dark brown, CW |
| | | | | 5.50 | 5.70 | 20 | DHG-01 (02) | Saprolite, Brownish green, HW |
| | | | | 7.00 | 7.20 | 20 | DHG-01 (03) | Saprolite, Brownish green, HW |
| | | | | 10.80 | 11.00 | 20 | DHG-01 (04) | Saprolite, Brownish green, HW |
| | | | | 15.30 | 15.55 | 25 | DHG-01 (05) | Dunite, Greenish grey, FR |
| | | | | 16.23 | 16.43 | 20 | DHG-01 (06) | Dunite, Dark grey, FR |
| | | | | 16.65 | 16.86 | 21 | DHG-01 (07) | Dunite, Dark grey, FR |

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**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 28/09/21 | 14.00 | 12.40 | YAR | DHG-01 |
| | 14.05 | 12.40 | YAR | DHG-01 |
| | 14.10 | 12.40 | YAR | DHG-01 |
| | | | | |
| 04/10/21 | 08.00 | 13.00 | YAR | DHG-01 |
| | 08.05 | 13.00 | YAR | DHG-01 |
| | 08.10 | 13.00 | YAR | DHG-01 |
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**GEOMINE**
MINING AND GEOTECHNICAL CONSULTANT

## FIELD DRILLING REPORT

Client: PT.HM
Project: GEOTECH HM
Location: BETE-BETE

Coordinates: 414197 / 9675839
Surface RL: Datum: 480 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-02 (Waste Dump)
Start Date: 27-09-2021
End Date: 27-09-2021
Logged by: Yoga A. Rimawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S1 | CW | Top Soil | Soil, gravel, MP, Medium Silt, Brown | Disposal Material |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S1 | CW | Top Soil | Soil, gravel, MP, Medium Silt, Brown | Disposal Material |
| 2,00 | 3,00 | 1,00 | 1,00 | | | S1 | CW | Top Soil | Soil, gravel, MP, Medium Silt, Brown | Disposal Material |
| 3,00 | 4,00 | 1,00 | 0,70 | | | S1 | CW | Limonite | Limonite, MP Medium Silt, Brown | |
| 4,00 | 5,00 | 1,00 | 0,80 | | | S1 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 5,00 | 6,00 | 1,00 | 1,00 | | | S1 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 6,00 | 7,00 | 1,00 | 0,80 | | | S1 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 7,00 | 8,00 | 1,00 | 0,80 | | | S1 / R2 | CW/HW | Limonite / Saprolite | Limonite / Saprolite Boulder, Brownish green | |
| 8,00 | 9,00 | 1,00 | 1,00 | | | R2 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 9,00 | 10,00 | 1,00 | 1,00 | | | R2 | HW | Saprolite | Saprolite, Boulder, Brownish green | |
| 10,00 | 11,00 | 1,00 | 1,00 | | | R3 | MW | Saprolite | Saprolite, Boulder, Greenish grey | |
| 11,00 | 12,00 | 1,00 | 1,00 | 0,79 | 79 | R3 | FR | Bedrock | Dunite, Boulder, Greenish grey | |
| 12,00 | 13,00 | 1,00 | 1,00 | 0,74 | 74 | R3 | FR | Bedrock | Dunite, Boulder, Greenish grey | |
| 13,00 | 14,00 | 1,00 | 1,00 | 0,68 | 68 | R3 | FR | Bedrock | Dunite, Boulder, Greenish grey | |
| | EOH | | | | | | | | | |

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

## FORM SAMPLING

Client: PT. HM
Project: GEOTECH HM
Location: BETE-BETE

Coordinates: 419147
Surface RL: 9675839
Datum: 480 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-02 (Waste Dump)
Start Date: 27-09-2021
End Date: 27-09-2021
Sampling by: Yoga A. Rimawan
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 27/09/21 | Geotech | Core | 2,5" | 3,40 | 3,80 | 40 | DHG-02(01) | Limonite, Brown, CW |
| | | | | 4,30 | 4,70 | 40 | DHG-02(02) | Limonite, Brown, CW |
| | | | | 9,10 | 9,20 | 10 | DHG-02(03) | Saprolite, Brownish green, HW |
| | | | | 9,78 | 9,88 | 10 | DHG-02(04) | Saprolite, Brownish green, HW |
| | | | | 10,27 | 10,37 | 10 | DHG-02(05) | Saprolite, Greenish grey, MW |
| | | | | 11,70 | 12,00 | 30 | DHG-02(06) | Dunite, Greenish grey, FR |
| | | | | 12,00 | 12,20 | 20 | DHG-02(07) | Dunite, Greenish grey, FR |
| | | | | 13,00 | 13,30 | 30 | DHG-02(08) | Dunite, Greenish grey, FR |

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**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 28/09/2021 | 08.00 | 3,71 | YAR | DHG-02 |
| | 08.10 | 3,71 | YAR | DHG-02 |
| | 08.20 | 3,72 | YAR | DHG-02 |
| | | | | |
| 04/10/2021 | 14.00 | 8,58 | YAR | DHG-02 |
| | 14.05 | 8,58 | YAR | DHG-02 |
| | 14.10 | 8.58 | YAR | DHG-02 |
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**GEOMINE**
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## FIELD DRILLING REPORT

Client: PT. HM
Project: GEOTECH HM
Location: BETE-BETE

Coordinates: 415011 9675627 Datum: 445 m
Surface RL:
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-03
Start Date: 22-09-2021
End Date: 22-09-2021
Logged by: Yoga A. Rmawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S1 | CW | Top Soil | Soil, HP, Clay, Reddish brown | |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S1 | CW | Top Soil | Soil, HP, Clay, Reddish brown | |
| 2,00 | 3,00 | 1,00 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Reddish brown | |
| 3,00 | 4,00 | 1,00 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Reddish brown | |
| 4,00 | 5,00 | 1,00 | 0,60 | | | S1 | CW | Limonite | Limonite, HP, Clay, Reddish brown | |
| 5,00 | 6,50 | 1,50 | 0,67 | | | S1 | CW | Limonite | Limonite, HP, Clay, Reddish brown | |
| 6.50 | 8,00 | 1.50 | 1,00 | | | S1 | CW | Limonite | Limonite, HP Clay Reddis brown | |
| 8,00 | 9,50 | 1,50 | 0,93 | | | S1 | CW | Limonite/Saprolite | Limonite/Saprolite, Clay/Boulder, Brown | |
| 9.50 | 11.00 | 1,50 | 1,00 | | | S1/S2 | CW | Saprolite | Saprolite, Boulder, Greenish brown | |
| 11,00 | 12,00 | 1,00 | 1,00 | | | R2 | HW | Saprolite | Saprolite, Boulder, Greenish brown | |
| 12,00 | 13,00 | 1,00 | 1,00 | | | R2/S2 | HW/CW | Saprolite | Saprolite, MP, Medium Silt, brown | |
| 13,00 | 14,00 | 1,00 | 1,00 | | | S2 | CW | Saprolite | Saprolite, MP Medium silt / Boulder, Brown | |
| 14,00 | 15,50 | 1,50 | 1,00 | | | S2/R2 | CW/HW | Saprolite | Saprolite, Medium silt / Boulder, Brown | |
| 15,50 | 17,00 | 1,50 | ~~0,60~~ | | | R2/S2 | HW/CW | Saprolite | Saprolite, MP Medium Silt / Boulder Brown | |
| 17,00 | 18,00 | 1,00 | 1,00 | | | R2 | HW | Saprolite | Saprolite, Boulder, Greenish Brown | |
| 18,00 | 19,00 | 1,00 | 1,00 | | | R2 | HW | Saprolite | Saprolite, Boulder, Greenish grey | |
| 19,00 | 20,00 | 1,00 | 0,60 | | | R2 | HW | Saprolite | Saprolite, Boulder, Greenish grey | |
| 20,00 | 21,00 | 1,00 | 0,55 | | | R1 | HW | Saprolite | Saprolite, Boulder, Greenish brown | |
| 21,00 | 22,00 | 1,00 | 0,85 | | | R1 | HW | Saprolite | Saprolite, Boulder, Greenish brown | |
| 22,00 | 23,00 | 1,00 | 0,50 | 0,20 | 40 | R3 | HW | Saprolite | Saprolite Boulder, Greenish grey | |
| 23,00 | 24,00 | 1,00 | 0,50 | | | R3 | HW | Saprolite | Saprolite, Boulder, Greenish grey | |
| 24,00 | 24,50 | 0,50 | 1,00 | | | R3 | MW | Saprolite | Saprolite Boulder Greenish grey | |
| 24,50 | 25,00 | 0,50 | 1,00 | | | R3 | MW | Saprolite | Saprolite, Boulder, Greenish grey | |
| 25,00 | 26,00 | 1,00 | 1,00 | | | R4 | MW | Saprolite | Saprock Boulder, Greenish grey | |
| 26,00 | 26,50 | 0,50 | 1,00 | | | R4 | SW | Saprolite | Saprock, Boulder, Greenish grey | |
| 26,50 | 27,50 | 1,00 | 1,00 | | | R4 | SW | Saprolite | Saprock, Boulder, Greenish grey | |
| 27,50 | 28,00 | 0,50 | 1,00 | | | R4 | SW | Saprolite | Saprock Boulder, Greenish grey. | |
| 28,00 | 29,00 | 1,00 | ~~0,50~~ | 0,50 | 50 | R4 | FR | Bedrock | Dunite, Boulder, Dark grey | |
| 29,00 | 29,50 | 0,50 | 1,00 | 0,20 | 52 | R4 | FR | Bedrock | Dunite, Boulder, Dark grey | |
| 29,50 | 30,00 | 0,50 | 1,00 | 0,35 | 70 | R4 | FR | Bedrock | Dunite Boulder Dark grey | |
| 30,00 | 31,00 | 1,00 | 0,50 | 0,12 | 12 | R4 | FR | Bedrock. | Dunite, Boulder, Dark grey | |
| EOH : 31,00 m | | | | | | | | | | |

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## FORM SAMPLING

Client: PT. HM
Project: GEOTECH HM
Location: BETE-BETE

Coordinates: 411501 / 9675627
Surface RL: Datum: 495 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-03
Start Date: 22-09-2021
End Date: 22-09-2021
Sampling by: Yoqo A. Rmawan
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 22/09/21 | Geotech | Core | 2.5" | 2,60 | 3,00 | 40 | DHG-03 (01) | Limonite, Reddish brown, CW |
| | | | | 6,60 | 7,00 | 40 | DHG-03 (02) | Limonite, Reddish brown, CW |
| | | | | 12,20 | 12,45 | 25 | DHG-03 (03) | Saprolite, Brown, HW |
| | | | | 13,10 | 13,35 | 25 | DHG-03 (04) | Saprolite, Brown, HW |
| | | | | 14,60 | 14,80 | 20 | DHG-03 (05) | Saprolite, Brown, HW |
| | | | | 28,30 | 2845 | 15 | DHG-03 (06) | Dunite, Dark grey, FR |
| | | | | 28,75 | 28,90 | 15 | DHG-03 (07) | Dunite, Dark grey, FR |
| | | | | 29,25 | 29,41 | 16 | DHG-03 (08) | Dunite, Dark grey, FR |
| | | | | 29,50 | 29,85 | 35 | DHG-03 (09) | Dunite, Dark grey, FR |

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**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 22/09/2021 | 08.30 | 4,82 | YAR | DHG-03 |
| | 08.35 | 4,81 | YAR | DHG-03 |
| | 0840 | 4,82 | YAR | DHG-03 |
| | | | | |
| 29/09/2021 | 08.00 | 5,07 | YAR | DHG-03 |
| | 08.05 | 5,07 | YAR | DHG-03 |
| | 08.10 | 5,07 | YAR | DHG-03 |
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**GEOMINE**
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## FIELD DRILLING REPORT

Client: PT. HM
Project: GEOTECH HM
Location: BETE-BETE SOUTH

Coordinates: 414243
Surface RL: 9674697
Datum: 423 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-09
Start Date: 25-09-2021
End Date:
Logged by:
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0.00 | 1.00 | 1.00 | 1.00 | | | S1 | CW | Top Soil | Soil, MP, Medium Silt, Dark brown | |
| 1.00 | 2.00 | 1.00 | 1.00 | | | S1 | CW | Top Soil | Soil, MP, Medium Silt, Dark brown | |
| 2.00 | 3.50 | 1.50 | 0.93 | | | S1 | CW | Limonite | Limonite, MP, Medium Silt, Dark brown | |
| 3.50 | 5.00 | 1.50 | 1.00 | | | S1 | CW | Limonite | Limonite, MP, Medium Silt, Dark brown | |
| 5.00 | 6.50 | 1.50 | 0.83 | | | S1 | CW | Limonite | Limonite, MP, Medium Silt, Dark brown | |
| 6.50 | 8.00 | 1.50 | 1.00 | | | S2 | CW | Limonite | Limonite, MP, Medium Silt, Dark brown | |
| 8.00 | 9.50 | 1.50 | 1.00 | | | S3 | CW | Limonite | Limonite, MP, Fine Sand, Dark brown | |
| 9.50 | 11.00 | 1.50 | 1.00 | | | S3 | CW | Limonite | Limonite, MP, Fine Sand, Dark brown | |
| 11.00 | 12.50 | 1.50 | 1.00 | | | S3 | CW | Limonite | Limonite, MP, Fine Sand, Brown | |
| 12.50 | 14.00 | 1.50 | 1.00 | | | S3 | CW | Limonite | Limonite, MP, Fine Sand, Brown | |
| 14.00 | 15.50 | 1.50 | 1.00 | | | S3 | CW | Limonite | Limonite MP, Medium Sand, Brown | |
| 15.50 | 17.00 | 1.50 | 1.00 | | | S3 | CW | Limonite | Limonite, MP, Medium Sand, Brown | |
| 17.00 | 18.50 | 1.50 | 1.00 | | | S3 | CW | Limonite/Saprolite | Saprolite MP, Medium Sand, Brown | |
| 18.50 | 20.00 | 1.50 | 1.00 | | | R3 | HW | Saprolite | Saprolite Rock, Boulder, Greenish dark grey | |
| 20.00 | 20.50 | 0.50 | 0.80 | | | R3 | HW | Saprolite | Saprolite Rock, Gravel-Boulder, Dark grey | |
| 20.50 | 21.00 | 0.50 | 0.80 | | | R3 | HW | Saprolite | Saprolite Rock, Gravel-Boulder, Dark grey | |
| 21.00 | 22.00 | 1.00 | 0.80 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 22.00 | 23.00 | 1.00 | 0.60 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 23.00 | 24.00 | 1.00 | 0.80 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 24.00 | 25.00 | 1.00 | 1.00 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 25.00 | 26.50 | 1.50 | 1.00 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 26.50 | 27.50 | 1.00 | 1.00 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 27.50 | 28.00 | 0.50 | 1.00 | | | R3 | MW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 28.00 | 29.00 | 1.00 | 1.00 | | | R4 | MW/SW | Saprolite | Saprolite Rock, Gravel - Boulder, Dark grey | |
| 29.00 | 30.00 | 1.00 | 0.80 | | | R4 | MW/SW | Saprolite | Saprolite Rock, Boulder, Dark grey | |
| 30.00 | 31.00 | 1.00 | 1.00 | | | R4 | MW/SW | Saprolite/Bedrock | Saprolite Rock, Boulder, Dark grey | |
| 31.00 | 32.00 | 1.00 | 1.00 | | | R4 | FR | Bedrock | Dunite, Boulder, Dark grey | |
| 32.00 | 33.00 | 1.00 | 1.00 | | | R4 | FR | Bedrock | Dunite, Boulder, Dark grey | |
| 33.00 | 34.00 | 1.00 | 0.50 | | | R4 | FR | Bedrock | Dunite, Boulder, Dark grey | |
| 34.00 | 35.00 | 1.00 | 0.50 | | | R4 | FR | Bedrock | Dunite Boulder Dark grey | |
| | EOH | | | | | | | | | |

GEOMINE
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## FORM SAMPLING

Client: PT.HM
Project: GEOTECH HM
Location: BETE-BETE SOUTH

Coordinates: 419243
Surface RL: 9674697
Datum:
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:**
Start Date: 25-09-2021
End Date:
Sampling by: Yoga A. Rimawan
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 25/09/21 | Geotech | Core | 2.5" | 5,00 | 5,40 | 40 | DHG-09(01) | Limonite, Dark brown, CW |
| | | | | 8,25 | 8,65 | 40 | DHG-09(02) | Limonite, Dark brown, CW |
| | | | | 17.00 | 17.25 | 25 | DHG-09(03) | Saprolite, Brown, CW |
| | | | | 18.60 | 18.20 | 20 | DHG-09(04) | Saprolite, Greenish dark grey, HW |
| | | | | 24.00 | 24.25 | 25 | DHG-09(05) | Saprolite, Dark grey, MW |
| 26/09/21 | Geotech | Core | 2.5" | 31.00 | 31.10 | 10 | DHG-09(06) | Dunite, Dark grey, FR |
| | | | | 32.25 | 32.35 | 10 | DHG-09(07) | Dunite, Dark grey, FR |
| | | | | 33,00 | 33,10 | 10 | DHG-09(08) | Dunite, Dark grey, FR |
| | | | | 34.20 | 34.32 | 12 | DHG-09(09) | Dunite, Dark grey, FR |

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**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 26/09/2021 | 09.00 | 6,23 | YAR | DHG-04 |
| | 09.10 | 6.24 | YAR | DHG-04 |
| | 09.20 | 6.24 | YAR | DHG-04 |
| | | | | |
| 03/10/2021 | 08.00 | 27.00 | YAR | DHG-04 |
| | 08.05 | 27.00 | YAR | DHG-04 |
| | 08.10 | 27.00 | YAR | DHG-04 |
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## FIELD DRILLING REPORT

Client: PT. HM
Project: GEOTECH HM
Location: BETE-BETE SOUTH

Coordinates: 415969
Surface RL: 9679988
Datum: 452 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-65
Start Date: 19-09-2021
End Date: 21-09-2021
Logged by: Yoga A. Rimawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S1 | CW | Disposal | Disposal, HP, Clay, Brown | |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S1 | CW | Disposal | Disposal HP Clay Brown | |
| 2,00 | 3,50 | 1,50 | 0,80 | | | S1 | CW | top Soil | Top Soil, HP, Clay, Brown | Root materials |
| 3,50 | 5,00 | 1,50 | 0,80 | | | S1 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 5,00 | 6,50 | 1,50 | 0,33 | | | S1 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 6,50 | 7,50 | 1,00 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 7,50 | 9,00 | 1,50 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Peddish Brown | |
| 9,00 | 10,50 | 1,50 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Peddish Brown | |
| 10,50 | 11,00 | 0,50 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Peddish Brown | |
| 11,00 | 12,50 | 1,50 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Peddish Brown | |
| 12,50 | 14,00 | 1,50 | 0,80 | | | S1 | CW | Limonite | Limonite HP Clay Brown | |
| 14,00 | 15,50 | 1,50 | 0,80 | | | S2 | CW/HW | Saprolite | Saprolite, Clay, Brown | |
| 15,50 | 17,00 | 1,50 | 1,00 | | | R2 | HW | Saprolite | Saprolite, Boulder, Greenish grey | |
| 17,00 | 18,00 | 1,00 | 1,00 | 0,20 | 20 | R2 | HW | Saprolite | Saprolite, Boulder, Greenish dark grey | |
| 18,00 | 19,00 | 1,00 | 0,69 | 0,18 | 18 | R2 | HW | Saprolite | Saprolite, Boulder, Greenish dark grey | |
| 19,00 | 20,00 | 1,00 | 0,70 | | | R2 | HW | Saprolite | Saprolite, Boulder, Greenish dark grey | |
| 20,00 | 20,50 | 0,50 | 1,00 | | | R4 | FR | Bedrock | Bedrock, Boulder, Dark grey | |
| 20,50 | 21,50 | 1,00 | 1,00 | 0,48 | 48 | R5 | FR | Bedrock | Bedrock, Boulder, Dark grey / black | |
| 21,50 | 22,00 | 0,50 | 1,00 | | | R5 | FR | Bedrock | Bedrock, Boulder, Dark grey / black | |
| 22,00 | 22,50 | 0,50 | 0,60 | | | R5 | FR | Bedrock | Dunrite, Boulder, Dark grey / black | |
| 22,50 | 23,00 | 0,50 | 1,00 | | | R5 | FR | Bedrock | Dunrite, Boulder, Dark grey / black | |

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## FORM SAMPLING

Client: PT. HM
Project: Geotech HM
Location: BETE-BETE SOUTH

Coordinates: 415969 / 9672988
Surface RL: Datum: 452 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-05
Start Date: 19-09-2021
End Date: 21-09-2021
Sampling by: Yoga A. Rimawan
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 19/09/21 | Geotech | Core | 2.5" | 8,45 | 8,85 | 40 | DHG-05 (01) | Limonite, Reddish brown, CW |
| | | | | 11,60 | 12.00 | 40 | DHG-05 (02) | Limonite, Reddish brown, CW |
| | | | | 14,75 | 14,95 | 20 | DHG-05 (03) | Saprolite, Brown, CW |
| | | | | 15,80 | 16.00 | 20 | DHG-05 (04) | Saprolite, Greenish brown, HW |
| | | | | 17,50 | 17.70 | 20 | DHG-05 (05) | Saprolite, Greenish brown, HW |
| 21/09/21 | Geotech | Core | 2,5" | 20,10 | 20,27 | 17 | DHG-05(06) | Dunite, Dark grey / black, FR |
| | | | | 20,70 | 20,87 | 17 | DHG-05(07) | Dunite, Dark grey / black, FR |
| | | | | 21,20 | 21,35 | 15 | DHG-05(08) | Dunite, Dark grey / black, FR |
| | | | | 21,50 | 21,64 | 14 | DHG-05(09) | Dunite, Dark grey / black, FR |

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MINING AND GEOTECHNICAL CONSULTANT

**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 21/09/2021 | 14.35 | 7,15 | YAR | DHG-05 |
| | 14.40 | 7,15 | YAR | DHG-05 |
| | 14.50 | 7,15 | YAR | DHG-05 |
| | | | | |
| 02/10/2021 | 14.00 | 18.70 | YAR | DHG-05 |
| | 14.05 | 18.70 | YAR | DHG-05 |
| | 14.10 | 18,70 | YAR | DHG-05 |
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**GEOMINE**
MINING AND GEOTECHNICAL CONSULTANT

## FIELD DRILLING REPORT

Client: PT. HML
Project: GEOTECH HML
Location: CENTRAL WEST

Coordinates: 415447 9673487 Datum: 332 m
Surface RL:
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG -06
Start Date: 15-09-2021
End Date: 16-09-2021
Logged by: Yoga A. Rimawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S1 | CW | Top Soil | Soil, HP, Clay, Brown | |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 2,00 | 3,50 | 1,50 | 0.67 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 3.50 | 5,00 | 1.50 | 0.63 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 5,00 | 6.00 | 1,00 | 1,00 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 6.00 | 7.00 | 1,00 | 0.90 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 7,00 | 8.00 | 1,00 | 1,00 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 8.00 | 9.00 | 1.00 | 1,00 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 9.00 | 10.00 | 1.00 | 1,00 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 10.00 | 11.00 | 1.00 | 1.00 | | | S2 | CW | Limonite | Limonite MP Medium Silt Brown | |
| 11.00 | 12.50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 12.50 | 14.00 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 14.00 | 15.50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 15.50 | 17.00 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 17.00 | 18.50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 18.50 | 20.00 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 20.00 | 21.50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Medium Silt, Brown | |
| 21.50 | 23.00 | 1.50 | 1,00 | | | S3 | CW | Limonite / Saprolite | Saprolite, MP, Medium Silt, Brown | |
| 23.00 | 24.00 | 1.00 | 0.80 | | | S3/R2 | CW/HW | Saprolite | Rocky Saprolite, Boulder, Brown | |
| 24.00 | 25.00 | 1.00 | 0.80 | | | R2 | HW | Saprolite | Rocky Saprolite, Boulder, Brown | |
| 25.00 | 26.00 | 1.00 | 0.80 | | | R3 | HW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 26.00 | 26.40 | 0.40 | 1,00 | | | S3/R3 | CW/HW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 26.40 | 27.50 | 1,10 | 1,00 | | | S3/R3 | CW/HW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 27.50 | 29.00. | 1.50 | 0.73 | | | R3 | MW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 29.00 | 30.00 | 1.00 | 1.00 | 0,22 | 22 | R3 | SW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 30.00 | 31,00 | 1,00 | 1.00 | 0,26 | 26 | R4 | SW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 31,00 | 32.00 | 1.00 | 1,00 | 0,28 | 28 | R4 | SW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 32.00 | 33.00 | 1.00 | 1,00 | | | R4 | SW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 33.00 | 34.00 | 1,00 | 1,00 | 0.13 | 13 | R4 | SW | Saprolite | Saprolite Rock, Boulder, Greenish Brown | |
| 34.00 | 35.00 | 1.00 | 1.00 | 0.14 | 14 | R4 | SW/FR | | Saprolite Rock, Boulder, Greenish Grey | |

**GEOMINE**
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## FIELD DRILLING REPORT

Client: PT HM
Project: GEOTECH HM
Location: CENTRAL WEST

Coordinates: 415497 / 9673987
Surface RL:
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°
Datum:

**Report of Borehole:** DHG-06
Start Date: 15-09-2021
End Date: 16-09-2021
Logged by: Yoga A. Rmawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 35.00 | 36.50 | 1.50 | 1.00 | 0.60 | 40 | R1 | FR | Bedrock | Dunite Boulder Greenish grey | |
| 36.50 | 38.00 | 1.50 | 1.00 | 0.33 | 22 | R1 | FR | Bedrock | Dunite Boulder Greenish grey | |
| 38.00 | 39.00 | 1.00 | 1.00 | 0.21 | 21 | R1 | FR | Bedrock | Dunite Boulder Greenish grey | |

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## FORM SAMPLING

Client: PT. HM
Project: GEOTECH HM
Location: CENTRAL WEST

Coordinates: 415447
Surface RL: 9673987 Datum:
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-06
Start Date: 15-09-2021
End Date: 16-09-2021
Sampling by: Yoga A. Pamawan
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 15/09/21 | Geotech | Core | 2.5" | 5.20 | 5.60 | 40 | DHG-06(01) | Limonite, Brown CW |
| 15/09/21 | | Core | 2.5" | 7.00 | 7.40 | 40 | DHG-06(02) | Limonite, Brown CW |
| 15/09/21 | | Core | 2.5" | 25.60 | 25.80 | 20 | DHG-06(03) | Saprolite, Brown, MW |
| 15/09/21 | | Core | 2.5" | 29.70 | 29.94 | 24 | DHG-06(04) | Saprolite, Greenish Brown SW |
| 15/09/21 | | Core | 2.5" | 31.56 | 31.74 | 18 | DHG-06(05) | Saprolite Greenish Brown SW |
| 16/09/21 | " | Core | 2.5" | 35.50 | 35.70 | 20 | DHG-06(06) | Dunite, Greenish grey, SW/FR |
| 16/09/21 | " | Core | 2.5" | 36.75 | 36.90 | 15 | DHG-06(07) | Dunite, Greenish grey, FR |
| 16/09/21 | " | Core | 2.5" | 37.50 | 37.68 | 18 | DHG-06(08) | Dunite, Greenish grey, FR |
| 16/09/21 | " | Core | 2.5" | 38.79 | 39.00 | 21 | DHG-06(09) | Dunite, Greenish grey, FR |

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**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 17/09/2021 | 10.00 | 20,02 m | YAR | DHG-06 |
| | 10.05 | 20,02 m | YAR | DHG-06 |
| | 10.10 | 20,02 | YAR | DHG-06 |
| | | | | |
| 02/10/2021 | 10.00 | 22.80 | YAR | DHG-06 |
| | 10,05 | 22,80 | YAR | DHG-06 |
| | 10.10 | 22,80 | YAR | DHG-06 |
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## FIELD DRILLING REPORT

GEOMINE
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Client: PT. HM GEOTECH
Project: GEOTECH HM
Location: CENTRAL EAST

Coordinates: 416755
Surface RL: 9674354
Datum: 417 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-07
Start Date: 11-09-2021
End Date: 12-09-2021
Logged by: Yoga A. Rimawan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0.00 | 1,00 | 1,00 | 1,00 | | | S1 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 1,00 | 2,50 | 1.50 | 0,93 | | | S1 | CW | Limonite | Limonite, HP, clay, Brown | |
| 2.50 | 4,00 | 1.50 | 0.87 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 4,00 | 5.50 | 1,50 | 0,47 | | | S2 | CW | Limonite | Limonite, HP, Clay, Brown | |
| 5,50 | 6.50 | 1.00 | 0,84 | | | S2 | CW | Saprolite | Saprolite, MP, Coarse Sand, Brown | |
| 6,50 | 7.50 | 1,00 | 0.30 | | | S2 | HW | Saprolite | Rocky Saprolite, Coarse Sand, LP, Brown | |
| 7.50 | 8.50 | 1.00 | 0,70 | | | R2 | MW | Saprolite | Saprock, Greenish grey, Boulder | |
| 8.50 | 10.00 | 1.50 | 0,67 | | | R2 | MW | Saprolite | Saprock, Boulder, Greenish grey | |
| 10.00 | 11.00 | 1,00 | 1,00 | | | R2 | MW | Saprolite | Saprock, Boulder, Greenish grey | |
| 11,00 | 12.50 | 1,50 | 1,00 | 1.00 | 67 | R4 | FR | Bedrock | Bedrock Dunite, Boulder, Grey | |
| 12.50 | 13.70 | 1,20 | 1,00 | 0,45 | 45 | R4 | FR | Bedrock | Dunite, Boulder, Grey | |
| 13,70 | 14.65 | 1.00 | 0,95 | 0,21 | 21 | R4 | FR | Bedrock | Dunite, Boulder, Grey | |
| 14.65 | 15.00 | 0.35 | 1,00 | | | R4 | FR | Bedrock | Dunite, Boulder, Grey | |
| EOH = 15.00 m | | | | | | | | | | |

## FORM SAMPLING

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

Client: PT HM
Project: Geotech HM
Location: CENTRAL EAST

Coordinates: 416755
9674354
Surface RL: Datum: 419 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-07
Start Date: 11-09-2021
End Date: 12-09-2021
Sampling by: Yogi A. Ramawan
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 11/09/21 | Geotech | core | 2,5" | 2,60 | 3,00 | 40 | DHG-07 (01) | Limonite, Brown, CW |
| | Geotech | core | 2,5" | 3,60 | 4,00 | 40 | DHG-07 (02) | Limonite, Brown, CW |
| | Geotech | core | 2,5" | 6,50 | 6,70 | 20 | DHG-07 (03) | Saprolite, Brown, CW |
| | Geotech | Core | 2,5" | 9,50 | 9,85 | 35 | DHG07 (04) | Saprolite, Greenish grey, MW |
| 12/09/21 | Geotech | Core | 2,5" | 11,00 | 11,20 | 20 | DHG07 (05) | Dunite, Grey, FR |
| | Geotech | core | 2,5" | 12,30 | 12,50 | 20 | DHG-07 (06) | Dunite, Grey, FR |
| | Geotech | core | 2,5" | 13,50 | 13,70 | 20 | DHG-07 (07) | Dunite, Grey, FR |

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**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 13/09/2021 | 10.00 | 10,19 | YAR | DHG-07 |
| | 10.10 | 10,19 | YAR | DHG-07 |
| | 10.20 | 10,20 | YAR | DHG-07 |
| | | | | |
| 04/10/2021 | 08.00 | 14.20 | YAR | DHG-07 |
| | 08.05 | 14.20 | YAR | DHG-07 |
| | 08.10 | 14.20 | YAR | DHG-07 |
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## FIELD DRILLING REPORT

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

Client: PT HM
Project: GEOTECH HM
Location: CENTRAL EAST

Coordinates: 417317
Surface RL: 9673539
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

Datum: 36 l m

**Report of Borehole:** DHG - 08
Start Date: 08-09-2021
End Date: 11-09-2021
Logged by: Yoga A. Rinaldwan
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S1 | CW | LM | Limonite, HP Clay, Reddish brown | |
| 1,00 | 2,00 | 1,00 | 1,00 | | | S1 | CW | LM | Limonite HP Clay, Reddish brown | |
| 2,00 | 3,50 | 1,50 | 1,00 | | | S1 | CW | LM | Limonite HP Clay, Reddish brown | |
| 3,50 | 5,00 | 1,50 | 0,67 | | | S1 | CW | LM | Limonite MP Med. Silt Reddish brown | |
| 5,00 | 6,50 | 1,50 | 0,33 | | | S1 | CW | LM | Limonite, MP Med. Silt, Brown | |
| 6,50 | 8,00 | 1,50 | 1,00 | | | S1 | CW | LM | Limonite, MP Med. Silt Brown | |
| 8,00 | 9,00 | 1,00 | 1,00 | | | S1 | CW | LM | Limonite, MP Med. Silt Brown | |
| 9,00 | 9,80 | 0,80 | 0,86 | | | R4 | SW | SP/BR | Saprock, Boulder, greenish grey | |
| 9,80 | 10,10 | 0,30 | 0,27 | | | R4 | SW | SP/BR | Saprock, Boulder, Greenish grey | |
| 10,10 | 10,40 | 0,30 | 0,90 | 0,12 | 40 | R4 | SW | SP/BR | Saprock Boulder, Greenish grey | |
| 10,40 | 11,00 | 0,60 | 0,88 | 0,10 | 17 | R4 | SW | SP/BR | Saprock, Boulder, Greenish grey | |
| 11,00 | 11,50 | 0,50 | 1,00 | | | R4 | SW | SP/BR | Saprock, Boulder, Greenish grey | |
| 11,50 | 12,00 | 0,50 | 1,00 | | | R4 | SW | SP/BR | Saprock, Boulder Greenish grey | |
| 12,00 | 13,00 | 1,00 | 0,50 | | | S3 | HW | SP | Rocky Saprolite, Coarse sand, Light brown | |
| 13,00 | 14,00 | 1,00 | 0,60 | 0,11 | 11 | R2 | HW | SP | Saprok, Boulder, Greenish brown | |
| 14,00 | 14,10 | 0,10 | 1,00 | | | R2 | HW | SP | Saprock, Boulder Greenish brown | |
| 14,10 | 15,00 | 0,90 | 0,67 | | | R4 | SW | SP/BR | Saprock, Boulder, Greenish grey | |
| 15,00 | 16,00 | 1,00 | 0,80 | 0,22 | 22 | R2 | MW | SP/BR | Saprock Boulder, Greenish brown | |
| 16,00 | 17,00 | 1,00 | 0,70 | 0,25 | 25 | R4 | FR | BR | Quartz, Boulder, Dark grey | |
| 17,00 | 17,50 | 0,50 | 1,00 | 0,30 | 60 | R4 | FR | BR | Quartz, Boulder, Dark grey | |
| 17,50 | 18,00 | 0,50 | 1,00 | | | R4 | FR | BR | Quartz, Boulder, Dark grey | |
| 18,00 | 19,00 | 1,00 | 0,95 | 0,17 | 17 | R4 | FR | BR | Quartz, Boulder, Dark grey | |
| 19,00 | 20,00 | 1,00 | 0,87 | 0,87 | 87 | R4 | FR | BR | Quartz, Boulder, Dark grey | |
| EOH | | | | | | | | | | |

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

## FORM SAMPLING

Client: PT HM
Project: GEOTECH HM
Location: CENTRAL EAST

Coordinates: 417817
Surface RL: 9673639 Datum: 361 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-08
Start Date: 08-09-2021
End Date: 11-09-2021
Sampling by: Yoga A. Prawoto
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 08/09/21 | Geotech | Core | 2.5" | 2.60 | 3.00 | 0.40 | DHG-08 (01) | Limonite Reddish brown, CW |
| 08/09/21 | Geotech | Core | 2.5" | 4.00 | 4.40 | 0.40 | DHG-08 (02) | Limonite Reddish brown, CW |
| 10/09/21 | Geotech | Core | 2.5" | 17.30 | 17.50 | 0.20 | DHG-08 (03) | Dunite, Greenish grey FR |
| 11/09/21 | Geotech | Core | 2.5" | 19.15 | 19.52 | 0.37 | DHG-08 (04) | Dunite, Greenish grey, FR |
| 11/09/21 | Geotech | Core | 2.5" | 19.65 | 19.87 | 0.32 | DHG-08 (05) | Dunite, Greenish grey, FR |

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MINING AND GEOTECHNICAL CONSULTANT

**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 09/09/2021 | 10.00 | 18.10 | YAR | DHG-08 |
| | 10.10 | 18.11 | YAR | DHG-08 |
| | 10.15 | 18.11 | YAR | DHG-08 |
| | | | | |
| 04/10/2021 | 11.00 | 19.20 | YAR | DHG-08 |
| | 11.05 | 19.20 | YAR | DHG-08 |
| | 11.10 | 19.20 | YAR | DHG-08 |
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## FIELD DRILLING REPORT

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

Client: PT. HM
Project: GEOTECH HM
Location: CENTRAL EAST

Coordinates: 418482,838 / 9673633,23
Surface RL:
Datum: 416 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-09
Start Date: 06-09-2021
End Date: 08-09-2021
Logged by: YOGA A. PIMAWAN
Checked:

| CORE RUN METERAGE | | | | | | FIELD MATERIAL DESCRIPTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH FROM (m) | DEPTH TO (m) | RUN LENTH (M) | CORE RECOVERY (m) | SUMSTICK > 0.1m | RQD (%) | INTACT ROCK STRENGTH | WEATHERING | TYPE OF MATERIAL (Top Soil/ Limonite/ Saprolite/Bedrock) | SOIL/ROCK MATERIAL DESCRIPTION (e.g. Soil or Rock Name, Plasticity, Grain Size, Colour) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| 0,00 | 1,00 | 1,00 | 1,00 | | | S2 | CW | Limonite | Limonite, MP, Clay, Dark brown | |
| 1,00 | 2,50 | 1,50 | 0,86 | | | S2 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 2,50 | 3,50 | 1,00 | 0,80 | | | S2 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 3,50 | 4,50 | 1,00 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 4,50 | 5,00 | 0,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 5,00 | 6,50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 6,50 | 8,00 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 8,00 | 9,50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 9,50 | 11,00 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 11,00 | 12,50 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 12,50 | 14,00 | 1,50 | 1,00 | | | S3 | CW | Limonite | Limonite, MP, Med. Silt, brown | |
| 14,00 | 14,80 | 0,80 | 1,00 | | | S3 | CW | Saprolite | Saprolite, LP, Fine Sand, Reddish brown | |
| 14,80 | 16,13 | 1,33 | 0,23 | | | R0 | HW | Rocky Saprolite | Saprolite, reddish brown, boulder | |
| 16,13 | 17,00 | 0,87 | 1,00 | | | S3 | CW | Saprolite | Saprolite LP brown, coarse sand | |
| 17,00 | 18,50 | 1,50 | 0,92 | | | S5 | CW | Rocky Saprolite | Saprolite LP, Light brown, Coarse sand | |
| 18,50 | 20,00 | 1,50 | 0,87 | | | S5 | CW | Rocky Saprolite | Saprolite LP, Light brown, Coarse sand | |
| 20,00 | 21,50 | 1,50 | 0,67 | | | R0 | HW | Rocky Saprolite | Saprolite, Boulder, brown | |
| 21,50 | 22,00 | 0,50 | 0,60 | 0,10 | 20 | R4 | SW | Rocky Saprolite | Saprolite, Boulder, greenish grey | |
| 22,00 | 23,00 | 1,00 | 0,70 | 0,16 | 16 | S3/R3 | HW/SW | Rocky Saprolite | Saprolite, LP light brown, boulder | |
| 23,00 | 24,00 | 1,00 | 1,00 | | | R1 | SW | Rocky Saprolite | Saprolite, greenish dark grey, boulder | |
| 24,00 | 25,00 | 1,00 | 0,90 | 0,49 | 49 | R1 | SW | Rocky Saprolite | Saprolite, boulder greenish dark grey | |
| 25,00 | 26,00 | 1,00 | 0,80 | 0,28 | 28 | R1 | SW | Rocky Saprolite | Saprolite, boulder greenish dark grey | |
| 26,00 | 26,50 | 0,50 | 1,00 | | | R1 | SW | Rocky Saprolite | Saprolite, boulder greenish dark grey | |
| 26,50 | 27,00 | 0,50 | 1,00 | | | R1 | SW | Saprock | Saprolite, boulder, greenish dark grey | |
| 27,00 | 28,00 | 1,00 | 1,00 | 0,44 | 44 | R3 | SW/FR | Saprock | Saprolite, boulder, greenish dark grey | |
| 28,00 | 28,50 | 0,50 | 1,00 | 0,20 | 48 | R3 | SW/FR | Saprock / Bed rock | Saprolite, boulder, greenish dark grey | |
| 28,50 | 29,00 | 0,50 | 1,00 | 0,50 | 100 | R3 | FR | Saprock / Bed rock | Diorite, boulder, brown | |
| 29,00 | 29,50 | 0,50 | 1,00 | 0,50 | 100 | R3 | FR | Bed rock | Diorite, boulder, brown | |
| 29,50 | 30,00 | 0,50 | 1,00 | 0,36 | 72 | R3 | FR | Bed rock | Diorite, boulder, brown | |
| EOH | | | | | | | | | | |

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

## FORM SAMPLING

Client: PT. HM
Project: GEOTECH HM
Location: CENTRAL EAST

Coordinates: 418 482, 338
Surface RL: 9647633, 23 Datum: 416 m
Drilling Method: TRIPLE TUBE FULL CORING
Inclination: 90°

**Report of Borehole:** DHG-09
Start Date: 06-09-2021
End Date: 08-09-2021
Sampling by: YOGA A. PRAWAN
Checked:

### FIELD SAMPLING AND TESTING

| Date | Project | Sample Type (Core/Bulk) | Hole Diameter | Depth | | Interval | Sample Number | Sample Description |
|---|---|---|---|---|---|---|---|---|
| | | | | From | To | | | Field Assessment of Recovered Sample (e.g. Soil or Rock Type, Colour, Weathering) |
| 06/09/21 | Geotech | CORE | 2.5" | 2,70 | 3,10 | 40 | DHG-09 (01) | Limonite brown |
| " | Geotech | CORE | 2,5" | 3,00 | 3,40 | 40 | DHG-09 (02) | Limonite brown |
| " | Geotech | CORE | 2,5" | 14.10 | 14.31 | 21 | DHG-09 (03) | Saprolite, light brown |
| " | Geotech | CORE | 2,5" | 16.27 | 16.48 | 21 | DHG-09 (04) | Saprolite, light brown |
| " | Geotech | CORE | 2,5" | 18,30 | 18.50 | 20 | DHG-09 (05) | Saprolite light brown |
| " | Geotech | CORE | 2,5" | 28,55 | 28,76 | 21 | DHG-09 (06) | Dunite, brown |
| 08/09/21 | Geotech | CORE | 2,5" | 29.30 | 29.52 | 22 | DHG-09 (07) | Dunite, brown |
| " | Geotech | CORE | 2,5" | 29.77 | 30.00 | 23 | DHG-09 (08) | Dunite, brown |

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Groundwater Level Measurement Form**

| Date<br>Tanggal | Time<br>Jam | GW-Level Depth (mbgs)<br>Kedalaman muka airtanah (mbgs) | Personel<br>Personel | Remarks<br>Keterangan |
|---|---|---|---|---|
| 09/09/2021 | 10.00 | 19.20 m | YAR | DHG-09 |
| | 10,05 | 19.21 m | YAR | DHG-09 |
| | 10,10 | 19.20 m | YAR | DHG-09 |
| | | | | |
| 01/10/2021 | 14.00 | 23.20 | YAR | DHG-09 |
| | 14.05 | 23.20 | YAR | DHG-09 |
| | 14.10 | 23.20 | YAR | DHG-09 |
| | | | | |
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| | | | | |

# Lampiran B

## Foto Core

# Foto Core DHG-01







HOLE ID :
DHG-01
BOX :
5
DEPTH FROM :
15,00 m
DEPTH TO :
17.00 m
EOH :
17,00 m
RIG/GEOLOGIST
28-29/09/2021
04/YAR
Sample DHG-01 (05)

# Foto Core DHG-02






# Foto Core DHG-03







HOLE ID :
DHG-03
BOX :
5-7
DEPTH FROM :
17,00 m
DEPTH TO :
31,00 m
EOH :
31.00 m
RIG/GEOLOGIST
04/YAR

# Foto Core DHG-04




4-6
DEPTH FROM :
12.00 m
25.00 m
EOH :
35.00m
RIG/GEOLOGIST
04/YAR
25-26/09/2021
0
20
40
60
80
90
70
50
30


HOLE ID :
DHG-04
BOX :
7-8
DEPTH FROM :
25,00 m
DEPTH TO :
31,00 m
EOH :
35,00m
RIG/GEOLOGIST
25-26/09/2021
04/YAR


HOLE ID :
DHG-04
BOX :
9
DEPTH FROM :
31,00 m
DEPTH TO :
35,00 m
EOH :
35,00m
RIG/GEOLOGIST
25-26/09/2021
04/YAR

## Foto Core DHG-05







HOLE ID :
DHG-05
BOX :
4-5
DEPTH FROM :
12.70 m
DEPTH TO :
20.00 m
EOH :
23.00 m
RIG/GEOLOGIST
04/YAR


HOLE ID :
DHG-05
BOX :
6
DEPTH FROM :
20.00 m
DEPTH TO :
23.00 m
EOH :
23.00 m
RIG/GEOLOGIST
04/YAR

## Foto Core DHG-06







HOLE ID :
DHG-06
BOX :
5-6
DEPTH FROM :
16.00 m
DEPTH TO :
24,20 m
EOH :
39.00 m
RIG/GEOLOGIST
04/YAR


HOLE ID :
DHG-06
BOX :
7
DEPTH FROM :
24,20m
DEPTH TO :
29,30 m
EOH :
39.00 m
RIG/GEOLOGIST
04/YAR


HOLE ID :
DHG-06
BOX :
8-9
DEPTH FROM :
29.30 m
DEPTH TO :
35.00 m
EOH :
39.00 m
RIG/GEOLOGIST
04/YAR


HOLE ID :
DHG-06
BOX :
10
DEPTH FROM :
35.00 m
DEPTH TO :
39.00 m
EOH :
39.00 m
RIG/GEOLOGIST
04/YAR

## Foto Core DHG-07




HOLE ID :
DHG-07
BOX :
4
DEPTH FROM :
11,00 m
DEPTH TO :
15,00 m
EOH :
15.00 m
RIG/GEOLOGIST
09/YAR

# Foto Core DHG-08







HOLE ID :
DHG-08
BOX :
4
DEPTH FROM :
13.00 m
DEPTH TO :
18.00 m
EOH :
20.00 m
RIG/GEOLOGIST
09/YAR


HOLE ID :
DHG-08
BOX :
5
DEPTH FROM :
18.00 m
DEPTH TO :
20,00 m
EOH :
20.00 m
RIG/GEOLOGIST
09/YAR

# Foto Core DHG-09







HOLE ID :
DHG-09
BOX :
5
DEPTH FROM :
17.00 m
DEPTH TO :
20.00 m
EOH :
30.00 m
RIG/GEOLOGIST
09/YAR
Sample DHG-09 (05)


HOLE ID :
DHG-09
BOX :
6-7
DEPTH FROM :
20.00 m
DEPTH TO :
23.00 m
EOH :
30.00 m
RIG/GEOLOGIST
09/YAR


HOLE ID :
DHG-09
BOX :
8
DEPTH FROM :
27.00 m
DEPTH TO :
30.00 m
EOH :
30.00 m
RIG/GEOLOGIST
09/YAR
Sample DHG-09(6)
Sample DHG-09(7)
Sample DHG-09(8)

# Lampiran C

## Slugtest Result PT HM

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 01-16-2021 | Well ID | DHG-01 |
| GW-Level Start (mbgs) | 0,00 m | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 3.50 m | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 16.00 m | Slug Type | |
| Screen Length (m) | 12.00 m | Volume (litre) | 480,420 |
| Across Screen | | GW-Level Finish (mbgs) | 13.00 |
| Above Screen | | Personel | YAR |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 0.80 | 35 | 00:19:40 | 7,80 |
| 2 | 00:00:04 | 0,88 | 36 | 00:22:40 | 8,38 |
| 3 | 00:00:06 | 1,00 | 37 | 00:25:40 | 9,00 |
| 4 | 00:00:08 | 1,08 | 38 | 00:28:40 | 9,50 |
| 5 | 00:00:10 | 1,13 | 39 | 00:31:40 | 9,98 |
| 6 | 00:00:15 | 1,30 | 40 | 00:36:40 | 10,62 |
| 7 | 00:00:20 | 1,42 | 41 | 00:41:40 | 10.98 |
| 8 | 00:00:25 | 1,51 | 42 | 00:46:40 | 11,13 |
| 9 | 00:00:30 | 1,60 | 43 | 00:51:40 | 11,60 |
| 10 | 00:00:35 | 1,70 | 44 | 01:01:40 | 11,82 |
| 11 | 00:00:40 | 1,75 | 45 | 01:11:40 | 12,06 |
| 12 | 00:00:45 | 1,80 | 46 | 01:21:40 | 12,21 |
| 13 | 00:00:50 | 1,88 | 47 | 01:31:40 | 12,37 |
| 14 | 00:00:55 | 1,92 | 48 | 01:46:40 | 12,40 |
| 15 | 00:01:00 | 1,97 | 49 | 02:01:40 | 12,49 |
| 16 | 00:01:10 | 1,97 | 50 | 02:16:40 | 12,54 |
| 17 | 00:01:20 | 2,00 | 51 | 02:31:40 | 12,60 |
| 18 | 00:01:30 | 2,03 | 52 | 02:46:40 | 12,67 |
| 19 | 00:01:40 | 2,14 | 53 | 03:16:40 | 12,80 |
| 20 | 00:02:10 | 2,38 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 2,54 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 2,68 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 2,78 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 2,90 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 3,07 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 3,28 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 3,52 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 3,75 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 3,88 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 3,98 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 4,30 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 6,10 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 6,54 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 7,18 | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 04-10-2021 | Well ID | DH6-02 |
| GW-Level Start (mbgs) | 0,00 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 8,00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 12,00 | Slug Type | |
| Screen Length (m) | 12.00 | Volume (litre) | 395,640 |
| Across Screen | | GW-Level Finish (mbgs) | 8.58 |
| Above Screen | | Personel | YAR |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 0,17 | 35 | 00:19:40 | 5,90 |
| 2 | 00:00:04 | 0,27 | 36 | 00:22:40 | 6,15 |
| 3 | 00:00:06 | 0,37 | 37 | 00:25:40 | 6,30 |
| 4 | 00:00:08 | 0,43 | 38 | 00:28:40 | 6,47 |
| 5 | 00:00:10 | 0,47 | 39 | 00:31:40 | 6,55 |
| 6 | 00:00:15 | 0,60 | 40 | 00:36:40 | 6,71 |
| 7 | 00:00:20 | 0,64 | 41 | 00:41:40 | 6,87 |
| 8 | 00:00:25 | 0,80 | 42 | 00:46:40 | 6,98 |
| 9 | 00:00:30 | 0,86 | 43 | 00:51:40 | 7,07 |
| 10 | 00:00:35 | 0,92 | 44 | 01:01:40 | 7,18 |
| 11 | 00:00:40 | 0,95 | 45 | 01:11:40 | 7,25 |
| 12 | 00:00:45 | 0,97 | 46 | 01:21:40 | 7,37 |
| 13 | 00:00:50 | 0,99 | 47 | 01:31:40 | 7,49 |
| 14 | 00:00:55 | 1,02 | 48 | 01:46:40 | 7,54 |
| 15 | 00:01:00 | 1,14 | 49 | 02:01:40 | 7,63 |
| 16 | 00:01:10 | 1,20 | 50 | 02:16:40 | 7,70 |
| 17 | 00:01:20 | 1,33 | 51 | 02:31:40 | 7,78 |
| 18 | 00:01:30 | 1,46 | 52 | 02:46:40 | 7,84 |
| 19 | 00:01:40 | 1,56 | 53 | 03:16:40 | 7,95 |
| 20 | 00:02:10 | 1,89 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 2,12 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 2,40 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 2,64 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 2,84 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 3,50 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 3,64 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 3,85 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 4,28 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 4,54 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 4,78 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 5,12 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 5,30 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 5,50 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 5,60 | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 30-09-2021 | Well ID | DHC-03 |
| GW-Level Start (mbgs) | 0,00 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 11.00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 28.00 | Slug Type | |
| Screen Length (m) | 20.00 | Volume (litre) | 876.060 |
| Across Screen | | GW-Level Finish (mbgs) | 5,07 |
| Above Screen | | Personel | |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 0,60 | 35 | 00:19:40 | 5,62 |
| 2 | 00:00:04 | 0,78 | 36 | 00:22:40 | 5.90 |
| 3 | 00:00:06 | 0,80 | 37 | 00:25:40 | 5,98 |
| 4 | 00:00:08 | 0,97 | 38 | 00:28:40 | 6.08 |
| 5 | 00:00:10 | 1,00 | 39 | 00:31:40 | 6,14 |
| 6 | 00:00:15 | 1.07 | 40 | 00:36:40 | 6,15 |
| 7 | 00:00:20 | 1,15 | 41 | 00:41:40 | 6,15 |
| 8 | 00:00:25 | 1.23 | 42 | 00:46:40 | 6,15 |
| 9 | 00:00:30 | 1,32 | 43 | 00:51:40 | |
| 10 | 00:00:35 | 1.42 | 44 | 01:01:40 | |
| 11 | 00:00:40 | 1,51 | 45 | 01:11:40 | |
| 12 | 00:00:45 | 1.59 | 46 | 01:21:40 | |
| 13 | 00:00:50 | 1,67 | 47 | 01:31:40 | |
| 14 | 00:00:55 | 1.74 | 48 | 01:46:40 | |
| 15 | 00:01:00 | 1,82 | 49 | 02:01:40 | |
| 16 | 00:01:10 | 1.94 | 50 | 02:16:40 | |
| 17 | 00:01:20 | 2.05 | 51 | 02:31:40 | |
| 18 | 00:01:30 | 2,15 | 52 | 02:46:40 | |
| 19 | 00:01:40 | 2,27 | 53 | 03:16:40 | |
| 20 | 00:02:10 | 2,48 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 2,70 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 2,98 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 3,24 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 3,42 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 3,65 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 3,90 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 4,10 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 4,65 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 4,48 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 4,83 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 5,08 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 5,19 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 5,30 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 5,47 | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 03-10-2021 | Well ID | DHG-04 |
| GW-Level Start (mbgs) | 0,00 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 20.00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 32.00 | Slug Type | |
| Screen Length (m) | 20.00 | Volume (litre) | 989.100 |
| Across Screen | | GW-Level Finish (mbgs) | 27.00 |
| Above Screen | | Personel | YAR |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 0,20 | 35 | 00:19:40 | 6,40 |
| 2 | 00:00:04 | 0,40 | 36 | 00:22:40 | 6,64 |
| 3 | 00:00:06 | 0,50 | 37 | 00:25:40 | 6,97 |
| 4 | 00:00:08 | 0,64 | 38 | 00:28:40 | 7,26 |
| 5 | 00:00:10 | 0,80 | 39 | 00:31:40 | 7,42 |
| 6 | 00:00:15 | 1,00 | 40 | 00:36:40 | 8.20 |
| 7 | 00:00:20 | 1,11 | 41 | 00:41:40 | 8,88 |
| 8 | 00:00:25 | 1,22 | 42 | 00:46:40 | 9.50 |
| 9 | 00:00:30 | 1,28 | 43 | 00:51:40 | 10.05 |
| 10 | 00:00:35 | 1,32 | 44 | 01:01:40 | 11,11 |
| 11 | 00:00:40 | 1,38 | 45 | 01:11:40 | 12.09 |
| 12 | 00:00:45 | 1,42 | 46 | 01:21:40 | 13.00 |
| 13 | 00:00:50 | 1,50 | 47 | 01:31:40 | 14,22 |
| 14 | 00:00:55 | 1,52 | 48 | 01:46:40 | 16.40 |
| 15 | 00:01:00 | 1,58 | 49 | 02:01:40 | 17,88 |
| 16 | 00:01:10 | 1,71 | 50 | 02:16:40 | 18.64 |
| 17 | 00:01:20 | 1,80 | 51 | 02:31:40 | 20.08 |
| 18 | 00:01:30 | 1,92 | 52 | 02:46:40 | 21,16 |
| 19 | 00:01:40 | 2,00 | 53 | 03:16:40 | 23.09 |
| 20 | 00:02:10 | 2,30 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 2,53 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 2,80 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 3,00 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 3,23 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 3,64 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 4,04 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 4,39 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 4,71 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 5,03 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 5,36 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 5,59 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 5,81 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 6,00 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 6,14 | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 02-10-2021 | Well ID | DH6-05 |
| GW-Level Start (mbgs) | 4.34 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 17.00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 20.00 | Slug Type | |
| Screen Length (m) | 12.00 | Volume (litre) | 649.980 |
| Across Screen | | GW-Level Finish (mbgs) | 18.70 |
| Above Screen | | Personel | YAR |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 4.40 | 35 | 00:19:40 | 7.82 |
| 2 | 00:00:04 | 4.43 | 36 | 00:22:40 | 7.85 |
| 3 | 00:00:06 | 4,52 | 37 | 00:25:40 | 7.88 |
| 4 | 00:00:08 | 4,55 | 38 | 00:28:40 | 7.93 |
| 5 | 00:00:10 | 4.56 | 39 | 00:31:40 | 7.98 |
| 6 | 00:00:15 | 4.59 | 40 | 00:36:40 | 8.04 |
| 7 | 00:00:20 | 4,57 | 41 | 00:41:40 | 8.06 |
| 8 | 00:00:25 | 4.59 | 42 | 00:46:40 | 8.10 |
| 9 | 00:00:30 | 4.59 | 43 | 00:51:40 | 8.12 |
| 10 | 00:00:35 | 4,61 | 44 | 01:01:40 | 8.16 |
| 11 | 00:00:40 | 4,61 | 45 | 01:11:40 | 8.17 |
| 12 | 00:00:45 | 4,60 | 46 | 01:21:40 | 8.21 |
| 13 | 00:00:50 | 4,58 | 47 | 01:31:40 | 8.24 |
| 14 | 00:00:55 | 4.66 | 48 | 01:46:40 | 8.36 |
| 15 | 00:01:00 | 4,75 | 49 | 02:01:40 | 8.40 |
| 16 | 00:01:10 | 4,85 | 50 | 02:16:40 | 8,44 |
| 17 | 00:01:20 | 4,89 | 51 | 02:31:40 | 8.52 |
| 18 | 00:01:30 | 5,00 | 52 | 02:46:40 | |
| 19 | 00:01:40 | 5,13 | 53 | 03:16:40 | |
| 20 | 00:02:10 | 5,43 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 5,96 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 6,47 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 6,66 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 6.89 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 7.00 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 7,23 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 7.36 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 7.40 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 7.43 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 7,53 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 7.51 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 7.56 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 7.60 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 7.70 | 68 | 20:46:40 | |

Remarks:

Stuck at 450 to 4.60 m

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 02-10-2021 | Well ID | DHG-02 |
| GW-Level Start (mbgs) | 1,00 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 24.00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 35.00 | Slug Type | |
| Screen Length (m) | 20.00 | Volume (litre) | 1.102.140 |
| Across Screen | | GW-Level Finish (mbgs) | 22.80 |
| Above Screen | | Personel | |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 6,09 | 35 | 00:19:40 | |
| 2 | 00:00:04 | 6,21 | 36 | 00:22:40 | |
| 3 | 00:00:06 | 6,23 | 37 | 00:25:40 | |
| 4 | 00:00:08 | 6,47 | 38 | 00:28:40 | |
| 5 | 00:00:10 | 6,56 | 39 | 00:31:40 | |
| 6 | 00:00:15 | 6,90 | 40 | 00:36:40 | |
| 7 | 00:00:20 | 7,08 | 41 | 00:41:40 | |
| 8 | 00:00:25 | 7,57 | 42 | 00:46:40 | |
| 9 | 00:00:30 | 8,05 | 43 | 00:51:40 | |
| 10 | 00:00:35 | 8,59 | 44 | 01:01:40 | |
| 11 | 00:00:40 | 8,97 | 45 | 01:11:40 | |
| 12 | 00:00:45 | 9,50 | 46 | 01:21:40 | |
| 13 | 00:00:50 | 10,04 | 47 | 01:31:40 | |
| 14 | 00:00:55 | 10,10 | 48 | 01:46:40 | |
| 15 | 00:01:00 | 11,10 | 49 | 02:01:40 | |
| 16 | 00:01:10 | 12,05 | 50 | 02:16:40 | |
| 17 | 00:01:20 | 12,87 | 51 | 02:31:40 | |
| 18 | 00:01:30 | 13,68 | 52 | 02:46:40 | |
| 19 | 00:01:40 | 14,45 | 53 | 03:16:40 | |
| 20 | 00:02:10 | 16,96 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 18,40 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 19,59 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 20,35 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 20,07 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 23,78 | 59 | 06:46:40 | |
| 26 | 00:06:10 | | 60 | 07:46:40 | |
| 27 | 00:07:10 | | 61 | 08:46:40 | |
| 28 | 00:08:10 | | 62 | 09:46:40 | |
| 29 | 00:09:10 | | 63 | 10:46:40 | |
| 30 | 00:10:40 | | 64 | 12:46:40 | |
| 31 | 00:12:10 | | 65 | 14:46:40 | |
| 32 | 00:13:40 | | 66 | 16:46:40 | |
| 33 | 00:15:10 | | 67 | 18:46:40 | |
| 34 | 00:16:40 | | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 04-10-2021 | Well ID | DHG-07 |
| GW-Level Start (mbgs) | 5.00 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 7.50 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 11.00 | Slug Type | |
| Screen Length (m) | 12.00 | Volume (litre) | 425.900 |
| Across Screen | | GW-Level Finish (mbgs) | 14.20 |
| Above Screen | | Personel | |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 5,23 | 35 | 00:19:40 | 10,54 |
| 2 | 00:00:04 | 5,31 | 36 | 00:22:40 | 10,62 |
| 3 | 00:00:06 | 5,33 | 37 | 00:25:40 | 10,72 |
| 4 | 00:00:08 | 5,38 | 38 | 00:28:40 | 10,76 |
| 5 | 00:00:10 | 5,44 | 39 | 00:31:40 | 10,79 |
| 6 | 00:00:15 | 5,58 | 40 | 00:36:40 | 10,80 |
| 7 | 00:00:20 | 5,70 | 41 | 00:41:40 | 10,84 |
| 8 | 00:00:25 | 5,77 | 42 | 00:46:40 | 10,89 |
| 9 | 00:00:30 | 5,88 | 43 | 00:51:40 | 10,97 |
| 10 | 00:00:35 | 5,95 | 44 | 01:01:40 | 11,03 |
| 11 | 00:00:40 | 6,05 | 45 | 01:11:40 | 11,08 |
| 12 | 00:00:45 | 6,10 | 46 | 01:21:40 | 11,20 |
| 13 | 00:00:50 | 6,23 | 47 | 01:31:40 | 11,32 |
| 14 | 00:00:55 | 6,37 | 48 | 01:46:40 | 11,40 |
| 15 | 00:01:00 | 6,45 | 49 | 02:01:40 | 11,47 |
| 16 | 00:01:10 | 6,64 | 50 | 02:16:40 | 11,53 |
| 17 | 00:01:20 | 6,73 | 51 | 02:31:40 | 11,60 |
| 18 | 00:01:30 | 6,76 | 52 | 02:46:40 | 11,69 |
| 19 | 00:01:40 | 7,33 | 53 | 03:16:40 | 11,72 |
| 20 | 00:02:10 | 7,97 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 8,43 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 8,69 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 8,97 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 9,22 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 9,93 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 9,59 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 9,81 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 9,92 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 10,02 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 10,10 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 10,22 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 10,32 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 10,39 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 10,47 | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 04-10-2021 | Well ID | DHG-08 |
| GW-Level Start (mbgs) | 4,40 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 9.00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 17.00 | Slug Type | |
| Screen Length (m) | 12.00 | Volume (litre) | 565.200 |
| Across Screen | | GW-Level Finish (mbgs) | 19.26 |
| Above Screen | | Personel | YAR |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 4.50 | 35 | 00:19:40 | 14.20 |
| 2 | 00:00:04 | 4.58 | 36 | 00:22:40 | 14.34 |
| 3 | 00:00:06 | 4.64 | 37 | 00:25:40 | 14.49 |
| 4 | 00:00:08 | 4.68 | 38 | 00:28:40 | 14.67 |
| 5 | 00:00:10 | 4.70 | 39 | 00:31:40 | 14.95 |
| 6 | 00:00:15 | 4.74 | 40 | 00:36:40 | 15.40 |
| 7 | 00:00:20 | 4.78 | 41 | 00:41:40 | 15.87 |
| 8 | 00:00:25 | 4.84 | 42 | 00:46:40 | 16.02 |
| 9 | 00:00:30 | 4.90 | 43 | 00:51:40 | 16.30 |
| 10 | 00:00:35 | 4.99 | 44 | 01:01:40 | 16.90 |
| 11 | 00:00:40 | 5.07 | 45 | 01:11:40 | 17.40 |
| 12 | 00:00:45 | 5.17 | 46 | 01:21:40 | 17.75 |
| 13 | 00:00:50 | 5.24 | 47 | 01:31:40 | 17.93 |
| 14 | 00:00:55 | 5.33 | 48 | 01:46:40 | 18.03 |
| 15 | 00:01:00 | 5.43 | 49 | 02:01:40 | 18.06 |
| 16 | 00:01:10 | 5.56 | 50 | 02:16:40 | 18.10 |
| 17 | 00:01:20 | 5.69 | 51 | 02:31:40 | 18.15 |
| 18 | 00:01:30 | 5.83 | 52 | 02:46:40 | 18.21 |
| 19 | 00:01:40 | 5.98 | 53 | 03:16:40 | 18.24 |
| 20 | 00:02:10 | 6.42 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 6.82 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 7.24 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 7.65 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 7.92 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 8.32 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 8.80 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 9.53 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 10.28 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 10.93 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 11.91 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 12.91 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 13.38 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 13.75 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 13.97 | 68 | 20:46:40 | |

Remarks:

GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

**Slugtest ID:** **Test No:**

| | | | |
|---|---|---|---|
| Date | 01-10-2021 | Well ID | DHG-09 |
| GW-Level Start (mbgs) | 1.00 | Well Diameter (mm) | 750 |
| Depth Top Aquifer (mbgs) | 20.00 | Casing Diameter (mm) | 600 |
| Depth Bottom Aquifer (mbgs) | 28.00 | Slug Type | |
| Screen Length (m) | 12.00 | Volume (litre) | 847,800 |
| Across Screen | | GW-Level Finish (mbgs) | 23.20 |
| Above Screen | | Personel | YAR |

| Entry | Time Hour : Min. : Sec. | Water Level (mbgs) | Entry | Time Hour : Min. : Sec. | Water Level (mbgs) |
|---|---|---|---|---|---|
| 1 | 00:00:02 | 1,90 | 35 | 00:19:40 | 9.39 |
| 2 | 00:00:04 | 1,93 | 36 | 00:22:40 | 10,03 |
| 3 | 00:00:06 | 1,96 | 37 | 00:25:40 | 10,63 |
| 4 | 00:00:08 | 2,02 | 38 | 00:28:40 | 11,33 |
| 5 | 00:00:10 | 2,08 | 39 | 00:31:40 | 11,93 |
| 6 | 00:00:15 | 2,19 | 40 | 00:36:40 | 12,89 |
| 7 | 00:00:20 | 2,22 | 41 | 00:41:40 | 13,78 |
| 8 | 00:00:25 | 2,28 | 42 | 00:46:40 | 14,56 |
| 9 | 00:00:30 | 2,36 | 43 | 00:51:40 | 15,37 |
| 10 | 00:00:35 | 2,46 | 44 | 01:01:40 | 16,80 |
| 11 | 00:00:40 | 2,53 | 45 | 01:11:40 | 17,88 |
| 12 | 00:00:45 | 2,65 | 46 | 01:21:40 | 19,01 |
| 13 | 00:00:50 | 2,72 | 47 | 01:31:40 | 19,86 |
| 14 | 00:00:55 | 2,82 | 48 | 01:46:40 | 20,93 |
| 15 | 00:01:00 | 2,92 | 49 | 02:01:40 | 21,55 |
| 16 | 00:01:10 | 3,08 | 50 | 02:16:40 | 22,09 |
| 17 | 00:01:20 | 3,20 | 51 | 02:31:40 | 22,48 |
| 18 | 00:01:30 | 3,38 | 52 | 02:46:40 | 22,95 |
| 19 | 00:01:40 | 3,45 | 53 | 03:16:40 | 23,00 |
| 20 | 00:02:10 | 3,81 | 54 | 03:46:40 | |
| 21 | 00:02:40 | 4,14 | 55 | 04:16:40 | |
| 22 | 00:03:10 | 4,36 | 56 | 04:46:40 | |
| 23 | 00:03:40 | 4,57 | 57 | 05:16:40 | |
| 24 | 00:04:10 | 4,68 | 58 | 05:46:40 | |
| 25 | 00:05:10 | 5,10 | 59 | 06:46:40 | |
| 26 | 00:06:10 | 5,44 | 60 | 07:46:40 | |
| 27 | 00:07:10 | 5,68 | 61 | 08:46:40 | |
| 28 | 00:08:10 | 5,95 | 62 | 09:46:40 | |
| 29 | 00:09:10 | 6,30 | 63 | 10:46:40 | |
| 30 | 00:10:40 | 6,77 | 64 | 12:46:40 | |
| 31 | 00:12:10 | 7,78 | 65 | 14:46:40 | |
| 32 | 00:13:40 | 7,74 | 66 | 16:46:40 | |
| 33 | 00:15:10 | 8,18 | 67 | 18:46:40 | |
| 34 | 00:16:40 | 8,82 | 68 | 20:46:40 | |

Remarks:

# Lampiran D

## Hasil Uji Lab PT HM

| No. | Borehole | Classification | | | | | | | | | | | | | | Triaxial UU | | Ucs | | Triaxial CU | | | | Falling Head | | Properties of Rock | | | | | | | Ucs Tosaca | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MC (%) | Normal Density (kNm3) | Dry Density (kNm3) | Void Ratio | Porosity | Saturation | Cc | LL | PL | PI | Gravel | Sand | Silt | Clay | Area | c uu (kPa) | ph uu (degree | c (kPa) | Sensivity | Es (kPa) | c cu (kPa) | ph cu (degree | c (kPa) | ph (degree | k cm/s | direction | Natural Density (kNm3) | Rock Dry Density (kNm3) | Saturated Density (kNm3) | Specific Gravity | Natural Moisture Content (%) | Absorption (%) | Saturation (%) | Porosity Rock | Void Ratio Rock | Sigma Max (MPa | Ei (MPa) | vi-i |
| 1 | X-DHC 01-01 25-01 85m | 31 12 | 19 18 | 12 3 | 1 922 | 0 658 | 100 | 3 805 | 50 3 | 32 4 | 18 3 | 0 | 20 37 | 79 13 | | 79 13 | 32 1 | 5 3 | | | | | | | | | | | | | | | | | | | |
| 2 | X-DHC 01-05 50-05 70m | | | | | | | | | | | | | | | | | | 3 | 1 55 | 5 00 | | | | | | | | | | | | | | | |
| 3 | X-DHC 01-07 00-07 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | 1044 7 | 4 785 | 12341 | 1 988 | 54 392 | 150 394 | 75 007 | 0 758 | 3 125 | | | |
| 4 | X-DHC 01-13 20-13 50m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 336 | 40 205 | 0 273 |
| 5 | X-DHC 01-18 23-18 43m | | | | | | | | | | | | | | | | | | | | | | | | | | | 28 732 | 28802 | 29 125 | 3 018 | 0 456 | 1 809 | 24 918 | 0 052 | 0 055 | | | |
| 6 | X-DHC 02-03 45-03 80m | 48 03 | 19 34 | 13 3 | 1 043 | 0 807 | 100 | 3 513 | 56 1 | 30 | 26 1 | 9 13 | 12 36 | 73 | | 73 | 28 4 | 7 1 | | | | | | | | | | | | | | | | | | | |
| 7 | X-DHC 02-06 30-06 70m | | | | | | | | | | | | | | | | | | | | | 7 55 | 24 2 | 5 02 | 33 8 | | | | | | | | | | | |
| 8 | X-DHC 02-09 70-09 00m | | | | | | | | | | | | | | | | | | | | | | | | | | | 22 35 7 | 20 35 0 | 22 69 8 | 2 65 0 | 9 38 1 | 11 53 5 | 35 49 0 | 0 23 5 | 0 30 7 | | | |
| 9 | X-DHC 02-11 75-12 00m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 75 8 | 53 57 9 | 0 25 0 |
| 10 | X-DHC 02-12 00-12 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | 22 98 0 | 22 89 3 | 24 28 5 | 2 65 0 | 6 05 8 | 5 99 2 | 77 73 1 | 0 13 7 | 0 15 9 | | | |
| 11 | X-DHC 03-02 60-02 80m | | | | | | | | | | | | | | | | 19 8 | 5 3 | | | | | | | | | | | | | | | | | | | |
| 12 | X-DHC 03-08 60-07 00m | 60 8 8 | 22 24 | 11 3 | 1 30 7 | 0 84 4 | 100 | 3 30 3 | 65 | 41 | 24 | 0 | 20 84 | 79 28 | | 79 28 | | | | | | | | | | 1 50656-08 | Vertical | | | | | | | | | | |
| 13 | X-DHC 03-11 25-12 45m | | | | | | | | | | | | | | | | | | 22 | 1 54 | 14 84 | | | | | | | | | | | | | | | |
| 14 | X-DHC 03-13 15-13 35m | | | | | | | | | | | | | | | | | | | | | | | | | | | 10 22 8 | 6 53 4 | 12 08 9 | 1 83 9 | 58 88 7 | 185 19 9 | 75 55 2 | 0 75 3 | 3 05 7 | | | |
| 15 | X-DHC 03-23 30-23 45m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 24 8 | 28 81 7 | 0 43 1 |
| 16 | X-DHC 04-05 10-05 40m | | | | | | | | | | | | | | | | 17 8 | 8 3 | | | | | | | | | | | | | | | | | | | |
| 17 | X-DHC 04-03 25-03 85m | 58 55 | 18 82 | 12 4 | 1 10 4 | 0 82 | 100 | 3 28 8 | 66 2 | 25 3 | 40 3 | 0 | 12 18 | 37 26 | | 37 26 | | | | | | | | | | 2 05456-08 | Vertical | | | | | | | | | | |
| 18 | X-DHC 04-17 80-17 25m | | | | | | | | | | | | | | | | | | 42 9 | 1 25 | 53 62 | | | | | | | | | | | | | | | |
| 19 | X-DHC 04-22 25-22 35m | | | | | | | | | | | | | | | | | | | | | | | | | | | 27 34 5 | 28 97 3 | 27 71 8 | 2 91 3 | 1 30 0 | 2 73 3 | 49 75 8 | 0 07 4 | 0 08 0 | | | |
| 20 | X-DHC 05-02 45-02 85m | | | | | | | | | | | | | | | | 58 5 | 7 9 | | | | | | | | | | | | | | | | | | | |
| 21 | X-DHC 05-11 80-12 00m | - | - | - | - | - | - | 3 18 1 | 110 7 | 48 9 | 61 8 | 0 | 10 59 | 88 21 | 23 2 | 39 41 | | | | | | | | | | | | | | | | | | | | | |
| 22 | X-DHC 05-14 75-14 90m | | | | | | | | | | | | | | | | | | 31 5 | 1 35 | 42 54 | | | | | | | | | | | | | | | |
| 23 | X-DHC 05-15 30-15 80m | | | | | | | | | | | | | | | | | | | | | | | | | | | 10 88 8 | 5 15 8 | 12 30 3 | 1 38 8 | 51 85 5 | 140 35 8 | 78 12 5 | 0 72 4 | 2 81 9 | | | |
| 24 | X-DHC 05-20 10-20 27m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 32 | 2 20 8 7 | 0 33 3 |
| 25 | X-DHC 06-05 20-05 80m | | | | | | | | | | | | | | | | 27 2 | 5 8 | | | | | | | | | | | | | | | | | | | |
| 26 | X-DHC 06-07 00-07 45m | 56 9 3 | 18 77 | 12 4 | 1 50 1 | 0 80 5 | 100 | 3 14 8 | 59 8 | 33 8 | 26 | 0 | 21 42 | 78 58 | | 78 58 | | | | | | | | | | | | | | | | | | | | | |
| 27 | X-DHC 06-23 80-23 30m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 23 | 44 80 | 0 37 5 |
| 28 | X-DHC 06-29 50-29 70m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 51 | 60 28 | 0 41 2 |
| 29 | X-DHC 07-02 80-03 00m | | | | | | | | | | | | | | | | 9 2 | 4 3 | | | | | | | | | | | | | | | | | | | |
| 30 | X-DHC 07-03 80-04 00m | - | - | - | - | - | - | 2 88 8 | 54 | 18 3 | 37 1 | 0 | 18 73 | 83 27 | | 83 27 | | | | | | | | | | 4 36 85 07 | Vertical | | | | | | | | | | |
| 31 | X-DHC 07-08 10-08 75m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 42 3 | 30 43 74 | 0 20 8 |
| 32 | X-DHC 07-09 50-09 25m | | | | | | | | | | | | | | | | | | | | | | | | | | | 20 21 4 | 18 99 5 | 20 50 7 | 2 62 0 | 13 94 3 | 30 88 9 | 91 84 5 | 0 25 1 | 0 34 1 | | | |
| 33 | X-DHC 07-11 00-11 20m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 45 7 | 1 25 0 49 | 0 44 7 |
| 34 | X-DHC 08-02 60-02 00m | | | | | | | | | | | | | | | | 21 2 | 8 3 | | | | | | | | | | | | | | | | | | | |
| 35 | X-DHC 08-04 80-04 40m | 84 25 | 18 28 | 11 2 | 2 30 3 | 0 88 8 | 100 | 3 50 2 | 73 8 | 34 1 | 44 7 | 0 | 12 38 | 37 12 | | 37 12 | | | | | | | | | | 4 36 85 07 | Vertical | | | | | | | | | | |
| 36 | X-DHC 08-17 30-17 50m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 24 8 | 23 38 31 | 0 43 2 |
| 37 | X-DHC 08-18 15-18 50m | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 89 3 | 30 75 0 | 31 27 4 | 3 24 5 | 0 45 3 | 1 76 5 | 28 30 3 | 0 05 2 | 0 05 5 | | | |
| 38 | X-DHC 09-02 70-03 10m | | | | | | | | | | | | | | | | 13 | 4 3 | | | | | | | | | | | | | | | | | | | |
| 39 | X-DHC 09-07 80-07 40m | 91 92 | 17 4 | 9 5 | 2 73 1 | 0 73 2 | 100 | 3 53 5 | 98 9 | 51 5 | 45 4 | 0 | 4 67 | 41 44 | 54 49 | 95 93 | | | | | | | | | | | | | | | | | | | | | |
| 40 | X-DHC 09-14 10-14 31m | | | | | | | | | | | | | | | | | | 51 | 1 24 | 76 5 | | | | | | | | | | | | | | | |
| 41 | X-DHC 09-15 27-15 47m | | | | | | | | | | | | | | | | | | | | | | | | | 1 30585-05 | Vertical | | | | | | | | | | |
| 42 | X-DHC 09-18 30-18 50m | | | | | | | | | | | | | | | | | | | | | | | | | | | 13 25 0 | 7 97 2 | 14 87 0 | 2 41 6 | 88 20 8 | 34 81 2 | 78 30 8 | 0 87 0 | 2 02 8 | | | |
| 43 | X-DHC 09-23 50-23 78m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 25 | 80 80 54 | 0 48 5 |
| 44 | X-DHC 09-29 30-29 55m | | | | | | | | | | | | | | | | | | | | | | | | | | | 22 80 4 | 21 19 3 | 22 99 5 | 2 58 5 | 8 65 0 | 8 50 3 | 79 30 1 | 0 18 0 | 0 22 0 | | | |

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 - 01.65 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | $kN/m^3$ | 19.2 |
| SL | % | - |
| Gs | - | 3.60 |
| MC | % | 51 |
| PL | % | 32 |
| LL | % | 51 |
| PI | % | 18 |
| Fines (#200) | % | 79 |
| $D_{10}$ | mm | 0.0075 |
| $D_{30}$ | mm | 0.0104 |
| $D_{60}$ | mm | 0.0421 |
| $C_u$ | - | 6 |
| $C_c$ | - | 0.35 |

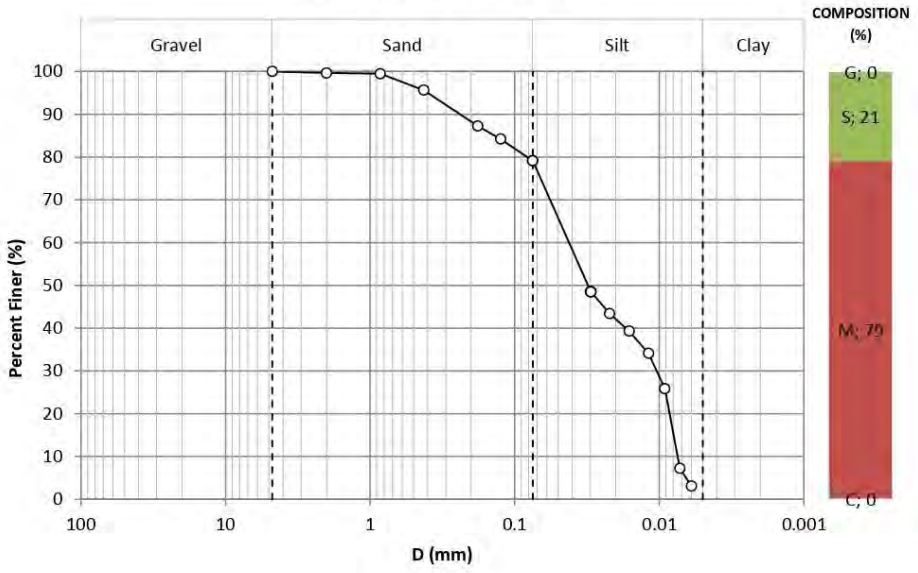
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.15 |
| $I_T$ | % | -119.80 |
| $I_L$ | % | 1.02 |
| $I_C$ | % | -0.02 |
| $S_r$ | % | 100.00 |
| e | - | 1.92 |
| n | - | 0.66 |
| A | - | 12.29 |

| | |
|---|---|
| Consistency** | Very Soft |
| Activity | Active |
| Plasticity Symbol | MH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 - 01.65 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1111 | 1234 | 1035 |
| Weight of Container | 4.55 | 4.57 | 5.36 |
| Weight of wet soil and container | 145.07 | 155.48 | 171.56 |
| Weight of dry soil and container | 96.30 | 102.51 | 119.10 |
| Moisture Content | 53.16 | 54.08 | 46.12 |
| Average MC | 51.12 | | |

**Unit weight**

| No. Ring | 1 |
|---|---|
| No. Container | 1056 |
| Weight of Ring | 27.82 |
| Volume of Ring | 15.669 |
| Weight of Container | 5.99 |
| Weight of wet soil and ring and containe | 63.83 |
| Weight of dry soil and ring and containe | 53.14 |
| Water Content | 55.303 |
| Density | 19.158 |
| Dry Density | 12.336 |
| Saturation | 100 |
| Void ratio | 1.9222 |
| Porosity | 0.6578 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 201 | 201 |
| Weight of Pycknometer + soil | 77.9 | 77.9 |
| Weight of Pycknometer + water + soil | 171.56 | 171.56 |
| T° C | 26 | 26 |
| Weight of Pycknometer | 52.92 | 52.92 |
| Weight of Pycknometer + water | 153.51 | 153.51 |
| Specific Gravity | 3.605 | 3.605 |
| Average Specific Gravity | 3.605 | |

**Shrinkage Limit**

| No. Ring | - |
|---|---|
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 - 01.65 m

Date Tested : 26/10/2021

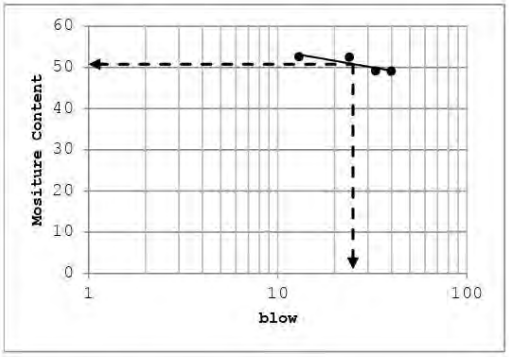
GEOMINE

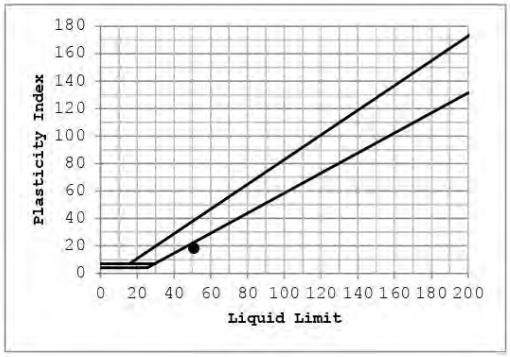
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1013 | 1183 | 1030 |
| Weight of Container | 5.41 | 4.42 | 5.86 |
| Weight of wet soil and container | 14.43 | 14.33 | 14.55 |
| Weight of dry soil and container | 12.38 | 11.83 | 12.34 |
| Plastic Limit | 29.41 | 33.74 | 34.10 |
| Average | 32.42 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1149 | 1146 | 1125 | 1105 | - |
| Weight of Container | 4.39 | 4.66 | 5.54 | 4.65 | - |
| Weight of wet soil and container | 14.45 | 14.68 | 14.7 | 14.75 | - |
| Weight of dry soil and container | 11.14 | 11.38 | 11.55 | 11.27 | - |
| Water Content | 49.04 | 49.11 | 52.41 | 52.57 | - |
| Number of blows | 40 | 33 | 24 | 13 | - |
| Liquid Limit | 50.76 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.18 |
| Weight of dry soil | 80.18 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0.28 | 0.35 | 0.35 | 99.65 |
| 20 | 0.85 | 0.14 | 0.17 | 0.53 | 99.47 |
| 40 | 0.425 | 3.06 | 3.82 | 4.34 | 95.66 |
| 80 | 0.18 | 6.72 | 8.38 | 12.72 | 87.28 |
| 120 | 0.125 | 2.45 | 3.06 | 15.78 | 84.22 |
| 200 | 0.075 | 4.08 | 5.09 | 20.87 | 79.13 |
| Pan | 0 | 3.06 | 79.13 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 - 01.65 m

Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 60.389 | | |
| Zerro correction | -1 | Gs | 3.6048 |
| Meniscus correction | 1 | a | 0.8617 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 44 | 0.0299 | 48.61 |
| 12:22 | 2 | 27 | 39 | 0.0220 | 43.44 |
| 12:24 | 4 | 27 | 35 | 0.0161 | 39.30 |
| 12:28 | 8 | 27 | 30 | 0.0118 | 34.13 |
| 12:35 | 15 | 27 | 22 | 0.0091 | 25.86 |
| 12:50 | 30 | 27 | 4 | 0.0072 | 7.24 |
| 13:05 | 45 | 27 | 0 | 0.0060 | 3.10 |
| 13:50 | 90 | 0 | 0 | 0.0000 | 1.03 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

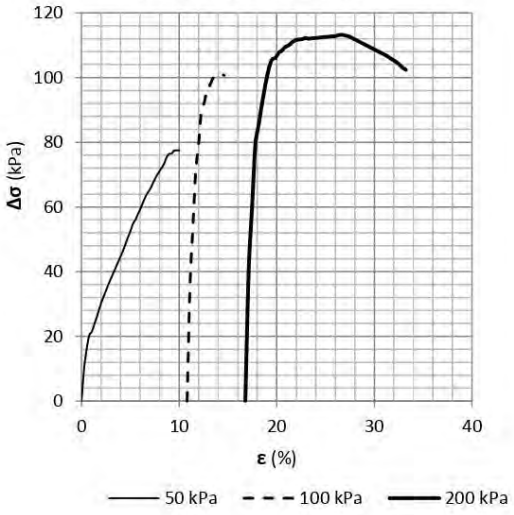
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 -01.65 m
Date Tested : 28/10/2021

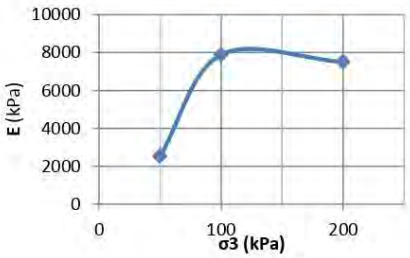
GEOMINE

## STRESS - STRAIN CURVE

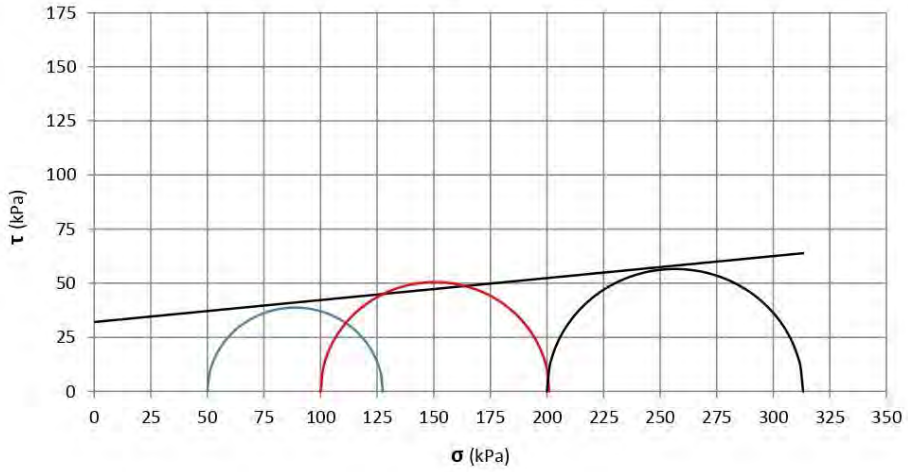



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 77.50 | 9.74 |
| 2. | 100 | 101.05 | 14.33 |
| 3. | 200 | 113.20 | 26.71 |

| Results | | |
|---|---|---|
| c | kPa | 32.1 |
| ø | ° | 5.8 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 -01.65 m
Date Tested : 28/10/2021

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 10 | 0.26 |
| 40 | 15.96 | 0.53 |
| 60 | 20.3 | 0.79 |
| 80 | 21.44 | 1.05 |
| 100 | 23.75 | 1.32 |
| 120 | 26.06 | 1.58 |
| 140 | 28.75 | 1.84 |
| 160 | 31.03 | 2.11 |
| 180 | 33.06 | 2.37 |
| 200 | 35.16 | 2.63 |
| 220 | 37.01 | 2.89 |
| 240 | 38.85 | 3.16 |
| 260 | 40.68 | 3.42 |
| 280 | 42.51 | 3.68 |
| 300 | 44.32 | 3.95 |
| 320 | 46.12 | 4.21 |
| 340 | 48.29 | 4.47 |
| 360 | 50.45 | 4.74 |
| 380 | 52.44 | 5 |
| 400 | 54.73 | 5.26 |
| 420 | 56.1 | 5.53 |
| 440 | 57.83 | 5.79 |
| 460 | 59.63 | 6.05 |
| 480 | 61.49 | 6.32 |
| 500 | 63.34 | 6.58 |
| 520 | 64.66 | 6.84 |
| 540 | 65.97 | 7.11 |
| 560 | 67.64 | 7.37 |
| 580 | 69.3 | 7.63 |
| 600 | 70.58 | 7.89 |
| 620 | 71.85 | 8.16 |
| 640 | 73.11 | 8.42 |
| 660 | 75.1 | 8.68 |
| 680 | 76.35 | 8.95 |
| 700 | 76.49 | 9.21 |
| 720 | 77.36 | 9.47 |
| 740 | 77.5 | 9.74 |
| 760 | 77.49 | 10 |

Deviator Stress Maximum: 77.50 kPa
Strain at Failure: 10.00 %
Deviator Stress at (50%): 52.44 kPa

$E_o$: 1156.31 kPa
$E_{50}$: 1048.88 kPa

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F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 -01.65 m
Date Tested : 28/10/2021

GEOMINE

Strain at (50%): 5.00 %

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 68.4 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 740 | 0 | 10.82 |
| 760 | 35.31 | 11.11 |
| 780 | 53.32 | 11.4 |
| 800 | 70.85 | 11.7 |
| 820 | 79.09 | 11.99 |
| 840 | 89.74 | 12.28 |
| 860 | 92.25 | 12.57 |
| 880 | 96.48 | 12.87 |
| 900 | 97.69 | 13.16 |
| 920 | 99.66 | 13.45 |
| 940 | 100.36 | 13.74 |
| 960 | 100.84 | 14.04 |
| 980 | 101.05 | 14.33 |
| 1000 | 100.71 | 14.62 |

Deviator Stress Maximum: 101.05 kPa $E_o$: 6625.80 kPa
Strain at Failure: 14.62 % $E_{50}$: 733.69 kPa
Deviator Stress at (50%): 92.25 kPa
Strain at (50%): 12.57 %

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 58.4 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 980 | 0 | 16.78 |
| 1000 | 39.9 | 17.12 |
| 1020 | 59.6 | 17.47 |
| 1040 | 79.14 | 17.81 |
| 1060 | 85.51 | 18.15 |
| 1080 | 91.89 | 18.49 |
| 1100 | 97.75 | 18.84 |
| 1120 | 102.59 | 19.18 |
| 1140 | 105.58 | 19.52 |
| 1160 | 106.1 | 19.86 |
| 1180 | 107.63 | 20.21 |

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F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 -01.65 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 108.44 | 20.55 |
| 1220 | 109.5 | 20.89 |
| 1240 | 109.97 | 21.23 |
| 1260 | 110.88 | 21.58 |
| 1280 | 111.52 | 21.92 |
| 1300 | 111.78 | 22.26 |
| 1320 | 111.85 | 22.6 |
| 1340 | 112.22 | 22.95 |
| 1360 | 112.03 | 23.29 |
| 1380 | 112.14 | 23.63 |
| 1400 | 112.25 | 23.97 |
| 1420 | 112.35 | 24.32 |
| 1440 | 112.5 | 24.66 |
| 1460 | 112.53 | 25 |
| 1480 | 112.62 | 25.34 |
| 1500 | 112.76 | 25.68 |
| 1520 | 112.83 | 26.03 |
| 1540 | 113.14 | 26.37 |
| 1560 | 113.2 | 26.71 |
| 1580 | 112.96 | 27.05 |
| 1600 | 112.72 | 27.4 |
| 1620 | 112.19 | 27.74 |
| 1640 | 111.66 | 28.08 |
| 1660 | 111.13 | 28.42 |
| 1680 | 110.6 | 28.77 |
| 1700 | 110.07 | 29.11 |
| 1720 | 109.53 | 29.45 |
| 1740 | 109 | 29.79 |
| 1760 | 108.47 | 30.14 |
| 1780 | 107.94 | 30.48 |
| 1800 | 107.41 | 30.82 |
| 1820 | 106.88 | 31.16 |
| 1840 | 106.23 | 31.51 |
| 1860 | 105.54 | 31.85 |
| 1880 | 104.9 | 32.19 |
| 1900 | 104.1 | 32.53 |
| 1920 | 103.14 | 32.88 |
| 1940 | 102.4 | 33.22 |

Deviator Stress Maximum: 113.20 kPa  $E_o$: 1914.38 kPa
Strain at Failure: 33.22 %  $E_{50}$: 450.14 kPa
Deviator Stress at (50%): 112.53 kPa
Strain at (50%): 25.00 %

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1156
Wet Soil + Container : 170.68 gram
Dry Soil + Container : 121.93 gram
Weight of Container : 4.38 gram
Density : 19.29 kN/m3
Moisture Content : 41.47 %

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 01.25 -01.65 m
Date Tested : 28/10/2021

GEOMINE

Dry Density : 13.64 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(01.25-01.65 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

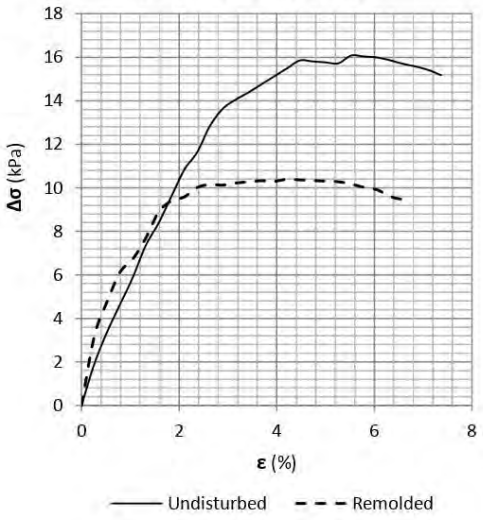
PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 05.50 - 05.70 m
Date Tested : 29/10/2021

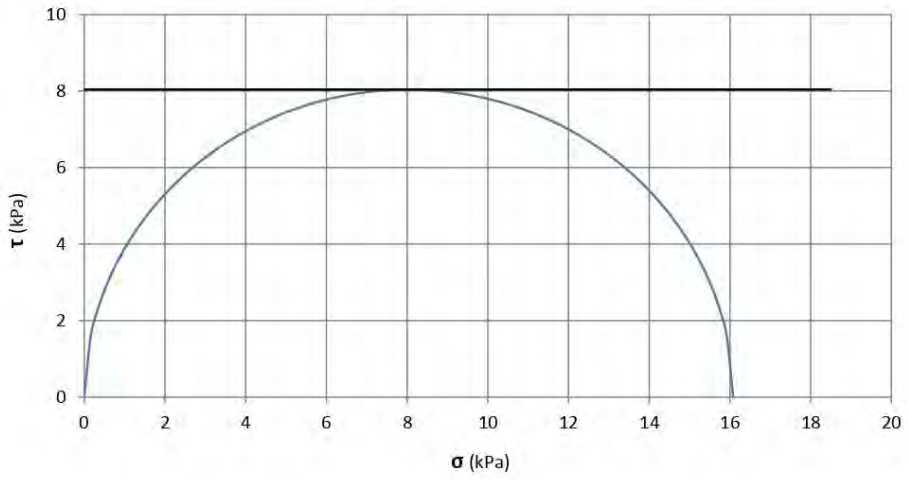
GEOMINE

## STRESS - STRAIN CURVE




| Results | | Undisturbed | Remolded |
|---|---|---|---|
| $\sigma_{max}$ | kPa | 16.1 | 10.4 |
| $\varepsilon_f$ | % | 5.53 | 4.21 |
| $S_t$ | - | 1.55 | |
| c | kPa | 8.0 | 5.2 |
| $E_{50}$ | kPa | 530 | 584 |
| $E_{sec}$ | kPa | 291 | 247 |

## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(05.50-05.70 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 05.50 - 05.70 m

Date Tested : 29/10/2021

GEOMINE

**Undisturbed**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

Water Content : 121.52 %
Unit Weight : 11.45 kN/m3
Dry Density : 5.17 kN/m3

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0.00 | 0.0000 | - | - | - |
| 20 | 1.91 | 0.2632 | | | |
| 40 | 3.39 | 0.5263 | | | |
| 60 | 4.64 | 0.7895 | | | |
| 80 | 5.89 | 1.0526 | | | |
| 100 | 7.35 | 1.3158 | | | |
| 120 | 8.38 | 1.5789 | | | |
| 140 | 9.61 | 1.8421 | | | |
| 160 | 10.83 | 2.1053 | | | |
| 180 | 11.63 | 2.3684 | | | |
| 200 | 12.84 | 2.6316 | | | |
| 220 | 13.64 | 2.8947 | | | |
| 240 | 14.05 | 3.1579 | | | |
| 260 | 14.38 | 3.4211 | | | |
| 280 | 14.75 | 3.6842 | | | |
| 300 | 15.12 | 3.9474 | | | |
| 320 | 15.49 | 4.2105 | | | |
| 340 | 15.85 | 4.4737 | | | |
| 360 | 15.81 | 4.7368 | | | |
| 380 | 15.77 | 5.0000 | | | |
| 400 | 15.72 | 5.2632 | | | |
| 420 | 16.08 | 5.5263 | | | |
| 440 | 16.04 | 5.7895 | | | |
| 460 | 15.99 | 6.0526 | | | |
| 480 | 15.87 | 6.3158 | | | |
| 500 | 15.70 | 6.5789 | | | |
| 520 | 15.58 | 6.8421 | | | |
| 540 | 15.42 | 7.1053 | | | |
| 560 | 15.18 | 7.3684 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(05.50-05.70 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 05.50 - 05.70 m
Date Tested : 29/10/2021

GEOMINE

**Remolded**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0 | 0.0000 | - | - | - |
| 20 | 3.18 | 0.2632 | | | |
| 40 | 4.78 | 0.5263 | | | |
| 60 | 6.12 | 0.7895 | | | |
| 80 | 6.74 | 1.0526 | | | |
| 100 | 7.68 | 1.3158 | | | |
| 120 | 8.88 | 1.5789 | | | |
| 140 | 9.40 | 1.8421 | | | |
| 160 | 9.58 | 2.1053 | | | |
| 180 | 10.01 | 2.3684 | | | |
| 200 | 10.15 | 2.6316 | | | |
| 220 | 10.12 | 2.8947 | | | |
| 240 | 10.22 | 3.1579 | | | |
| 260 | 10.27 | 3.4211 | | | |
| 280 | 10.33 | 3.6842 | | | |
| 300 | 10.30 | 3.9474 | | | |
| 320 | 10.39 | 4.2105 | | | |
| 340 | 10.37 | 4.4737 | | | |
| 360 | 10.34 | 4.7368 | | | |
| 380 | 10.31 | 5.0000 | | | |
| 400 | 10.28 | 5.2632 | | | |
| 420 | 10.17 | 5.5263 | | | |
| 440 | 10.02 | 5.7895 | | | |
| 460 | 9.91 | 6.0526 | | | |
| 480 | 9.61 | 6.3158 | | | |
| 500 | 9.46 | 6.5789 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(05.50-05.70 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 01
Depth : 07.00 - 07.20 m
Date Tested : 25/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m³ | 10.45 |
| Dry Density | kN/m³ | 4.76 |
| Saturated Density | kN/m³ | 12.34 |
| Spesific Gravity | - | 1.97 |
| Natural Water Content | % | 54 |
| Absorption | % | 159 |
| Saturation | % | 0.76 |
| Porosity | - | 0.76 |
| Void Ratio | - | 3.13 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(07.00-07.20 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

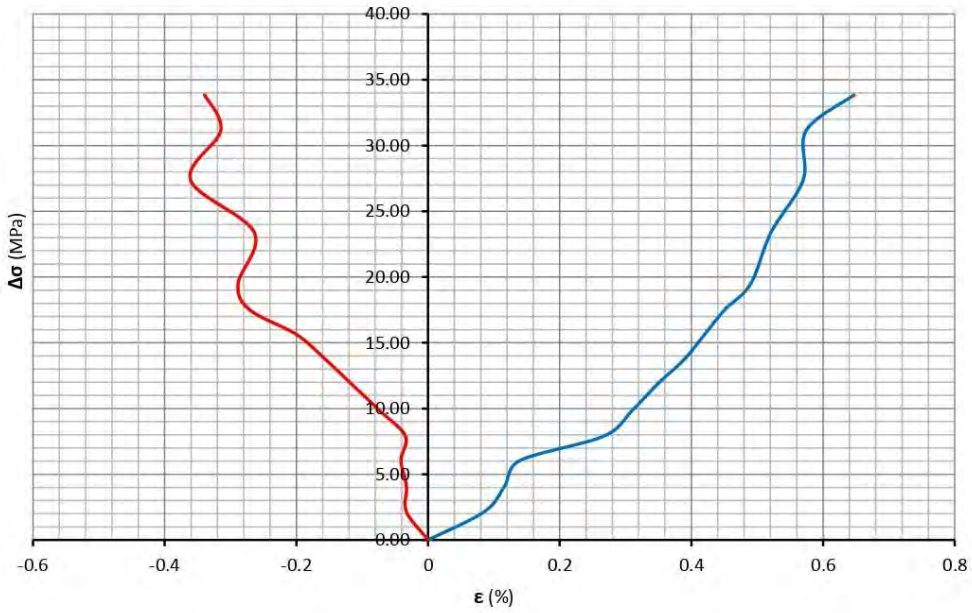
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 01
Depth : 15.30 - 15.55 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 33.84 |
| v | - | 0.27 |
| E | MPa | 4072 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(15.30-15.55 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 01
Depth : 16.23 - 16.43 m
Date Tested : 27/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 28.73 |
| Dry Density | kN/m$^3$ | 28.60 |
| Saturated Density | kN/m$^3$ | 29.13 |
| Spesific Gravity | - | 3.02 |
| Natural Water Content | % | 0 |
| Absorption | % | 2 |
| Saturation | % | 0.05 |
| Porosity | - | 0.05 |
| Void Ratio | - | 0.06 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 01-(16.23-16.43 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 - 03.80 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | $kN/m^3$ | 19.9 |
| SL | % | - |
| Gs | - | 3.51 |
| MC | % | 46 |
| PL | % | 30 |
| LL | % | 56 |
| PI | % | 26 |
| Fines (#200) | % | 78 |
| $D_{10}$ | mm | 0.0112 |
| $D_{30}$ | mm | 0.0149 |
| $D_{60}$ | mm | 0.0467 |
| $C_u$ | - | 4 |
| $C_c$ | - | 0.42 |

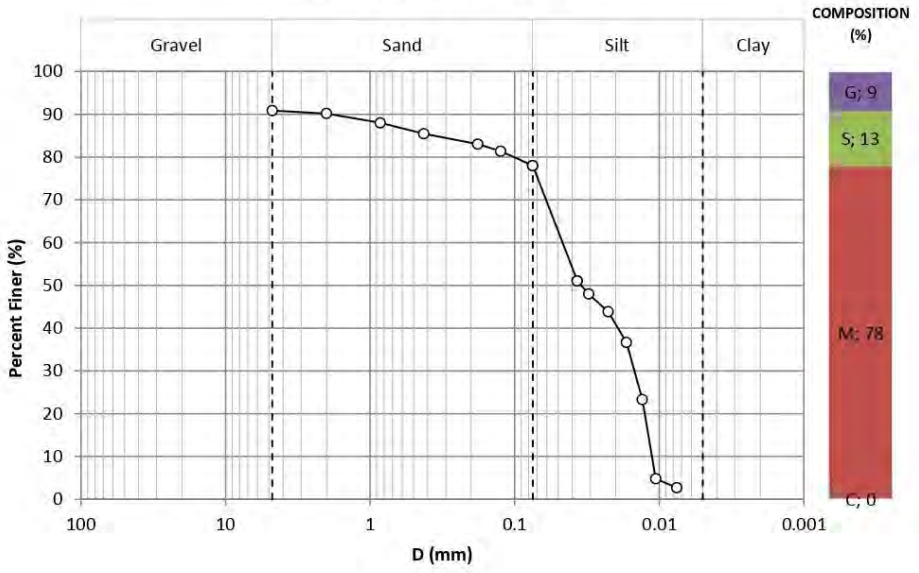
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.11 |
| $I_T$ | % | -238.86 |
| $I_L$ | % | 0.62 |
| $I_C$ | % | 0.38 |
| $S_r$ | % | 100.00 |
| e | - | 1.54 |
| n | - | 0.61 |
| A | - | 19.59 |

| | |
|---|---|
| Consistency** | Soft |
| Activity | Active |
| Plasticity Symbol | MH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 - 03.80 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1125 | 1105 | 1146 |
| Weight of Container | 5.54 | 4.65 | 4.66 |
| Weight of wet soil and container | 144.48 | 152.82 | 141.02 |
| Weight of dry soil and container | 100.28 | 106.13 | 98.33 |
| Moisture Content | 46.65 | 46.01 | 45.57 |
| Average MC | 46.08 | | |

**Unit weight**

| | |
|---|---|
| No. Ring | 16 |
| No. Container | 1149 |
| Weight of Ring | 26.86 |
| Volume of Ring | 15.216 |
| Weight of Container | 4.39 |
| Weight of wet soil and ring and containe | 61.59 |
| Weight of dry soil and ring and containe | 52.27 |
| Water Content | 44.339 |
| Density | 19.939 |
| Dry Density | 13.814 |
| Saturation | 100 |
| Void ratio | 1.5429 |
| Porosity | 0.6068 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 201 | 201 |
| Weight of Pycknometer + soil | 84.11 | 84.11 |
| Weight of Pycknometer + water + soil | 175.75 | 175.75 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 52.92 | 52.92 |
| Weight of Pycknometer + water | 153.44 | 153.44 |
| Specific Gravity | 3.513 | 3.513 |
| Average Specific Gravity | 3.513 | |

**Shrinkage Limit**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 - 03.80 m

Date Tested : 26/10/2021

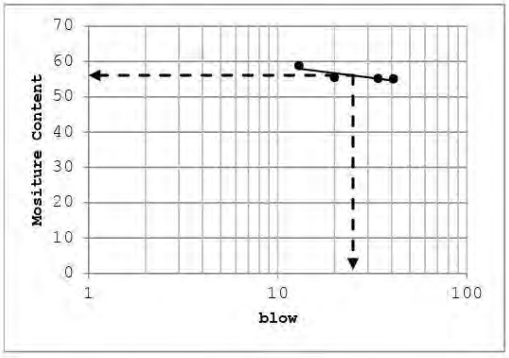
GEOMINE

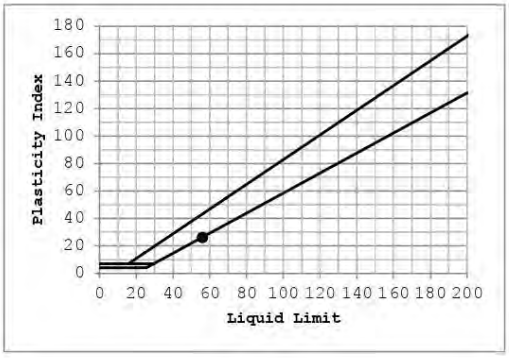
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1012 | 1214 | 1240 |
| Weight of Container | 5.87 | 4.53 | 4.43 |
| Weight of wet soil and container | 14.55 | 14.67 | 13.96 |
| Weight of dry soil and container | 12.59 | 12.28 | 11.76 |
| Plastic Limit | 29.17 | 30.84 | 30.01 |
| Average | 30.01 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1120 | 1060 | 1001 | 1050 | - |
| Weight of Container | 4.96 | 5.61 | 5.89 | 5.77 | - |
| Weight of wet soil and container | 15.89 | 15.93 | 15.62 | 15.31 | - |
| Weight of dry soil and container | 12.01 | 12.26 | 12.15 | 11.78 | - |
| Water Content | 55.04 | 55.19 | 55.43 | 58.74 | - |
| Number of blows | 41 | 34 | 20 | 13 | - |
| Liquid Limit | 56.09 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.7 |
| Weight of dry soil | 80.7 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 7.37 | 9.13 | 9.13 | 90.87 |
| 10 | 2 | 0.56 | 0.69 | 9.83 | 90.17 |
| 20 | 0.85 | 1.76 | 2.18 | 12.01 | 87.99 |
| 40 | 0.425 | 2.04 | 2.53 | 14.54 | 85.46 |
| 80 | 0.18 | 1.96 | 2.43 | 16.96 | 83.04 |
| 120 | 0.125 | 1.34 | 1.66 | 18.62 | 81.38 |
| 200 | 0.075 | 2.72 | 3.37 | 22.00 | 78.00 |
| Pan | 0 | 1.29 | 78.00 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 - 03.80 m
Date Tested : 26/10/2021

GEOMINE

Hydrometer

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 61.66 | | |
| Zerro correction | -1 | Gs | 3.5129 |
| Meniscus correction | 1 | a | 0.8704 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 26 | 44 | 0.0307 | 47.97 |
| 12:22 | 2 | 26 | 40 | 0.0226 | 43.86 |
| 12:24 | 4 | 26 | 33 | 0.0169 | 36.66 |
| 12:28 | 8 | 26 | 20 | 0.0131 | 23.29 |
| 12:35 | 15 | 26 | 2 | 0.0106 | 4.78 |
| 12:50 | 30 | 26 | 0 | 0.0076 | 2.73 |
| 13:05 | 45 | 0 | 0 | 0.0000 | 1.03 |
| 13:50 | 90 | 0 | 0 | 0.0000 | 1.03 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

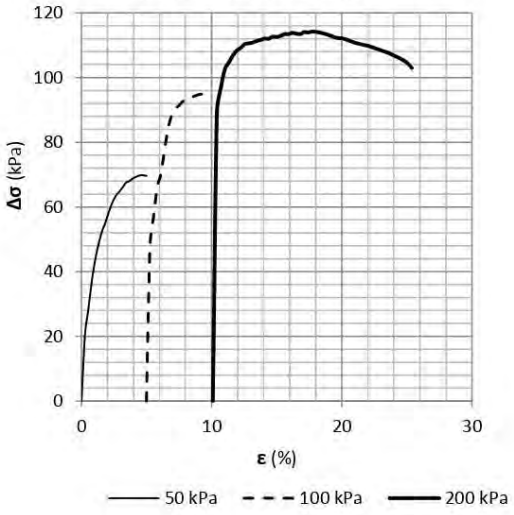
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 -03.80 m
Date Tested : 28/10/2021

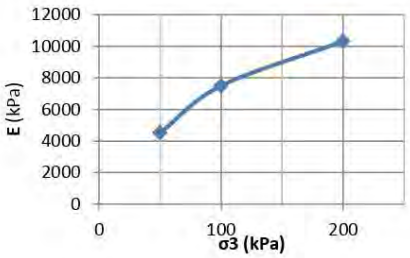
GEOMINE

## STRESS - STRAIN CURVE

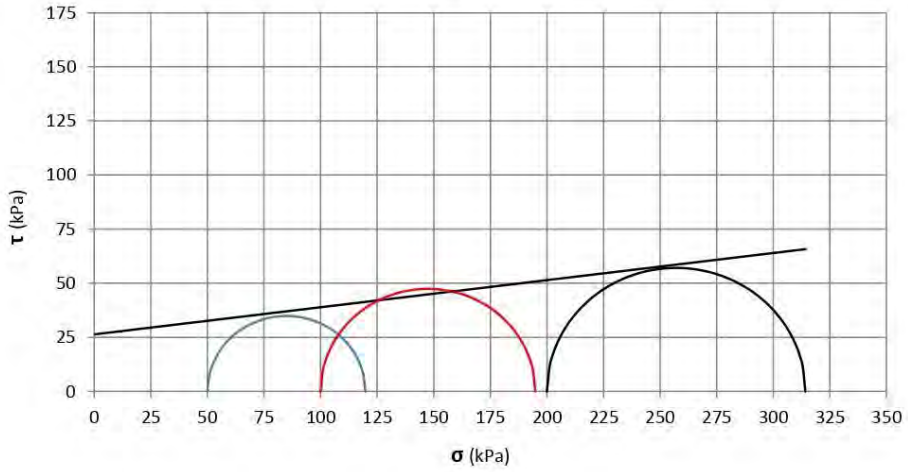



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 69.79 | 4.74 |
| 2. | 100 | 94.85 | 9.42 |
| 3. | 200 | 114.19 | 17.74 |

| Results | | |
|---|---|---|
| c | kPa | 26.4 |
| ø | ° | 7.1 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 -03.80 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 20.25 | 0.26 |
| 40 | 28.33 | 0.53 |
| 60 | 37.02 | 0.79 |
| 80 | 43.67 | 1.05 |
| 100 | 48.54 | 1.32 |
| 120 | 52.52 | 1.58 |
| 140 | 55.21 | 1.84 |
| 160 | 58.52 | 2.11 |
| 180 | 61.34 | 2.37 |
| 200 | 63.44 | 2.63 |
| 220 | 64.67 | 2.89 |
| 240 | 66.05 | 3.16 |
| 260 | 67.5 | 3.42 |
| 280 | 68.01 | 3.68 |
| 300 | 68.82 | 3.95 |
| 320 | 69.33 | 4.21 |
| 340 | 69.75 | 4.47 |
| 360 | 69.79 | 4.74 |
| 380 | 69.6 | 5 |

Deviator Stress Maximum: 69.79 kPa
Strain at Failure: 5.00 %
Deviator Stress at (50%): 61.34 kPa
Strain at (50%): 2.37 %

$E_{o}$: 3492.06 kPa
$E_{50}$: 2589.87 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 72.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 360 | 0 | 4.99 |
| 380 | 47.89 | 5.26 |
| 400 | 57.07 | 5.54 |
| 420 | 66.12 | 5.82 |
| 440 | 70.07 | 6.09 |
| 460 | 77.38 | 6.37 |
| 480 | 84.27 | 6.65 |
| 500 | 88.2 | 6.93 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 -03.80 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 90.32 | 7.2 |
| 540 | 91.31 | 7.48 |
| 560 | 92.52 | 7.76 |
| 580 | 93.2 | 8.03 |
| 600 | 93.43 | 8.31 |
| 620 | 94.11 | 8.59 |
| 640 | 94.55 | 8.86 |
| 660 | 94.85 | 9.14 |
| 680 | 94.85 | 9.42 |

Deviator Stress Maximum: 94.85 kPa
Strain at Failure: 9.42 %
Deviator Stress at (50%): 90.32 kPa
Strain at (50%): 7.20 %

$E_o$: 4770.44 kPa
$E_{50}$: 1254.05 kPa

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 65.4 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 660 | 0 | 10.09 |
| 680 | 88.79 | 10.4 |
| 700 | 96.73 | 10.7 |
| 720 | 102.47 | 11.01 |
| 740 | 104.6 | 11.31 |
| 760 | 106.73 | 11.62 |
| 780 | 108.26 | 11.93 |
| 800 | 109.16 | 12.23 |
| 820 | 110.32 | 12.54 |
| 840 | 110.56 | 12.84 |
| 860 | 110.8 | 13.15 |
| 880 | 111.32 | 13.46 |
| 900 | 111.61 | 13.76 |
| 920 | 112.05 | 14.07 |
| 940 | 111.99 | 14.37 |
| 960 | 112.62 | 14.68 |
| 980 | 112.56 | 14.98 |
| 1000 | 112.83 | 15.29 |
| 1020 | 113.44 | 15.6 |
| 1040 | 113.43 | 15.9 |
| 1060 | 113.83 | 16.21 |
| 1080 | 113.55 | 16.51 |
| 1100 | 113.46 | 16.82 |
| 1120 | 114.04 | 17.13 |
| 1140 | 113.95 | 17.43 |
| 1160 | 114.19 | 17.74 |
| 1180 | 114.1 | 18.04 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 03.40 -03.80 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 113.87 | 18.35 |
| 1220 | 113.57 | 18.65 |
| 1240 | 113.21 | 18.96 |
| 1260 | 112.72 | 19.27 |
| 1280 | 112.29 | 19.57 |
| 1300 | 112.18 | 19.88 |
| 1320 | 111.95 | 20.18 |
| 1340 | 111.52 | 20.49 |
| 1360 | 111.09 | 20.8 |
| 1380 | 110.66 | 21.1 |
| 1400 | 110.36 | 21.41 |
| 1420 | 110.06 | 21.71 |
| 1440 | 109.81 | 22.02 |
| 1460 | 109.38 | 22.32 |
| 1480 | 108.95 | 22.63 |
| 1500 | 108.52 | 22.94 |
| 1520 | 108.09 | 23.24 |
| 1540 | 107.66 | 23.55 |
| 1560 | 107.11 | 23.85 |
| 1580 | 106.49 | 24.16 |
| 1600 | 105.94 | 24.46 |
| 1620 | 105.21 | 24.77 |
| 1640 | 104.3 | 25.08 |
| 1660 | 102.98 | 25.38 |

Deviator Stress Maximum: 114.19 kPa
Strain at Failure: 25.38 %
Deviator Stress at (50%): 114.19 kPa
Strain at (50%): 17.74 %

$E_{s_i}$: 1393.35 kPa
$E_{50}$: 643.81 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1120
Wet Soil + Container : 169.35 gram
Dry Soil + Container : 117.39 gram
Weight of Container : 4.96 gram
Density : 19.07 kN/m3
Moisture Content : 46.22 %
Dry Density : 13.04 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(03.40-03.80 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

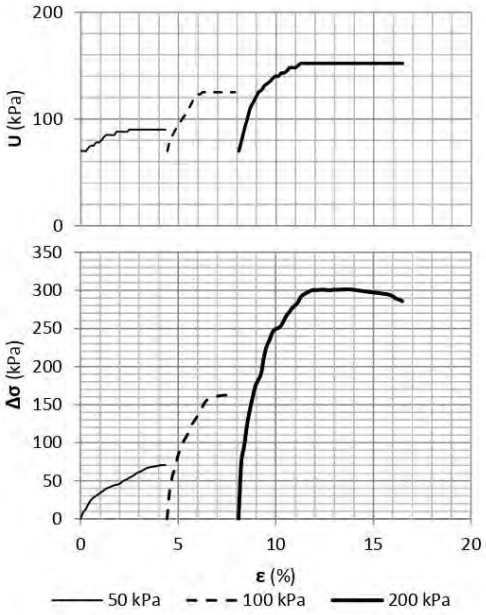
PARTNER FOR DESIGN

# Triaxial Consolidated Undrained Test

GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

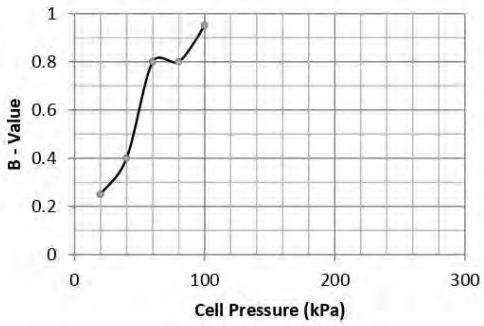
## PWP-STRAIN AND STRESS-STRAIN CURVE



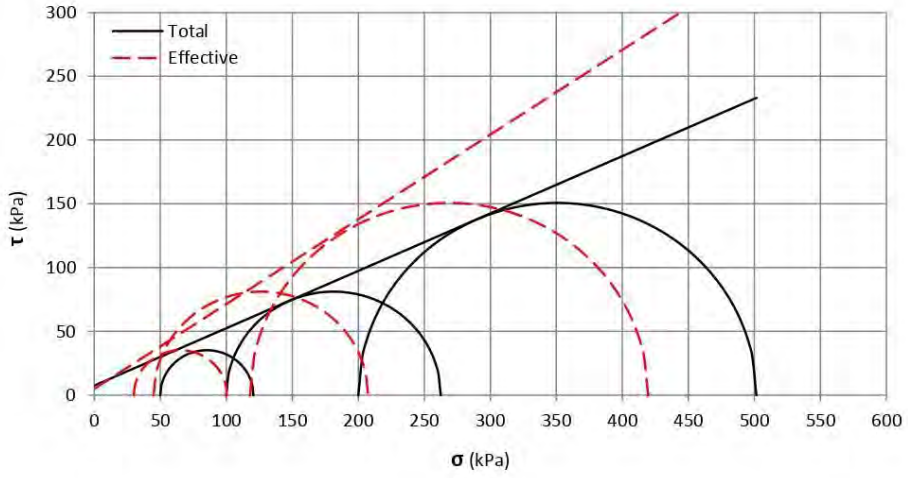

| No. | σ3 (kPa) | σ1 (kPa) | σ3' (kPa) | σ1' (kPa) | Δσ (kPa) | U (kPa) |
|---|---|---|---|---|---|---|
| 1. | 50 | 121 | 30 | 101 | 71 | 90 |
| 2. | 100 | 262 | 45 | 207 | 162 | 125 |
| 3. | 200 | 501 | 118 | 419 | 301 | 152 |

| Results | | Total | Effective |
|---|---|---|---|
| c | kPa | 7.5 | 5.0 |
| ø | ° | 24.2 | 33.6 |

## SATURATION BUILD - UP




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(04.30-04.70 m)-TX CU.xlsm

F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

# Triaxial Consolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

GEOMINE

Height of Sample: 76.00 mm
Diameter of Sample: 38.00 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

Cell Pressure: 120 kPa
Back Pressure: 70 kPa
Effective Pressure: 50 kPa

--- TRIAXIAL S A T U R A T I O N ---

| CP (kPa) | BP (kPa) | PWP (kPa) | B Value - |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 20 | | 5 | 0.25 |
| | 10 | 10 | |
| 40 | | 18 | 0.4 |
| | 30 | 22 | |
| 60 | | 38 | 0.8 |
| | 50 | 42 | |
| 80 | | 58 | 0.8 |
| | 70 | 62 | |
| 100 | | 81 | 0.95 |

--- TRIAXIAL C O N S O L I D A T I O N ---

| | | | | | |
|---|---|---|---|---|---|
| Cell Pressure | 120 | kPa | tf: 48.7 minute | mv: 0.46 m2/MN | |
| Back Pressure | 70 | kPa | tfmin: 120.0 minute | Cv: 1.11 m2/year | |
| PWP bulit up | 0 | kPa | Strain to Failure: 8.0% | k: 1.596E-10 m/s | |
| Effective Pressure | 50 | kPa | Rate of Strain: 0.0507 mm/minute | | |
| Different | 30 | kPa | | | |

| t (minute) | √t (-) | PWP (kPa) | dPWP (kPa) | Dissipation (%) | Volume Change of BP (cm3) | dVolume (cm3) |
|---|---|---|---|---|---|---|
| 0 | 0 | 100 | 0 | 0 | 34.8 | 0 |
| 1 | 1 | 95 | 5 | 16.7 | 34.6 | 0.2 |
| 4 | 2 | 90 | 10 | 33.3 | 34 | 0.8 |
| 9 | 3 | 83 | 17 | 56.7 | 33.7 | 1.1 |
| 16 | 4 | 75 | 25 | 83.3 | 33.5 | 1.3 |
| 25 | 5 | 72 | 28 | 93.3 | 33.2 | 1.6 |
| 36 | 6 | 70 | 30 | 100 | 33 | 1.8 |
| 49 | 7 | 70 | 30 | 100 | 33 | 1.8 |
| 64 | 8 | 70 | 30 | 100 | 33 | 1.8 |

--- TRIAXIAL S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) | U (kPa) | dU (kPa) | s1 (kPa) | s1' (kPa) | s3 (kPa) | s3' (kPa) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 70 | 0 | 50 | 50 | 50 | 50 |
| 10 | 8.29 | 0.13 | 70 | 0 | 58.29 | 58.29 | 50 | 50 |
| 20 | 12.42 | 0.26 | 70 | 0 | 62.42 | 62.42 | 50 | 50 |
| 30 | 19.05 | 0.39 | 73 | 3 | 69.05 | 66.05 | 50 | 47 |
| 40 | 24.28 | 0.53 | 75 | 5 | 74.28 | 69.28 | 50 | 45 |
| 50 | 27.65 | 0.66 | 75 | 5 | 77.65 | 72.65 | 50 | 45 |
| 60 | 30.11 | 0.79 | 78 | 8 | 80.11 | 72.11 | 50 | 42 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(04.30-04.70 m)-TX CU.xlsm

F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

# Triaxial Consolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

GEOMINE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 70 | 32.41 | 0.92 | 78 | 8 | 82.41 | 74.41 | 50 | 42 |
| 80 | 34.86 | 1.05 | 80 | 10 | 84.86 | 74.86 | 50 | 40 |
| 90 | 37.15 | 1.18 | 83 | 13 | 87.15 | 74.15 | 50 | 37 |
| 100 | 39.75 | 1.32 | 85 | 15 | 89.75 | 74.75 | 50 | 35 |
| 110 | 41.06 | 1.45 | 85 | 15 | 91.06 | 76.06 | 50 | 35 |
| 120 | 42.45 | 1.58 | 85 | 15 | 92.45 | 77.45 | 50 | 35 |
| 130 | 43.99 | 1.71 | 85 | 15 | 93.99 | 78.99 | 50 | 35 |
| 140 | 44.73 | 1.84 | 88 | 18 | 94.73 | 76.73 | 50 | 32 |
| 150 | 45.71 | 1.97 | 88 | 18 | 95.71 | 77.71 | 50 | 32 |
| 160 | 47.95 | 2.11 | 88 | 18 | 97.95 | 79.95 | 50 | 32 |
| 170 | 50.52 | 2.24 | 88 | 18 | 100.52 | 82.52 | 50 | 32 |
| 180 | 51.64 | 2.37 | 88 | 18 | 101.64 | 83.64 | 50 | 32 |
| 190 | 54.03 | 2.5 | 90 | 20 | 104.03 | 84.03 | 50 | 30 |
| 200 | 55.7 | 2.63 | 90 | 20 | 105.7 | 85.7 | 50 | 30 |
| 210 | 57.76 | 2.76 | 90 | 20 | 107.76 | 87.76 | 50 | 30 |
| 220 | 60.21 | 2.89 | 90 | 20 | 110.21 | 90.21 | 50 | 30 |
| 230 | 61.63 | 3.03 | 90 | 20 | 111.63 | 91.63 | 50 | 30 |
| 240 | 63.2 | 3.16 | 90 | 20 | 113.2 | 93.2 | 50 | 30 |
| 250 | 65.32 | 3.29 | 90 | 20 | 115.32 | 95.32 | 50 | 30 |
| 260 | 66.8 | 3.42 | 90 | 20 | 116.8 | 96.8 | 50 | 30 |
| 270 | 67.65 | 3.55 | 90 | 20 | 117.65 | 97.65 | 50 | 30 |
| 280 | 68.26 | 3.68 | 90 | 20 | 118.26 | 98.26 | 50 | 30 |
| 290 | 68.87 | 3.82 | 90 | 20 | 118.87 | 98.87 | 50 | 30 |
| 300 | 69.56 | 3.95 | 90 | 20 | 119.56 | 99.56 | 50 | 30 |
| 310 | 70.33 | 4.08 | 90 | 20 | 120.33 | 100.33 | 50 | 30 |
| 320 | 70.54 | 4.21 | 90 | 20 | 120.54 | 100.54 | 50 | 30 |
| 330 | 70.44 | 4.34 | 90 | 20 | 120.44 | 100.44 | 50 | 30 |

Deviator Stress Maximum: 70.54 kPa
Strain at Failure: 4.21 %
Deviator Stress at (50%): 47.95 kPa
Strain at (50%): 2.11 %

$E_o$: 4187 kPa
$E_{50}$: 2278 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 72.17 mm
Diameter of Sample: 38.58 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

Cell Pressure: 170 kPa
Back Pressure: 70 kPa
Effective Pressure: 100 kPa

--- TRIAXIAL S A T U R A T I O N ---

| CP (kPa) | BP (kPa) | PWP (kPa) | B Value - |
|---|---|---|---|
| 0 | 0 | 0 | 0 |

--- TRIAXIAL C O N S O L I D A T I O N ---

| | | | | | |
|---|---|---|---|---|---|
| Cell Pressure | 170 | kPa | tf: 98.3 minute | mv: 0.18 m2/MN |
| Back Pressure | 70 | kPa | tfmin: 120.0 minute | Cv: 0.55 m2/year |
| PWP bulit up | 0 | kPa | Strain to Failure: 8.0% | k: 3.049E-11 m/s |
| Effective Pressure | 100 | kPa | Rate of Strain: 0.0481 mm/minute | |
| Different | 75 | kPa | | |

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F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

# Triaxial Consolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

GEOMINE

| t (minute) | √t (-) | PWP (kPa) | dPWP (kPa) | Dissipation (%) | Volume Change of BP (cm3) | dVolume (cm3) |
|---|---|---|---|---|---|---|
| 0 | 0 | 145 | 0 | 0 | 33 | 0 |
| 1 | 1 | 138 | 7 | 9.3 | 32.8 | 0.2 |
| 4 | 2 | 125 | 20 | 26.7 | 32.5 | 0.5 |
| 9 | 3 | 115 | 30 | 40 | 32.3 | 0.7 |
| 16 | 4 | 100 | 45 | 60 | 32.1 | 0.9 |
| 25 | 5 | 90 | 55 | 73.3 | 31.8 | 1.2 |
| 36 | 6 | 81 | 64 | 85.3 | 31.5 | 1.5 |
| 49 | 7 | 75 | 70 | 93.3 | 31.4 | 1.6 |
| 64 | 8 | 70 | 75 | 100 | 31.3 | 1.7 |
| 81 | 9 | 70 | 75 | 100 | 31.3 | 1.7 |
| 100 | 10 | 70 | 75 | 100 | 31.3 | 1.7 |

--- TRIAXIAL S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) | U (kPa) | dU (kPa) | s1 (kPa) | s1' (kPa) | s3 (kPa) | s3' (kPa) |
|---|---|---|---|---|---|---|---|---|
| 320 | 0 | 4.43 | 70 | 0 | 100 | 100 | 100 | 100 |
| 330 | 37.87 | 4.57 | 80 | 10 | 137.87 | 127.87 | 100 | 90 |
| 340 | 56.39 | 4.71 | 85 | 15 | 156.39 | 141.39 | 100 | 85 |
| 350 | 67.56 | 4.85 | 90 | 20 | 167.56 | 147.56 | 100 | 80 |
| 360 | 82.46 | 4.99 | 93 | 23 | 182.46 | 159.46 | 100 | 77 |
| 370 | 92.47 | 5.13 | 98 | 28 | 192.47 | 164.47 | 100 | 72 |
| 380 | 101.05 | 5.27 | 102 | 32 | 201.05 | 169.05 | 100 | 68 |
| 390 | 107.1 | 5.4 | 105 | 35 | 207.1 | 172.1 | 100 | 65 |
| 400 | 114.02 | 5.54 | 110 | 40 | 214.02 | 174.02 | 100 | 60 |
| 410 | 123.01 | 5.68 | 115 | 45 | 223.01 | 178.01 | 100 | 55 |
| 420 | 128.18 | 5.82 | 120 | 50 | 228.18 | 178.18 | 100 | 50 |
| 430 | 133.78 | 5.96 | 123 | 53 | 233.78 | 180.78 | 100 | 47 |
| 440 | 140.92 | 6.1 | 123 | 53 | 240.92 | 187.92 | 100 | 47 |
| 450 | 146.55 | 6.24 | 125 | 55 | 246.55 | 191.55 | 100 | 45 |
| 460 | 153.13 | 6.37 | 125 | 55 | 253.13 | 198.13 | 100 | 45 |
| 470 | 156.74 | 6.51 | 125 | 55 | 256.74 | 201.74 | 100 | 45 |
| 480 | 158.35 | 6.65 | 125 | 55 | 258.35 | 203.35 | 100 | 45 |
| 490 | 160.54 | 6.79 | 125 | 55 | 260.54 | 205.54 | 100 | 45 |
| 500 | 161.04 | 6.93 | 125 | 55 | 261.04 | 206.04 | 100 | 45 |
| 510 | 161.31 | 7.07 | 125 | 55 | 261.31 | 206.31 | 100 | 45 |
| 520 | 162.02 | 7.21 | 125 | 55 | 262.02 | 207.02 | 100 | 45 |
| 530 | 162.29 | 7.34 | 125 | 55 | 262.29 | 207.29 | 100 | 45 |
| 540 | 162.41 | 7.48 | 125 | 55 | 262.41 | 207.41 | 100 | 45 |
| 550 | 162.39 | 7.62 | 125 | 55 | 262.39 | 207.39 | 100 | 45 |
| 560 | 162.15 | 7.76 | 125 | 55 | 262.15 | 207.15 | 100 | 45 |
| 570 | 162.05 | 7.9 | 125 | 55 | 262.05 | 207.05 | 100 | 45 |

Deviator Stress Maximum: 162.41 kPa
Strain at Failure: 7.48 %
Deviator Stress at (50%): 133.78 kPa
Strain at (50%): 5.96 %

$E_c$: 12523 kPa
$E_{50}$: 2245 kPa

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F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

# Triaxial Consolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

GEOMINE

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 69.19 mm
Diameter of Sample: 39.93 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

Cell Pressure: 270 kPa
Back Pressure: 70 kPa
Effective Pressure: 200 kPa

--- TRIAXIAL S A T U R A T I O N ---

| CP (kPa) | BP (kPa) | PWP (kPa) | B Value - |
|---|---|---|---|
| 0 | 0 | 0 | 0 |

--- TRIAXIAL C O N S O L I D A T I O N ---

| | | | | |
|---|---|---|---|---|
| Cell Pressure | 270 kPa | tf: 68.7 minute | | mv: 0.16 m2/MN |
| Back Pressure | 70 kPa | tfmin: 120.0 minute | | Cv: 0.79 m2/year |
| PWP bulit up | 0 kPa | Strain to Failure: 8.0% | | k: 3.881E-11 m/s |
| Effective Pressure | 200 kPa | Rate of Strain: 0.0461 mm/minute | | |
| Different | 140 kPa | | | |

| t (minute) | √t (-) | PWP (kPa) | dPWP (kPa) | Dissipation (%) | Volume Change of BP (cm3) | dVolume (cm3) |
|---|---|---|---|---|---|---|
| 0 | 0 | 210 | 0 | 0 | 31.3 | 0 |
| 1 | 1 | 190 | 20 | 14.3 | 31 | 0.3 |
| 4 | 2 | 170 | 40 | 28.6 | 30.5 | 0.8 |
| 9 | 3 | 155 | 55 | 39.3 | 30.1 | 1.2 |
| 16 | 4 | 140 | 70 | 50 | 29.7 | 1.6 |
| 25 | 5 | 122 | 88 | 62.9 | 29.5 | 1.8 |
| 36 | 6 | 110 | 100 | 71.4 | 29.3 | 2 |
| 49 | 7 | 90 | 120 | 85.7 | 29.1 | 2.2 |
| 64 | 8 | 80 | 130 | 92.9 | 28.9 | 2.4 |
| 81 | 9 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 100 | 10 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 121 | 11 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 144 | 12 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 169 | 13 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 196 | 14 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 225 | 15 | 75 | 135 | 96.4 | 28.7 | 2.6 |
| 1440 | 37.947 | 70 | 140 | 100 | 28.4 | 2.9 |

--- TRIAXIAL S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) | U (kPa) | dU (kPa) | s1 (kPa) | s1' (kPa) | s3 (kPa) | s3' (kPa) |
|---|---|---|---|---|---|---|---|---|
| 560 | 0 | 8.09 | 70 | 0 | 200 | 200 | 200 | 200 |
| 570 | 75.23 | 8.24 | 80 | 10 | 275.23 | 265.23 | 200 | 190 |
| 580 | 95.47 | 8.38 | 91 | 21 | 295.47 | 274.47 | 200 | 179 |
| 590 | 122.72 | 8.53 | 100 | 30 | 322.72 | 292.72 | 200 | 170 |
| 600 | 142.75 | 8.67 | 110 | 40 | 342.75 | 302.75 | 200 | 160 |
| 610 | 159.4 | 8.82 | 115 | 45 | 359.4 | 314.4 | 200 | 155 |
| 620 | 174.64 | 8.96 | 120 | 50 | 374.64 | 324.64 | 200 | 150 |

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F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

## Triaxial Consolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

GEOMINE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 630 | 182.47 | 9.11 | 125 | 55 | 382.47 | 327.47 | 200 | 145 |
| 640 | 190.55 | 9.25 | 127 | 57 | 390.55 | 333.55 | 200 | 143 |
| 650 | 212.26 | 9.39 | 131 | 61 | 412.26 | 351.26 | 200 | 139 |
| 660 | 226.72 | 9.54 | 133 | 63 | 426.72 | 363.72 | 200 | 137 |
| 670 | 235.08 | 9.68 | 135 | 65 | 435.08 | 370.08 | 200 | 135 |
| 680 | 244.69 | 9.83 | 138 | 68 | 444.69 | 376.69 | 200 | 132 |
| 690 | 248.98 | 9.97 | 140 | 70 | 448.98 | 378.98 | 200 | 130 |
| 700 | 250.52 | 10.12 | 140 | 70 | 450.52 | 380.52 | 200 | 130 |
| 710 | 253.45 | 10.26 | 143 | 73 | 453.45 | 380.45 | 200 | 127 |
| 720 | 259.9 | 10.41 | 143 | 73 | 459.9 | 386.9 | 200 | 127 |
| 730 | 266.93 | 10.55 | 145 | 75 | 466.93 | 391.93 | 200 | 125 |
| 740 | 271.61 | 10.7 | 148 | 78 | 471.61 | 393.61 | 200 | 122 |
| 750 | 276.67 | 10.84 | 148 | 78 | 476.67 | 398.67 | 200 | 122 |
| 760 | 280.19 | 10.98 | 148 | 78 | 480.19 | 402.19 | 200 | 122 |
| 770 | 284.1 | 11.13 | 150 | 80 | 484.1 | 404.1 | 200 | 120 |
| 780 | 291.15 | 11.27 | 152 | 82 | 491.15 | 409.15 | 200 | 118 |
| 790 | 294.43 | 11.42 | 152 | 82 | 494.43 | 412.43 | 200 | 118 |
| 800 | 296.64 | 11.56 | 152 | 82 | 496.64 | 414.64 | 200 | 118 |
| 810 | 298.59 | 11.71 | 152 | 82 | 498.59 | 416.59 | 200 | 118 |
| 820 | 300.2 | 11.85 | 152 | 82 | 500.2 | 418.2 | 200 | 118 |
| 830 | 300.55 | 12 | 152 | 82 | 500.55 | 418.55 | 200 | 118 |
| 840 | 300.45 | 12.14 | 152 | 82 | 500.45 | 418.45 | 200 | 118 |
| 850 | 300.87 | 12.29 | 152 | 82 | 500.87 | 418.87 | 200 | 118 |
| 860 | 300.9 | 12.43 | 152 | 82 | 500.9 | 418.9 | 200 | 118 |
| 870 | 300.53 | 12.57 | 152 | 82 | 500.53 | 418.53 | 200 | 118 |
| 880 | 300.36 | 12.72 | 152 | 82 | 500.36 | 418.36 | 200 | 118 |
| 890 | 300.51 | 12.86 | 152 | 82 | 500.51 | 418.51 | 200 | 118 |
| 900 | 300.85 | 13.01 | 152 | 82 | 500.85 | 418.85 | 200 | 118 |
| 910 | 300.8 | 13.15 | 152 | 82 | 500.8 | 418.8 | 200 | 118 |
| 920 | 301.07 | 13.3 | 152 | 82 | 501.07 | 419.07 | 200 | 118 |
| 930 | 301.15 | 13.44 | 152 | 82 | 501.15 | 419.15 | 200 | 118 |
| 940 | 301.42 | 13.59 | 152 | 82 | 501.42 | 419.42 | 200 | 118 |
| 950 | 301.49 | 13.73 | 152 | 82 | 501.49 | 419.49 | 200 | 118 |
| 960 | 301.18 | 13.88 | 152 | 82 | 501.18 | 419.18 | 200 | 118 |
| 970 | 300.67 | 14.02 | 152 | 82 | 500.67 | 418.67 | 200 | 118 |
| 980 | 300.17 | 14.16 | 152 | 82 | 500.17 | 418.17 | 200 | 118 |
| 990 | 299.66 | 14.31 | 152 | 82 | 499.66 | 417.66 | 200 | 118 |
| 1000 | 299.16 | 14.45 | 152 | 82 | 499.16 | 417.16 | 200 | 118 |
| 1010 | 298.65 | 14.6 | 152 | 82 | 498.65 | 416.65 | 200 | 118 |
| 1020 | 298.15 | 14.74 | 152 | 82 | 498.15 | 416.15 | 200 | 118 |
| 1030 | 297.64 | 14.89 | 152 | 82 | 497.64 | 415.64 | 200 | 118 |
| 1040 | 297.32 | 15.03 | 152 | 82 | 497.32 | 415.32 | 200 | 118 |
| 1050 | 296.82 | 15.18 | 152 | 82 | 496.82 | 414.82 | 200 | 118 |
| 1060 | 296.31 | 15.32 | 152 | 82 | 496.31 | 414.31 | 200 | 118 |
| 1070 | 295.81 | 15.47 | 152 | 82 | 495.81 | 413.81 | 200 | 118 |
| 1080 | 295.3 | 15.61 | 152 | 82 | 495.3 | 413.3 | 200 | 118 |
| 1090 | 294.79 | 15.75 | 152 | 82 | 494.79 | 412.79 | 200 | 118 |
| 1100 | 293.48 | 15.9 | 152 | 82 | 493.48 | 411.48 | 200 | 118 |
| 1110 | 291.54 | 16.04 | 152 | 82 | 491.54 | 409.54 | 200 | 118 |
| 1120 | 288.73 | 16.19 | 152 | 82 | 488.73 | 406.73 | 200 | 118 |

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F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

# Triaxial Consolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 04.30 - 04.70 m
Date Tested : 2/11/2021

GEOMINE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1130 | 287.98 | 16.33 | 152 | 82 | 487.98 | 405.98 | 200 | 118 |
| 1140 | 285.87 | 16.48 | 152 | 82 | 485.87 | 403.87 | 200 | 118 |

Deviator Stress Maximum: 301.49 kPa
Strain at Failure: 13.73 %
Deviator Stress at (50%): 276.67 kPa
Strain at (50%): 10.84 %

$E_o$: 20298 kPa
$E_{50}$: 2552 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

Weight of Sample: 160.93 gram

No. Container: 1133
Wet Soil + Container: 157.88 gram
Dry Soil + Container: 113.38 gram
Weight of Container: 4.55 gram

Density initial: 18.67 kN/m3
Moisture Content initial: 39.51 %
Dry Density initial: 13.38 kN/m3

Density after: 17.79 kN/m3
Moisture Content after: 40.89 %
Dry Density after: 12.63 kN/m3

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F GWL OL 009; R 08-(6/09/18)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 02
Depth : 09.78 - 09.88 m
Date Tested : 4/11/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m³ | 22.36 |
| Dry Density | kN/m³ | 20.35 |
| Saturated Density | kN/m³ | 22.70 |
| Spesific Gravity | - | 2.66 |
| Natural Water Content | % | 10 |
| Absorption | % | 12 |
| Saturation | % | 0.23 |
| Porosity | - | 0.23 |
| Void Ratio | - | 0.31 |

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F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

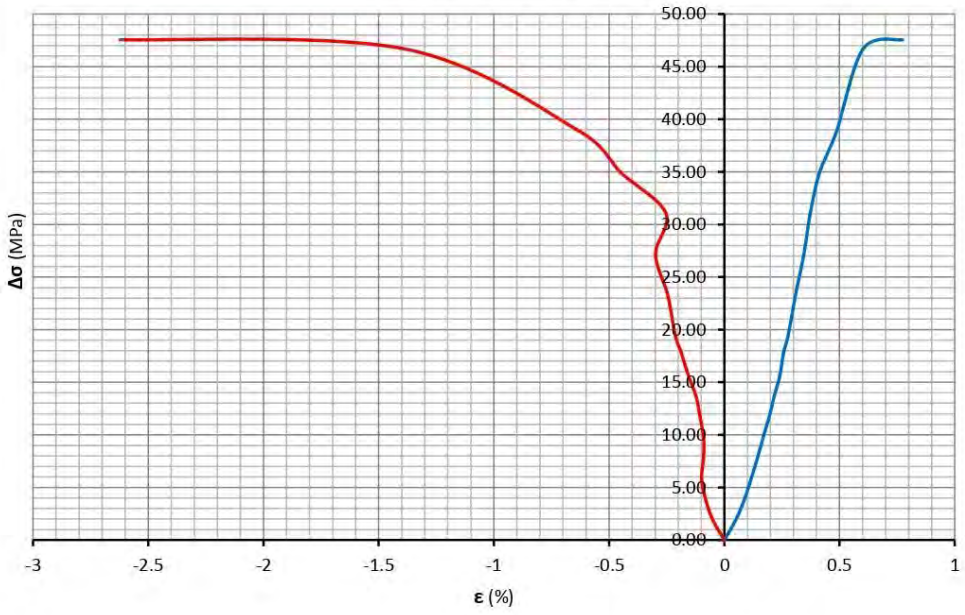
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 02
Depth : 11.70 - 12.00 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max}$* | MPa | 47.56 |
| v | - | 0.25 |
| E | MPa | 5821 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(11.70-12.00 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 02
Depth : 12.00 - 12.20 m
Date Tested : 4/11/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m³ | 23.96 |
| Dry Density | kN/m³ | 22.89 |
| Saturated Density | kN/m³ | 24.27 |
| Spesific Gravity | - | 2.65 |
| Natural Water Content | % | 5 |
| Absorption | % | 6 |
| Saturation | % | 0.14 |
| Porosity | - | 0.14 |
| Void Ratio | - | 0.16 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 02-(12.00-12.20 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

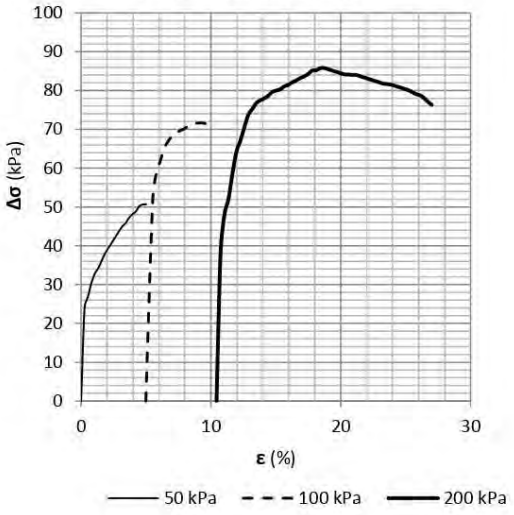
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

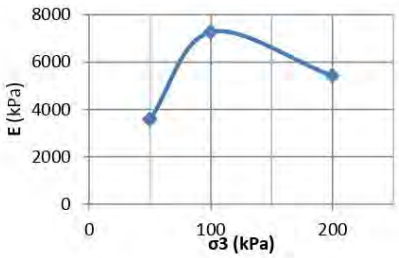
GEOMINE

## STRESS - STRAIN CURVE

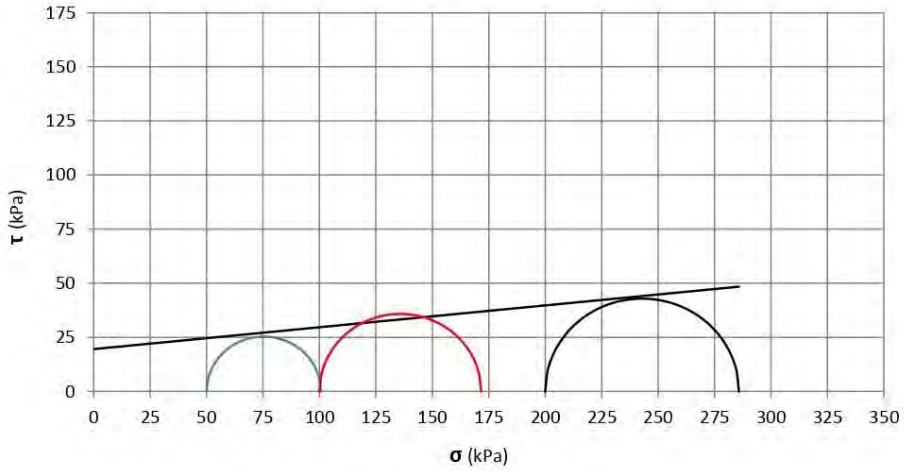



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 50.67 | 5.00 |
| 2. | 100 | 71.63 | 9.14 |
| 3. | 200 | 85.81 | 18.71 |

| Results | | |
|---|---|---|
| c | kPa | 19.6 |
| ø | ° | 5.8 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.11567 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 23.9 | 0.26 |
| 40 | 26.89 | 0.53 |
| 60 | 30.36 | 0.79 |
| 80 | 32.8 | 1.05 |
| 100 | 34.22 | 1.32 |
| 120 | 36.14 | 1.58 |
| 140 | 38.04 | 1.84 |
| 160 | 39.44 | 2.11 |
| 180 | 40.83 | 2.37 |
| 200 | 42.21 | 2.63 |
| 220 | 43.58 | 2.89 |
| 240 | 44.94 | 3.16 |
| 260 | 45.8 | 3.42 |
| 280 | 47.15 | 3.68 |
| 300 | 48.1 | 3.95 |
| 320 | 48.85 | 4.21 |
| 340 | 50.18 | 4.47 |
| 360 | 50.62 | 4.74 |
| 380 | 50.67 | 5 |

Deviator Stress Maximum: 50.67 kPa
Strain at Failure: 5.00 %
Deviator Stress at (50%): 40.83 kPa
Strain at (50%): 2.37 %

$E_{o}$: 2185.05 kPa
$E_{50}$: 1723.77 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 72.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.11567 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 360 | 0 | 4.99 |
| 380 | 28.99 | 5.26 |
| 400 | 52.99 | 5.54 |
| 420 | 59.08 | 5.82 |
| 440 | 61.78 | 6.09 |
| 460 | 64.94 | 6.37 |
| 480 | 66.65 | 6.65 |
| 500 | 67.87 | 6.93 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 68.14 | 7.2 |
| 540 | 69.36 | 7.48 |
| 560 | 69.81 | 7.76 |
| 580 | 70.35 | 8.03 |
| 600 | 71.07 | 8.31 |
| 620 | 71.32 | 8.59 |
| 640 | 71.57 | 8.86 |
| 660 | 71.63 | 9.14 |
| 680 | 71.6 | 9.42 |
| 700 | 71.38 | 9.7 |

Deviator Stress Maximum: 71.63 kPa
Strain at Failure: 9.70 %
Deviator Stress at (50%): 68.14 kPa
Strain at (50%): 7.20 %

$E_{o}$: 4426.18 kPa
$E_{50}$: 946.17 kPa

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 65.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.11567 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 680 | 0 | 10.43 |
| 700 | 37.78 | 10.74 |
| 720 | 48.09 | 11.04 |
| 740 | 51.99 | 11.35 |
| 760 | 58.57 | 11.66 |
| 780 | 64.2 | 11.96 |
| 800 | 67.11 | 12.27 |
| 820 | 70.53 | 12.58 |
| 840 | 73.75 | 12.88 |
| 860 | 75.26 | 13.19 |
| 880 | 76.76 | 13.5 |
| 900 | 77.45 | 13.8 |
| 920 | 77.96 | 14.11 |
| 940 | 78.65 | 14.42 |
| 960 | 79.58 | 14.72 |
| 980 | 79.99 | 15.03 |
| 1000 | 80.3 | 15.34 |
| 1020 | 81.05 | 15.64 |
| 1040 | 81.44 | 15.95 |
| 1060 | 82.08 | 16.26 |
| 1080 | 82.54 | 16.56 |
| 1100 | 83.17 | 16.87 |
| 1120 | 83.63 | 17.18 |
| 1140 | 84.24 | 17.48 |
| 1160 | 85.1 | 17.79 |
| 1180 | 85.2 | 18.1 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 85.72 | 18.4 |
| 1220 | 85.81 | 18.71 |
| 1240 | 85.49 | 19.02 |
| 1260 | 85.16 | 19.33 |
| 1280 | 84.84 | 19.63 |
| 1300 | 84.51 | 19.94 |
| 1320 | 84.19 | 20.25 |
| 1340 | 84.11 | 20.55 |
| 1360 | 84.03 | 20.86 |
| 1380 | 84.02 | 21.17 |
| 1400 | 83.7 | 21.47 |
| 1420 | 83.37 | 21.78 |
| 1440 | 83.04 | 22.09 |
| 1460 | 82.71 | 22.39 |
| 1480 | 82.39 | 22.7 |
| 1500 | 82.06 | 23.01 |
| 1520 | 81.73 | 23.31 |
| 1540 | 81.64 | 23.62 |
| 1560 | 81.47 | 23.93 |
| 1580 | 81.14 | 24.23 |
| 1600 | 80.81 | 24.54 |
| 1620 | 80.48 | 24.85 |
| 1640 | 80.15 | 25.15 |
| 1660 | 79.67 | 25.46 |
| 1680 | 79.12 | 25.77 |
| 1700 | 78.79 | 26.07 |
| 1720 | 78.16 | 26.38 |
| 1740 | 77.17 | 26.69 |
| 1760 | 76.32 | 26.99 |

Deviator Stress Maximum: 85.81 kPa
Strain at Failure: 26.99 %
Deviator Stress at (50%): 85.81 kPa
Strain at (50%): 18.71 %

$E_o$: 1323.57 kPa
$E_{50}$: 458.59 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1216
Wet Soil + Container : 164.92 gram
Dry Soil + Container : 113.64 gram
Weight of Container : 4.6 gram
Density : 18.60 kN/m3
Moisture Content : 47.03 %
Dry Density : 12.65 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 06.60 - 07.00 m

Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | kN/m³ | 22.3 |
| SL | % | - |
| Gs | - | 3.30 |
| MC | % | 61 |
| PL | % | 41 |
| LL | % | 65 |
| PI | % | 24 |
| Fines (#200) | % | 79 |
| $D_{10}$ | mm | 0.0110 |
| $D_{30}$ | mm | 0.0130 |
| $D_{60}$ | mm | 0.0410 |
| $C_u$ | - | 4 |
| $C_c$ | - | 0.37 |

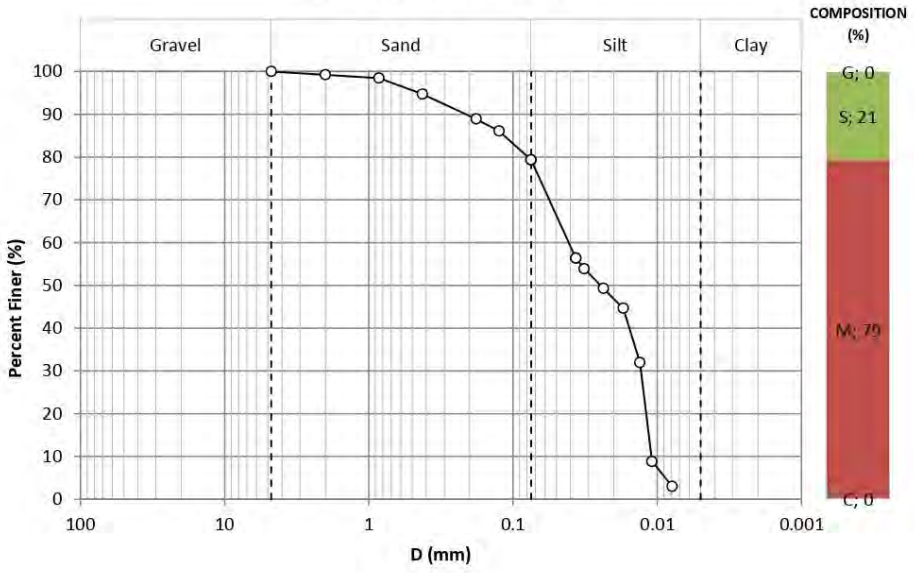
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.22 |
| $I_T$ | % | -109.14 |
| $I_L$ | % | 0.82 |
| $I_C$ | % | 0.18 |
| $S_r$ | % | 100.00 |
| e | - | 1.81 |
| n | - | 0.64 |
| A | - | 16.24 |

| | |
|---|---|
| Consistency** | Very Soft |
| Activity | Active |
| Plasticity Symbol | MH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(06.60-07.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 06.60 - 07.00 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1149 | 1240 | 1129 |
| Weight of Container | 4.39 | 4.43 | 4.56 |
| Weight of wet soil and container | 119.39 | 109.80 | 111.29 |
| Weight of dry soil and container | 75.46 | 70.18 | 71.31 |
| Moisture Content | 61.81 | 60.26 | 59.90 |
| Average MC | 60.66 | | |

**Unit weight**

| No. Ring | 5 |
|---|---|
| No. Container | 1214 |
| Weight of Ring | 27.63 |
| Volume of Ring | 15.669 |
| Weight of Container | 4.53 |
| Weight of wet soil and ring and containe | 67.17 |
| Weight of dry soil and ring and containe | 50.6 |
| Water Content | 89.859 |
| Density | 22.343 |
| Dry Density | 11.768 |
| Saturation | 100 |
| Void ratio | 1.8069 |
| Porosity | 0.6437 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 203 | 203 |
| Weight of Pycknometer + soil | 76.13 | 76.13 |
| Weight of Pycknometer + water + soil | 167.52 | 167.52 |
| T° C | 26 | 26 |
| Weight of Pycknometer | 54.5 | 54.5 |
| Weight of Pycknometer + water | 152.44 | 152.44 |
| Specific Gravity | 3.303 | 3.303 |
| Average Specific Gravity | 3.303 | |

**Shrinkage Limit**

| No. Ring | - |
|---|---|
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(06.60-07.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 06.60 - 07.00 m

Date Tested : 26/10/2021

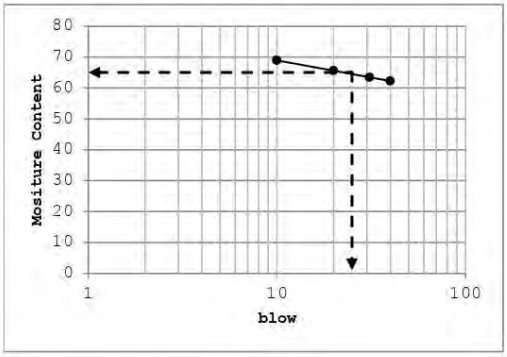
GEOMINE

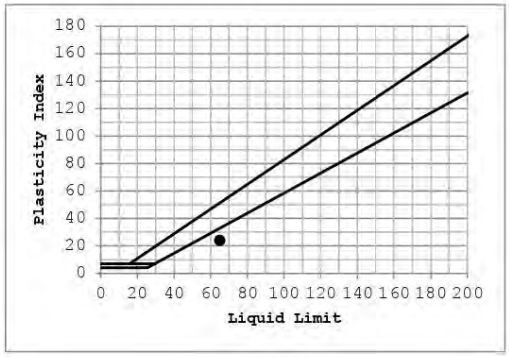
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1047 | 1056 | 1213 |
| Weight of Container | 5.46 | 5.99 | 4.54 |
| Weight of wet soil and container | 13.26 | 13.85 | 13.77 |
| Weight of dry soil and container | 11.08 | 11.5 | 11.06 |
| Plastic Limit | 38.79 | 42.65 | 41.56 |
| Average | 41.00 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1115 | 1144 | 1064 | 1203 | - |
| Weight of Container | 4.76 | 4.45 | 4.83 | 4.46 | - |
| Weight of wet soil and container | 16.8 | 16.74 | 16.54 | 16.2 | - |
| Weight of dry soil and container | 12.18 | 11.97 | 11.9 | 11.41 | - |
| Water Content | 62.26 | 63.43 | 65.63 | 68.92 | - |
| Number of blows | 40 | 31 | 20 | 10 | - |
| Liquid Limit | 65.04 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.57 |
| Weight of dry soil | 80.57 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0.62 | 0.77 | 0.77 | 99.23 |
| 20 | 0.85 | 0.62 | 0.77 | 1.54 | 98.46 |
| 40 | 0.425 | 3 | 3.72 | 5.26 | 94.74 |
| 80 | 0.18 | 4.69 | 5.82 | 11.08 | 88.92 |
| 120 | 0.125 | 2.28 | 2.83 | 13.91 | 86.09 |
| 200 | 0.075 | 5.42 | 6.73 | 20.64 | 79.36 |
| Pan | 0 | 1.62 | 79.36 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(06.60-07.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 06.60 - 07.00 m

Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 62.319 | | |
| Zerro correction | -1 | Gs | 3.3032 |
| Meniscus correction | 1 | a | 0.893 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 26 | 44 | 0.0321 | 53.92 |
| 12:22 | 2 | 26 | 40 | 0.0236 | 49.30 |
| 12:24 | 4 | 26 | 36 | 0.0172 | 44.68 |
| 12:28 | 8 | 26 | 25 | 0.0132 | 31.96 |
| 12:35 | 15 | 26 | 5 | 0.0109 | 8.84 |
| 12:50 | 30 | 26 | 0 | 0.0079 | 3.06 |
| 13:05 | 45 | 0 | 0 | 0.0000 | 1.16 |
| 13:50 | 90 | 0 | 0 | 0.0000 | 1.16 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(06.60-07.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Falling Head

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 06.60 -07.00 m
Date Tested : 27/10/2021

GEOMINE

| Time (minute) | Volume (cm3) | delta time (minute) | delta volume (cm3) |
|---|---|---|---|
| 0 | 7.7 | 0 | 0 |
| 30 | 8 | 30 | 0.3 |
| 80 | 8.4 | 50 | 0.4 |
| 140 | 8.9 | 60 | 0.5 |
| 210 | 9.5 | 70 | 0.6 |
| 288 | 10 | 78 | 0.5 |
| 348 | 10.4 | 60 | 0.4 |
| 400 | 10.7 | 52 | 0.3 |

t-sample (cm): 6.60
Area-sample (cm2): 11.34
Head (cm): 50

k (cm/s): 1.505E-06

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(06.60-07.00 m)-Falling Head.xlsm

F GWL OL 040; R 01-(6/12/18)

PARTNER FOR DESIGN

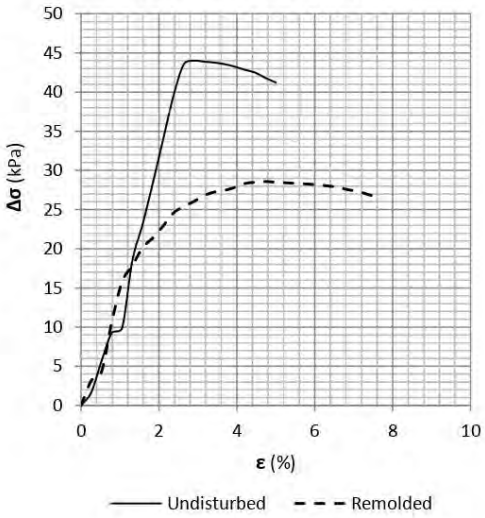
# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 12.20 - 12.45 m

Date Tested : 29/10/2021

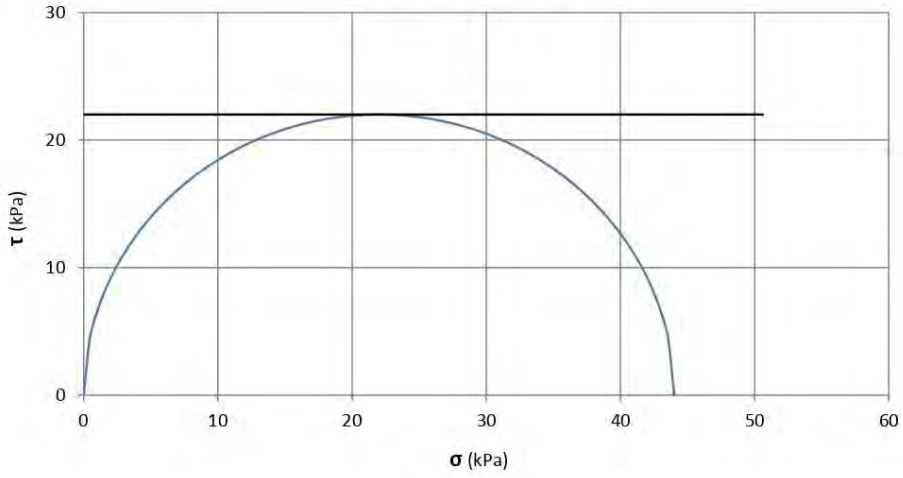
GEOMINE

## STRESS - STRAIN CURVE




| Results | | Undisturbed | Remolded |
|---|---|---|---|
| $\sigma_{max}$ | kPa | 44.0 | 28.6 |
| $\varepsilon_f$ | % | 2.89 | 4.74 |
| $S_t$ | - | 1.54 | |
| c | kPa | 22.0 | 14.3 |
| $E_{50}$ | kPa | 1464 | 1356 |
| $E_{sec}$ | kPa | 1520 | 603 |

## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(12.20-12.45 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 12.20 - 12.45 m

Date Tested : 29/10/2021

GEOMINE

**Undisturbed**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

Water Content : 103.66 %
Unit Weight : 11.48 kN/m3
Dry Density : 5.64 kN/m3

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|
| 0 | 0.00 | 0.0000 |
| 20 | 1.70 | 0.2632 |
| 40 | 5.71 | 0.5263 |
| 60 | 9.29 | 0.7895 |
| 80 | 9.89 | 1.0526 |
| 100 | 18.48 | 1.3158 |
| 120 | 23.12 | 1.5789 |
| 140 | 28.40 | 1.8421 |
| 160 | 33.95 | 2.1053 |
| 180 | 39.47 | 2.3684 |
| 200 | 43.50 | 2.6316 |
| 220 | 44.01 | 2.8947 |
| 240 | 43.89 | 3.1579 |
| 260 | 43.77 | 3.4211 |
| 280 | 43.57 | 3.6842 |
| 300 | 43.24 | 3.9474 |
| 320 | 42.84 | 4.2105 |
| 340 | 42.48 | 4.4737 |
| 360 | 41.79 | 4.7368 |
| 380 | 41.23 | 5.0000 |

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|
| - | - | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(12.20-12.45 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 12.20 - 12.45 m
Date Tested : 29/10/2021

GEOMINE

**Remolded**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0 | 0.0000 | - | - | - |
| 20 | 3.18 | 0.2632 | | | |
| 40 | 4.36 | 0.5263 | | | |
| 60 | 10.68 | 0.7895 | | | |
| 80 | 15.79 | 1.0526 | | | |
| 100 | 17.85 | 1.3158 | | | |
| 120 | 20.14 | 1.5789 | | | |
| 140 | 21.39 | 1.8421 | | | |
| 160 | 22.91 | 2.1053 | | | |
| 180 | 24.55 | 2.3684 | | | |
| 200 | 25.40 | 2.6316 | | | |
| 220 | 26.03 | 2.8947 | | | |
| 240 | 26.79 | 3.1579 | | | |
| 260 | 27.25 | 3.4211 | | | |
| 280 | 27.46 | 3.6842 | | | |
| 300 | 27.83 | 3.9474 | | | |
| 320 | 28.33 | 4.2105 | | | |
| 340 | 28.50 | 4.4737 | | | |
| 360 | 28.58 | 4.7368 | | | |
| 380 | 28.50 | 5.0000 | | | |
| 400 | 28.42 | 5.2632 | | | |
| 420 | 28.34 | 5.5263 | | | |
| 440 | 28.26 | 5.7895 | | | |
| 460 | 28.18 | 6.0526 | | | |
| 480 | 28.03 | 6.3158 | | | |
| 500 | 27.87 | 6.5789 | | | |
| 520 | 27.55 | 6.8421 | | | |
| 540 | 27.31 | 7.1053 | | | |
| 560 | 26.92 | 7.3684 | | | |
| 580 | 26.53 | 7.6316 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(12.20-12.45 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 03
Depth : 13.10 - 13.35 m
Date Tested : 25/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 10.23 |
| Dry Density | kN/m$^3$ | 4.53 |
| Saturated Density | kN/m$^3$ | 12.07 |
| Spesific Gravity | - | 1.84 |
| Natural Water Content | % | 56 |
| Absorption | % | 166 |
| Saturation | % | 0.75 |
| Porosity | - | 0.75 |
| Void Ratio | - | 3.06 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(13.10-13.35 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

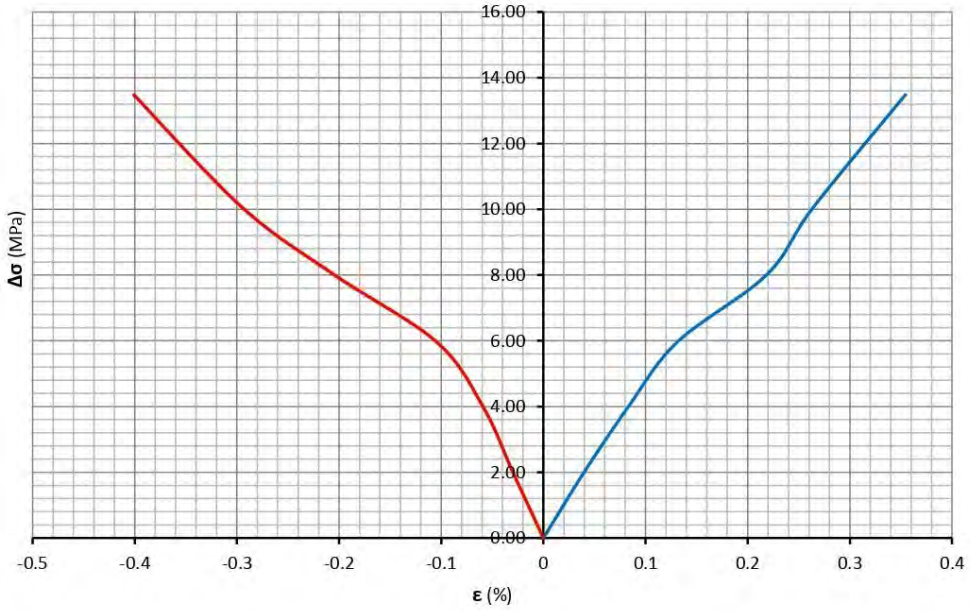
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 03
Depth : 28.30 - 28.45 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 13.48 |
| v | - | 0.43 |
| E | MPa | 2889 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 03-(28.30-28.45 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

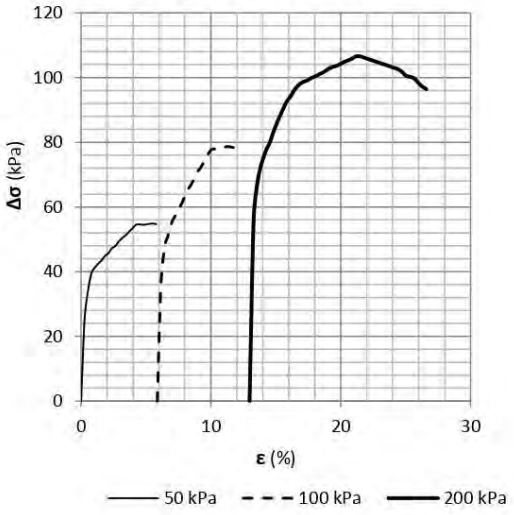
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 05.00 -05.40 m
Date Tested : 28/10/2021

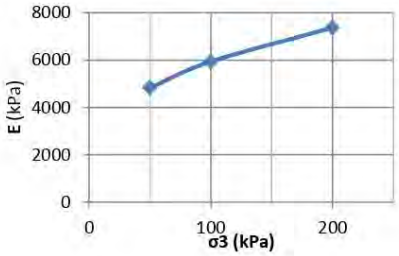
GEOMINE

## STRESS - STRAIN CURVE

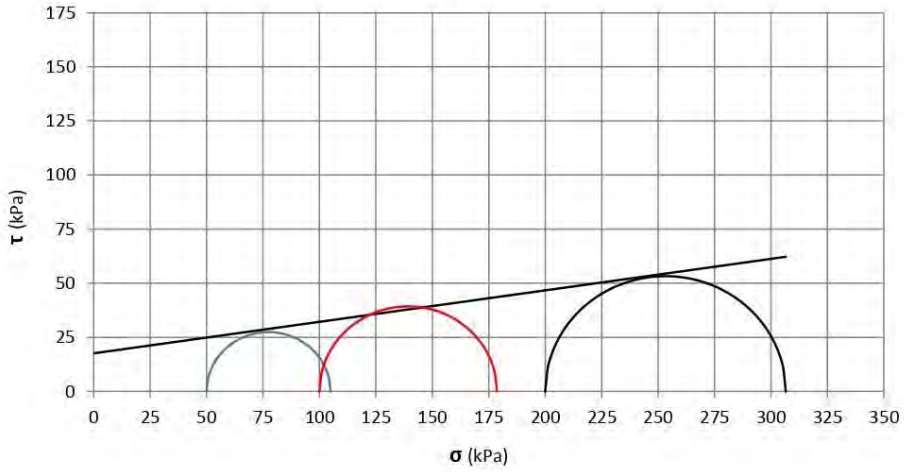



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 54.87 | 5.53 |
| 2. | 100 | 78.62 | 11.17 |
| 3. | 200 | 106.56 | 21.20 |

| Results | | |
|---|---|---|
| c | kPa | 17.6 |
| ø | ° | 8.3 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(05.00-05.40 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 05.00 -05.40 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1432 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 25.19 | 0.26 |
| 40 | 33.91 | 0.53 |
| 60 | 39.46 | 0.79 |
| 80 | 41.23 | 1.05 |
| 100 | 42.49 | 1.32 |
| 120 | 43.5 | 1.58 |
| 140 | 44.87 | 1.84 |
| 160 | 45.73 | 2.11 |
| 180 | 47.21 | 2.37 |
| 200 | 47.95 | 2.63 |
| 220 | 49.29 | 2.89 |
| 240 | 50.38 | 3.16 |
| 260 | 51.22 | 3.42 |
| 280 | 52.29 | 3.68 |
| 300 | 53.36 | 3.95 |
| 320 | 54.43 | 4.21 |
| 340 | 54.64 | 4.47 |
| 360 | 54.49 | 4.74 |
| 380 | 54.58 | 5 |
| 400 | 54.79 | 5.26 |
| 420 | 54.87 | 5.53 |
| 440 | 54.72 | 5.79 |

Deviator Stress Maximum: 54.87 kPa
Strain at Failure: 5.79 %
Deviator Stress at (50%): 49.29 kPa
Strain at (50%): 2.89 %

$E_{o}$: 2339.84 kPa
$E_{50}$: 1702.73 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + +

Height of Sample: 71.6 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1432 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 420 | 0 | 5.87 |
| 440 | 35.55 | 6.15 |
| 460 | 47.62 | 6.42 |
| 480 | 51.24 | 6.7 |
| 500 | 55.2 | 6.98 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(05.00-05.40 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 05.00 -05.40 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 57.38 | 7.26 |
| 540 | 59.54 | 7.54 |
| 560 | 61.69 | 7.82 |
| 580 | 64.75 | 8.1 |
| 600 | 66.29 | 8.38 |
| 620 | 68.28 | 8.66 |
| 640 | 70.71 | 8.94 |
| 660 | 72.21 | 9.22 |
| 680 | 74.28 | 9.5 |
| 700 | 76.33 | 9.78 |
| 720 | 77.79 | 10.06 |
| 740 | 77.89 | 10.34 |
| 760 | 77.88 | 10.61 |
| 780 | 78.19 | 10.89 |
| 800 | 78.62 | 11.17 |
| 820 | 78.6 | 11.45 |
| 840 | 78.35 | 11.73 |

Deviator Stress Maximum: 78.62 kPa  $E_{o}$: 2938.82 kPa
Strain at Failure: 11.73 %  $E_{50}$: 788.49 kPa
Deviator Stress at (50%): 68.28 kPa
Strain at (50%): 8.66 %

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 63.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1432 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 820 | 0 | 12.97 |
| 840 | 56.06 | 13.29 |
| 860 | 68.18 | 13.61 |
| 880 | 73.69 | 13.92 |
| 900 | 77.42 | 14.24 |
| 920 | 80.16 | 14.56 |
| 940 | 83.84 | 14.87 |
| 960 | 86.95 | 15.19 |
| 980 | 89.83 | 15.51 |
| 1000 | 92.47 | 15.82 |
| 1020 | 94.24 | 16.14 |
| 1040 | 96.31 | 16.46 |
| 1060 | 97.73 | 16.77 |
| 1080 | 98.62 | 17.09 |
| 1100 | 99.07 | 17.41 |
| 1120 | 99.84 | 17.72 |
| 1140 | 100.39 | 18.04 |
| 1160 | 101.03 | 18.35 |
| 1180 | 101.66 | 18.67 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(05.00-05.40 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 05.00 -05.40 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 102.5 | 18.99 |
| 1220 | 103.22 | 19.3 |
| 1240 | 103.52 | 19.62 |
| 1260 | 104.13 | 19.94 |
| 1280 | 104.82 | 20.25 |
| 1300 | 105.31 | 20.57 |
| 1320 | 105.89 | 20.89 |
| 1340 | 106.56 | 21.2 |
| 1360 | 106.53 | 21.52 |
| 1380 | 106.1 | 21.84 |
| 1400 | 105.67 | 22.15 |
| 1420 | 105.24 | 22.47 |
| 1440 | 104.81 | 22.78 |
| 1460 | 104.38 | 23.1 |
| 1480 | 103.95 | 23.42 |
| 1500 | 103.52 | 23.73 |
| 1520 | 103.09 | 24.05 |
| 1540 | 102.66 | 24.37 |
| 1560 | 101.85 | 24.68 |
| 1580 | 100.67 | 25 |
| 1600 | 100.24 | 25.32 |
| 1620 | 99.82 | 25.63 |
| 1640 | 98.46 | 25.95 |
| 1660 | 97.29 | 26.27 |
| 1680 | 96.41 | 26.58 |

Deviator Stress Maximum: 106.56 kPa
Strain at Failure: 26.58 %
Deviator Stress at (50%): 103.52 kPa
Strain at (50%): 19.62 %

$E_o$: 1862.96 kPa
$E_{50}$: 527.63 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1004
Wet Soil + Container : 177.86 gram
Dry Soil + Container : 127.96 gram
Weight of Container : 5.84 gram
Density : 19.96 kN/m3
Moisture Content : 40.86 %
Dry Density : 14.17 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(05.00-05.40 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 08.25 - 08.65 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | kN/m³ | 18.6 |
| SL | % | - |
| Gs | - | 3.27 |
| MC | % | 57 |
| PL | % | 26 |
| LL | % | 66 |
| PI | % | 40 |
| Fines (#200) | % | 88 |
| $D_{10}$ | mm | 0.0078 |
| $D_{30}$ | mm | 0.0090 |
| $D_{60}$ | mm | 0.0176 |
| $C_u$ | - | 2 |
| $C_c$ | - | 0.59 |

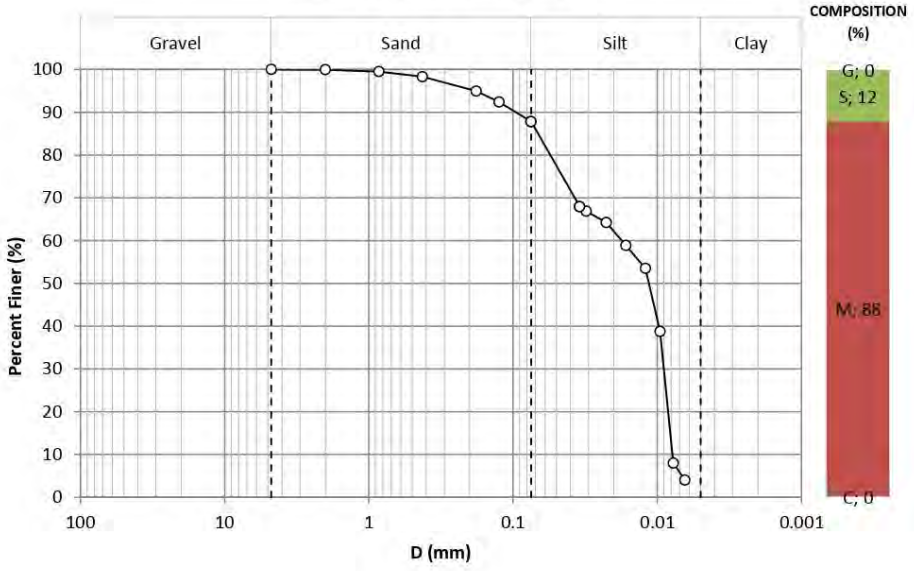
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.46 |
| $I_T$ | % | -87.22 |
| $I_L$ | % | 0.76 |
| $I_C$ | % | 0.24 |
| $S_r$ | % | 100.00 |
| e | - | 1.63 |
| n | - | 0.62 |
| A | - | 21.39 |

| | |
|---|---|
| Consistency** | Very Soft |
| Activity | Active |
| Plasticity Symbol | CH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(08.25-08.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 08.25 - 08.65 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1002 | 1140 | 1142 |
| Weight of Container | 5.65 | 4.37 | 5.03 |
| Weight of wet soil and container | 77.79 | 91.60 | 93.96 |
| Weight of dry soil and container | 51.82 | 59.72 | 62.11 |
| Moisture Content | 56.25 | 57.60 | 55.80 |
| Average MC | 56.55 | | |

**Unit weight**

| No. Ring | 19 |
|---|---|
| No. Container | 1041 |
| Weight of Ring | 26.8 |
| Volume of Ring | 15.216 |
| Weight of Container | 5.34 |
| Weight of wet soil and ring and containe | 60.47 |
| Weight of dry soil and ring and containe | 51.01 |
| Water Content | 50.132 |
| Density | 18.618 |
| Dry Density | 12.401 |
| Saturation | 100 |
| Void ratio | 1.6336 |
| Porosity | 0.6203 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 201 | 201 |
| Weight of Pycknometer + soil | 76.17 | 76.17 |
| Weight of Pycknometer + water + soil | 169.57 | 169.57 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 52.92 | 52.92 |
| Weight of Pycknometer + water | 153.44 | 153.44 |
| Specific Gravity | 3.266 | 3.266 |
| Average Specific Gravity | 3.266 | |

**Shrinkage Limit**

| No. Ring | - |
|---|---|
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(08.25-08.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 08.25 - 08.65 m

Date Tested : 26/10/2021

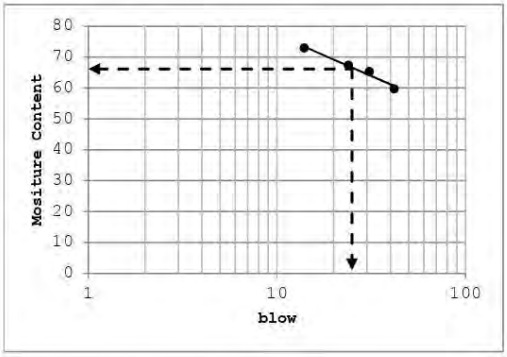
GEOMINE

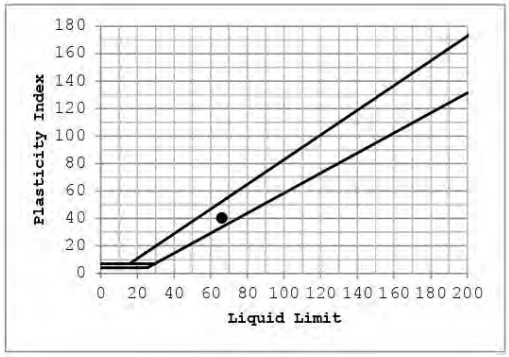
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1084 | 1119 | 1160 |
| Weight of Container | 4.67 | 4.94 | 4.48 |
| Weight of wet soil and container | 12.18 | 12.23 | 11.21 |
| Weight of dry soil and container | 10.7 | 10.68 | 9.82 |
| Plastic Limit | 24.54 | 27.00 | 26.03 |
| Average | 25.86 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1016 | 1011 | 1025 | 1145 | - |
| Weight of Container | 6.15 | 5.75 | 5.16 | 4.62 | - |
| Weight of wet soil and container | 16.45 | 16.77 | 16.74 | 16.62 | - |
| Weight of dry soil and container | 12.6 | 12.42 | 12.08 | 11.56 | - |
| Water Content | 59.69 | 65.22 | 67.34 | 72.91 | - |
| Number of blows | 42 | 31 | 24 | 14 | - |
| Liquid Limit | 66.15 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.26 |
| Weight of dry soil | 80.26 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0.04 | 0.05 | 0.05 | 99.95 |
| 20 | 0.85 | 0.36 | 0.45 | 0.50 | 99.50 |
| 40 | 0.425 | 0.95 | 1.18 | 1.68 | 98.32 |
| 80 | 0.18 | 2.69 | 3.35 | 5.03 | 94.97 |
| 120 | 0.125 | 2.05 | 2.55 | 7.59 | 92.41 |
| 200 | 0.075 | 3.67 | 4.57 | 12.16 | 87.84 |
| Pan | 0 | 1.76 | 87.84 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(08.25-08.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 08.25 - 08.65 m
Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 68.739 | | |
| Zerro correction | -1 | Gs | 3.266 |
| Meniscus correction | 1 | a | 0.8974 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 47 | 0.0311 | 66.89 |
| 12:22 | 2 | 27 | 45 | 0.0225 | 64.21 |
| 12:24 | 4 | 27 | 41 | 0.0165 | 58.86 |
| 12:28 | 8 | 27 | 37 | 0.0121 | 53.51 |
| 12:35 | 15 | 27 | 26 | 0.0096 | 38.80 |
| 12:50 | 30 | 27 | 3 | 0.0077 | 8.03 |
| 13:05 | 45 | 27 | 0 | 0.0064 | 4.01 |
| 13:50 | 90 | 0 | 0 | 0.0000 | 1.34 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(08.25-08.65 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Falling Head

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 08.25 -08.65 m
Date Tested : 27/10/2021

GEOMINE

| Time (minute) | Volume (cm3) | delta time (minute) | delta volume (cm3) |
|---|---|---|---|
| 0 | 5.3 | 0 | 0 |
| 30 | 5.9 | 30 | 0.6 |
| 80 | 6.7 | 50 | 0.8 |
| 150 | 7.5 | 70 | 0.8 |
| 228 | 8.6 | 78 | 1.1 |
| 288 | 9.8 | 60 | 1.2 |
| 348 | 10.6 | 60 | 0.8 |
| 400 | 11.5 | 52 | 0.9 |

t-sample (cm): 6.60
Area-sample (cm2): 11.34
Head (cm): 50

k (cm/s): 2.954E-06

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(08.25-08.65 m)-Falling Head.xlsm

F GWL OL 040; R 01-(6/12/18)

PARTNER FOR DESIGN

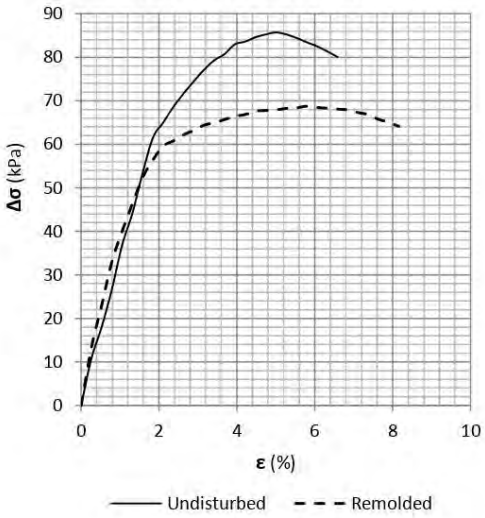
# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 17.00 - 17.25 m

Date Tested : 29/10/2021

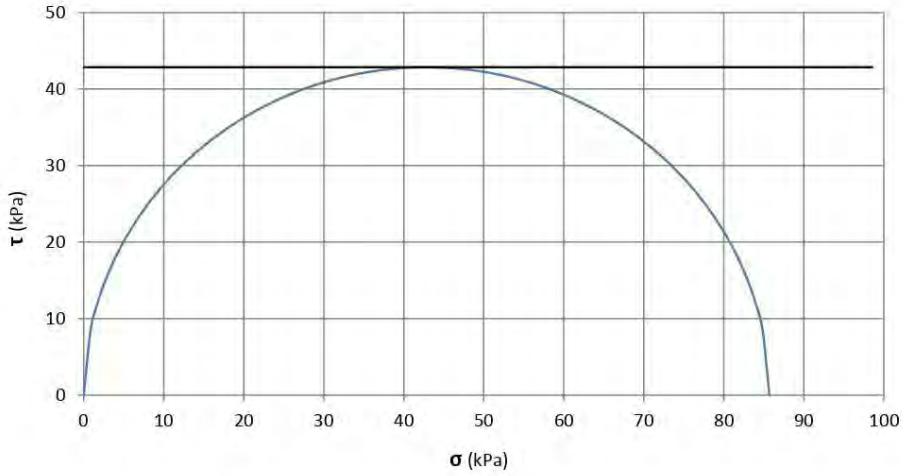
GEOMINE

## STRESS - STRAIN CURVE




| Results | | Undisturbed | Remolded |
|---|---|---|---|
| $\sigma_{max}$ | kPa | 85.7 | 68.8 |
| $\varepsilon_f$ | % | 5.00 | 5.79 |
| $S_t$ | - | 1.25 | |
| c | kPa | 42.9 | 34.4 |
| $E_{50}$ | kPa | 3382 | 3520 |
| $E_{sec}$ | kPa | 1714 | 1188 |

## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(17.00-17.25 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 17.00 - 17.25 m
Date Tested : 29/10/2021

GEOMINE

**Undisturbed**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

Water Content : 91.03 %
Unit Weight : 13.15 kN/m3
Dry Density : 6.88 kN/m3

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0.00 | 0.0000 | - | - | - |
| 20 | 10.74 | 0.2632 | | | |
| 40 | 17.99 | 0.5263 | | | |
| 60 | 26.64 | 0.7895 | | | |
| 80 | 36.84 | 1.0526 | | | |
| 100 | 44.13 | 1.3158 | | | |
| 120 | 53.40 | 1.5789 | | | |
| 140 | 61.48 | 1.8421 | | | |
| 160 | 64.99 | 2.1053 | | | |
| 180 | 68.59 | 2.3684 | | | |
| 200 | 71.68 | 2.6316 | | | |
| 220 | 74.50 | 2.8947 | | | |
| 240 | 77.14 | 3.1579 | | | |
| 260 | 79.32 | 3.4211 | | | |
| 280 | 80.74 | 3.6842 | | | |
| 300 | 82.97 | 3.9474 | | | |
| 320 | 83.60 | 4.2105 | | | |
| 340 | 84.59 | 4.4737 | | | |
| 360 | 85.25 | 4.7368 | | | |
| 380 | 85.70 | 5.0000 | | | |
| 400 | 85.26 | 5.2632 | | | |
| 420 | 84.46 | 5.5263 | | | |
| 440 | 83.47 | 5.7895 | | | |
| 460 | 82.55 | 6.0526 | | | |
| 480 | 81.37 | 6.3158 | | | |
| 500 | 80.10 | 6.5789 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(17.00-17.25 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 04
Depth : 17.00 - 17.25 m
Date Tested : 29/10/2021

GEOMINE

**Remolded**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0 | 0.0000 | - | - | - |
| 20 | 13.24 | 0.2632 | | | |
| 40 | 22.94 | 0.5263 | | | |
| 60 | 33.01 | 0.7895 | | | |
| 80 | 40.00 | 1.0526 | | | |
| 100 | 46.32 | 1.3158 | | | |
| 120 | 52.35 | 1.5789 | | | |
| 140 | 56.39 | 1.8421 | | | |
| 160 | 59.57 | 2.1053 | | | |
| 180 | 60.78 | 2.3684 | | | |
| 200 | 62.19 | 2.6316 | | | |
| 220 | 63.22 | 2.8947 | | | |
| 240 | 64.41 | 3.1579 | | | |
| 260 | 64.97 | 3.4211 | | | |
| 280 | 65.70 | 3.6842 | | | |
| 300 | 66.42 | 3.9474 | | | |
| 320 | 66.85 | 4.2105 | | | |
| 340 | 67.60 | 4.4737 | | | |
| 360 | 67.78 | 4.7368 | | | |
| 380 | 67.91 | 5.0000 | | | |
| 400 | 68.25 | 5.2632 | | | |
| 420 | 68.38 | 5.5263 | | | |
| 440 | 68.75 | 5.7895 | | | |
| 460 | 68.48 | 6.0526 | | | |
| 480 | 68.29 | 6.3158 | | | |
| 500 | 68.10 | 6.5789 | | | |
| 520 | 67.91 | 6.8421 | | | |
| 540 | 67.32 | 7.1053 | | | |
| 560 | 66.81 | 7.3684 | | | |
| 580 | 65.76 | 7.6316 | | | |
| 600 | 65.06 | 7.8947 | | | |
| 620 | 64.13 | 8.1579 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(17.00-17.25 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 04
Depth : 32.25 - 32.35 m
Date Tested : 27/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 27.35 |
| Dry Density | kN/m$^3$ | 26.98 |
| Saturated Density | kN/m$^3$ | 27.72 |
| Spesific Gravity | - | 2.91 |
| Natural Water Content | % | 1 |
| Absorption | % | 3 |
| Saturation | % | 0.07 |
| Porosity | - | 0.07 |
| Void Ratio | - | 0.08 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 04-(32.25-32.35 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

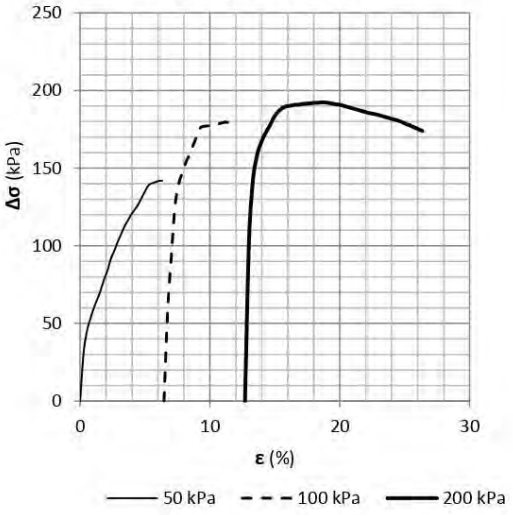
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

GEOMINE

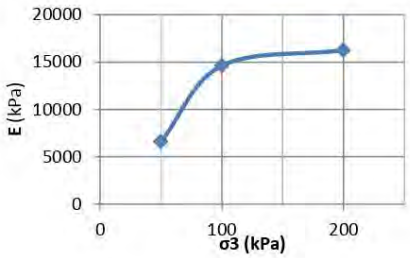
Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 08.45 -08.85 m
Date Tested : 28/10/2021

## STRESS - STRAIN CURVE

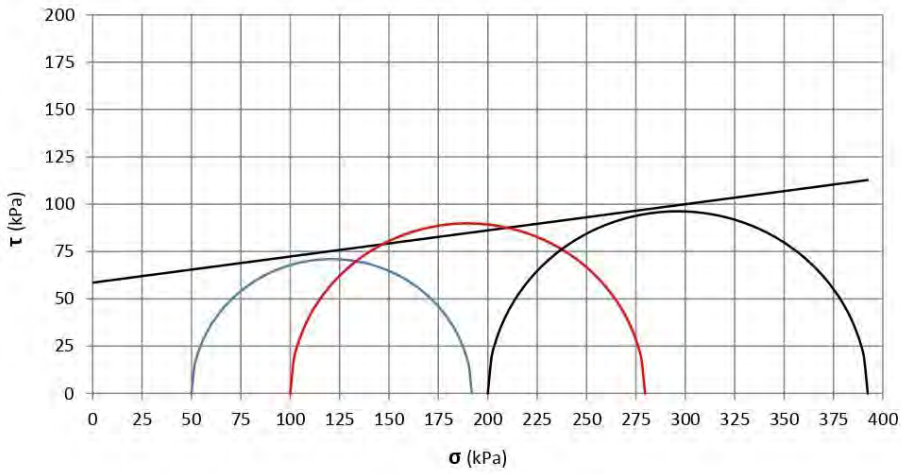



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 141.91 | 6.32 |
| 2. | 100 | 179.64 | 11.24 |
| 3. | 200 | 192.38 | 18.73 |

| Results | | |
|---|---|---|
| c | kPa | 58.5 |
| ø | ° | 7.9 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(08.45-08.85 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 08.45 -08.85 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1391 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 30.58 | 0.26 |
| 40 | 45.14 | 0.53 |
| 60 | 52.93 | 0.79 |
| 80 | 59.83 | 1.05 |
| 100 | 65.48 | 1.32 |
| 120 | 71.22 | 1.58 |
| 140 | 78.25 | 1.84 |
| 160 | 84.05 | 2.11 |
| 180 | 91.61 | 2.37 |
| 200 | 96.73 | 2.63 |
| 220 | 102.43 | 2.89 |
| 240 | 107.49 | 3.16 |
| 260 | 112.53 | 3.42 |
| 280 | 116.36 | 3.68 |
| 300 | 120.17 | 3.95 |
| 320 | 123.36 | 4.21 |
| 340 | 126.54 | 4.47 |
| 360 | 130.86 | 4.74 |
| 380 | 135.16 | 5 |
| 400 | 138.85 | 5.26 |
| 420 | 140.21 | 5.53 |
| 440 | 140.97 | 5.79 |
| 460 | 141.73 | 6.05 |
| 480 | 141.91 | 6.32 |

Deviator Stress Maximum: 141.91 kPa
Strain at Failure: 6.32 %
Deviator Stress at (50%): 107.49 kPa
Strain at (50%): 3.16 %

$E_o$: 3704.52 kPa
$E_{50}$: 3403.97 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 71.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1391 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 460 | 0 | 6.46 |
| 480 | 57.53 | 6.74 |
| 500 | 92.94 | 7.02 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(08.45-08.85 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 08.45 -08.85 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 125.06 | 7.3 |
| 540 | 139.42 | 7.58 |
| 560 | 146.91 | 7.87 |
| 580 | 153.78 | 8.15 |
| 600 | 158.7 | 8.43 |
| 620 | 164.6 | 8.71 |
| 640 | 170.79 | 8.99 |
| 660 | 175.94 | 9.27 |
| 680 | 176.94 | 9.55 |
| 700 | 177.17 | 9.83 |
| 720 | 177.83 | 10.11 |
| 740 | 178.59 | 10.39 |
| 760 | 178.58 | 10.67 |
| 780 | 179.22 | 10.96 |
| 800 | 179.64 | 11.24 |
| 820 | 179.07 | 11.52 |

Deviator Stress Maximum: 179.64 kPa  $E_{s_i}$: 10296.55 kPa
Strain at Failure: 11.52 %  $E_{50}$: 1900.01 kPa
Deviator Stress at (50%): 170.79 kPa
Strain at (50%): 8.99 %

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 63 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1391 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 800 | 0 | 12.7 |
| 820 | 104.87 | 13.02 |
| 840 | 143.71 | 13.33 |
| 860 | 158.97 | 13.65 |
| 880 | 167.04 | 13.97 |
| 900 | 172.62 | 14.29 |
| 920 | 177.22 | 14.6 |
| 940 | 182.61 | 14.92 |
| 960 | 186.19 | 15.24 |
| 980 | 188.5 | 15.56 |
| 1000 | 189.86 | 15.87 |
| 1020 | 190.17 | 16.19 |
| 1040 | 190.78 | 16.51 |
| 1060 | 190.87 | 16.83 |
| 1080 | 191.36 | 17.14 |
| 1100 | 191.54 | 17.46 |
| 1120 | 191.81 | 17.78 |
| 1140 | 192.07 | 18.1 |
| 1160 | 192.13 | 18.41 |
| 1180 | 192.38 | 18.73 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(08.45-08.85 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 08.45 -08.85 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 192.12 | 19.05 |
| 1220 | 191.67 | 19.37 |
| 1240 | 191.11 | 19.68 |
| 1260 | 190.84 | 20 |
| 1280 | 190.09 | 20.32 |
| 1300 | 189.33 | 20.63 |
| 1320 | 188.57 | 20.95 |
| 1340 | 187.82 | 21.27 |
| 1360 | 187.06 | 21.59 |
| 1380 | 186.3 | 21.9 |
| 1400 | 185.54 | 22.22 |
| 1420 | 185.07 | 22.54 |
| 1440 | 184.5 | 22.86 |
| 1460 | 183.74 | 23.17 |
| 1480 | 182.98 | 23.49 |
| 1500 | 182.22 | 23.81 |
| 1520 | 181.46 | 24.13 |
| 1540 | 180.71 | 24.44 |
| 1560 | 179.76 | 24.76 |
| 1580 | 178.54 | 25.08 |
| 1600 | 177.51 | 25.4 |
| 1620 | 176.3 | 25.71 |
| 1640 | 175.19 | 26.03 |
| 1660 | 173.89 | 26.35 |

Deviator Stress Maximum: 192.38 kPa
Strain at Failure: 26.35 %
Deviator Stress at (50%): 191.67 kPa
Strain at (50%): 19.37 %

$E_o$: 3698.11 kPa
$E_{50}$: 989.76 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1223
Wet Soil + Container : 159.71 gram
Dry Soil + Container : 108.05 gram
Weight of Container : 4.58 gram
Density : 18.00 kN/m3
Moisture Content : 49.93 %
Dry Density : 12.00 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(08.45-08.85 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 11.60 - 12.00 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | kN/m³ | - |
| SL | % | - |
| Gs | - | 3.18 |
| MC | % | - |
| PL | % | 49 |
| LL | % | 111 |
| PI | % | 62 |
| Fines (#200) | % | 89 |
| $D_{10}$ | mm | 0.0028 |
| $D_{30}$ | mm | 0.0062 |
| $D_{60}$ | mm | 0.0083 |
| $C_u$ | - | 3 |
| $C_c$ | - | 1.69 |

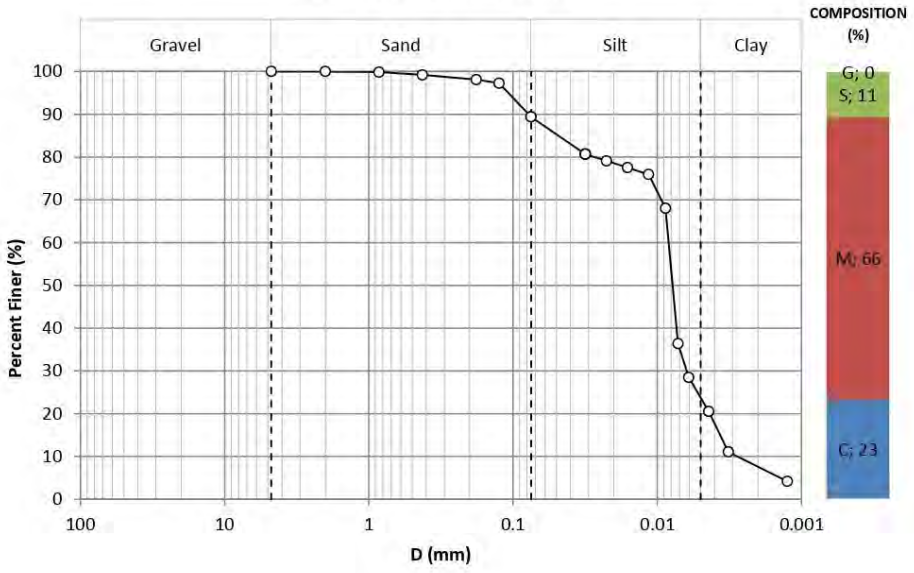
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.58 |
| $I_T$ | % | -107.18 |
| $I_L$ | % | - |
| $I_C$ | % | - |
| $S_r$ | % | - |
| e | - | - |
| n | - | - |
| A | - | 10.17 |

| | |
|---|---|
| Consistency** | - |
| Activity | Active |
| Plasticity Symbol | MH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(11.60-12.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 11.60 - 12.00 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | | 1 | 2 | 3 |
|---|---|---|---|---|
| No. Container | - | - | - | |
| Weight of Container | - | - | - | |
| Weight of wet soil and container | - | - | - | |
| Weight of dry soil and container | - | - | - | |
| Moisture Content | - | - | - | |
| Average MC | - | | | |

**Unit weight**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and ring and containe | - |
| Weight of dry soil and ring and containe | - |
| Water Content | - |
| Density | - |
| Dry Density | - |
| Saturation | - |
| Void ratio | - |
| Porosity | - |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 203 | 203 |
| Weight of Pycknometer + soil | 73.33 | 73.33 |
| Weight of Pycknometer + water + soil | 165.27 | 165.27 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 54.5 | 54.5 |
| Weight of Pycknometer + water | 152.36 | 152.36 |
| Specific Gravity | 3.181 | 3.181 |
| Average Specific Gravity | 3.181 | |

**Shrinkage Limit**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(11.60-12.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 11.60 - 12.00 m

Date Tested : 26/10/2021

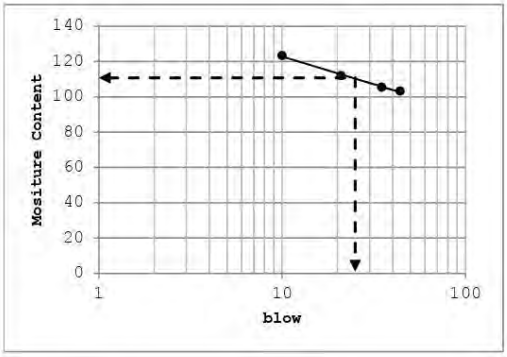
GEOMINE

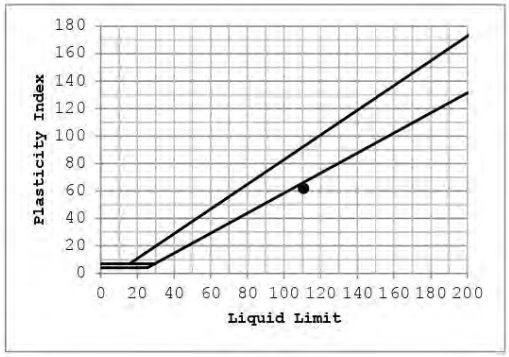
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1234 | 1099 | 1209 |
| Weight of Container | 4.57 | 4.76 | 4.52 |
| Weight of wet soil and container | 12.67 | 11.37 | 11.76 |
| Weight of dry soil and container | 10 | 9.18 | 9.41 |
| Plastic Limit | 49.17 | 49.55 | 48.06 |
| Average | 48.93 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1196 | 1151 | 1204 | 1207 | - |
| Weight of Container | 4.41 | 4.51 | 4.37 | 4.48 | - |
| Weight of wet soil and container | 13.9 | 13.65 | 13.44 | 13.61 | - |
| Weight of dry soil and container | 9.08 | 8.96 | 8.65 | 8.57 | - |
| Water Content | 103.21 | 105.39 | 111.92 | 123.23 | - |
| Number of blows | 44 | 35 | 21 | 10 | - |
| Liquid Limit | 110.74 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.35 |
| Weight of dry soil | 80.35 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0 | 0.00 | 0.00 | 100.00 |
| 20 | 0.85 | 0.1 | 0.12 | 0.13 | 99.87 |
| 40 | 0.425 | 0.53 | 0.66 | 0.79 | 99.21 |
| 80 | 0.18 | 0.89 | 1.11 | 1.89 | 98.11 |
| 120 | 0.125 | 0.66 | 0.82 | 2.71 | 97.29 |
| 200 | 0.075 | 6.33 | 7.88 | 10.59 | 89.41 |
| Pan | 0 | 1.31 | 89.41 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(11.60-12.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 11.60 - 12.00 m

Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 70.529 | | |
| Zerro correction | -1 | Gs | 3.181 |
| Meniscus correction | 1 | a | 0.9081 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 48 | 0.0315 | 80.69 |
| 12:22 | 2 | 27 | 47 | 0.0224 | 79.10 |
| 12:24 | 4 | 27 | 46 | 0.0160 | 77.52 |
| 12:28 | 8 | 27 | 45 | 0.0115 | 75.94 |
| 12:35 | 15 | 27 | 40 | 0.0088 | 68.03 |
| 12:50 | 30 | 27 | 20 | 0.0072 | 36.39 |
| 13:05 | 45 | 27 | 15 | 0.0060 | 28.48 |
| 13:50 | 90 | 27 | 10 | 0.0044 | 20.57 |
| 15:20 | 180 | 27 | 4 | 0.0032 | 11.07 |
| 9:20 | 1260 | 26 | 0 | 0.0013 | 4.19 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(11.60-12.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

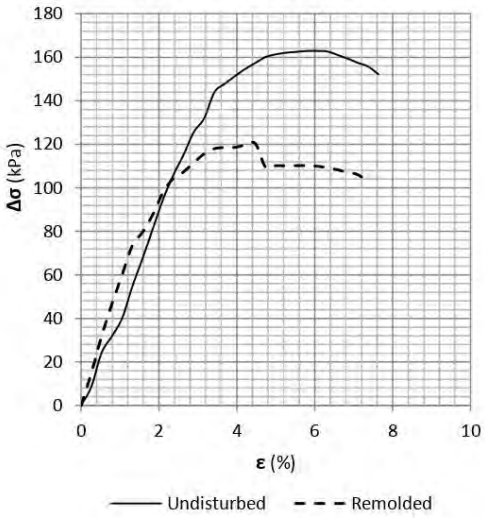
# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 14.75 - 14.90 m

Date Tested : 29/10/2021

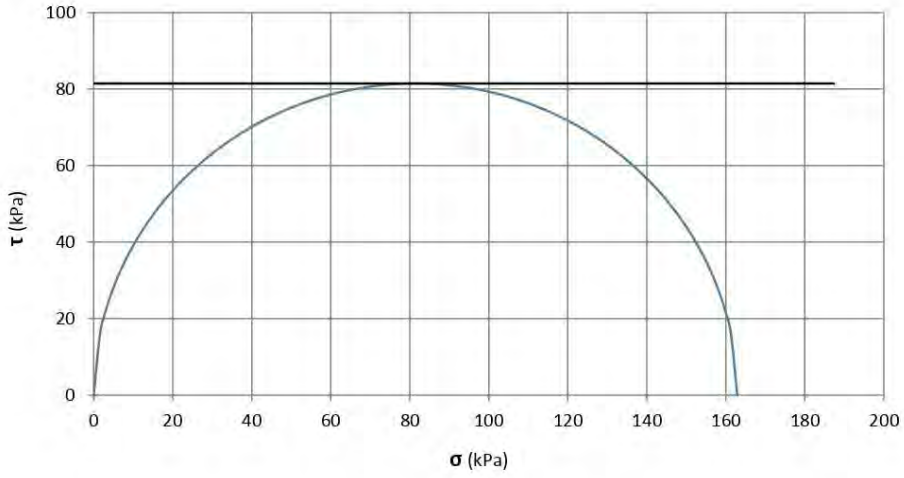
GEOMINE

## STRESS - STRAIN CURVE




| Results | | Undisturbed | Remolded |
|---|---|---|---|
| $\sigma_{max}$ | kPa | 162.9 | 120.3 |
| $\varepsilon_f$ | % | 6.05 | 4.47 |
| $S_t$ | - | 1.35 | |
| c | kPa | 81.5 | 60.2 |
| $E_{50}$ | kPa | 4284 | 5585 |
| $E_{sec}$ | kPa | 2692 | 2690 |

## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(14.75-14.90 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 14.75 - 14.90 m

Date Tested : 29/10/2021

GEOMINE

**Undisturbed**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

Water Content : 69.49 %
Unit Weight : 14.44 kN/m3
Dry Density : 8.52 kN/m3

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|
| 0 | 0.00 | 0.0000 |
| 20 | 8.62 | 0.2632 |
| 40 | 24.21 | 0.5263 |
| 60 | 31.79 | 0.7895 |
| 80 | 40.04 | 1.0526 |
| 100 | 54.72 | 1.3158 |
| 120 | 67.64 | 1.5789 |
| 140 | 81.24 | 1.8421 |
| 160 | 94.77 | 2.1053 |
| 180 | 105.94 | 2.3684 |
| 200 | 115.23 | 2.6316 |
| 220 | 125.70 | 2.8947 |
| 240 | 131.91 | 3.1579 |
| 260 | 143.88 | 3.4211 |
| 280 | 147.75 | 3.6842 |
| 300 | 151.31 | 3.9474 |
| 320 | 154.61 | 4.2105 |
| 340 | 157.39 | 4.4737 |
| 360 | 160.12 | 4.7368 |
| 380 | 161.34 | 5.0000 |
| 400 | 162.10 | 5.2632 |
| 420 | 162.49 | 5.5263 |
| 440 | 162.88 | 5.7895 |
| 460 | 162.91 | 6.0526 |
| 480 | 162.69 | 6.3158 |
| 500 | 161.12 | 6.5789 |
| 520 | 159.40 | 6.8421 |
| 540 | 157.45 | 7.1053 |
| 560 | 155.74 | 7.3684 |
| 580 | 152.19 | 7.6316 |

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|
| - | - | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(14.75-14.90 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 14.75 - 14.90 m
Date Tested : 29/10/2021

GEOMINE

**Remolded**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0 | 0.0000 | - | - | - |
| 20 | 14.98 | 0.2632 | | | |
| 40 | 31.87 | 0.5263 | | | |
| 60 | 46.52 | 0.7895 | | | |
| 80 | 60.00 | 1.0526 | | | |
| 100 | 73.49 | 1.3158 | | | |
| 120 | 79.66 | 1.5789 | | | |
| 140 | 87.80 | 1.8421 | | | |
| 160 | 97.94 | 2.1053 | | | |
| 180 | 104.36 | 2.3684 | | | |
| 200 | 107.35 | 2.6316 | | | |
| 220 | 111.65 | 2.8947 | | | |
| 240 | 115.59 | 3.1579 | | | |
| 260 | 117.99 | 3.4211 | | | |
| 280 | 118.53 | 3.6842 | | | |
| 300 | 118.61 | 3.9474 | | | |
| 320 | 119.63 | 4.2105 | | | |
| 340 | 120.32 | 4.4737 | | | |
| 360 | 109.49 | 4.7368 | | | |
| 380 | 110.16 | 5.0000 | | | |
| 400 | 110.10 | 5.2632 | | | |
| 420 | 110.19 | 5.5263 | | | |
| 440 | 110.25 | 5.7895 | | | |
| 460 | 109.94 | 6.0526 | | | |
| 480 | 109.27 | 6.3158 | | | |
| 500 | 108.33 | 6.5789 | | | |
| 520 | 107.07 | 6.8421 | | | |
| 540 | 106.06 | 7.1053 | | | |
| 560 | 102.56 | 7.3684 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(14.75-14.90 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 05
Depth : 15.80 - 16.00 m
Date Tested : 25/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 10.67 |
| Dry Density | kN/m$^3$ | 5.16 |
| Saturated Density | kN/m$^3$ | 12.39 |
| Spesific Gravity | - | 1.87 |
| Natural Water Content | % | 52 |
| Absorption | % | 140 |
| Saturation | % | 0.72 |
| Porosity | - | 0.72 |
| Void Ratio | - | 2.62 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(15.80-16.00 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

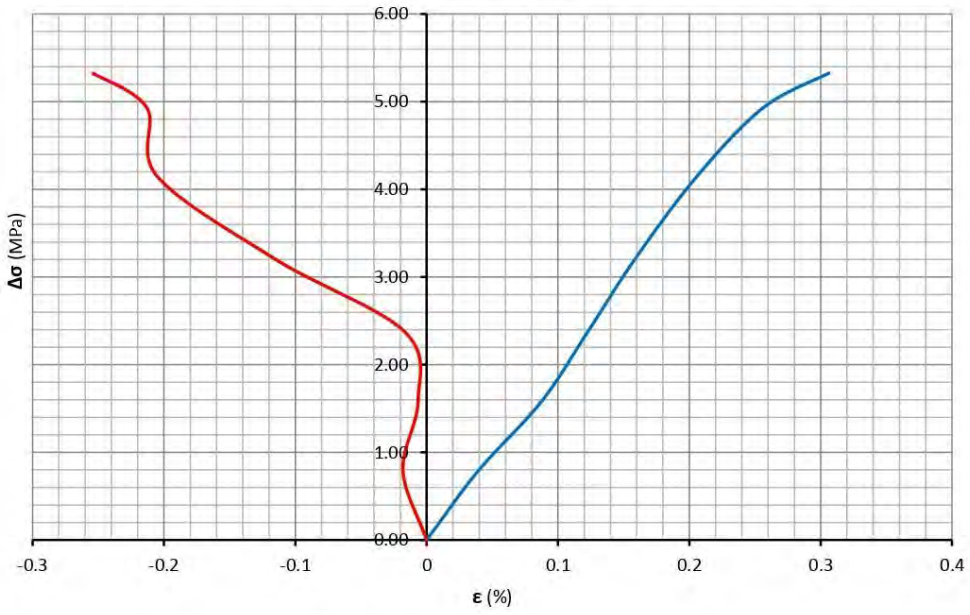
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 05
Depth : 20.10 - 20.27 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 5.32 |
| v | - | 0.33 |
| E | MPa | 2284 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 05-(20.10-20.27 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

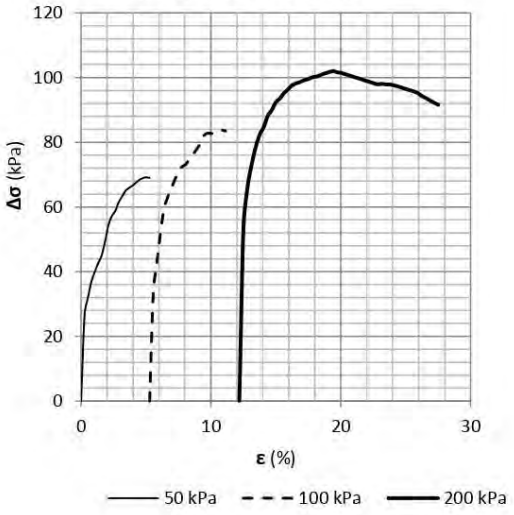
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 05.20 -05.60 m
Date Tested : 28/10/2021

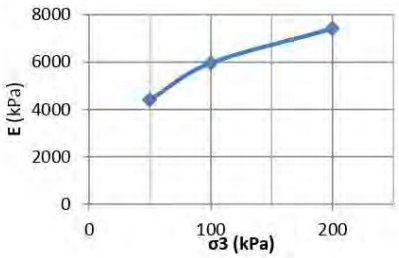
GEOMINE

## STRESS - STRAIN CURVE

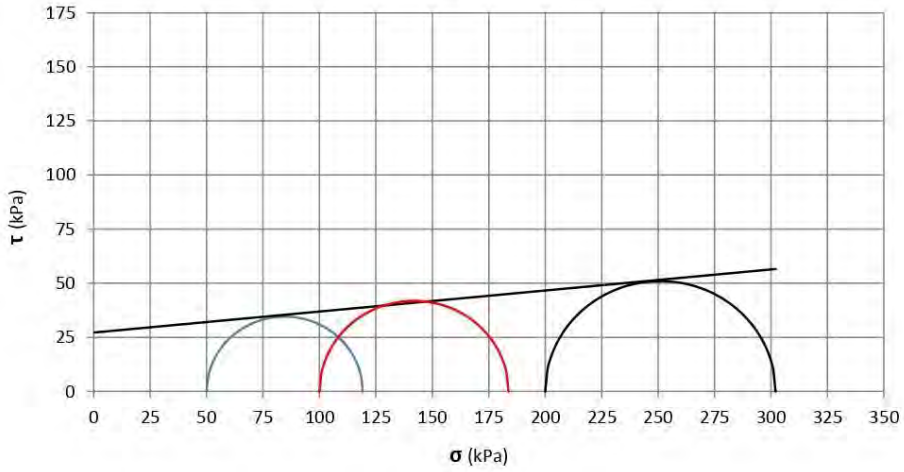



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 69.17 | 5.00 |
| 2. | 100 | 83.73 | 10.83 |
| 3. | 200 | 102.03 | 19.38 |

| Results | | |
|---|---|---|
| c | kPa | 27.2 |
| ø | ° | 5.6 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(05.20-05.60 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 05.20 -05.60 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1139 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 26.54 | 0.26 |
| 40 | 31.97 | 0.53 |
| 60 | 36.87 | 0.79 |
| 80 | 39.95 | 1.05 |
| 100 | 42.62 | 1.32 |
| 120 | 44.97 | 1.58 |
| 140 | 49.29 | 1.84 |
| 160 | 54.37 | 2.11 |
| 180 | 57.16 | 2.37 |
| 200 | 58.77 | 2.63 |
| 220 | 61.44 | 2.89 |
| 240 | 63.22 | 3.16 |
| 260 | 64.99 | 3.42 |
| 280 | 65.87 | 3.68 |
| 300 | 66.56 | 3.95 |
| 320 | 67.44 | 4.21 |
| 340 | 68.31 | 4.47 |
| 360 | 68.88 | 4.74 |
| 380 | 69.17 | 5 |
| 400 | 68.98 | 5.26 |

Deviator Stress Maximum: 69.17 kPa
Strain at Failure: 5.26 %
Deviator Stress at (50%): 58.77 kPa
Strain at (50%): 2.63 %

$E_o$: 2375.66 kPa
$E_{50}$: 2233.28 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 72 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1139 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 380 | 0 | 5.28 |
| 400 | 33.2 | 5.56 |
| 420 | 42.75 | 5.83 |
| 440 | 51.96 | 6.11 |
| 460 | 59.42 | 6.39 |
| 480 | 62.99 | 6.67 |
| 500 | 65.7 | 6.94 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(05.20-05.60 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 05.20 -05.60 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 68.49 | 7.22 |
| 540 | 70.79 | 7.5 |
| 560 | 72.43 | 7.78 |
| 580 | 73.13 | 8.06 |
| 600 | 74.75 | 8.33 |
| 620 | 76.18 | 8.61 |
| 640 | 77.78 | 8.89 |
| 660 | 79.55 | 9.17 |
| 680 | 81.94 | 9.44 |
| 700 | 82.78 | 9.72 |
| 720 | 82.7 | 10 |
| 740 | 82.9 | 10.28 |
| 760 | 83.54 | 10.56 |
| 780 | 83.73 | 10.83 |
| 800 | 83.47 | 11.11 |

Deviator Stress Maximum: 83.73 kPa  $E_o$: 3514.56 kPa
Strain at Failure: 11.11 %  $E_{50}$: 907.87 kPa
Deviator Stress at (50%): 73.13 kPa
Strain at (50%): 8.06 %

+ + + + + + + + + STAGE - 2 + + + + + + + +

Height of Sample: 64 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1139 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 780 | 0 | 12.19 |
| 800 | 52.99 | 12.5 |
| 820 | 65.93 | 12.81 |
| 840 | 72.85 | 13.13 |
| 860 | 78.33 | 13.44 |
| 880 | 82.29 | 13.75 |
| 900 | 84.67 | 14.06 |
| 920 | 88.14 | 14.38 |
| 940 | 89.96 | 14.69 |
| 960 | 92.37 | 15 |
| 980 | 93.56 | 15.31 |
| 1000 | 95.16 | 15.63 |
| 1020 | 96.33 | 15.94 |
| 1040 | 97.57 | 16.25 |
| 1060 | 98.21 | 16.56 |
| 1080 | 98.59 | 16.88 |
| 1100 | 99.22 | 17.19 |
| 1120 | 99.51 | 17.5 |
| 1140 | 100.12 | 17.81 |
| 1160 | 100.32 | 18.13 |
| 1180 | 100.75 | 18.44 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(05.20-05.60 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 05.20 -05.60 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 101.27 | 18.75 |
| 1220 | 101.61 | 19.06 |
| 1240 | 102.03 | 19.38 |
| 1260 | 101.63 | 19.69 |
| 1280 | 101.48 | 20 |
| 1300 | 101.08 | 20.31 |
| 1320 | 100.68 | 20.63 |
| 1340 | 100.29 | 20.94 |
| 1360 | 99.89 | 21.25 |
| 1380 | 99.49 | 21.56 |
| 1400 | 99.1 | 21.88 |
| 1420 | 98.7 | 22.19 |
| 1440 | 98.3 | 22.5 |
| 1460 | 97.91 | 22.81 |
| 1480 | 98.05 | 23.13 |
| 1500 | 97.88 | 23.44 |
| 1520 | 97.87 | 23.75 |
| 1540 | 97.62 | 24.06 |
| 1560 | 97.29 | 24.38 |
| 1580 | 96.89 | 24.69 |
| 1600 | 96.49 | 25 |
| 1620 | 96.09 | 25.31 |
| 1640 | 95.68 | 25.63 |
| 1660 | 95.21 | 25.94 |
| 1680 | 94.29 | 26.25 |
| 1700 | 93.67 | 26.56 |
| 1720 | 92.9 | 26.88 |
| 1740 | 92.21 | 27.19 |
| 1760 | 91.6 | 27.5 |

Deviator Stress Maximum: 102.03 kPa
Strain at Failure: 27.50 %
Deviator Stress at (50%): 101.63 kPa
Strain at (50%): 19.69 %

$E_o$: 1582.25 kPa
$E_{50}$: 516.21 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1237
Wet Soil + Container : 167.3 gram
Dry Soil + Container : 117.7 gram
Weight of Container : 4.48 gram
Density : 18.89 kN/m3
Moisture Content : 43.81 %
Dry Density : 13.14 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(05.20-05.60 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 07.00 - 07.40 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | kN/m³ | 18.8 |
| SL | % | - |
| Gs | - | 3.15 |
| MC | % | 56 |
| PL | % | 34 |
| LL | % | 60 |
| PI | % | 26 |
| Fines (#200) | % | 79 |
| $D_{10}$ | mm | 0.0093 |
| $D_{30}$ | mm | 0.0125 |
| $D_{60}$ | mm | 0.0429 |
| $C_u$ | - | 5 |
| $C_c$ | - | 0.39 |

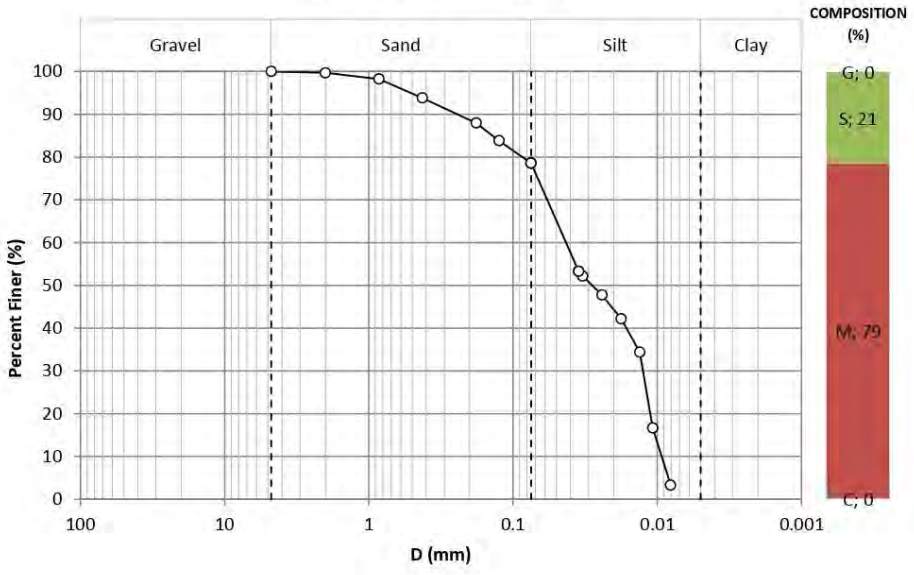
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.08 |
| $I_T$ | % | -329.92 |
| $I_L$ | % | 0.86 |
| $I_C$ | % | 0.14 |
| $S_r$ | % | 100.00 |
| e | - | 1.53 |
| n | - | 0.60 |
| A | - | 17.86 |

| | |
|---|---|
| Consistency** | Very Soft |
| Activity | Active |
| Plasticity Symbol | MH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 07.00 - 07.40 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1224 | 1030 | 1176 |
| Weight of Container | 4.57 | 5.86 | 4.42 |
| Weight of wet soil and container | 125.47 | 112.59 | 128.43 |
| Weight of dry soil and container | 81.03 | 74.76 | 84.55 |
| Moisture Content | 58.12 | 54.91 | 54.76 |
| Average MC | 55.93 | | |

**Unit weight**

| | |
|---|---|
| No. Ring | 9 |
| No. Container | 1166 |
| Weight of Ring | 27.15 |
| Volume of Ring | 15.669 |
| Weight of Container | 4.55 |
| Weight of wet soil and ring and containe | 61.11 |
| Weight of dry soil and ring and containe | 51.19 |
| Water Content | 50.898 |
| Density | 18.769 |
| Dry Density | 12.438 |
| Saturation | 100 |
| Void ratio | 1.5308 |
| Porosity | 0.6049 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 203 | 203 |
| Weight of Pycknometer + soil | 72.41 | 72.41 |
| Weight of Pycknometer + water + soil | 164.58 | 164.58 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 54.5 | 54.5 |
| Weight of Pycknometer + water | 152.36 | 152.36 |
| Specific Gravity | 3.148 | 3.148 |
| Average Specific Gravity | 3.148 | |

**Shrinkage Limit**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 07.00 - 07.40 m

Date Tested : 26/10/2021

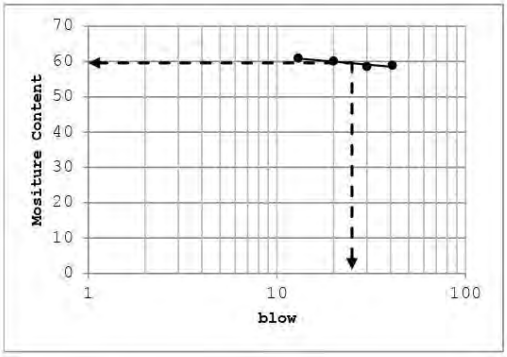
GEOMINE

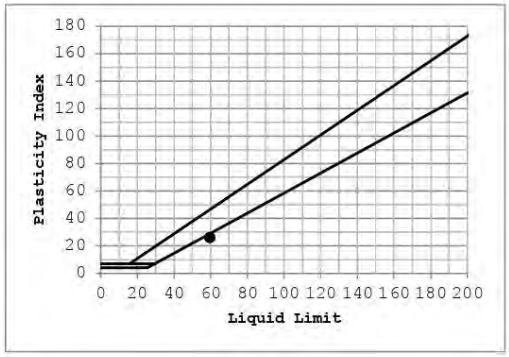
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1178 | 1143 | 1031 |
| Weight of Container | 4.12 | 4.18 | 5.77 |
| Weight of wet soil and container | 13.14 | 13.55 | 13.7 |
| Weight of dry soil and container | 10.87 | 11.16 | 11.74 |
| Plastic Limit | 33.63 | 34.24 | 32.83 |
| Average | 33.57 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1184 | 1034 | 1199 | 1139 | - |
| Weight of Container | 4.24 | 5.22 | 4.59 | 4.45 | - |
| Weight of wet soil and container | 15.33 | 15.7 | 15.94 | 15.49 | - |
| Weight of dry soil and container | 11.22 | 11.83 | 11.68 | 11.31 | - |
| Water Content | 58.88 | 58.55 | 60.08 | 60.93 | - |
| Number of blows | 41 | 30 | 20 | 13 | - |
| Liquid Limit | 59.61 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.31 |
| Weight of dry soil | 80.31 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0.23 | 0.29 | 0.29 | 99.71 |
| 20 | 0.85 | 1.18 | 1.47 | 1.76 | 98.24 |
| 40 | 0.425 | 3.54 | 4.41 | 6.16 | 93.84 |
| 80 | 0.18 | 4.72 | 5.88 | 12.04 | 87.96 |
| 120 | 0.125 | 3.32 | 4.13 | 16.18 | 83.82 |
| 200 | 0.075 | 4.21 | 5.24 | 21.42 | 78.58 |
| Pan | 0 | 1.39 | 78.58 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 07.00 - 07.40 m

Date Tested : 26/10/2021

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 61.719 | | |
| Zerro correction | -1 | Gs | 3.1478 |
| Meniscus correction | 1 | a | 0.9125 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 44 | 0.0329 | 52.20 |
| 12:22 | 2 | 27 | 40 | 0.0242 | 47.76 |
| 12:24 | 4 | 27 | 35 | 0.0178 | 42.21 |
| 12:28 | 8 | 27 | 28 | 0.0132 | 34.43 |
| 12:35 | 15 | 27 | 12 | 0.0107 | 16.66 |
| 12:50 | 30 | 27 | 0 | 0.0081 | 3.33 |
| 13:05 | 45 | 0 | 0 | 0.0000 | 1.11 |
| 13:50 | 90 | 0 | 0 | 0.0000 | 1.11 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

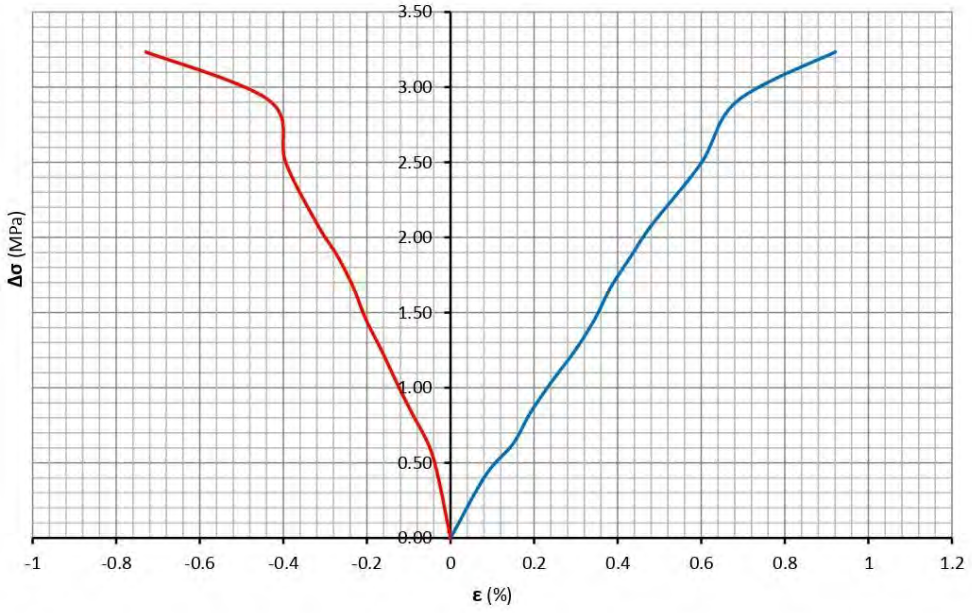
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 25.60 - 25.80 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 3.23 |
| v | - | 0.38 |
| E | MPa | 445 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(25.60-25.80 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

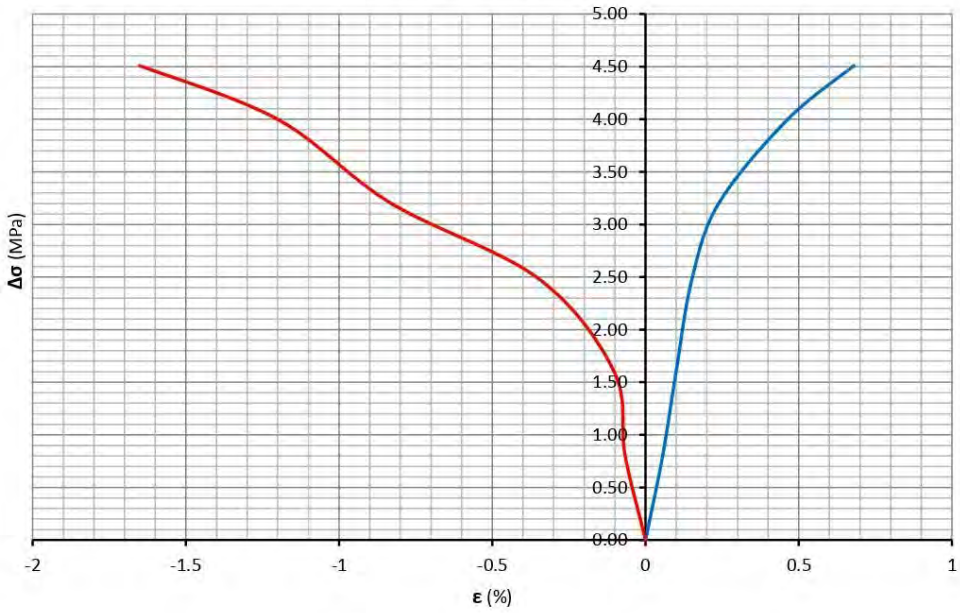
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 06
Depth : 35.50 - 35.70 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 4.51 |
| v | - | 0.41 |
| E | MPa | 623 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 06-(35.50-35.70 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

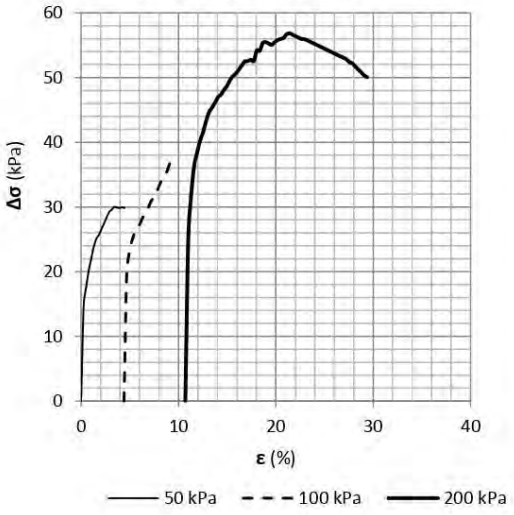
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

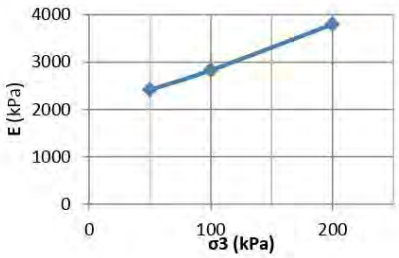
GEOMINE

## STRESS - STRAIN CURVE

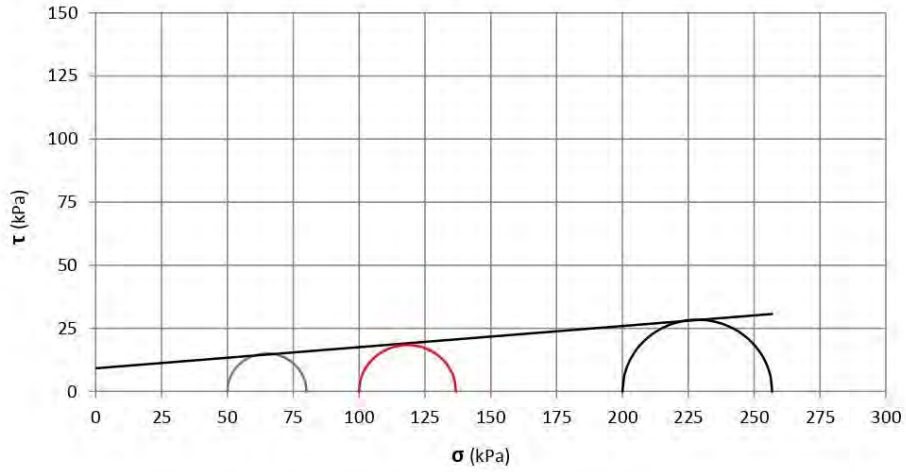



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 30.00 | 3.42 |
| 2. | 100 | 36.78 | 9.37 |
| 3. | 200 | 56.84 | 21.41 |

| Results | | |
|---|---|---|
| c | kPa | 9.2 |
| ø | ° | 4.8 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1101 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 14.81 | 0.26 |
| 40 | 17.67 | 0.53 |
| 60 | 20.23 | 0.79 |
| 80 | 22.09 | 1.05 |
| 100 | 23.95 | 1.32 |
| 120 | 25.13 | 1.58 |
| 140 | 25.73 | 1.84 |
| 160 | 26.61 | 2.11 |
| 180 | 27.49 | 2.37 |
| 200 | 28.45 | 2.63 |
| 220 | 29.22 | 2.89 |
| 240 | 29.61 | 3.16 |
| 260 | 30 | 3.42 |
| 280 | 29.92 | 3.68 |
| 300 | 29.84 | 3.95 |
| 320 | 29.94 | 4.21 |
| 340 | 29.86 | 4.47 |

Deviator Stress Maximum: 30.00 kPa
Strain at Failure: 4.47 %
Deviator Stress at (50%): 26.61 kPa
Strain at (50%): 2.11 %

$E_{s_i}$: 1565.00 kPa
$E_{50}$: 1263.98 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 72.6 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1101 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 320 | 0 | 4.41 |
| 340 | 19.71 | 4.68 |
| 360 | 23.07 | 4.96 |
| 380 | 24.84 | 5.23 |
| 400 | 25.96 | 5.51 |
| 420 | 26.71 | 5.79 |
| 440 | 27.45 | 6.06 |
| 460 | 28.37 | 6.34 |
| 480 | 29.01 | 6.61 |
| 500 | 29.83 | 6.89 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 30.82 | 7.16 |
| 540 | 31.45 | 7.44 |
| 560 | 32.25 | 7.71 |
| 580 | 33.14 | 7.99 |
| 600 | 34.11 | 8.26 |
| 620 | 34.89 | 8.54 |
| 640 | 35.5 | 8.82 |
| 660 | 36.63 | 9.09 |
| 680 | 36.78 | 9.37 |
| 700 | 36.67 | 9.64 |
| 720 | 36.56 | 9.92 |

Deviator Stress Maximum: 36.78 kPa
Strain at Failure: 9.92 %
Deviator Stress at (50%): 30.82 kPa
Strain at (50%): 7.16 %

$E_o$: 1286.57 kPa
$E_{50}$: 430.34 kPa

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 65.4 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1101 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 700 | 0 | 10.7 |
| 720 | 25.31 | 11.01 |
| 740 | 32.03 | 11.31 |
| 760 | 36.46 | 11.62 |
| 780 | 38.48 | 11.93 |
| 800 | 40.3 | 12.23 |
| 820 | 41.6 | 12.54 |
| 840 | 43.32 | 12.84 |
| 860 | 44.69 | 13.15 |
| 880 | 45.37 | 13.46 |
| 900 | 46.13 | 13.76 |
| 920 | 46.97 | 14.07 |
| 940 | 47.38 | 14.37 |
| 960 | 48.12 | 14.68 |
| 980 | 48.69 | 14.98 |
| 1000 | 49.59 | 15.29 |
| 1020 | 50.23 | 15.6 |
| 1040 | 50.62 | 15.9 |
| 1060 | 51.25 | 16.21 |
| 1080 | 51.87 | 16.51 |
| 1100 | 52.49 | 16.82 |
| 1120 | 52.54 | 17.13 |
| 1140 | 52.74 | 17.43 |
| 1160 | 52.55 | 17.74 |
| 1180 | 54.18 | 18.04 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 54.14 | 18.35 |
| 1220 | 55.36 | 18.65 |
| 1240 | 55.46 | 18.96 |
| 1260 | 55.26 | 19.27 |
| 1280 | 55.05 | 19.57 |
| 1300 | 55.46 | 19.88 |
| 1320 | 55.79 | 20.18 |
| 1340 | 55.96 | 20.49 |
| 1360 | 56.13 | 20.8 |
| 1380 | 56.68 | 21.1 |
| 1400 | 56.84 | 21.41 |
| 1420 | 56.62 | 21.71 |
| 1440 | 56.4 | 22.02 |
| 1460 | 56.18 | 22.32 |
| 1480 | 55.96 | 22.63 |
| 1500 | 55.96 | 22.94 |
| 1520 | 55.74 | 23.24 |
| 1540 | 55.52 | 23.55 |
| 1560 | 55.29 | 23.85 |
| 1580 | 55.07 | 24.16 |
| 1600 | 54.85 | 24.46 |
| 1620 | 54.63 | 24.77 |
| 1640 | 54.41 | 25.08 |
| 1660 | 54.18 | 25.38 |
| 1680 | 53.96 | 25.69 |
| 1700 | 53.74 | 25.99 |
| 1720 | 53.52 | 26.3 |
| 1740 | 53.3 | 26.61 |
| 1760 | 53.07 | 26.91 |
| 1780 | 52.85 | 27.22 |
| 1800 | 52.42 | 27.52 |
| 1820 | 52.2 | 27.83 |
| 1840 | 51.77 | 28.13 |
| 1860 | 51.27 | 28.44 |
| 1880 | 50.84 | 28.75 |
| 1900 | 50.35 | 29.05 |
| 1920 | 50.06 | 29.36 |

Deviator Stress Maximum: 56.84 kPa
Strain at Failure: 29.36 %
Deviator Stress at (50%): 55.46 kPa
Strain at (50%): 19.88 %

$E_o$: 638.59 kPa
$E_{50}$: 279 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1232
Wet Soil + Container : 164.29 gram
Dry Soil + Container : 114.53 gram
Weight of Container : 4.39 gram
Density : 18.55 kN/m3
Moisture Content : 45.18 %
Dry Density : 12.78 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 03.60 - 04.00 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | $kN/m^3$ | - |
| SL | % | - |
| Gs | - | 2.67 |
| MC | % | - |
| PL | % | 17 |
| LL | % | 54 |
| PI | % | 37 |
| Fines (#200) | % | 83 |
| $D_{10}$ | mm | 0.0108 |
| $D_{30}$ | mm | 0.0144 |
| $D_{60}$ | mm | 0.0421 |
| $C_u$ | - | 4 |
| $C_c$ | - | 0.46 |

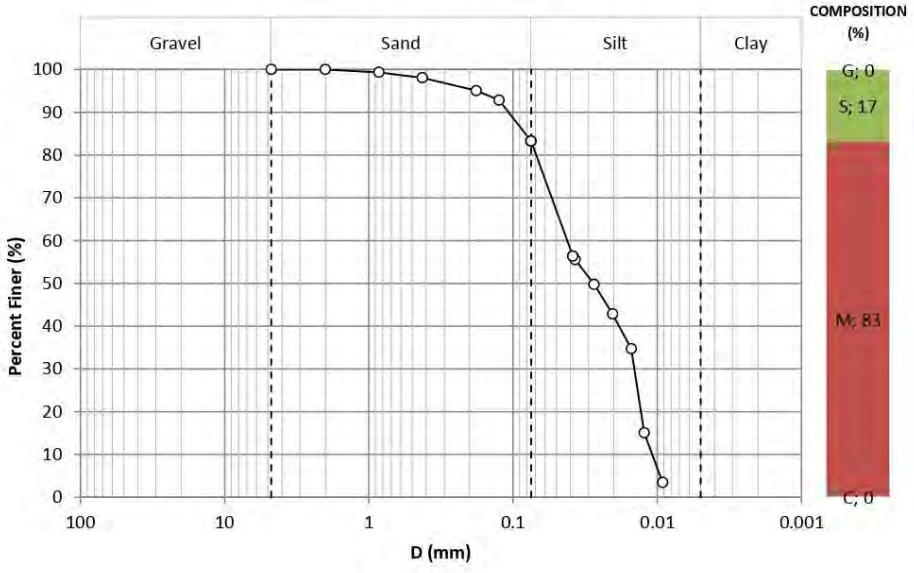
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.19 |
| $I_T$ | % | -198.18 |
| $I_L$ | % | - |
| $I_C$ | % | - |
| $S_r$ | % | - |
| e | - | - |
| n | - | - |
| A | - | 25.25 |

| | |
|---|---|
| Consistency** | - |
| Activity | Active |
| Plasticity Symbol | CH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(03.60-04.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 03.60 - 04.00 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | | 1 | 2 | 3 |
|---|---|---|---|---|
| No. Container | - | - | - | |
| Weight of Container | - | - | - | |
| Weight of wet soil and container | - | - | - | |
| Weight of dry soil and container | - | - | - | |
| Moisture Content | - | - | - | |
| Average MC | - | | | |

**Unit weight**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and ring and containe | - |
| Weight of dry soil and ring and containe | - |
| Water Content | - |
| Density | - |
| Dry Density | - |
| Saturation | - |
| Void ratio | - |
| Porosity | - |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 201 | 201 |
| Weight of Pycknometer + soil | 92.86 | 92.86 |
| Weight of Pycknometer + water + soil | 178.4 | 178.4 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 52.92 | 52.92 |
| Weight of Pycknometer + water | 153.44 | 153.44 |
| Specific Gravity | 2.666 | 2.666 |
| Average Specific Gravity | 2.666 | |

**Shrinkage Limit**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(03.60-04.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 03.60 - 04.00 m

Date Tested : 26/10/2021

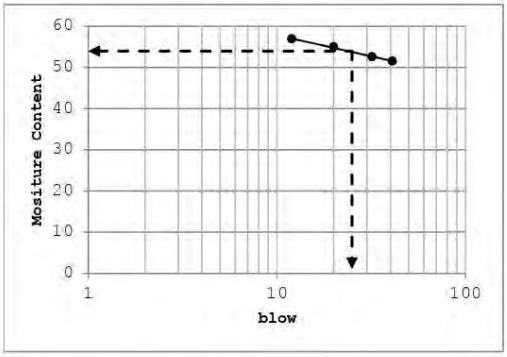
GEOMINE

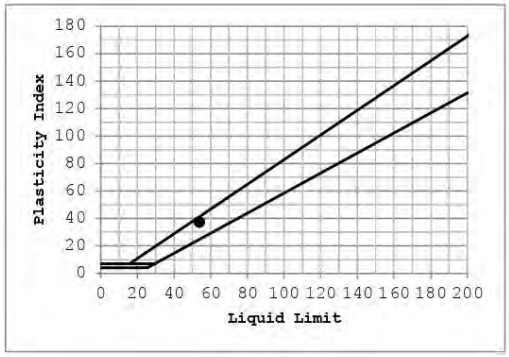
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1035 | 1002 | 1129 |
| Weight of Container | 5.36 | 5.65 | 4.56 |
| Weight of wet soil and container | 13.95 | 13.88 | 13.3 |
| Weight of dry soil and container | 12.69 | 12.75 | 12.01 |
| Plastic Limit | 17.19 | 15.92 | 17.32 |
| Average | 16.81 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1194 | 1092 | 1027 | 1225 | - |
| Weight of Container | 4.56 | 4.71 | 5.06 | 4.6 | - |
| Weight of wet soil and container | 15.68 | 15.45 | 15.35 | 15.88 | - |
| Weight of dry soil and container | 11.9 | 11.75 | 11.7 | 11.79 | - |
| Water Content | 51.50 | 52.56 | 54.97 | 56.88 | - |
| Number of blows | 41 | 32 | 20 | 12 | - |
| Liquid Limit | 53.95 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.4 |
| Weight of dry soil | 80.4 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0 | 0.00 | 0.00 | 100.00 |
| 20 | 0.85 | 0.52 | 0.65 | 0.65 | 99.35 |
| 40 | 0.425 | 1.02 | 1.27 | 1.92 | 98.08 |
| 80 | 0.18 | 2.43 | 3.02 | 4.94 | 95.06 |
| 120 | 0.125 | 1.78 | 2.21 | 7.15 | 92.85 |
| 200 | 0.075 | 7.7 | 9.58 | 16.73 | 83.27 |
| Pan | 0 | 1.62 | 83.27 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(03.60-04.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 03.60 - 04.00 m
Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 65.329 | | |
| Zerro correction | -1 | Gs | 2.6664 |
| Meniscus correction | 1 | a | 0.8963 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 45 | 0.0371 | 55.57 |
| 12:22 | 2 | 27 | 40 | 0.0274 | 49.78 |
| 12:24 | 4 | 27 | 34 | 0.0204 | 42.83 |
| 12:28 | 8 | 27 | 27 | 0.0151 | 34.73 |
| 12:35 | 15 | 27 | 10 | 0.0123 | 15.05 |
| 12:50 | 30 | 27 | 0 | 0.0092 | 3.47 |
| 13:05 | 45 | 0 | 0 | 0.0000 | 1.16 |
| 13:50 | 90 | 0 | 0 | 0.0000 | 1.16 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(03.60-04.00 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Falling Head

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 03.60 -04.00 m
Date Tested : 27/10/2021

GEOMINE

| Time (minute) | Volume (cm3) | delta time (minute) | delta volume (cm3) |
|---|---|---|---|
| 0 | 6.9 | 0 | 0 |
| 80 | 7.1 | 80 | 0.2 |
| 140 | 7.3 | 60 | 0.2 |
| 210 | 7.5 | 70 | 0.2 |
| 288 | 7.6 | 78 | 0.1 |
| 348 | 7.7 | 60 | 0.1 |
| 400 | 7.9 | 52 | 0.2 |
| 456 | 8.1 | 56 | 0.2 |

t-sample (cm): 6.60
Area-sample (cm2): 11.34
Head (cm): 50

k (cm/s): 4.850E-07

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(03.60-04.00 m)-Falling Head.xlsm

F GWL OL 040; R 01-(6/12/18)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

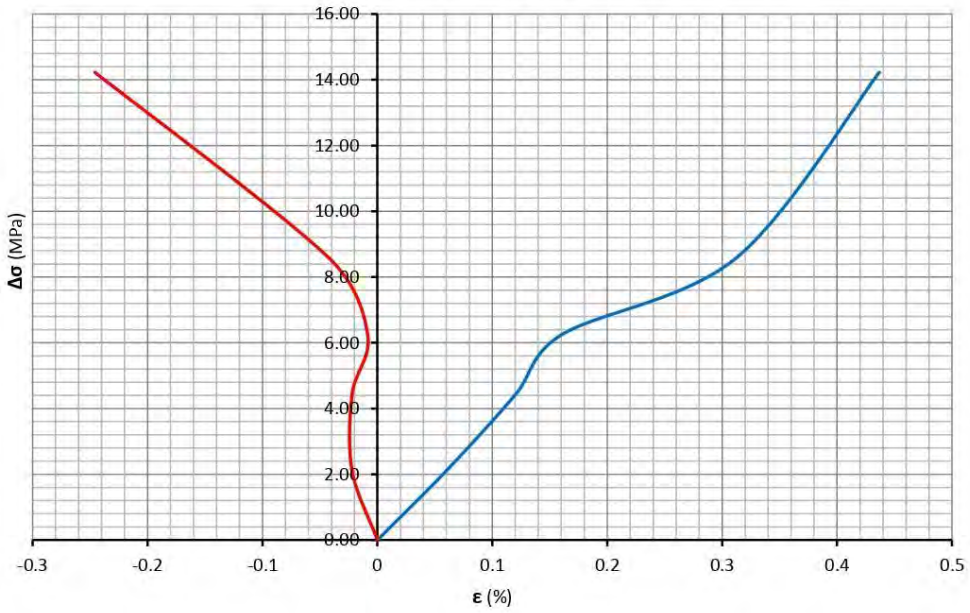
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 06.50 - 06.70 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 14.23 |
| v | - | 0.21 |
| E | MPa | 3049 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(06.50-06.70 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 07
Depth : 09.50 - 09.85 m
Date Tested : 27/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 20.21 |
| Dry Density | kN/m$^3$ | 16.99 |
| Saturated Density | kN/m$^3$ | 20.51 |
| Spesific Gravity | - | 2.62 |
| Natural Water Content | % | 19 |
| Absorption | % | 21 |
| Saturation | % | 0.35 |
| Porosity | - | 0.35 |
| Void Ratio | - | 0.54 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(09.50-09.85 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

# Uniaxial Compressive Strength Test (v)

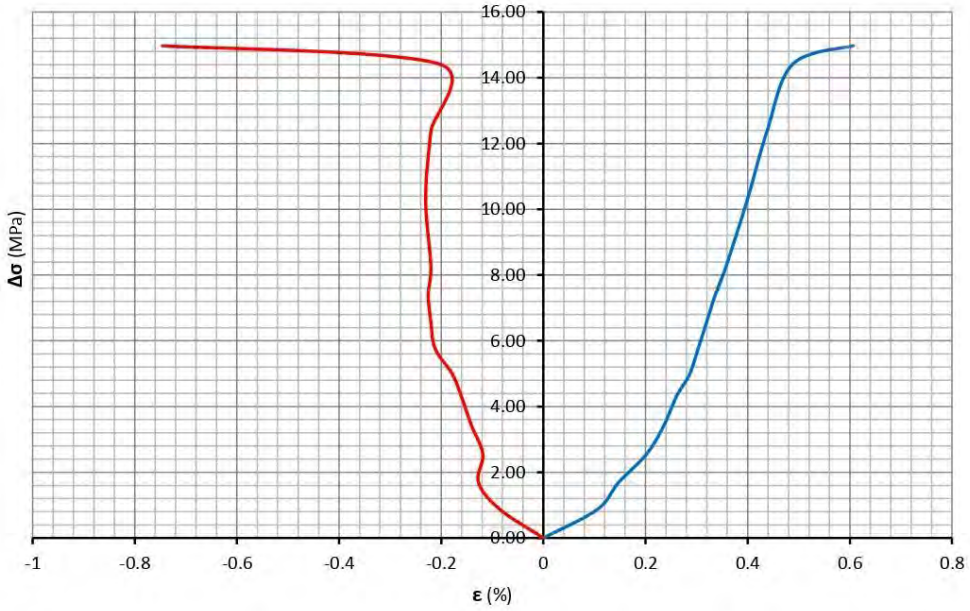
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 07
Depth : 11.00 - 11.20 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 14.97 |
| v | - | 0.45 |
| E | MPa | 1255 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 07-(11.00-11.20 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

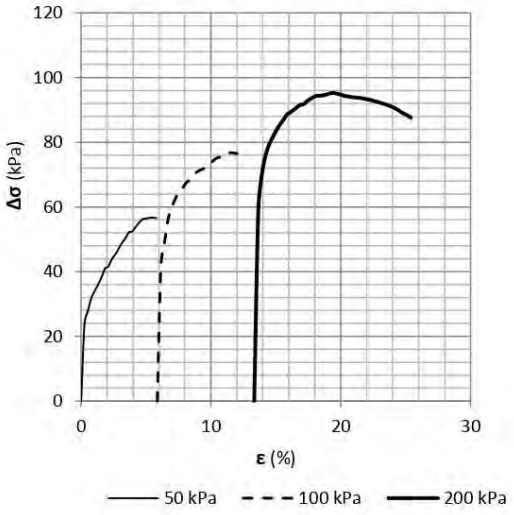
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

GEOMINE

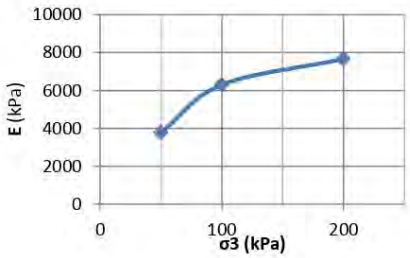
Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

## STRESS - STRAIN CURVE

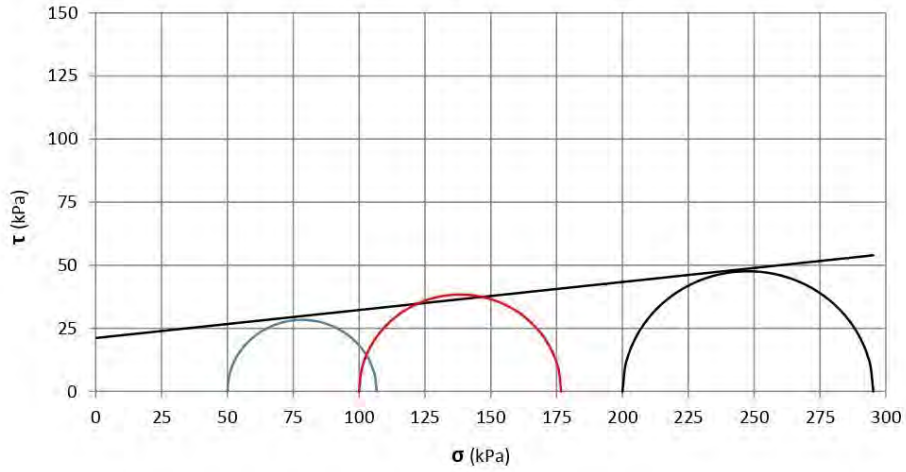



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 56.70 | 5.53 |
| 2. | 100 | 76.73 | 11.45 |
| 3. | 200 | 95.24 | 19.37 |

| Results | | |
|---|---|---|
| c | kPa | 21.2 |
| ø | ° | 6.3 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 24.01 | 0.26 |
| 40 | 27.94 | 0.53 |
| 60 | 31.84 | 0.79 |
| 80 | 34.14 | 1.05 |
| 100 | 36.03 | 1.32 |
| 120 | 38.3 | 1.58 |
| 140 | 40.96 | 1.84 |
| 160 | 41.63 | 2.11 |
| 180 | 43.87 | 2.37 |
| 200 | 45.31 | 2.63 |
| 220 | 47.14 | 2.89 |
| 240 | 48.95 | 3.16 |
| 260 | 50.37 | 3.42 |
| 280 | 52.17 | 3.68 |
| 300 | 52.41 | 3.95 |
| 320 | 53.88 | 4.21 |
| 340 | 55.19 | 4.47 |
| 360 | 56.18 | 4.74 |
| 380 | 56.41 | 5 |
| 400 | 56.63 | 5.26 |
| 420 | 56.7 | 5.53 |
| 440 | 56.54 | 5.79 |

Deviator Stress Maximum: 56.70 kPa
Strain at Failure: 5.79 %
Deviator Stress at (50%): 47.14 kPa
Strain at (50%): 2.89 %

$E_{o}$: 1969.86 kPa
$E_{50}$: 1628.45 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + +

Height of Sample: 71.6 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 420 | 0 | 5.87 |
| 440 | 41.65 | 6.15 |
| 460 | 49.03 | 6.42 |
| 480 | 56.22 | 6.7 |
| 500 | 59.93 | 6.98 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 62.58 | 7.26 |
| 540 | 64.77 | 7.54 |
| 560 | 65.9 | 7.82 |
| 580 | 67.47 | 8.1 |
| 600 | 68.37 | 8.38 |
| 620 | 69.7 | 8.66 |
| 640 | 70.87 | 8.94 |
| 660 | 71.46 | 9.22 |
| 680 | 72.04 | 9.5 |
| 700 | 73.26 | 9.78 |
| 720 | 73.83 | 10.06 |
| 740 | 74.9 | 10.34 |
| 760 | 75.31 | 10.61 |
| 780 | 75.86 | 10.89 |
| 800 | 76.41 | 11.17 |
| 820 | 76.73 | 11.45 |
| 840 | 76.7 | 11.73 |
| 860 | 76.46 | 12.01 |

Deviator Stress Maximum: 76.73 kPa
Strain at Failure: 12.01 %
Deviator Stress at (50%): 70.87 kPa
Strain at (50%): 8.94 %

$E_{50}$: 3158.95 kPa
$E_{50}$: 792.91 kPa

+ + + + + + + + + STAGE - 2 + + + + + + + + +

Height of Sample: 63 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.091 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 840 | 0 | 13.33 |
| 860 | 59.1 | 13.65 |
| 880 | 71.1 | 13.97 |
| 900 | 77.03 | 14.29 |
| 920 | 80.31 | 14.6 |
| 940 | 82.81 | 14.92 |
| 960 | 85.01 | 15.24 |
| 980 | 86.8 | 15.56 |
| 1000 | 88.56 | 15.87 |
| 1020 | 89.44 | 16.19 |
| 1040 | 90.44 | 16.51 |
| 1060 | 91.43 | 16.83 |
| 1080 | 91.81 | 17.14 |
| 1100 | 92.85 | 17.46 |
| 1120 | 93.68 | 17.78 |
| 1140 | 94.31 | 18.1 |
| 1160 | 94.4 | 18.41 |
| 1180 | 94.55 | 18.73 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 02.60 -03.00 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 94.96 | 19.05 |
| 1220 | 95.24 | 19.37 |
| 1240 | 95.06 | 19.68 |
| 1260 | 94.68 | 20 |
| 1280 | 94.31 | 20.32 |
| 1300 | 94.12 | 20.63 |
| 1320 | 93.87 | 20.95 |
| 1340 | 93.81 | 21.27 |
| 1360 | 93.62 | 21.59 |
| 1380 | 93.37 | 21.9 |
| 1400 | 93.18 | 22.22 |
| 1420 | 92.79 | 22.54 |
| 1440 | 92.41 | 22.86 |
| 1460 | 92.03 | 23.17 |
| 1480 | 91.65 | 23.49 |
| 1500 | 91.15 | 23.81 |
| 1520 | 90.59 | 24.13 |
| 1540 | 89.91 | 24.44 |
| 1560 | 89.05 | 24.76 |
| 1580 | 88.43 | 25.08 |
| 1600 | 87.58 | 25.4 |

Deviator Stress Maximum: 95.24 kPa
Strain at Failure: 25.40 %
Deviator Stress at (50%): 95.24 kPa
Strain at (50%): 19.37 %

$E_o$: 1861.9 kPa
$E_{50}$: 491.81 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1155
Wet Soil + Container : 167.52 gram
Dry Soil + Container : 117.85 gram
Weight of Container : 4.24 gram
Density : 18.94 kN/m3
Moisture Content : 43.72 %
Dry Density : 13.18 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(02.60-03.00 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 04.00 - 04.40 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | kN/m³ | 18.3 |
| SL | % | - |
| Gs | - | 3.59 |
| MC | % | 64 |
| PL | % | 34 |
| LL | % | 79 |
| PI | % | 45 |
| Fines (#200) | % | 87 |
| $D_{10}$ | mm | 0.0069 |
| $D_{30}$ | mm | 0.0084 |
| $D_{60}$ | mm | 0.0149 |
| $C_u$ | - | 2 |
| $C_c$ | - | 0.69 |

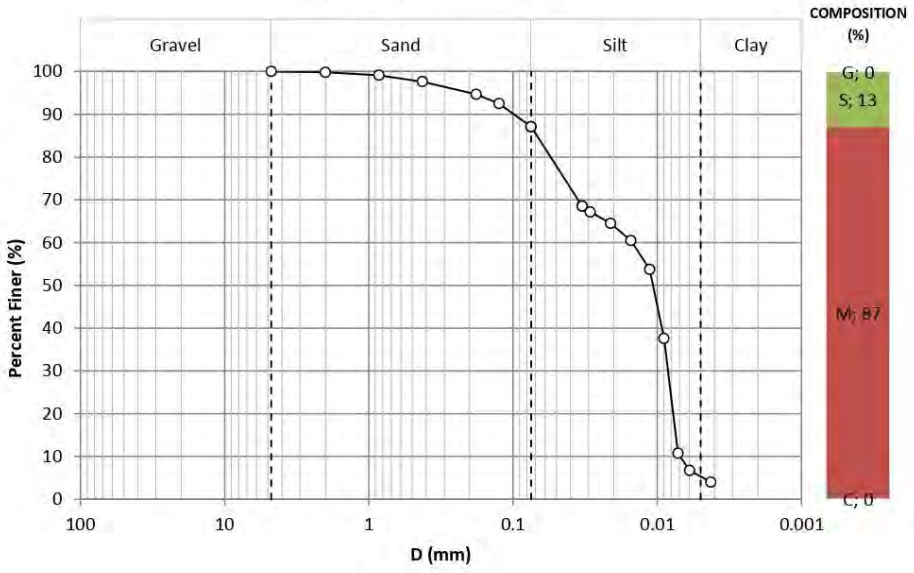
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.29 |
| $I_T$ | % | -154.53 |
| $I_L$ | % | 0.67 |
| $I_C$ | % | 0.33 |
| $S_r$ | % | 100.00 |
| e | - | 2.20 |
| n | - | 0.69 |
| A | - | - |

| Consistency** | Soft |
|---|---|
| Activity | - |
| Plasticity Symbol | CH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(04.00-04.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 04.00 - 04.40 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1074 | 1085 | 1061 |
| Weight of Container | 4.90 | 4.93 | 4.70 |
| Weight of wet soil and container | 113.77 | 103.68 | 114.94 |
| Weight of dry soil and container | 71.16 | 65.40 | 71.46 |
| Moisture Content | 64.31 | 63.30 | 65.13 |
| Average MC | 64.25 | | |

**Unit weight**

| No. Ring | 3 |
|---|---|
| No. Container | 1081 |
| Weight of Ring | 27.16 |
| Volume of Ring | 15.669 |
| Weight of Container | 4.69 |
| Weight of wet soil and ring and containe | 60.46 |
| Weight of dry soil and ring and containe | 49.42 |
| Water Content | 62.834 |
| Density | 18.259 |
| Dry Density | 11.213 |
| Saturation | 100 |
| Void ratio | 2.2032 |
| Porosity | 0.6878 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 201 | 201 |
| Weight of Pycknometer + soil | 71.09 | 71.09 |
| Weight of Pycknometer + water + soil | 166.55 | 166.55 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 52.92 | 52.92 |
| Weight of Pycknometer + water | 153.44 | 153.44 |
| Specific Gravity | 3.592 | 3.592 |
| Average Specific Gravity | 3.592 | |

**Shrinkage Limit**

| No. Ring | - |
|---|---|
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(04.00-04.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 04.00 - 04.40 m

Date Tested : 26/10/2021

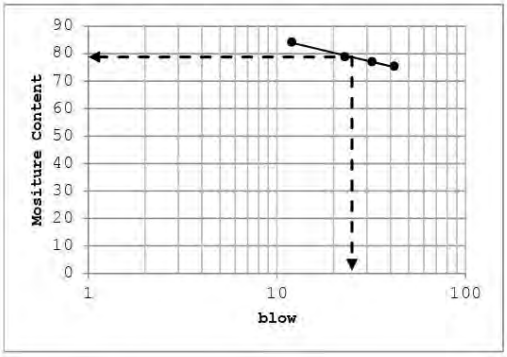
GEOMINE

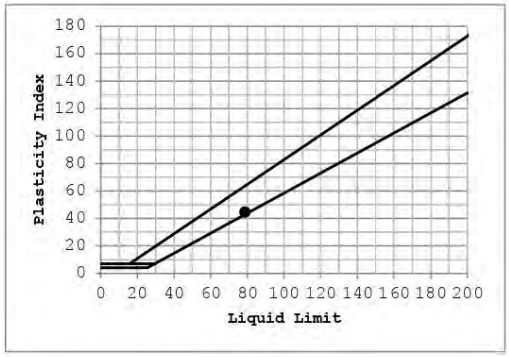
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1142 | 1108 | 1041 |
| Weight of Container | 5.03 | 4.71 | 5.34 |
| Weight of wet soil and container | 12.68 | 12.67 | 12.41 |
| Weight of dry soil and container | 10.75 | 10.66 | 10.58 |
| Plastic Limit | 33.74 | 33.78 | 34.92 |
| Average | 34.15 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1141 | 1179 | 1110 | 1140 | - |
| Weight of Container | 4.54 | 4.33 | 5.03 | 4.37 | - |
| Weight of wet soil and container | 15.57 | 15.64 | 15.92 | 15.68 | - |
| Weight of dry soil and container | 10.83 | 10.72 | 11.12 | 10.51 | - |
| Water Content | 75.36 | 77.00 | 78.82 | 84.20 | - |
| Number of blows | 42 | 32 | 23 | 12 | - |
| Liquid Limit | 78.80 | | | | |




**Sieve Analysis**

| Bowl | 0 |
|---|---|
| Soil + Bowl | 80.3 |
| Weight of dry soil | 80.3 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0.14 | 0.17 | 0.18 | 99.82 |
| 20 | 0.85 | 0.56 | 0.70 | 0.87 | 99.13 |
| 40 | 0.425 | 1.19 | 1.48 | 2.35 | 97.65 |
| 80 | 0.18 | 2.37 | 2.95 | 5.31 | 94.69 |
| 120 | 0.125 | 1.77 | 2.20 | 7.51 | 92.49 |
| 200 | 0.075 | 4.31 | 5.37 | 12.88 | 87.12 |
| Pan | 0 | 3.03 | 87.12 | 100 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(04.00-04.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 04.00 - 04.40 m

Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 66.929 | | |
| Zerro correction | -1 | Gs | 3.5918 |
| Meniscus correction | 1 | a | 0.8629 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 47 | 0.0291 | 67.19 |
| 12:22 | 2 | 27 | 45 | 0.0211 | 64.50 |
| 12:24 | 4 | 27 | 42 | 0.0152 | 60.47 |
| 12:28 | 8 | 27 | 37 | 0.0113 | 53.75 |
| 12:35 | 15 | 27 | 25 | 0.0090 | 37.63 |
| 12:50 | 30 | 27 | 5 | 0.0072 | 10.75 |
| 13:05 | 45 | 27 | 2 | 0.0059 | 6.72 |
| 13:50 | 90 | 27 | 0 | 0.0042 | 4.03 |
| 15:20 | 180 | 0 | 0 | 0.0000 | 0.00 |
| 9:20 | 1260 | 0 | 0 | 0.0000 | 0.00 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(04.00-04.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Falling Head

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 04.00 -04.40 m
Date Tested : 27/10/2021

GEOMINE

| Time (minute) | Volume (cm3) | delta time (minute) | delta volume (cm3) |
|---|---|---|---|
| 0 | 4.4 | 0 | 0 |
| 80 | 4.6 | 80 | 0.2 |
| 140 | 4.8 | 60 | 0.2 |
| 210 | 5 | 70 | 0.2 |
| 288 | 5.2 | 78 | 0.2 |
| 348 | 5.3 | 60 | 0.1 |
| 400 | 5.4 | 52 | 0.1 |
| 456 | 5.5 | 56 | 0.1 |

t-sample (cm): 6.60
Area-sample (cm2): 11.34
Head (cm): 50

k (cm/s): 4.850E-07

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(04.00-04.40 m)-Falling Head.xlsm

F GWL OL 040; R 01-(6/12/18)

PARTNER FOR DESIGN

## Uniaxial Compressive Strength Test (v)

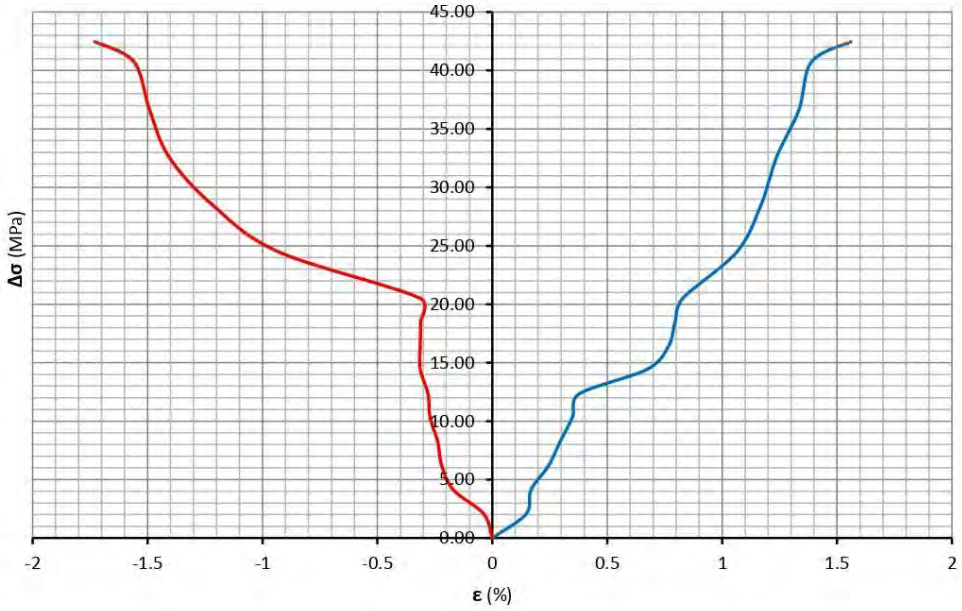
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 08
Depth : 17.30 - 17.50 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 42.46 |
| v | - | 0.43 |
| E | MPa | 2386 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(17.30-17.50 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 08
Depth : 19.15 - 19.52 m
Date Tested : 27/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 30.90 |
| Dry Density | kN/m$^3$ | 30.75 |
| Saturated Density | kN/m$^3$ | 31.27 |
| Spesific Gravity | - | 3.25 |
| Natural Water Content | % | 0 |
| Absorption | % | 2 |
| Saturation | % | 0.05 |
| Porosity | - | 0.05 |
| Void Ratio | - | 0.06 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 08-(19.15-19.52 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

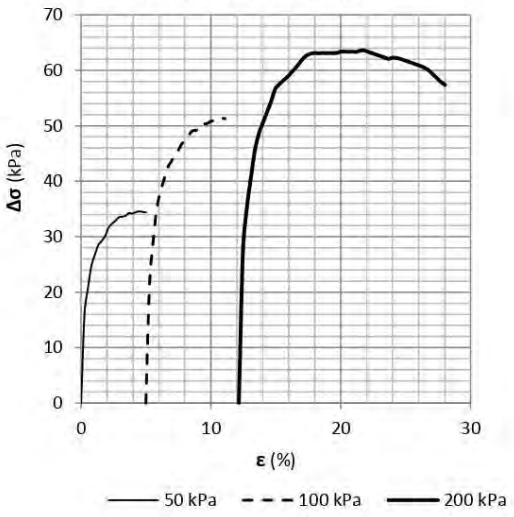
PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

GEOMINE

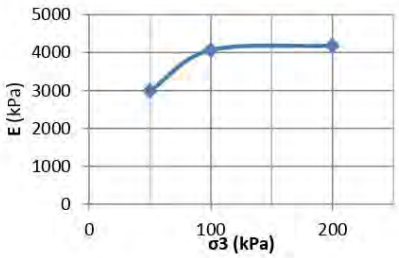
Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 02.70 -03.10 m
Date Tested : 28/10/2021

## STRESS - STRAIN CURVE

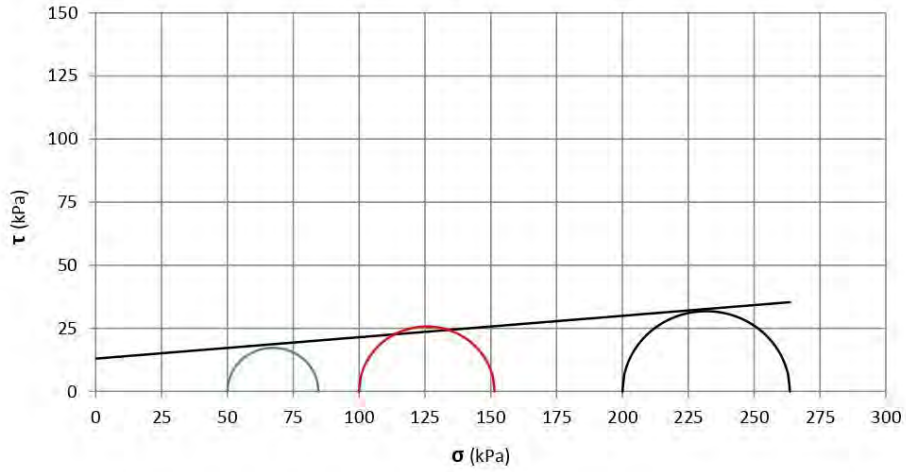



| No. | σ3 (kPa) | Δσ (kPa) | $\varepsilon_f$ (%) |
|---|---|---|---|
| 1. | 50 | 34.56 | 4.47 |
| 2. | 100 | 51.42 | 10.80 |
| 3. | 200 | 63.58 | 21.81 |

| Results | | |
|---|---|---|
| c | kPa | 13.0 |
| ø | ° | 4.8 |




## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(02.70-03.10 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 02.70 -03.10 m
Date Tested : 28/10/2021

GEOMINE

Height of Sample: 76 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1391 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 0 | 0 | 0 |
| 20 | 16.15 | 0.26 |
| 40 | 20.74 | 0.53 |
| 60 | 24.7 | 0.79 |
| 80 | 26.7 | 1.05 |
| 100 | 28.44 | 1.32 |
| 120 | 29.21 | 1.58 |
| 140 | 30.1 | 1.84 |
| 160 | 31.58 | 2.11 |
| 180 | 32.33 | 2.37 |
| 200 | 32.84 | 2.63 |
| 220 | 33.47 | 2.89 |
| 240 | 33.61 | 3.16 |
| 260 | 33.76 | 3.42 |
| 280 | 34.26 | 3.68 |
| 300 | 34.16 | 3.95 |
| 320 | 34.42 | 4.21 |
| 340 | 34.56 | 4.47 |
| 360 | 34.47 | 4.74 |
| 380 | 34.37 | 5 |

Deviator Stress Maximum: 34.56 kPa
Strain at Failure: 5.00 %
Deviator Stress at (50%): 32.33 kPa
Strain at (50%): 2.37 %

$E_{o}$: 1930.77 kPa
$E_{50}$: 1365.10 kPa

+ + + + + + + + + STAGE - 1 + + + + + + + + +

Height of Sample: 72.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1391 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 360 | 0 | 4.99 |
| 380 | 21.03 | 5.26 |
| 400 | 28.96 | 5.54 |
| 420 | 34.89 | 5.82 |
| 440 | 38.01 | 6.09 |
| 460 | 40.19 | 6.37 |
| 480 | 42.36 | 6.65 |
| 500 | 43.49 | 6.93 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(02.70-03.10 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 02.70 -03.10 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 520 | 44.62 | 7.2 |
| 540 | 45.5 | 7.48 |
| 560 | 46.73 | 7.76 |
| 580 | 47.38 | 8.03 |
| 600 | 48.36 | 8.31 |
| 620 | 49.11 | 8.59 |
| 640 | 49.18 | 8.86 |
| 660 | 50.15 | 9.14 |
| 680 | 50.33 | 9.42 |
| 700 | 50.4 | 9.7 |
| 720 | 50.79 | 9.97 |
| 740 | 50.97 | 10.25 |
| 760 | 51.36 | 10.53 |
| 780 | 51.42 | 10.8 |
| 800 | 51.26 | 11.08 |

Deviator Stress Maximum: 51.42 kPa  $E_o$: 2249.27 kPa
Strain at Failure: 11.08 %  $E_{50}$: 589.74 kPa
Deviator Stress at (50%): 47.38 kPa
Strain at (50%): 8.03 %

+ + + + + + + + + STAGE - 2 + + + + + + + +

Height of Sample: 64.2 mm
Diameter of Sample: 38 mm
Calibration Dial Gauge: 0.1391 kg/div
Calibration Strain Gauge: 0.01 mm/div

--- Triaxial S H E A R I N G ---

| Strain Gauge (div) | Deviator Stress (kPa) | Strain (%) |
|---|---|---|
| 780 | 0 | 12.15 |
| 800 | 27.16 | 12.46 |
| 820 | 35.31 | 12.77 |
| 840 | 40.72 | 13.08 |
| 860 | 45.67 | 13.4 |
| 880 | 48.69 | 13.71 |
| 900 | 50.62 | 14.02 |
| 920 | 52.54 | 14.33 |
| 940 | 54.44 | 14.64 |
| 960 | 56.64 | 14.95 |
| 980 | 57.47 | 15.26 |
| 1000 | 58.19 | 15.58 |
| 1020 | 58.8 | 15.89 |
| 1040 | 59.61 | 16.2 |
| 1060 | 60.42 | 16.51 |
| 1080 | 61.31 | 16.82 |
| 1100 | 62.2 | 17.13 |
| 1120 | 62.78 | 17.45 |
| 1140 | 63.04 | 17.76 |
| 1160 | 63.11 | 18.07 |
| 1180 | 63.07 | 18.38 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(02.70-03.10 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

## Triaxial Unconsolidated Undrained Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 02.70 -03.10 m
Date Tested : 28/10/2021

GEOMINE

| | | |
|---|---|---|
| 1200 | 63.13 | 18.69 |
| 1220 | 63.08 | 19 |
| 1240 | 63.14 | 19.31 |
| 1260 | 63.09 | 19.63 |
| 1280 | 63.34 | 19.94 |
| 1300 | 63.38 | 20.25 |
| 1320 | 63.33 | 20.56 |
| 1340 | 63.37 | 20.87 |
| 1360 | 63.32 | 21.18 |
| 1380 | 63.55 | 21.5 |
| 1400 | 63.58 | 21.81 |
| 1420 | 63.33 | 22.12 |
| 1440 | 63.08 | 22.43 |
| 1460 | 62.82 | 22.74 |
| 1480 | 62.57 | 23.05 |
| 1500 | 62.32 | 23.36 |
| 1520 | 62.06 | 23.68 |
| 1540 | 62.28 | 23.99 |
| 1560 | 62.21 | 24.3 |
| 1580 | 62.04 | 24.61 |
| 1600 | 61.79 | 24.92 |
| 1620 | 61.53 | 25.23 |
| 1640 | 61.28 | 25.55 |
| 1660 | 61.02 | 25.86 |
| 1680 | 60.76 | 26.17 |
| 1700 | 60.42 | 26.48 |
| 1720 | 59.98 | 26.79 |
| 1740 | 59.28 | 27.1 |
| 1760 | 58.58 | 27.41 |
| 1780 | 57.89 | 27.73 |
| 1800 | 57.37 | 28.04 |

Deviator Stress Maximum: 63.58 kPa
Strain at Failure: 28.04 %
Deviator Stress at (50%): 63.34 kPa
Strain at (50%): 19.94 %

$E_o$: 1072.54 kPa
$E_{50}$: 317.67 kPa

+ + + + + + + + + STAGE - 3 + + + + + + + + +

No. Container : 1132
Wet Soil + Container : 153.19 gram
Dry Soil + Container : 100.19 gram
Weight of Container : 4.46 gram
Density : 17.26 kN/m3
Moisture Content : 55.36 %
Dry Density : 11.11 kN/m3

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(02.70-03.10 m)-TX UU.xlsm

F GWL OL 008; R 05-(14/09/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 07.00 - 07.40 m
Date Tested : 26/10/2021

GEOMINE

| Test | | Results |
|---|---|---|
| Unit Weight | kN/m³ | 17.4 |
| SL | % | - |
| Gs | - | 3.54 |
| MC | % | 92 |
| PL | % | 52 |
| LL | % | 97 |
| PI | % | 45 |
| Fines (#200) | % | 96 |
| $D_{10}$ | mm | 0.0014 |
| $D_{30}$ | mm | 0.0028 |
| $D_{60}$ | mm | 0.0055 |
| $C_u$ | - | 4 |
| $C_c$ | - | 1.01 |

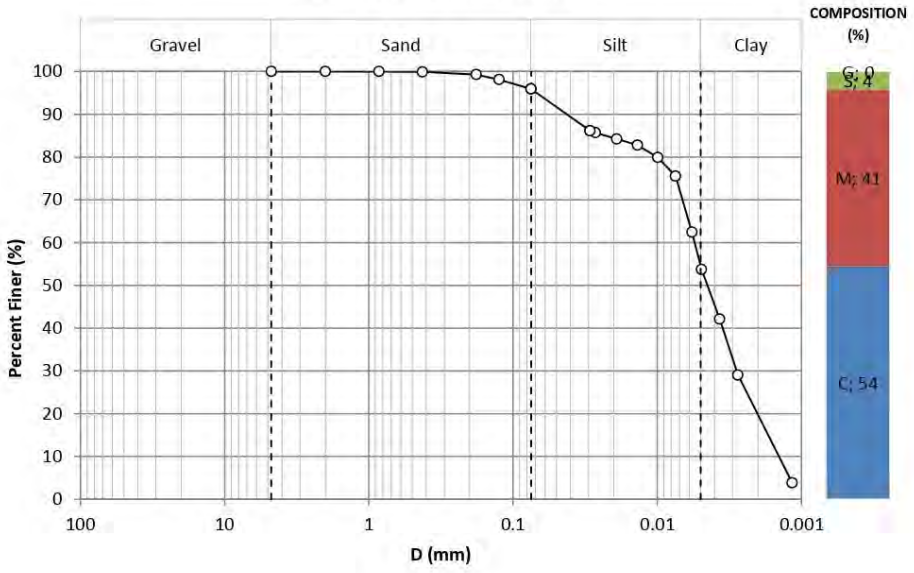
* Casagrande's Method

** Based on Consistency Index (Ic)

| Properties | | Results |
|---|---|---|
| $I_F$ | % | -0.59 |
| $I_T$ | % | -77.34 |
| $I_L$ | % | 0.89 |
| $I_C$ | % | 0.11 |
| $S_r$ | % | 100.00 |
| e | - | 2.73 |
| n | - | 0.73 |
| A | - | 4.07 |

| | |
|---|---|
| Consistency** | Very Soft |
| Activity | Active |
| Plasticity Symbol | MH or OH |

## PARTICLE SIZE DISTRIBUTION




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 07.00 - 07.40 m

Date Tested : 26/10/2021

GEOMINE

**Moisture Content**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1229 | 1117 | 1069 |
| Weight of Container | 4.62 | 4.96 | 4.97 |
| Weight of wet soil and container | 107.42 | 128.54 | 123.72 |
| Weight of dry soil and container | 58.70 | 69.04 | 66.56 |
| Moisture Content | 90.09 | 92.85 | 92.81 |
| Average MC | 91.92 | | |

**Unit weight**

| | |
|---|---|
| No. Ring | 11 |
| No. Container | 1070 |
| Weight of Ring | 26.93 |
| Volume of Ring | 15.216 |
| Weight of Container | 4.77 |
| Weight of wet soil and ring and containe | 58.17 |
| Weight of dry soil and ring and containe | 46.12 |
| Water Content | 83.564 |
| Density | 17.396 |
| Dry Density | 9.4768 |
| Saturation | 100 |
| Void ratio | 2.7305 |
| Porosity | 0.7319 |

**Specific Gravity**

| No. Test | 1 | 2 |
|---|---|---|
| No. Pycknometer | 203 | 203 |
| Weight of Pycknometer + soil | 77.16 | 77.16 |
| Weight of Pycknometer + water + soil | 168.61 | 168.61 |
| T° C | 28 | 28 |
| Weight of Pycknometer | 54.5 | 54.5 |
| Weight of Pycknometer + water | 152.36 | 152.36 |
| Specific Gravity | 3.535 | 3.535 |
| Average Specific Gravity | 3.535 | |

**Shrinkage Limit**

| | |
|---|---|
| No. Ring | - |
| No. Container | - |
| Weight of Ring | - |
| Volume of Ring | - |
| Weight of Container | - |
| Weight of wet soil and container | - |
| Weight of dry soil and container | - |
| Weight of plate | - |
| Weight of plate and Mercury | - |
| Volume dry soil | - |
| Shrinkage Limit | - |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 07.00 - 07.40 m

Date Tested : 26/10/2021

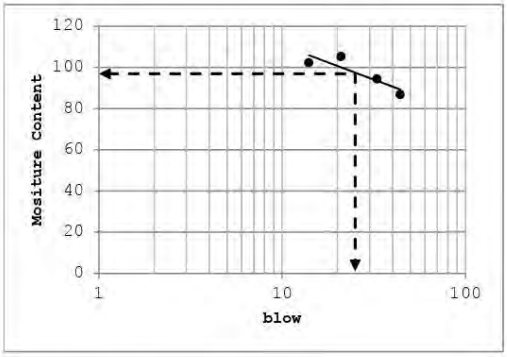
GEOMINE

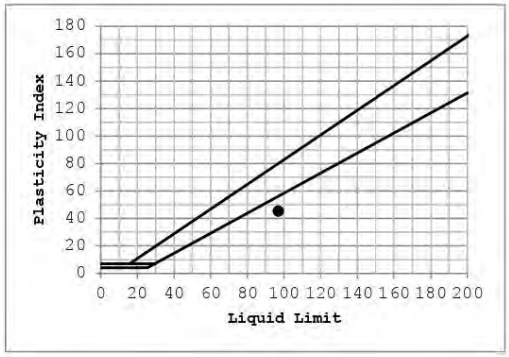
**Plastic Limit**

| No. Test | 1 | 2 | 3 |
|---|---|---|---|
| No. Container | 1191 | 1187 | 1230 |
| Weight of Container | 4.28 | 4.44 | 4.56 |
| Weight of wet soil and container | 11.8 | 11.82 | 11.12 |
| Weight of dry soil and container | 9.28 | 9.25 | 8.91 |
| Plastic Limit | 50.40 | 53.43 | 50.80 |
| Average | 51.54 | | |

**Liquid Limit**

| No. Test | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| No. Container | 1232 | 1066 | 1224 | 1120 | - |
| Weight of Container | 4.39 | 4.8 | 4.57 | 4.96 | - |
| Weight of wet soil and container | 15.54 | 15.7 | 15.53 | 15.7 | - |
| Weight of dry soil and container | 10.36 | 10.41 | 9.91 | 10.27 | - |
| Water Content | 86.77 | 94.30 | 105.24 | 102.26 | - |
| Number of blows | 44 | 33 | 21 | 14 | - |
| Liquid Limit | 96.92 | | | | |




**Sieve Analysis**

| | |
|---|---|
| Bowl | 0 |
| Soil + Bowl | 80.33 |
| Weight of dry soil | 80.33 |

| Sieve No. | Sieve Diameter | Weight of Soil Retained | Percent Retained | Cumulative Percent Retained | Percent Finer |
|---|---|---|---|---|---|
| 4 | 4.75 | 0.001 | 0.00 | 0.00 | 100.00 |
| 10 | 2 | 0 | 0.00 | 0.00 | 100.00 |
| 20 | 0.85 | 0 | 0.00 | 0.00 | 100.00 |
| 40 | 0.425 | 0.05 | 0.06 | 0.06 | 99.94 |
| 80 | 0.18 | 0.52 | 0.65 | 0.71 | 99.29 |
| 120 | 0.125 | 0.93 | 1.16 | 1.87 | 98.13 |
| 200 | 0.075 | 1.77 | 2.20 | 4.07 | 95.93 |
| Pan | 0 | 1.39 | 95.93 | 100 | 0.00 |

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F GWL OL 001; R 12-(17/10/18)

PARTNER FOR DESIGN

# Classification Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 07.00 - 07.40 m

Date Tested : 26/10/2021

GEOMINE

**Hydrometer**

Dry Sample

| | | | |
|---|---|---|---|
| Weight of sample | 75.669 | | |
| Zerro correction | -1 | Gs | 3.5353 |
| Meniscus correction | 1 | a | 0.8682 |

| Time | t (minute) | T (Co) | Ra | Diameter | Percent Finer |
|---|---|---|---|---|---|
| 12:20 | 0 | | | | |
| 12:21 | 1 | 27 | 56 | 0.0269 | 85.70 |
| 12:22 | 2 | 27 | 55 | 0.0191 | 84.25 |
| 12:24 | 4 | 27 | 54 | 0.0137 | 82.80 |
| 12:28 | 8 | 27 | 52 | 0.0099 | 79.89 |
| 12:35 | 15 | 27 | 49 | 0.0075 | 75.53 |
| 12:50 | 30 | 27 | 40 | 0.0057 | 62.46 |
| 13:05 | 45 | 27 | 34 | 0.0049 | 53.75 |
| 13:50 | 90 | 27 | 26 | 0.0037 | 42.12 |
| 15:20 | 180 | 27 | 17 | 0.0028 | 29.05 |
| 9:20 | 1260 | 26 | 0 | 0.0012 | 3.85 |
| 12:20 | 1440 | 0 | 0 | 0.0000 | 0.00 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(07.00-07.40 m)-Classification.xlsm

F GWL OL 001; R 12-(17/10/18)

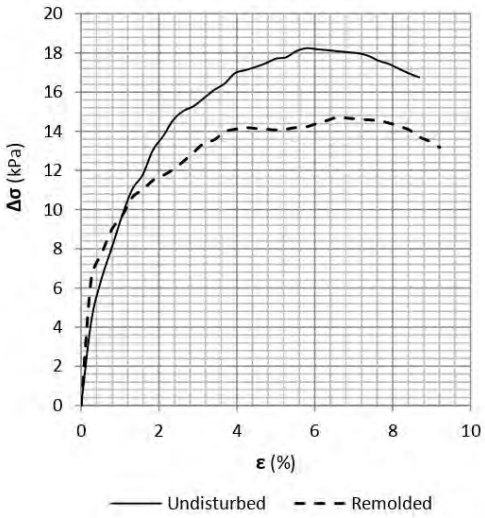
PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 14.10 - 14.31 m
Date Tested : 29/10/2021

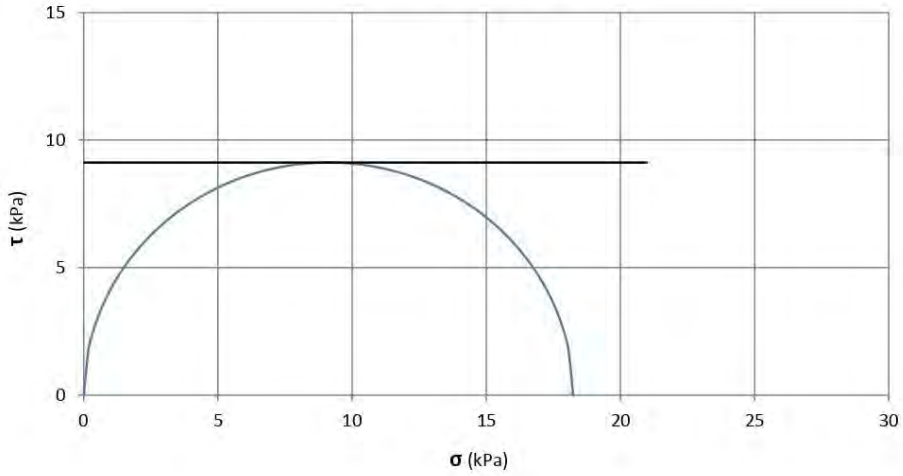
GEOMINE

## STRESS - STRAIN CURVE




| Results | | Undisturbed | Remolded |
|---|---|---|---|
| $\sigma_{max}$ | kPa | 18.2 | 14.7 |
| $\varepsilon_f$ | % | 5.79 | 6.58 |
| $S_t$ | - | 1.24 | |
| c | kPa | 9.1 | 7.4 |
| $E_{50}$ | kPa | 745 | 807 |
| $E_{sec}$ | kPa | 315 | 224 |

## MOHR's DIAGRAM




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(14.10-14.31 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 14.10 - 14.31 m
Date Tested : 29/10/2021

GEOMINE

**Undisturbed**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

Water Content : 62.66 %
Unit Weight : 13.98 kN/m3
Dry Density : 8.59 kN/m3

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0.00 | 0.0000 | - | - | - |
| 20 | 4.33 | 0.2632 | | | |
| 40 | 6.48 | 0.5263 | | | |
| 60 | 8.06 | 0.7895 | | | |
| 80 | 9.68 | 1.0526 | | | |
| 100 | 11.04 | 1.3158 | | | |
| 120 | 11.77 | 1.5789 | | | |
| 140 | 13.03 | 1.8421 | | | |
| 160 | 13.75 | 2.1053 | | | |
| 180 | 14.58 | 2.3684 | | | |
| 200 | 15.04 | 2.6316 | | | |
| 220 | 15.29 | 2.8947 | | | |
| 240 | 15.70 | 3.1579 | | | |
| 260 | 16.11 | 3.4211 | | | |
| 280 | 16.44 | 3.6842 | | | |
| 300 | 16.96 | 3.9474 | | | |
| 320 | 17.12 | 4.2105 | | | |
| 340 | 17.28 | 4.4737 | | | |
| 360 | 17.47 | 4.7368 | | | |
| 380 | 17.71 | 5.0000 | | | |
| 400 | 17.78 | 5.2632 | | | |
| 420 | 18.09 | 5.5263 | | | |
| 440 | 18.24 | 5.7895 | | | |
| 460 | 18.19 | 6.0526 | | | |
| 480 | 18.14 | 6.3158 | | | |
| 500 | 18.09 | 6.5789 | | | |
| 520 | 18.04 | 6.8421 | | | |
| 540 | 17.99 | 7.1053 | | | |
| 560 | 17.86 | 7.3684 | | | |
| 580 | 17.61 | 7.6316 | | | |
| 600 | 17.44 | 7.8947 | | | |
| 620 | 17.20 | 8.1579 | | | |
| 640 | 16.95 | 8.4211 | | | |
| 660 | 16.75 | 8.6842 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(14.10-14.31 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Unconfined Compression Test

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 14.10 - 14.31 m
Date Tested : 29/10/2021

GEOMINE

**Remolded**

Height of Sample : 76 mm
Diameter of Sample : 38 mm
Calibration Dial Gauge : 0.04826 kg/div
Calibration Strain Load : 0.01 mm/div

| Strain Gauge (div) | Deviator Stress (kPa) | ε (%) | Strain Gauge (div) | Deviator Stress (kPa) | ε (%) |
|---|---|---|---|---|---|
| 0 | 0 | 0.0000 | - | - | - |
| 20 | 6.49 | 0.2632 | | | |
| 40 | 7.75 | 0.5263 | | | |
| 60 | 8.99 | 0.7895 | | | |
| 80 | 9.68 | 1.0526 | | | |
| 100 | 10.62 | 1.3158 | | | |
| 120 | 11.01 | 1.5789 | | | |
| 140 | 11.49 | 1.8421 | | | |
| 160 | 11.75 | 2.1053 | | | |
| 180 | 12.05 | 2.3684 | | | |
| 200 | 12.47 | 2.6316 | | | |
| 220 | 12.93 | 2.8947 | | | |
| 240 | 13.39 | 3.1579 | | | |
| 260 | 13.56 | 3.4211 | | | |
| 280 | 13.98 | 3.6842 | | | |
| 300 | 14.10 | 3.9474 | | | |
| 320 | 14.18 | 4.2105 | | | |
| 340 | 14.15 | 4.4737 | | | |
| 360 | 14.11 | 4.7368 | | | |
| 380 | 14.07 | 5.0000 | | | |
| 400 | 14.11 | 5.2632 | | | |
| 420 | 14.19 | 5.5263 | | | |
| 440 | 14.23 | 5.7895 | | | |
| 460 | 14.39 | 6.0526 | | | |
| 480 | 14.55 | 6.3158 | | | |
| 500 | 14.71 | 6.5789 | | | |
| 520 | 14.67 | 6.8421 | | | |
| 540 | 14.63 | 7.1053 | | | |
| 560 | 14.58 | 7.3684 | | | |
| 580 | 14.54 | 7.6316 | | | |
| 600 | 14.42 | 7.8947 | | | |
| 620 | 14.26 | 8.1579 | | | |
| 640 | 14.07 | 8.4211 | | | |
| 660 | 13.72 | 8.6842 | | | |
| 680 | 13.48 | 8.9474 | | | |
| 700 | 13.17 | 9.2105 | | | |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(14.10-14.31 m)-UCT.xlsm

F GWL OL 002; R 05-(6/09/18)

PARTNER FOR DESIGN

# Falling Head

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 16.27 -16.48 m
Date Tested : 27/10/2021

GEOMINE

| Time (minute) | Volume (cm3) | delta time (minute) | delta volume (cm3) |
|---|---|---|---|
| 0 | 5.6 | 0 | 0 |
| 30 | 9.3 | 30 | 3.7 |
| 80 | 14.6 | 50 | 5.3 |
| 210 | 20.5 | 130 | 5.9 |
| 288 | 25.2 | 78 | 4.7 |
| 348 | 30 | 60 | 4.8 |
| 400 | 34.2 | 52 | 4.2 |
| 456 | 37.5 | 56 | 3.3 |

t-sample (cm): 6.60
Area-sample (cm2): 11.34
Head (cm): 50

k (cm/s): 1.387E-05

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(16.27-16.48 m)-Falling Head.xlsm

F GWL OL 040; R 01-(6/12/18)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 09
Depth : 18.30 - 18.50 m
Date Tested : 25/10/2021

GEOMINE

| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 13.25 |
| Dry Density | kN/m$^3$ | 7.97 |
| Saturated Density | kN/m$^3$ | 14.67 |
| Spesific Gravity | - | 2.41 |
| Natural Water Content | % | 66 |
| Absorption | % | 84 |
| Saturation | % | 0.67 |
| Porosity | - | 0.67 |
| Void Ratio | - | 2.03 |

D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(18.30-18.50 m)-Properties (Rock).xlsm

F GWL OL 026; R 04-(10/7/21)

PARTNER FOR DESIGN

# Uniaxial Compressive Strength Test (v)

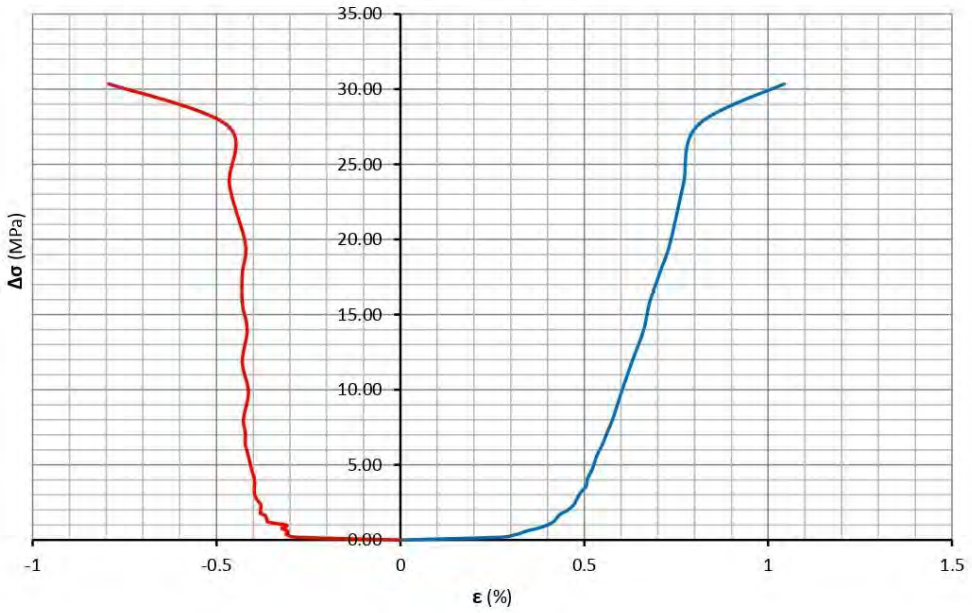
GEOMINE

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : 21 031
Area : -
Point ID : DHG 09
Depth : 28.55 - 28.76 m
Date Tested : 3/11/2021

| Results | | |
|---|---|---|
| $\sigma_{max*}$ | MPa | 30.35 |
| v | - | 0.46 |
| E | MPa | 6031 |

* Coreccted by Hoek and Brown (1980a)

STRESS - STRAIN CURVE




D:\Projects\2021\21 031\Technical\Test Data\F 21 031 GWL-X-DHG 09-(28.55-28.76 m)-UCS (Poisson).xlsm

F GWL OL 033; R 01-(22/09/14)

PARTNER FOR DESIGN

## Properties Test (Rock)

Client ID : Geomine
Project ID : Hengjaya Mineralindo
GWL ID : : 21 031
Area : -
Point ID : DHG 09
Depth : 29.30 - 29.55 m
Date Tested : 27/10/2021

GEOMINE

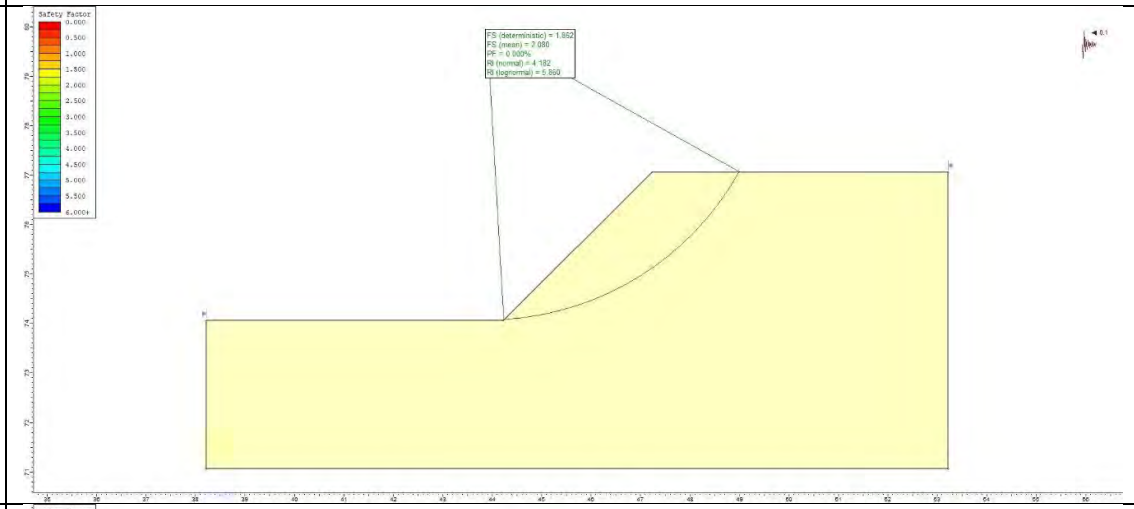
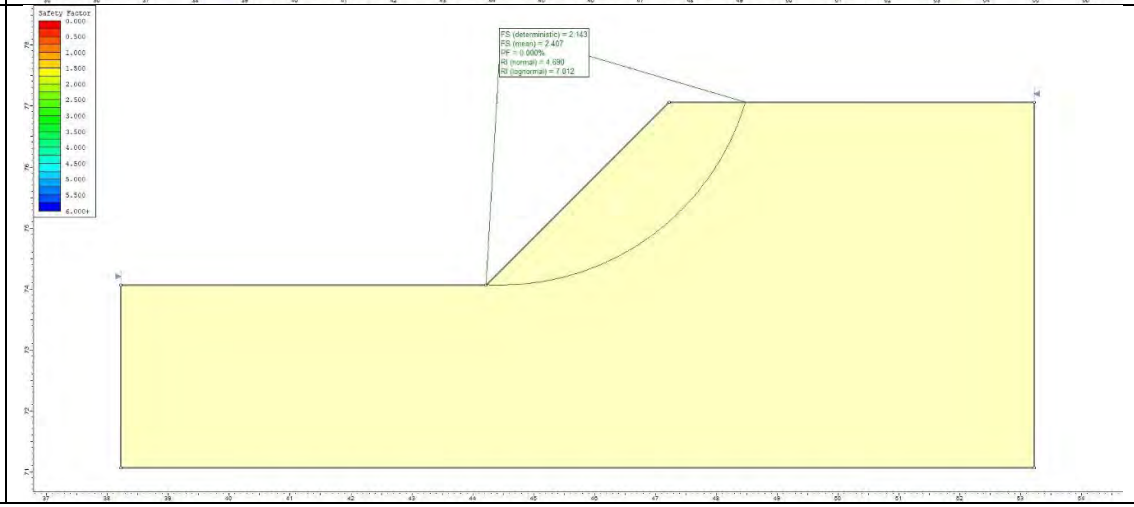
| Result | | |
|---|---|---|
| Natural Density | kN/m$^3$ | 22.60 |
| Dry Density | kN/m$^3$ | 21.19 |
| Saturated Density | kN/m$^3$ | 23.00 |
| Spesific Gravity | - | 2.59 |
| Natural Water Content | % | 7 |
| Absorption | % | 9 |
| Saturation | % | 0.18 |
| Porosity | - | 0.18 |
| Void Ratio | - | 0.22 |

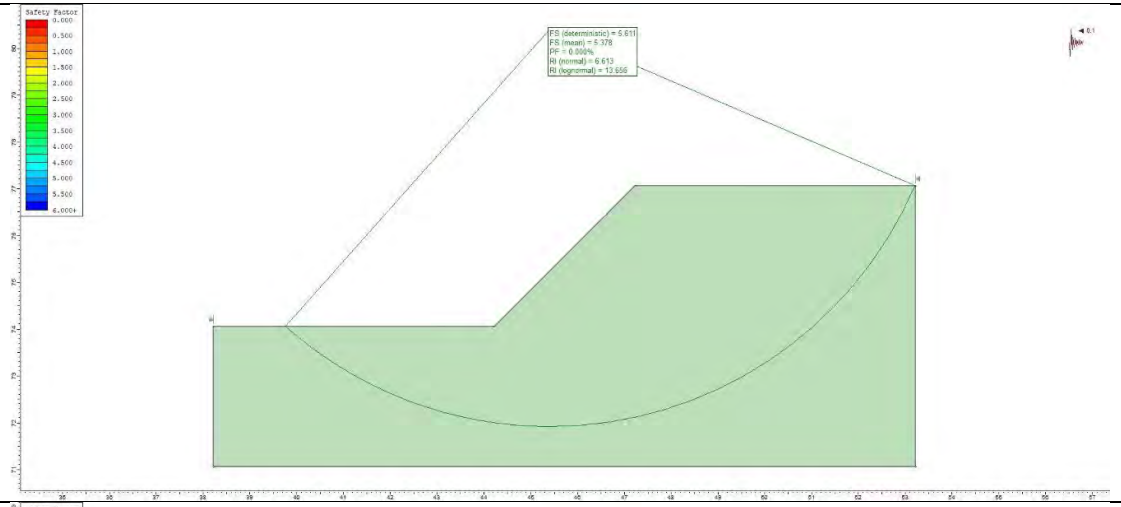
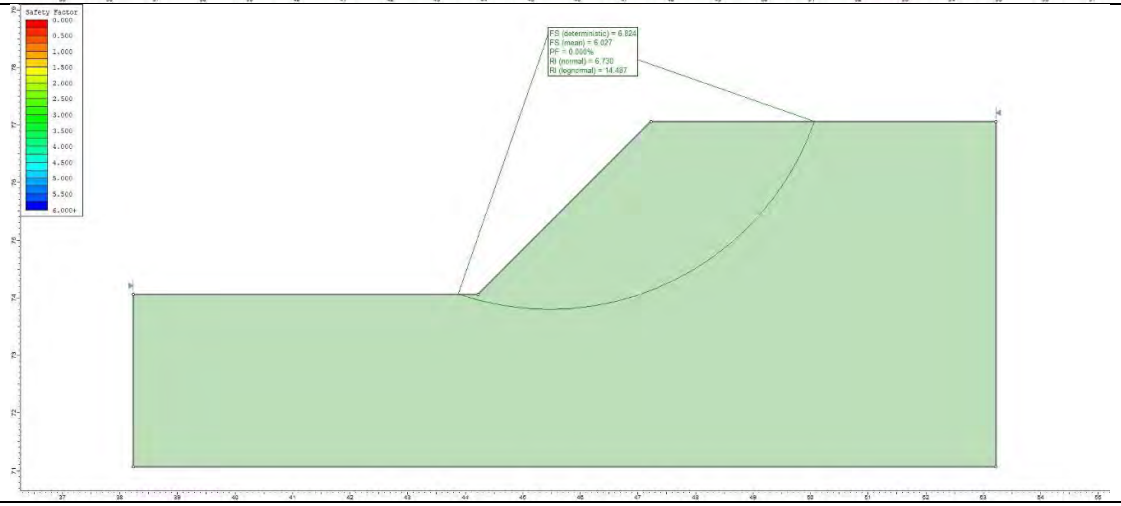
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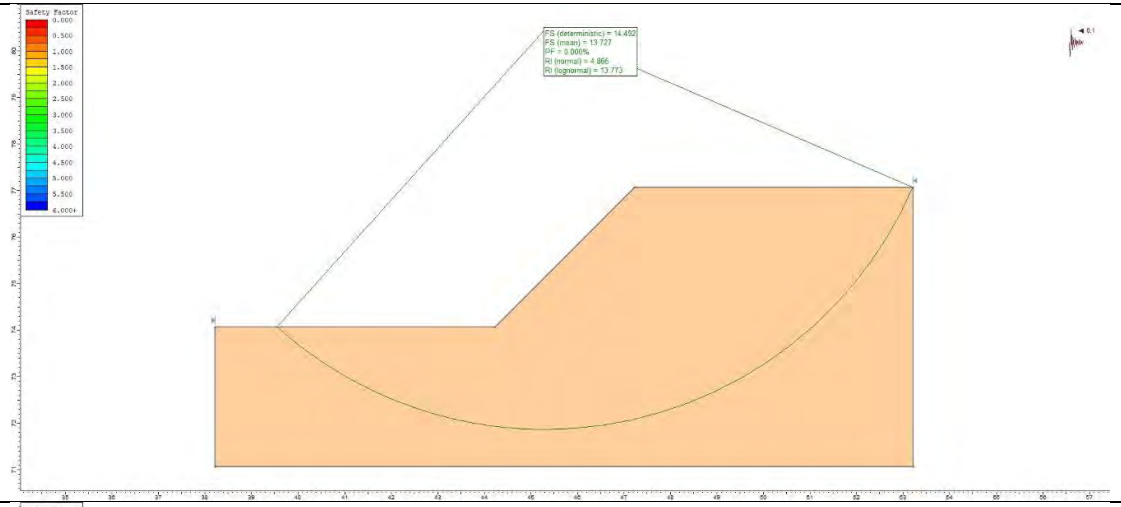
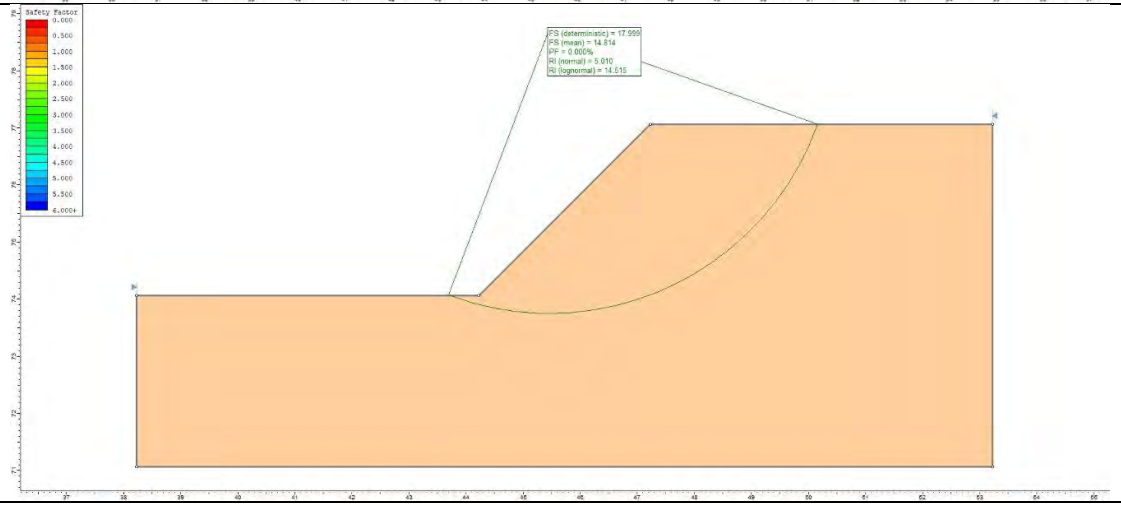
F GWL OL 026; R 04-(10/7/21)

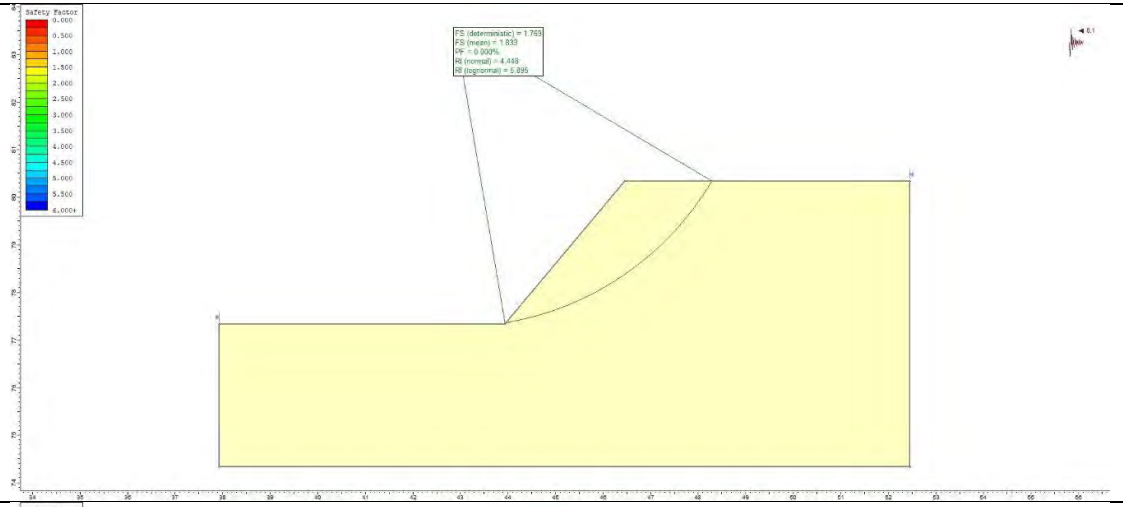
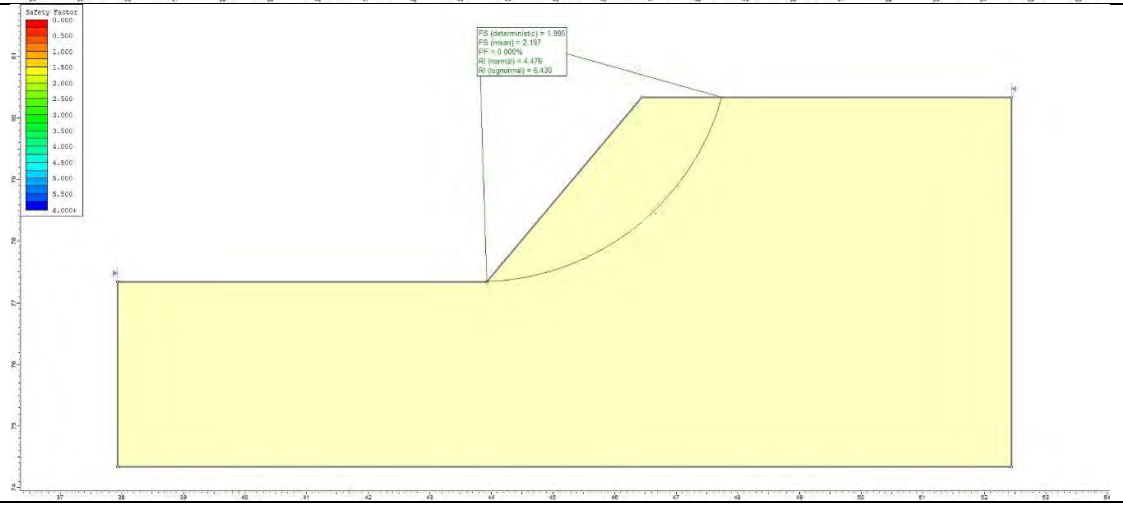
# Lampiran E

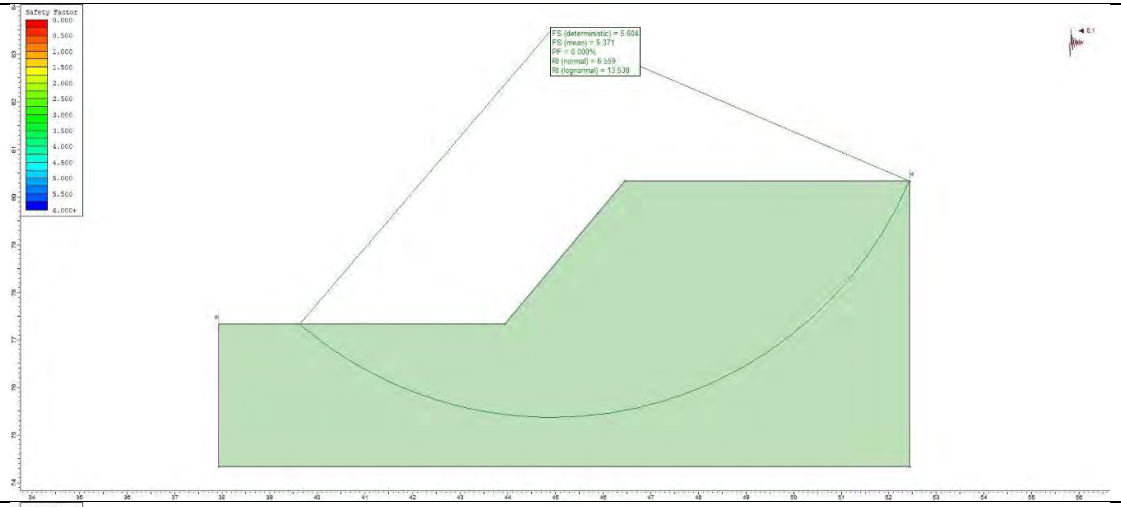
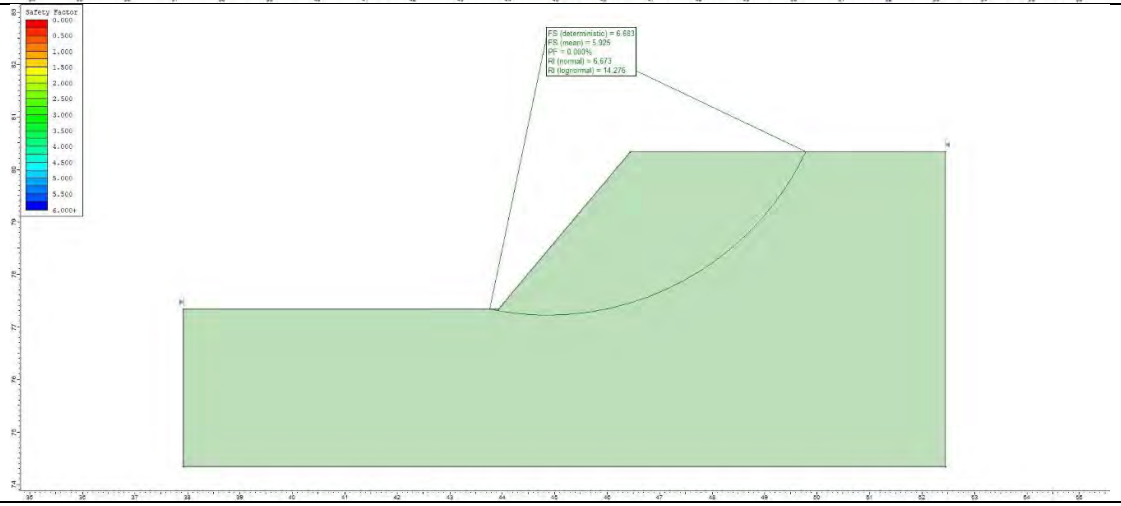
## Hasil Analisis Kestabilan Lereng

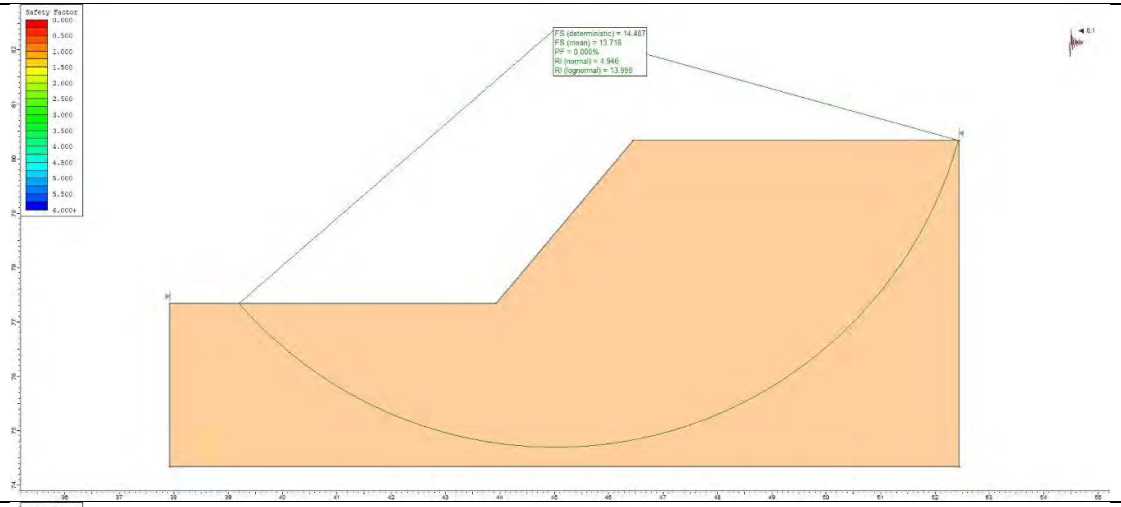
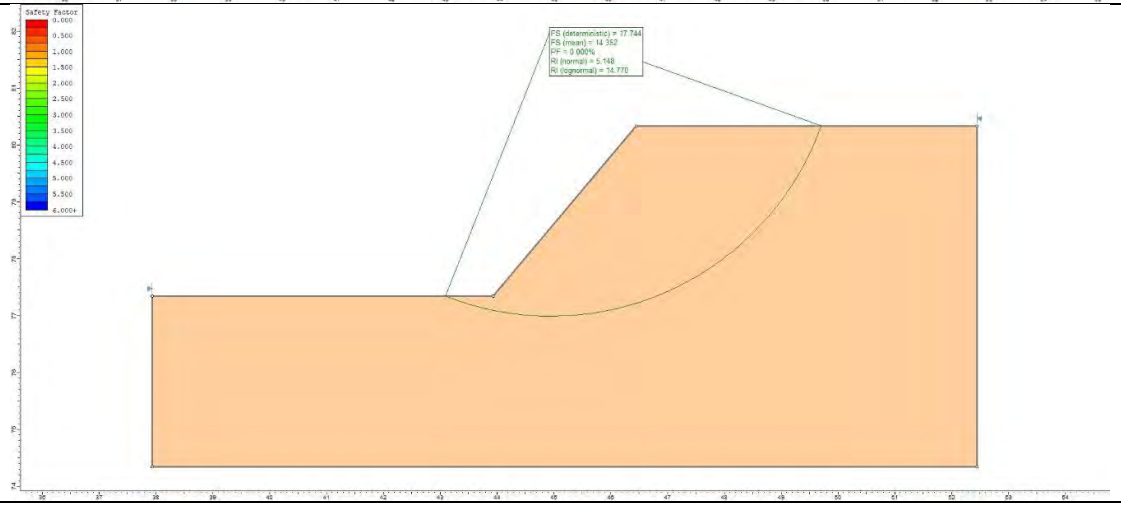
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=45 | Dinamik |  | 1,86 |
| | Statik |  | 2,14 |

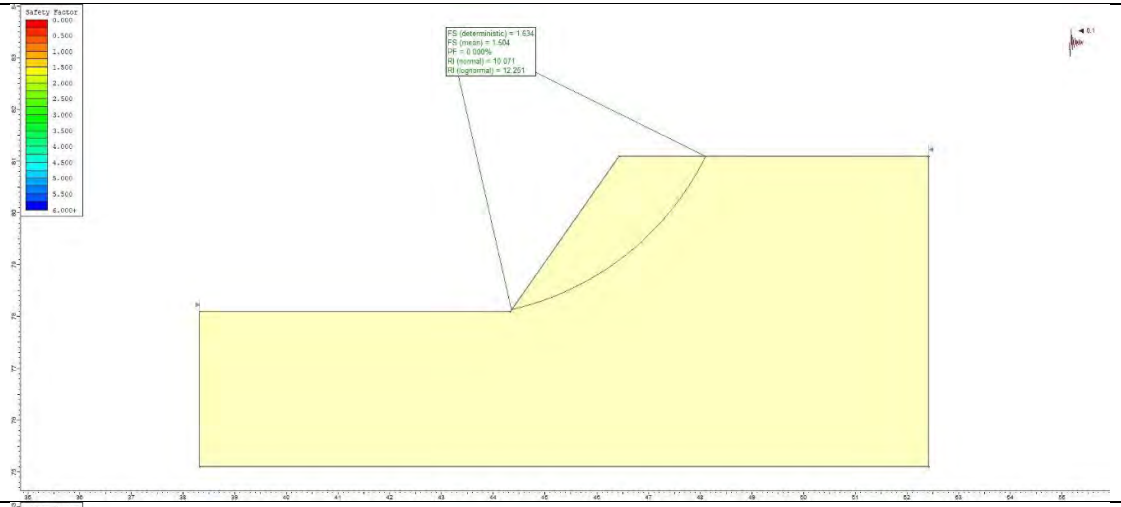
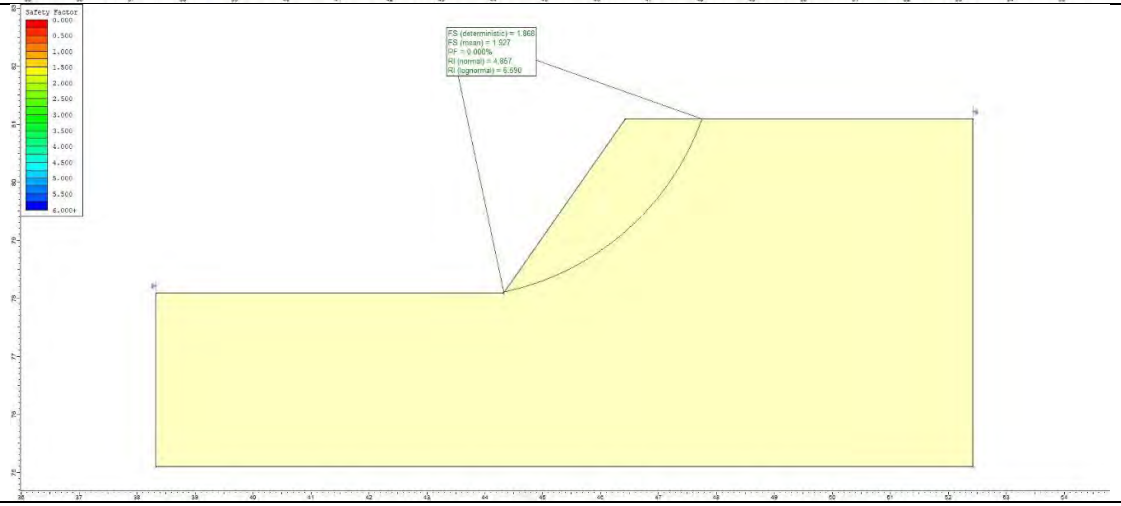
| Saprolite | | | |
|---|---|---|---|
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| H=3<br>S=45 | Dinamik |  | 5,61 |
| | Statik |  | 6,82 |

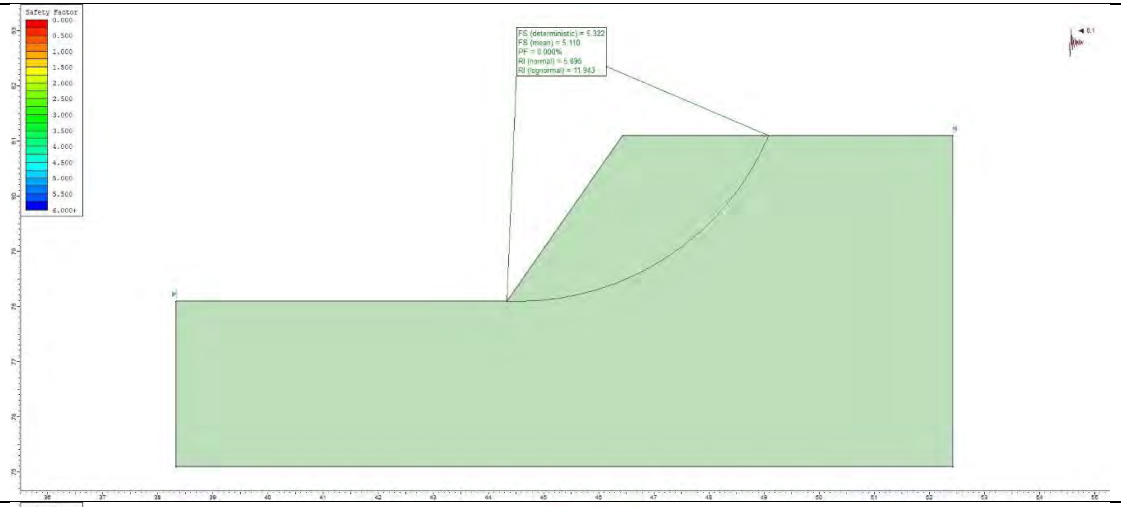
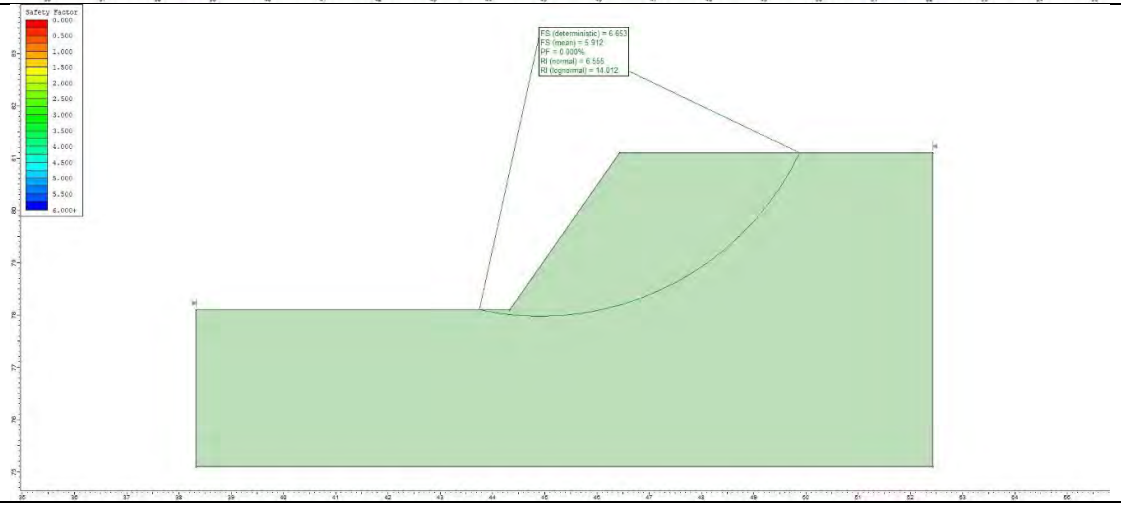
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=45 | Dinamik |  | 14,49 |
| | Statik |  | 17,99 |

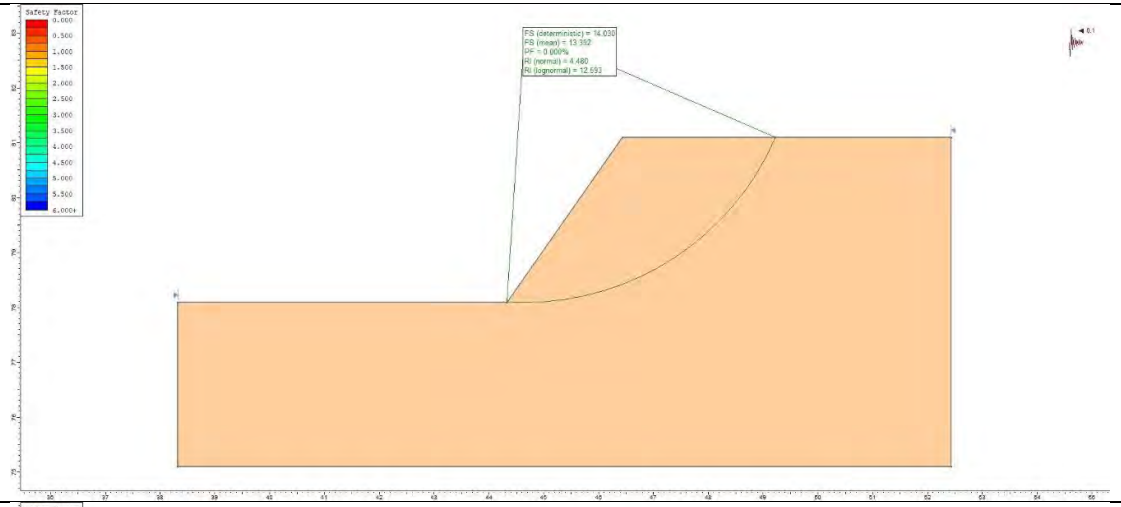
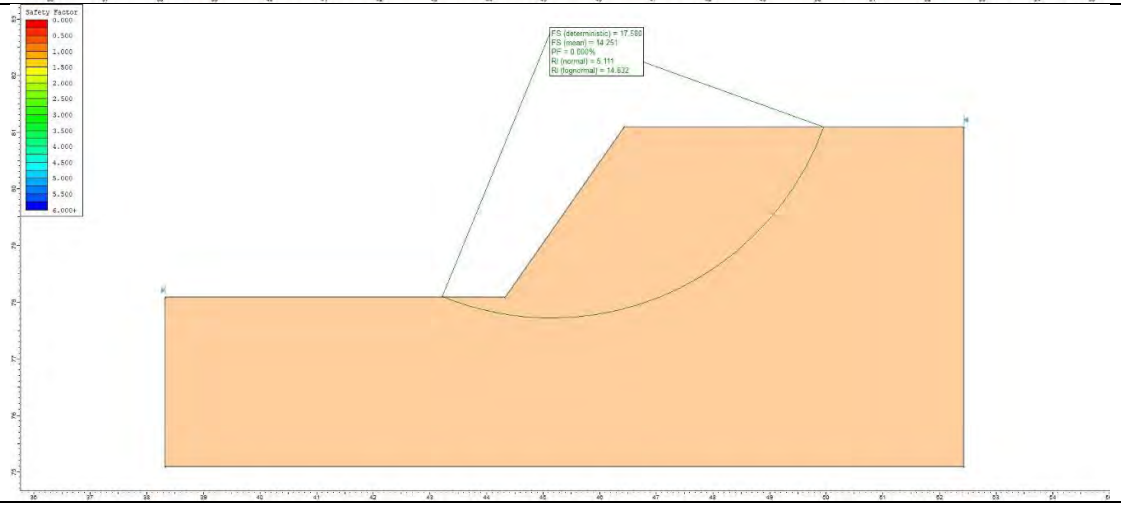
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=50 | Dinamik |  | 1,77 |
| | Statik |  | 1,99 |

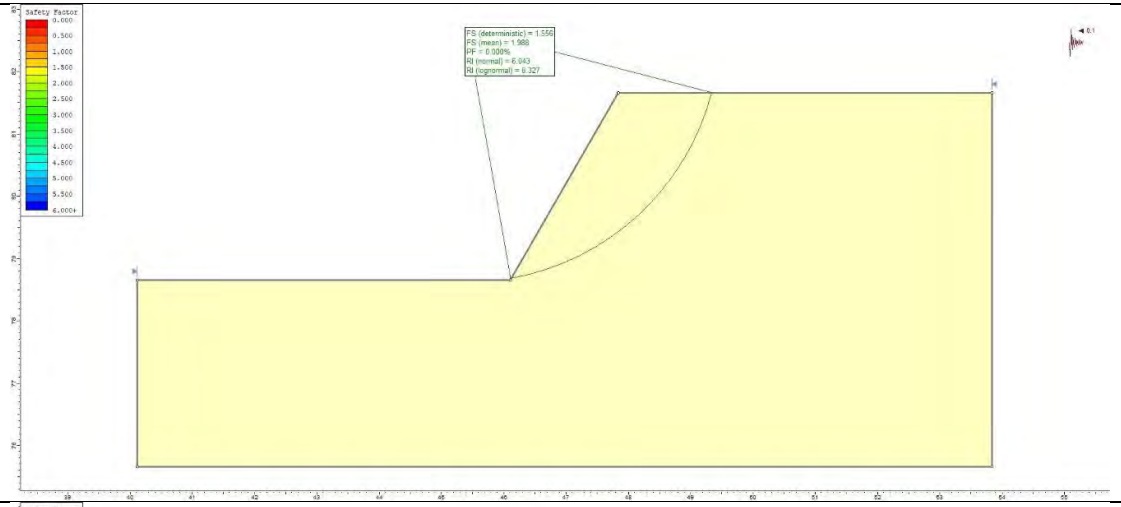
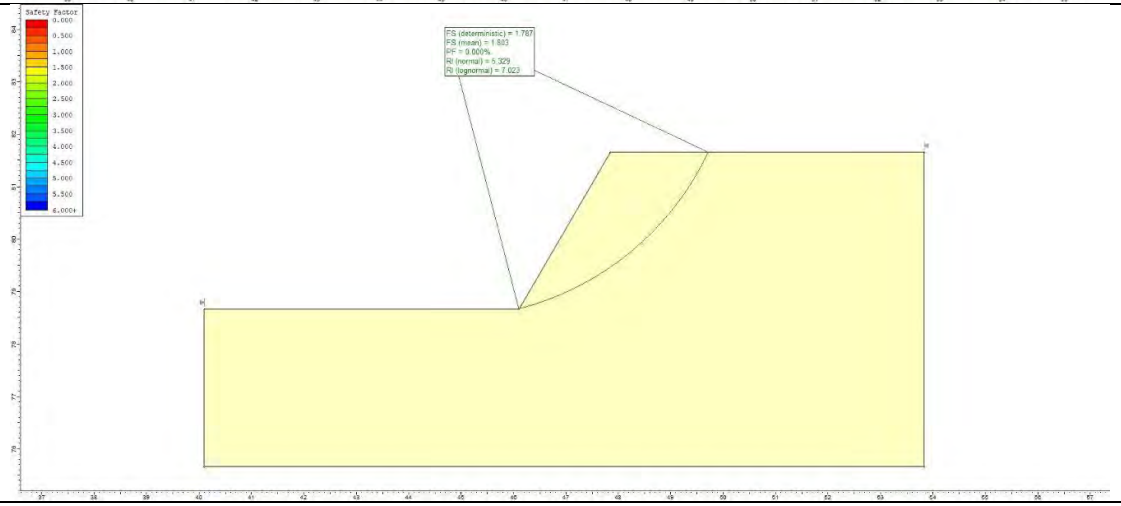
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=50 | Dinamik |  | 5,60 |
| | Statik |  | 6,68 |

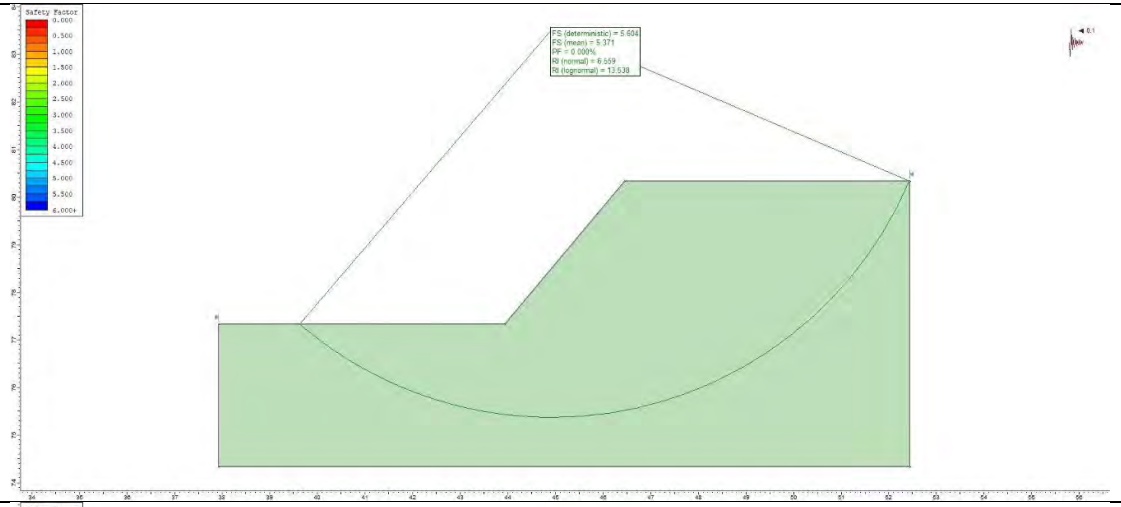
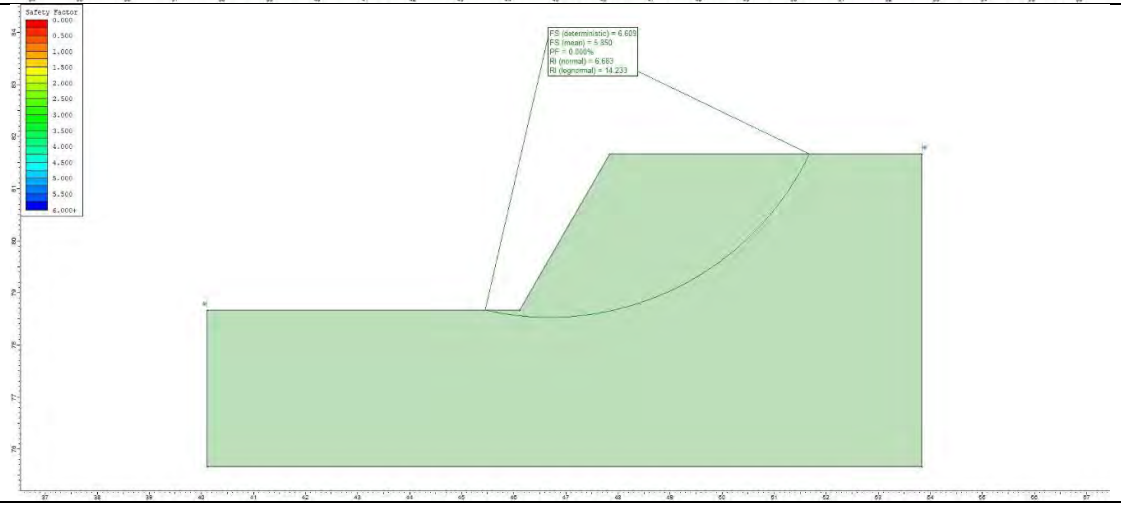
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=50 | Dinamik |  | 14,49 |
| | Statik |  | 17,74 |

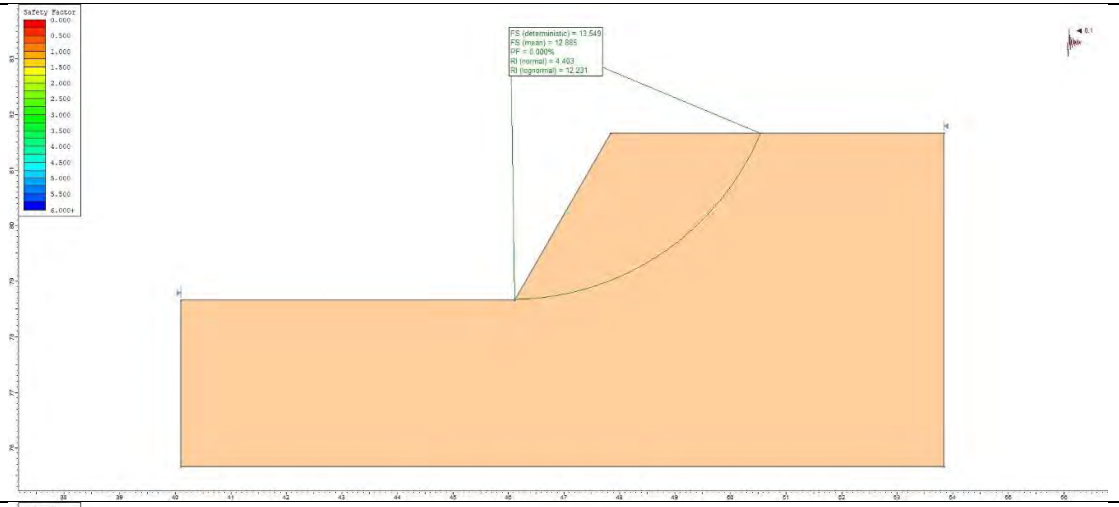
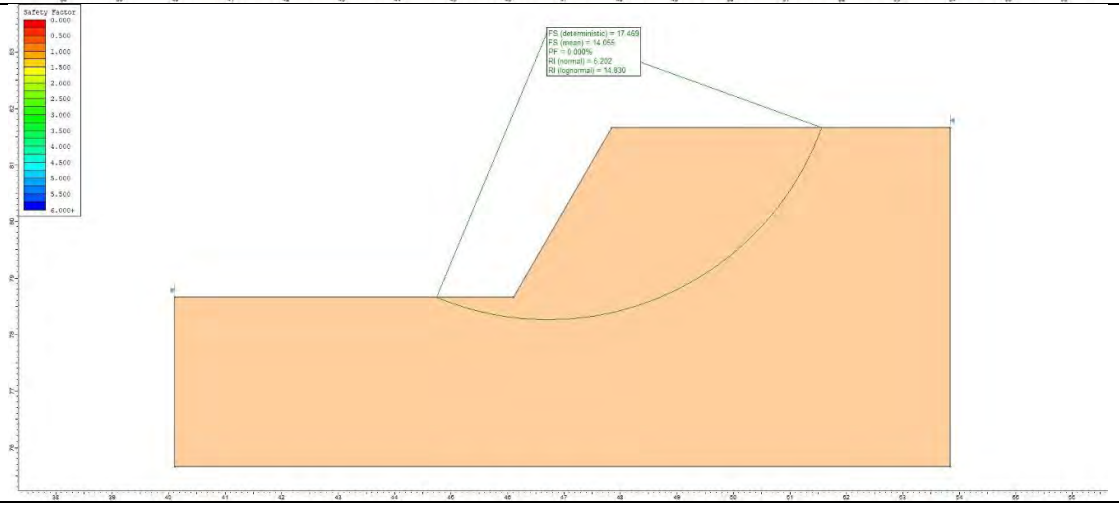
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=55 | Dinamik |  | 1,63 |
| | Statik |  | 1,87 |

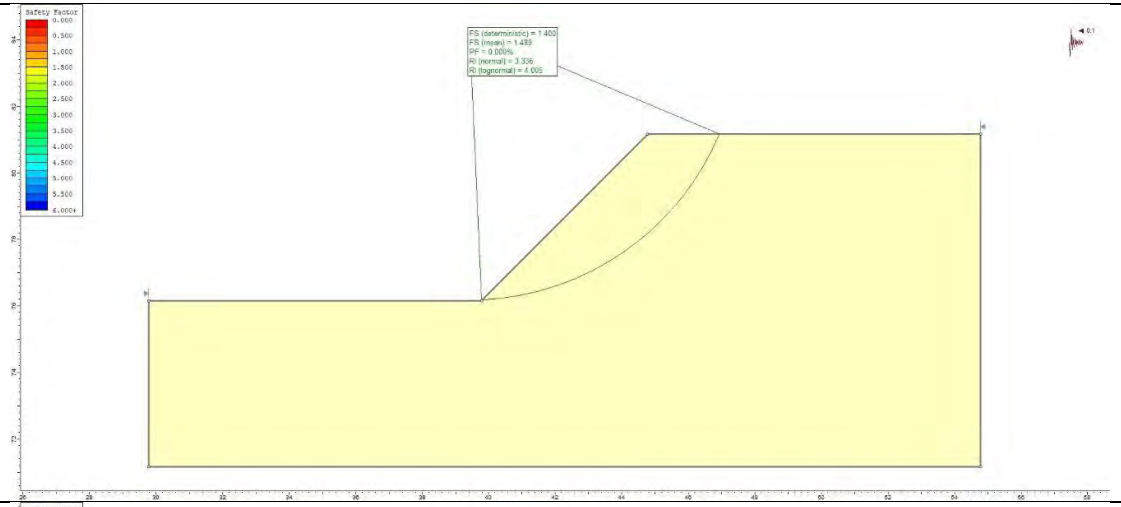
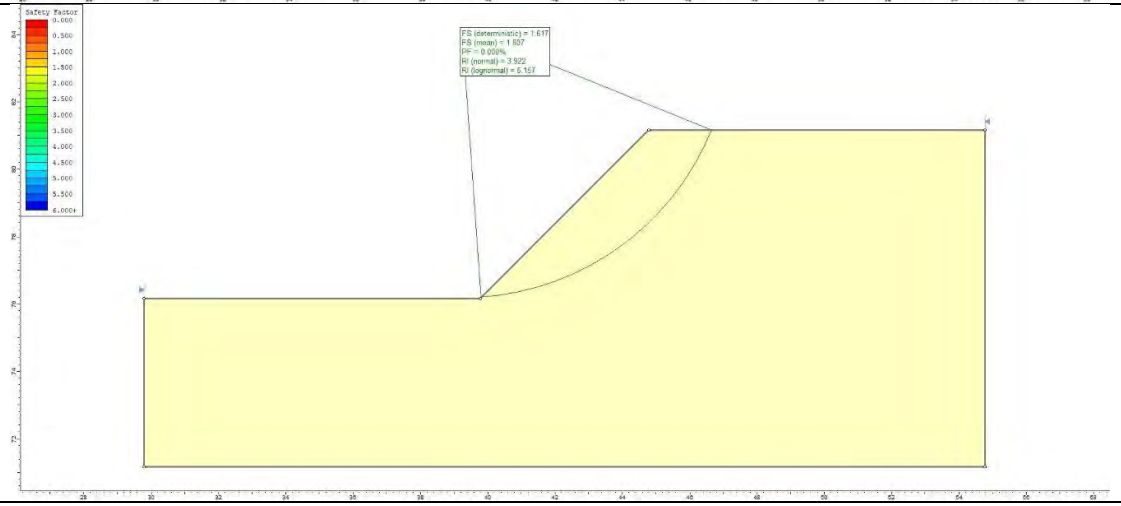
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=55 | Dinamik |  | 5,32 |
| | Statik |  | 6,65 |

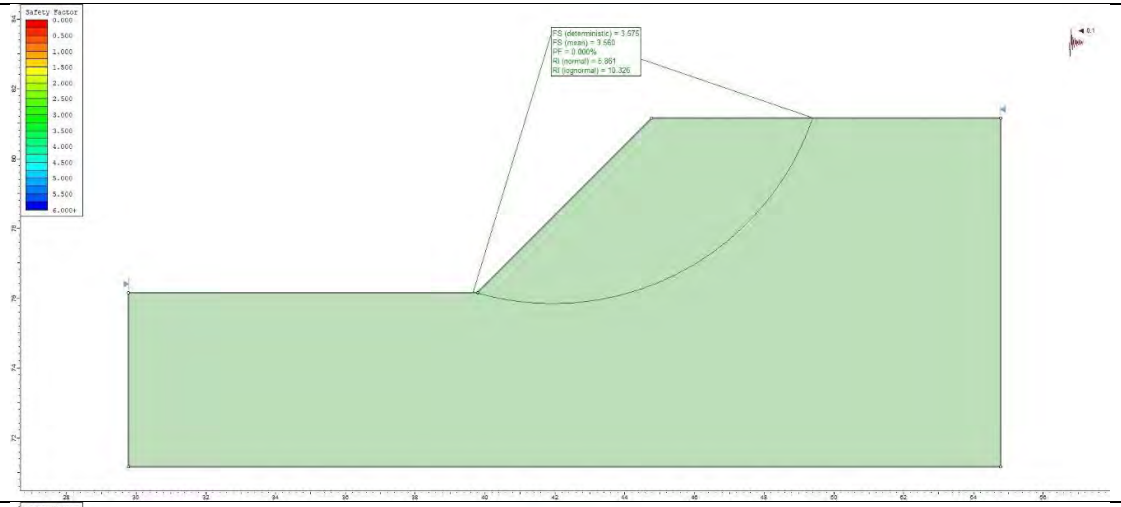
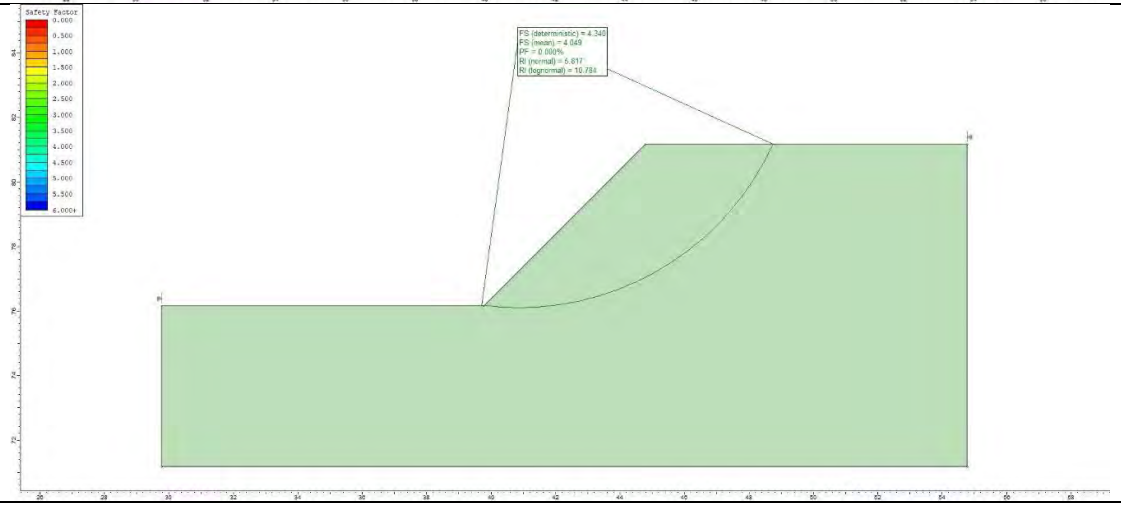
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=55 | Dinamik |  | 14,03 |
| | Statik |  | 17,58 |

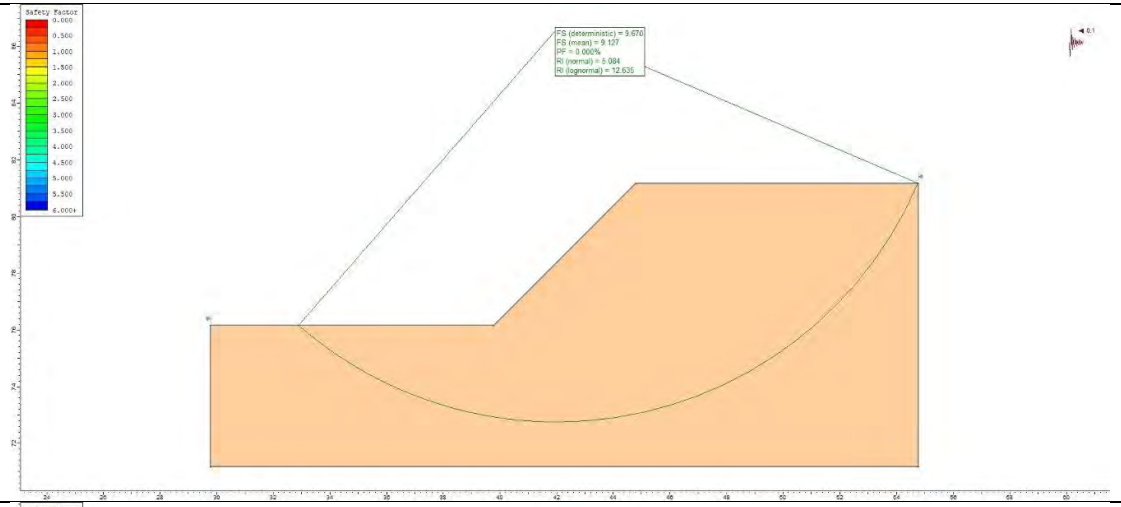
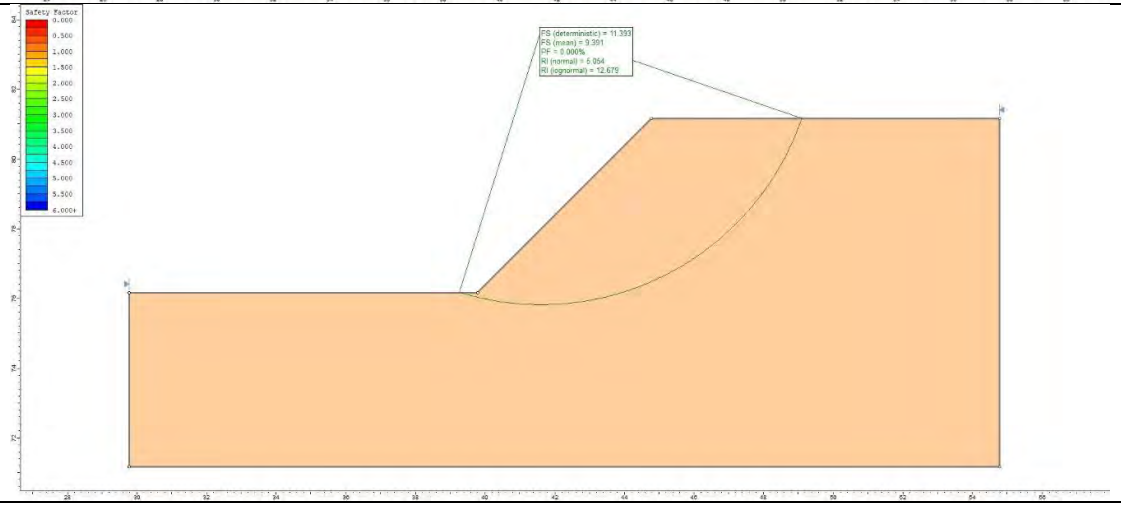
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=60 | Dinamik |  | 1,56 |
| | Statik |  | 1,79 |

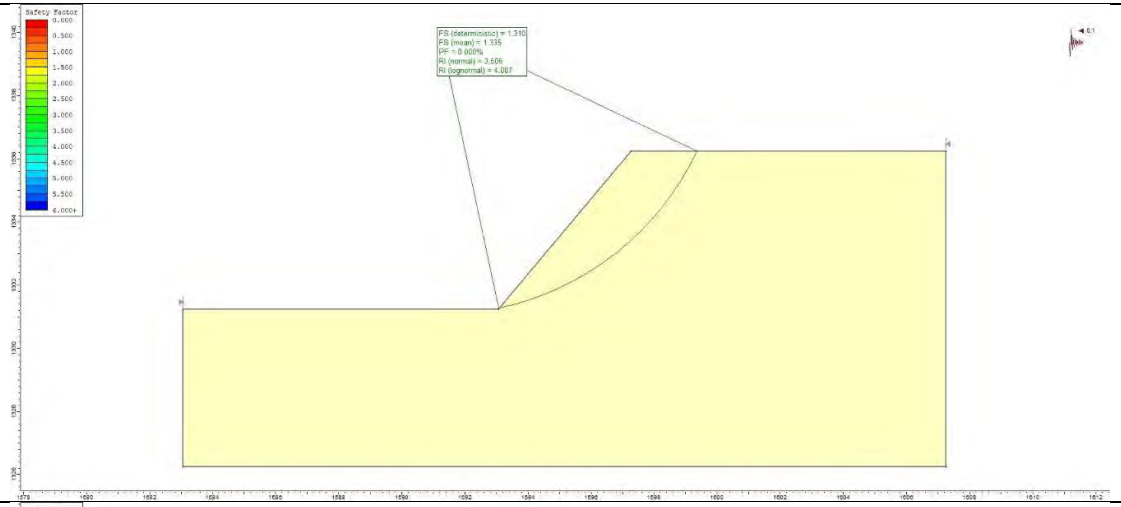
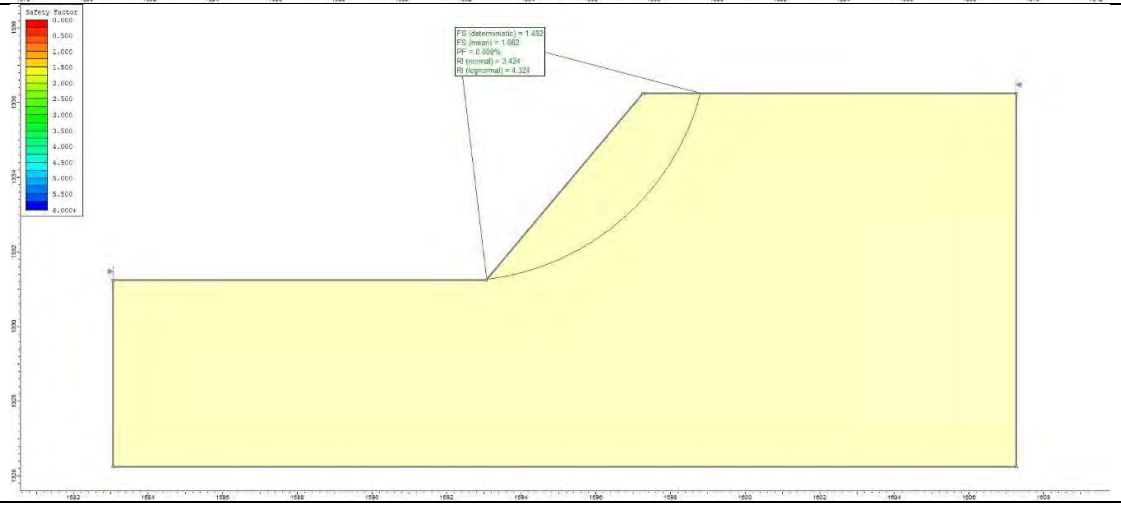
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=60 | Dinamik |  | 5,13 |
| | Statik |  | 6,61 |

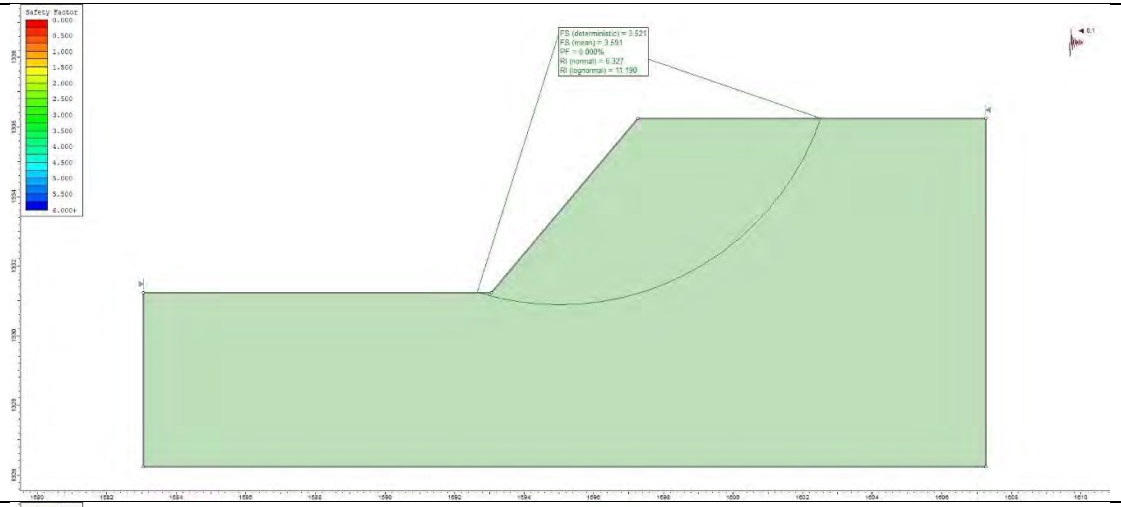
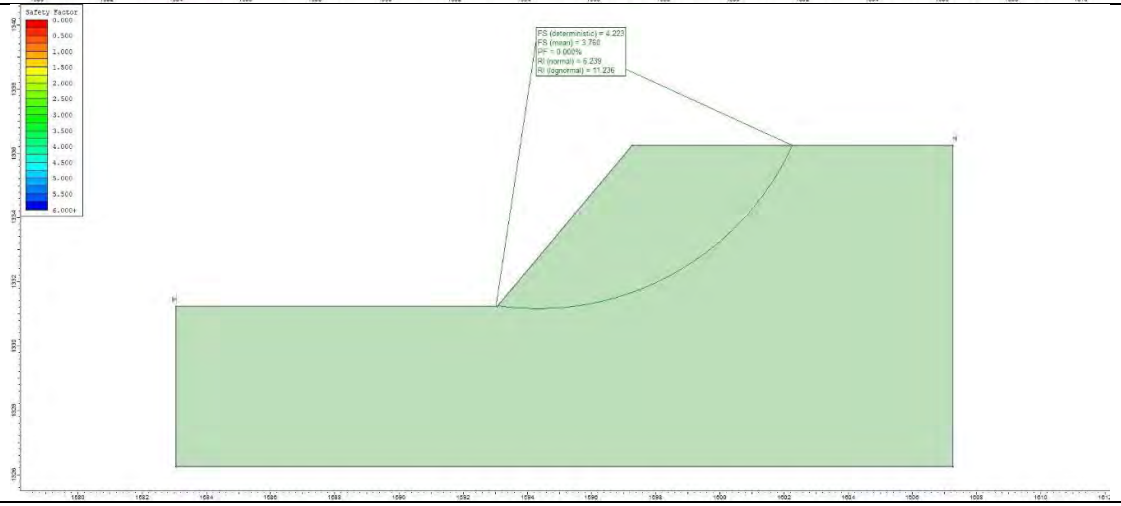
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|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=60 | Dinamik |  | 13,55 |
| | Statik |  | 17,47 |

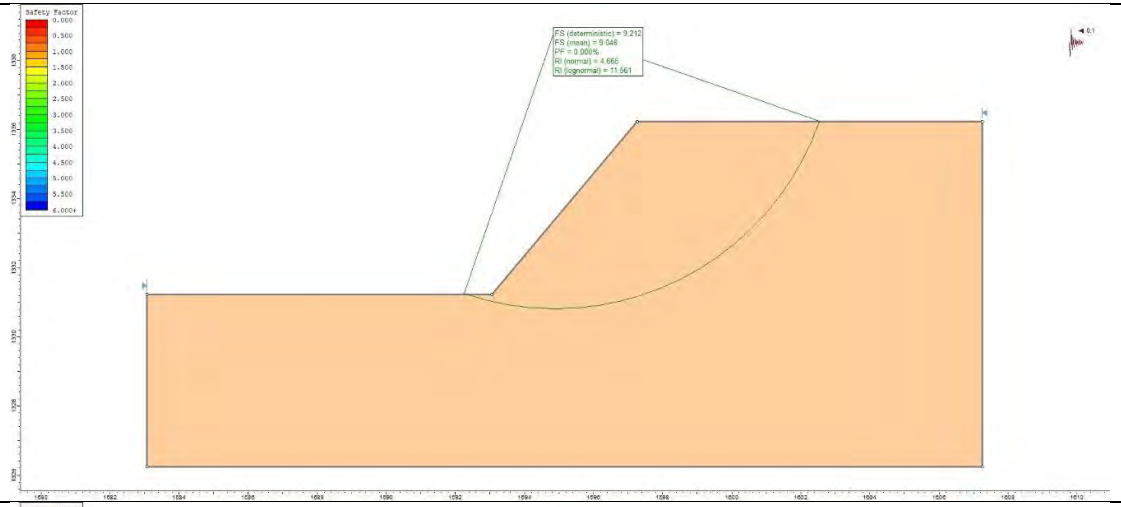
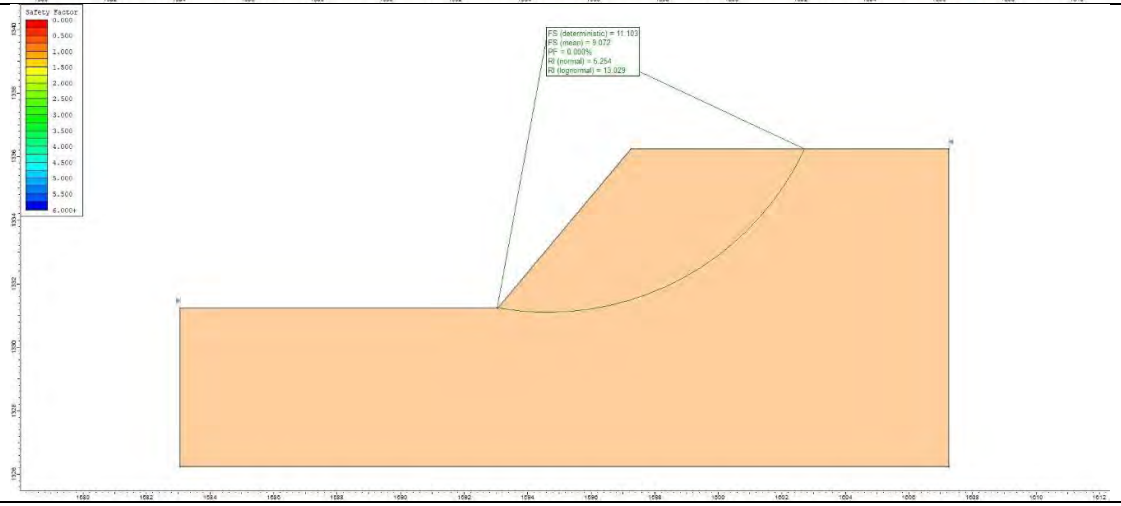
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=45 | Dinamik |  | 1,40 |
| | Statik |  | 1,62 |

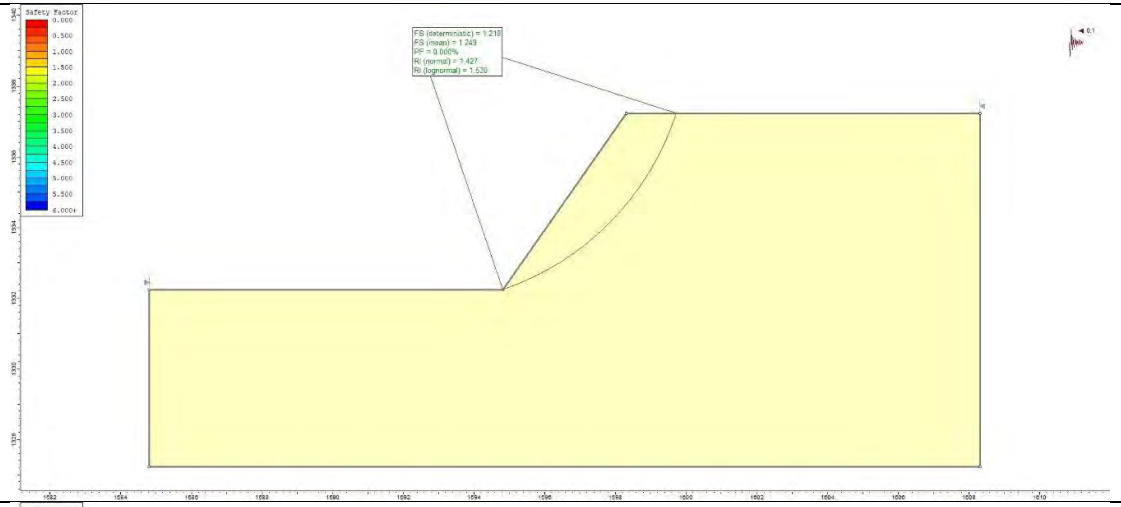
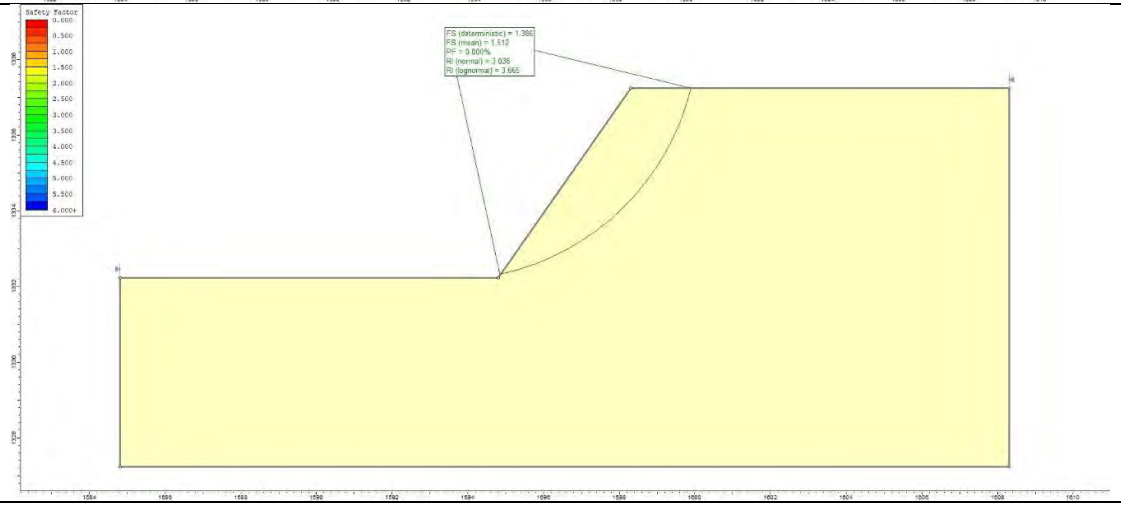
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=45 | Dinamik |  | 3,57 |
| | Statik |  | 4,34 |

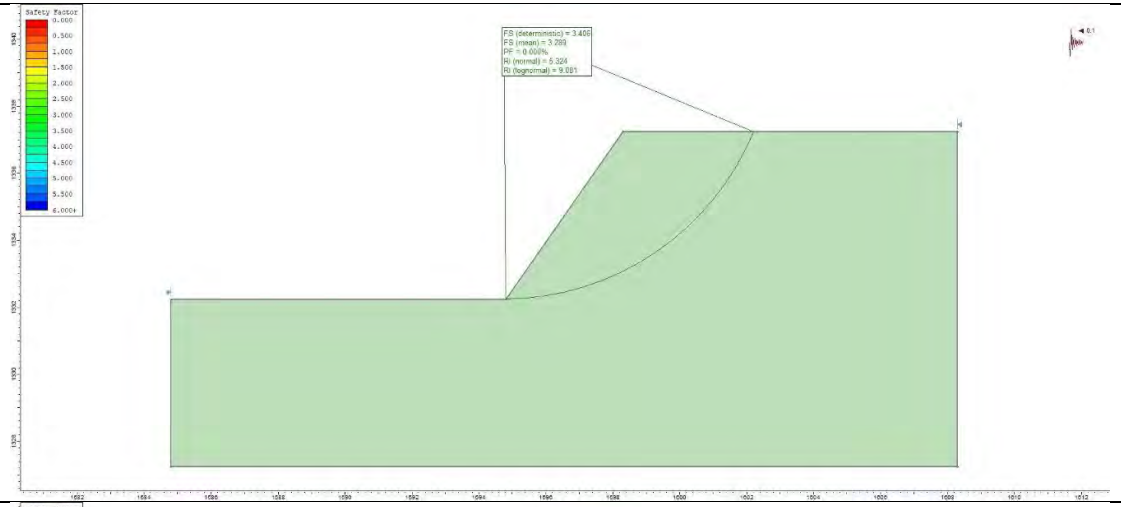
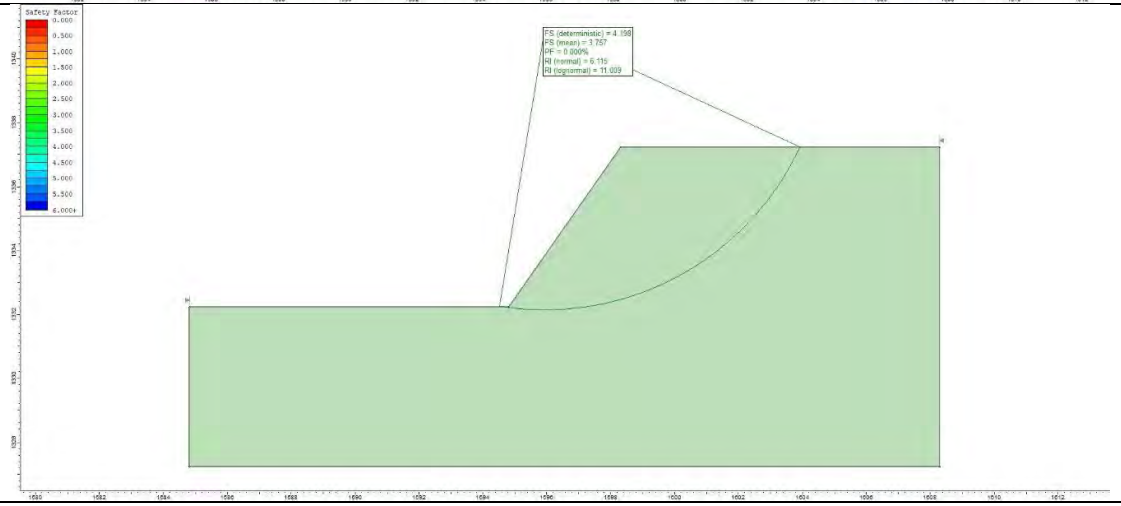
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=45 | Dinamik |  | 9,67 |
| | Statik |  | 11,39 |

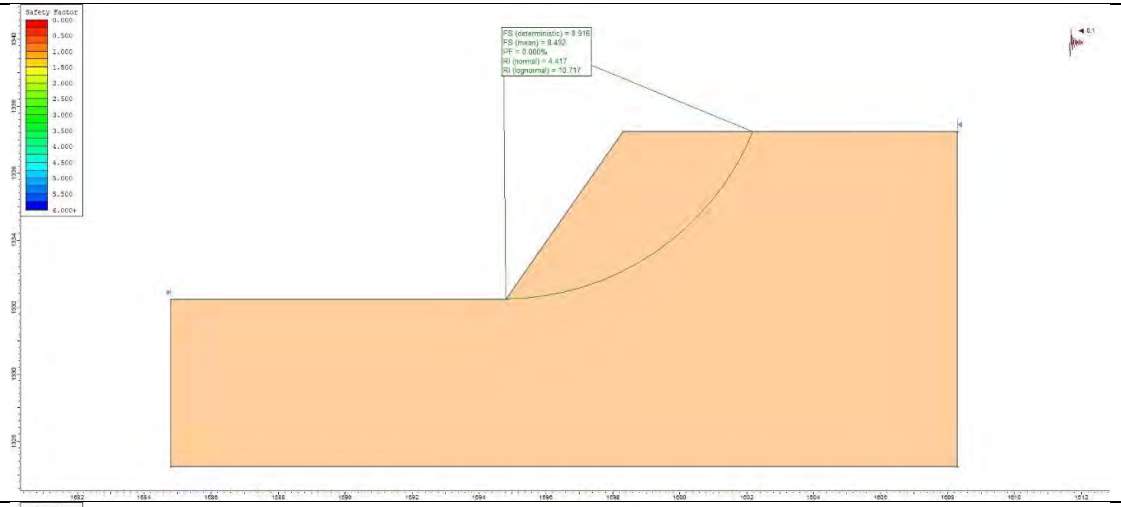
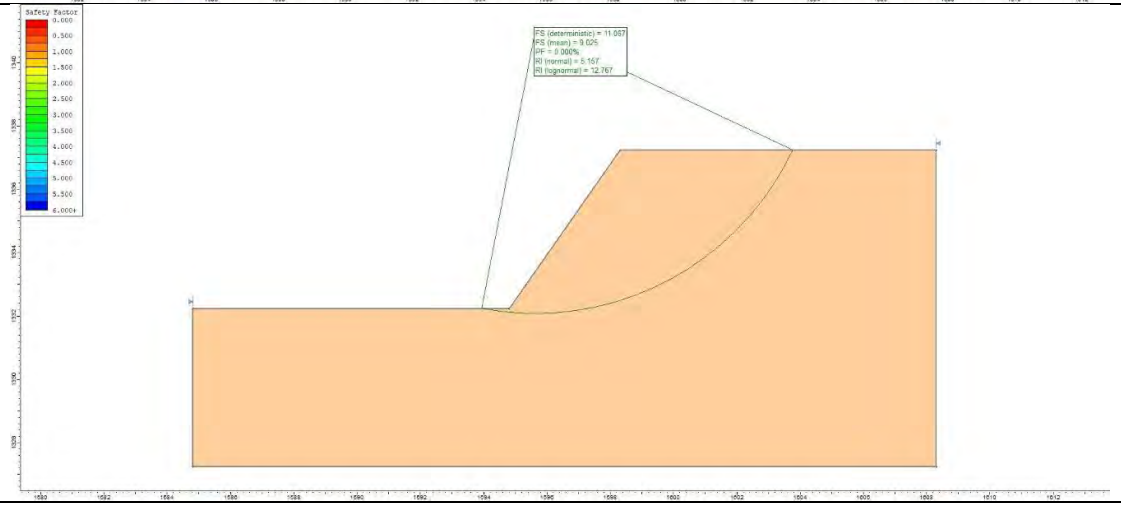
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=50 | Dinamik |  | 1,30 |
| | Statik |  | 1,49 |

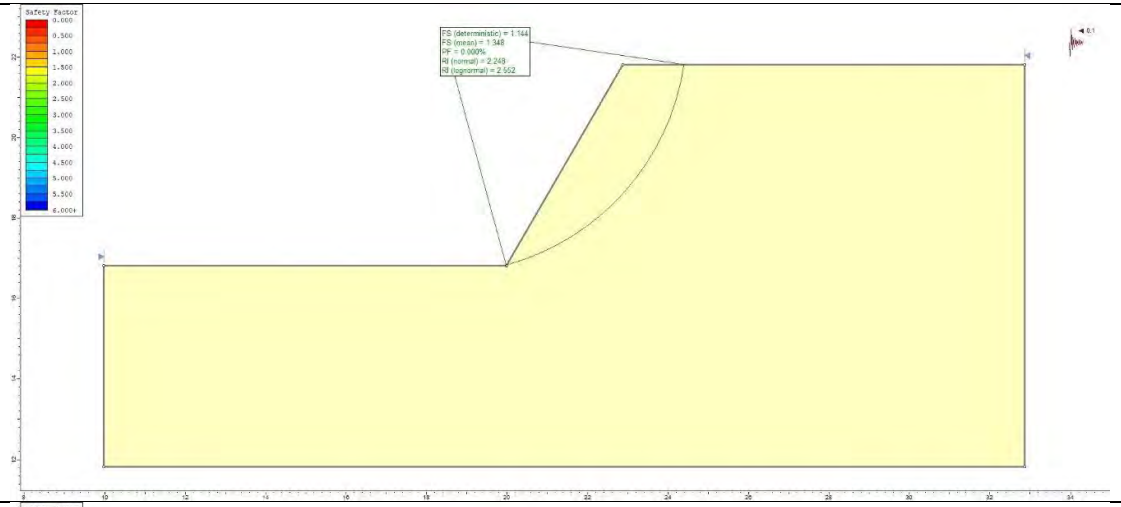
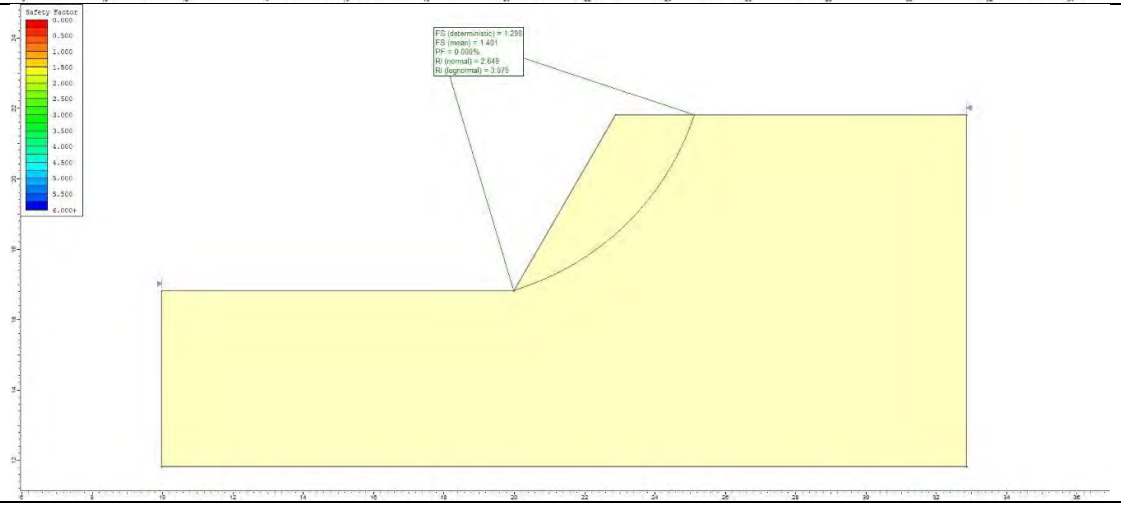
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=50 | Dinamik |  | 3,52 |
| | Statik |  | 4,22 |

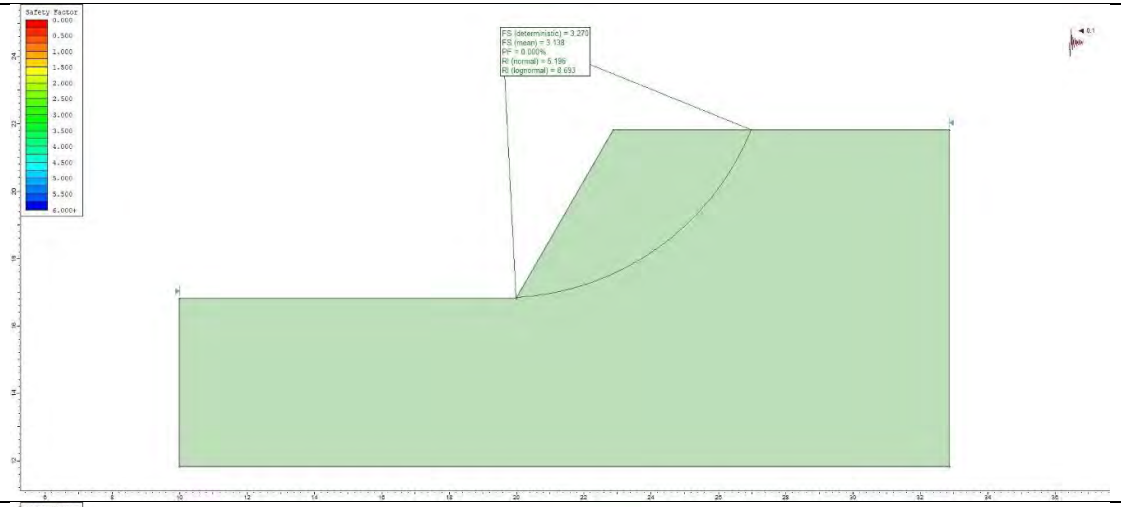
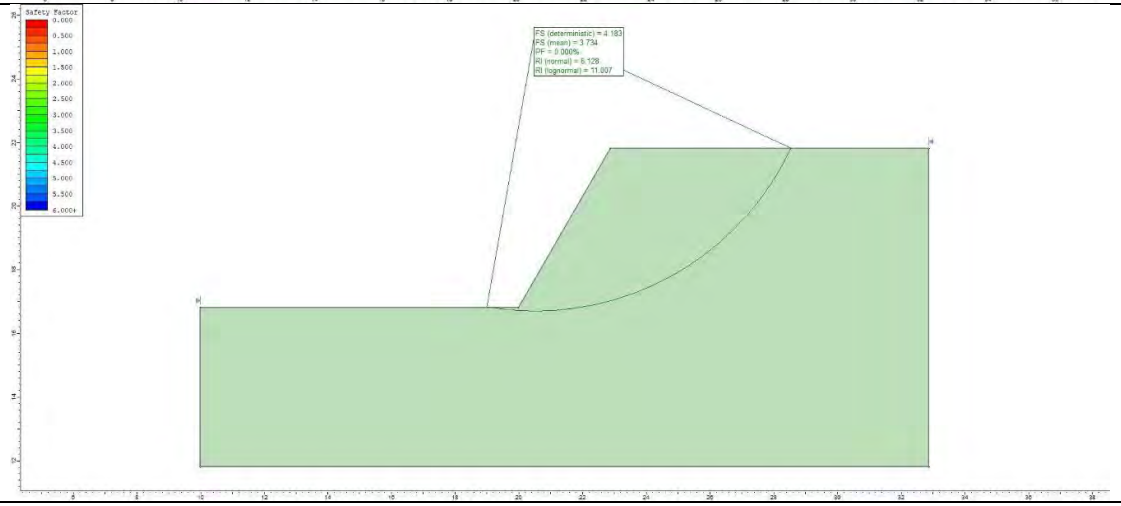
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=50 | Dinamik |  | 9,21 |
| | Statik |  | 11,10 |

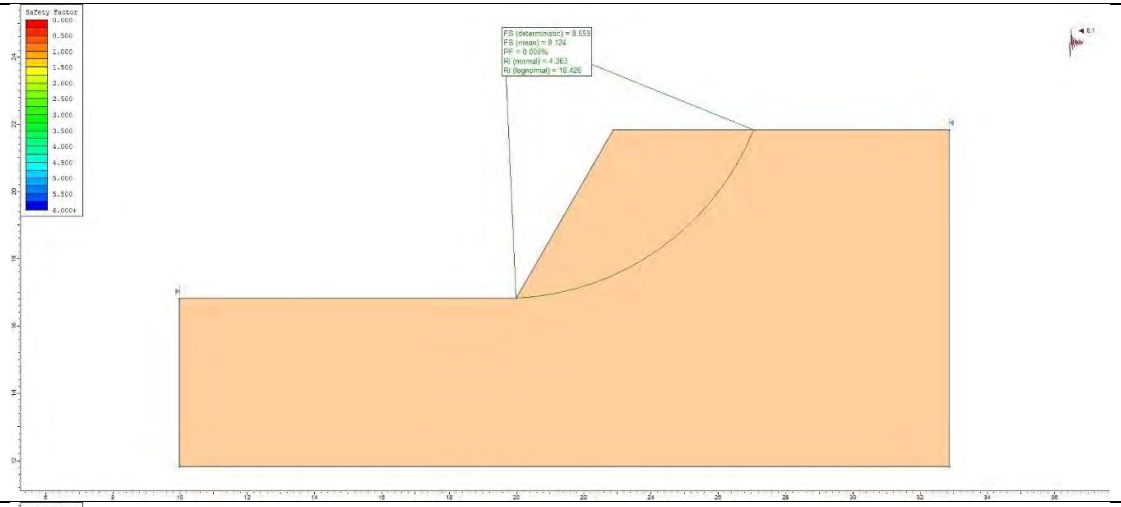
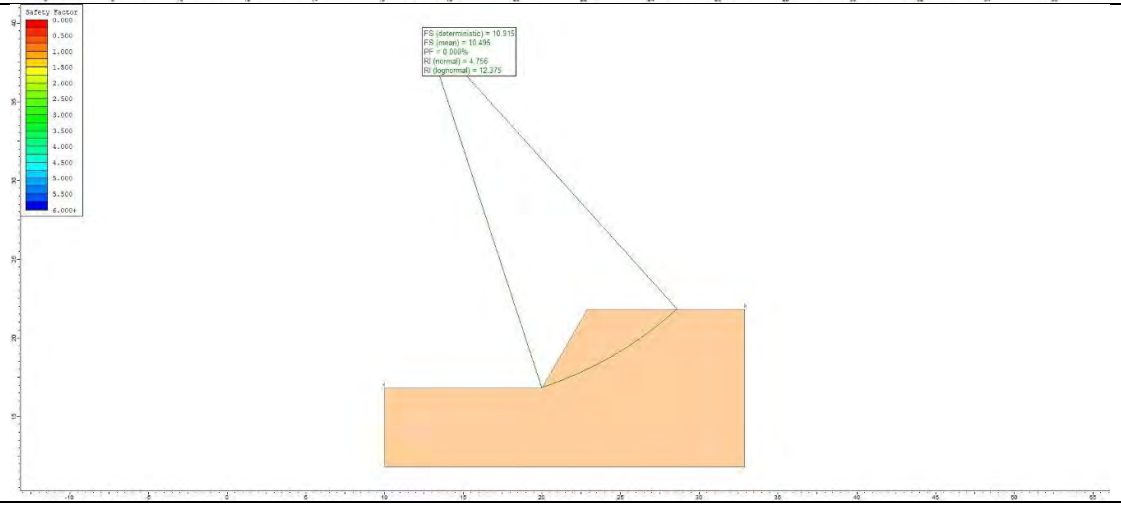
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
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| | Statik |  | 1,39 |

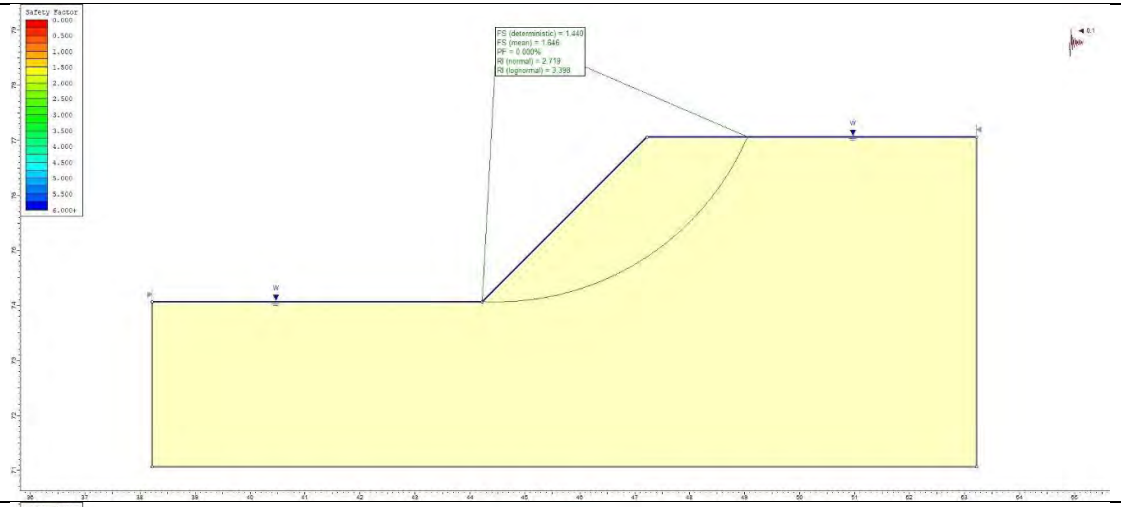
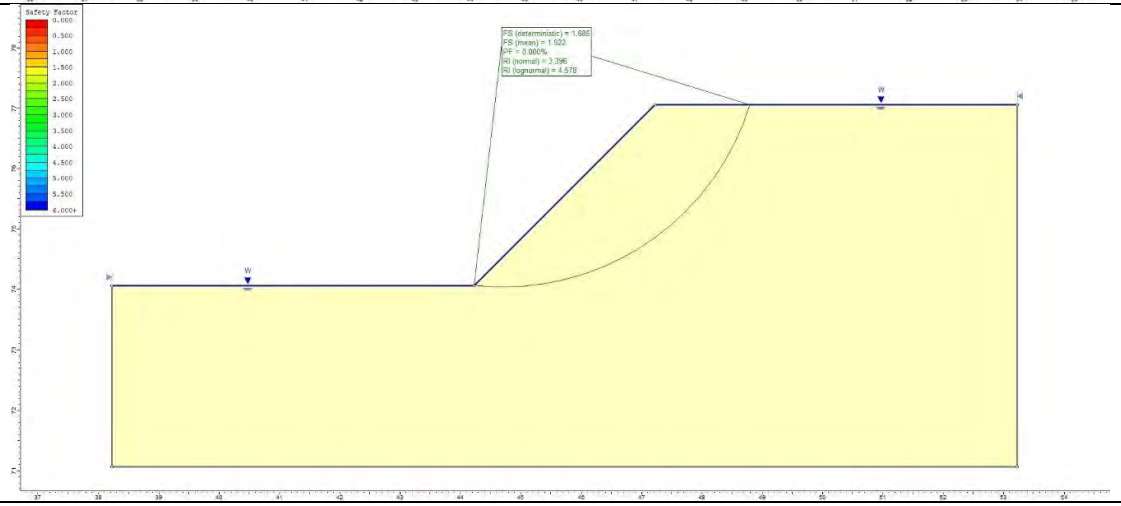
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|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=55 | Dinamik |  | 3,41 |
| | Statik |  | 4,20 |

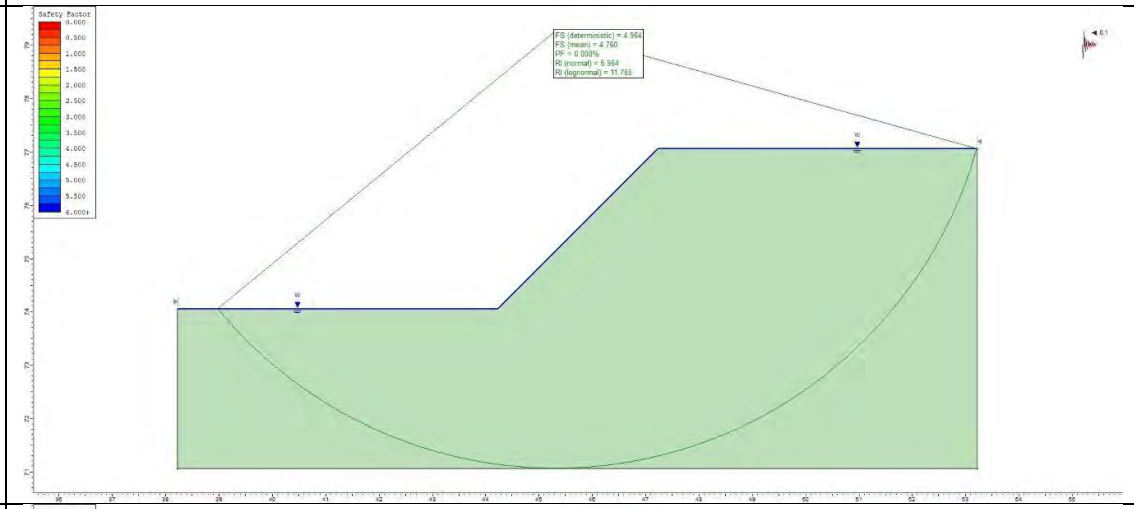
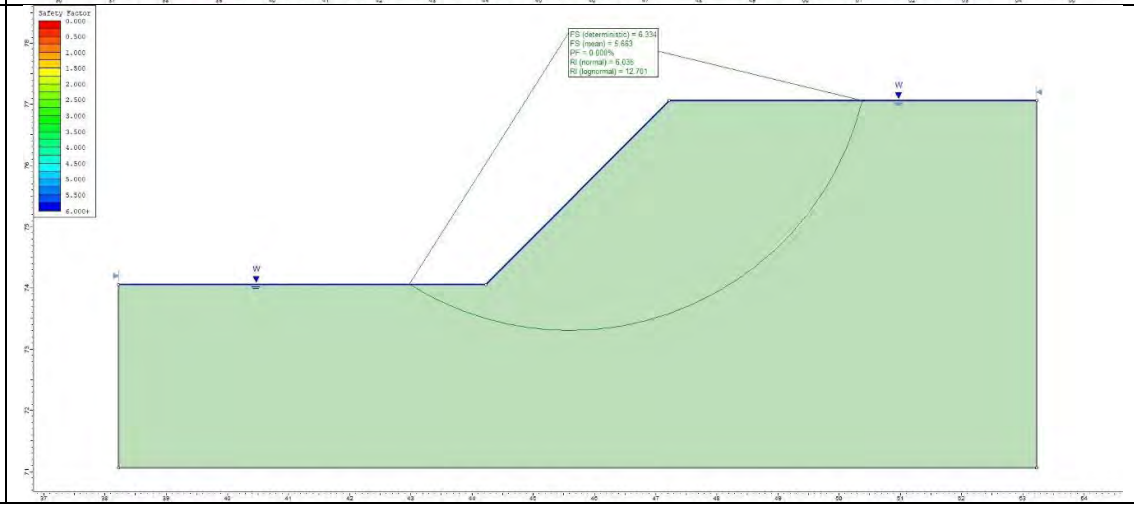
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| H=5<br>S=55 | Dinamik |  | 8,92 |
| | Statik |  | 11,07 |

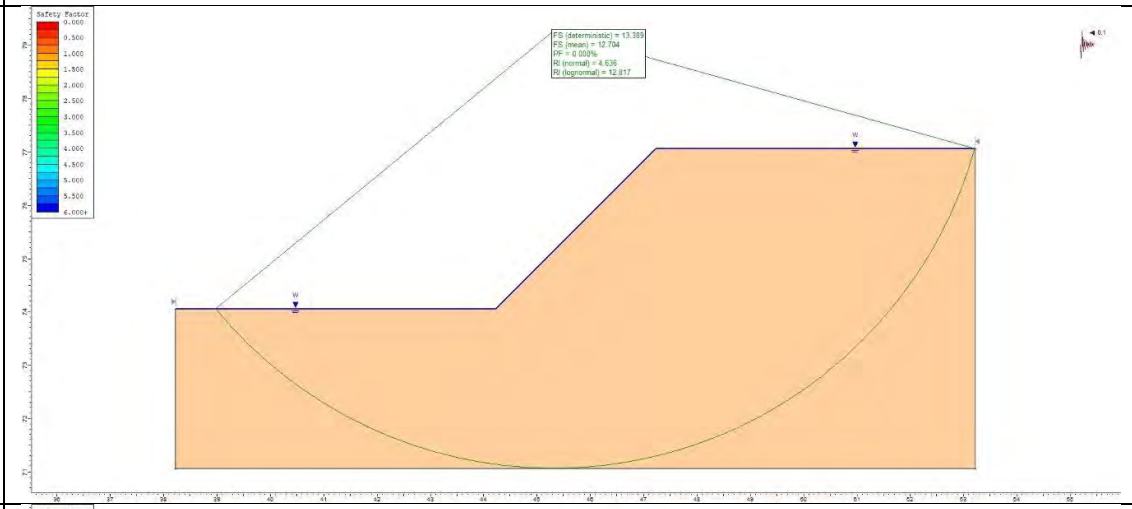
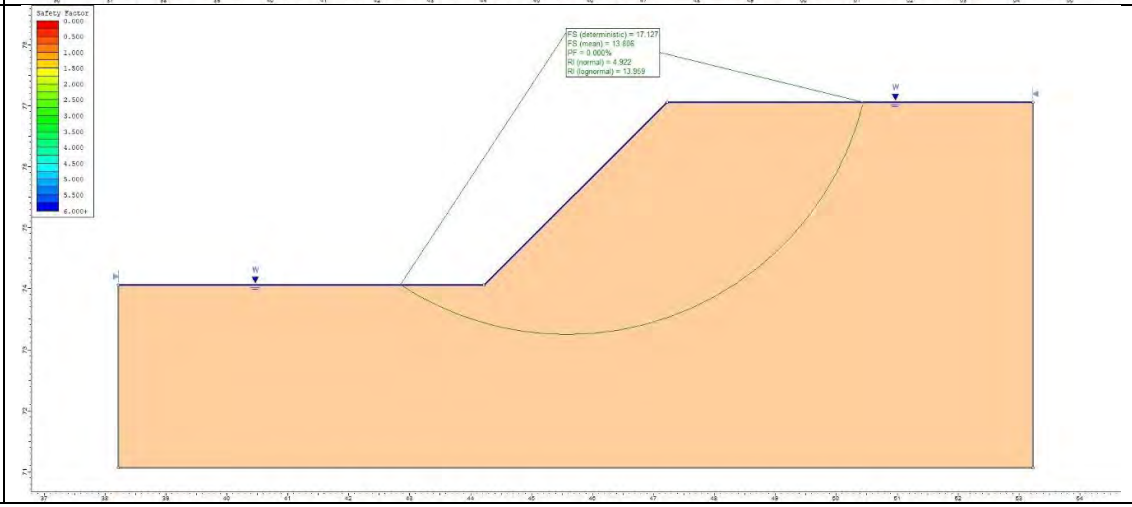
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| | Statik |  | 1,30 |

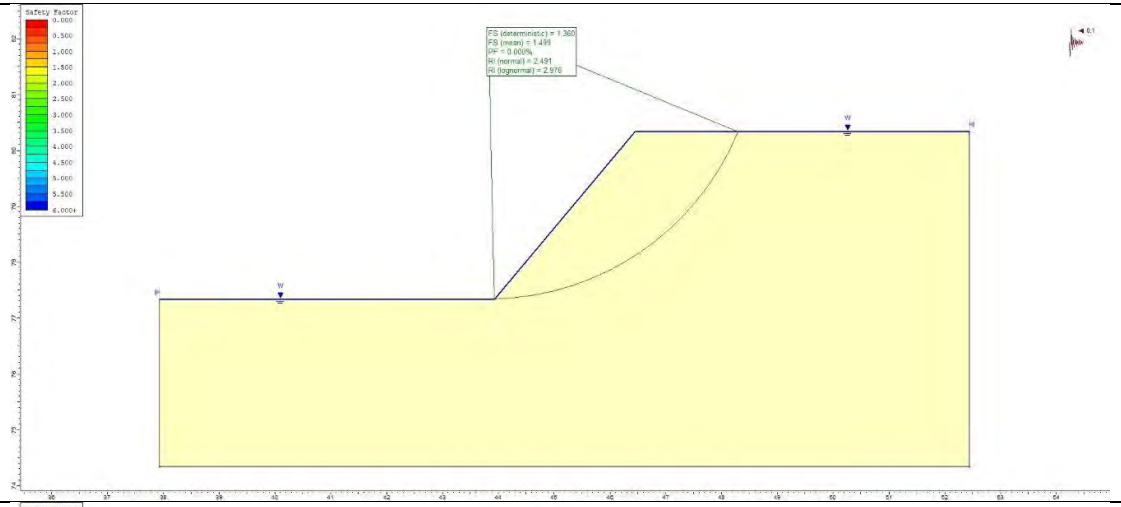
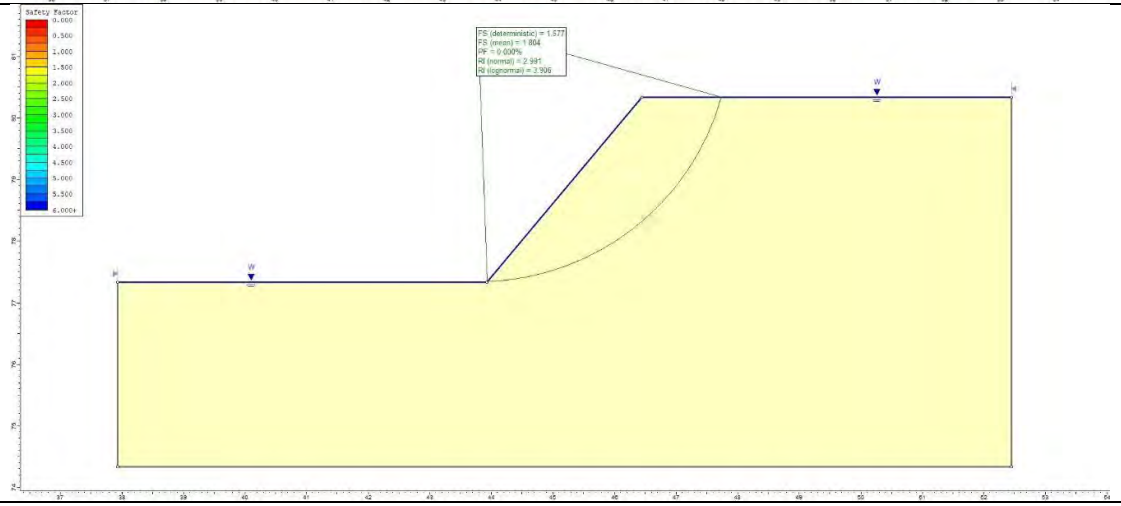
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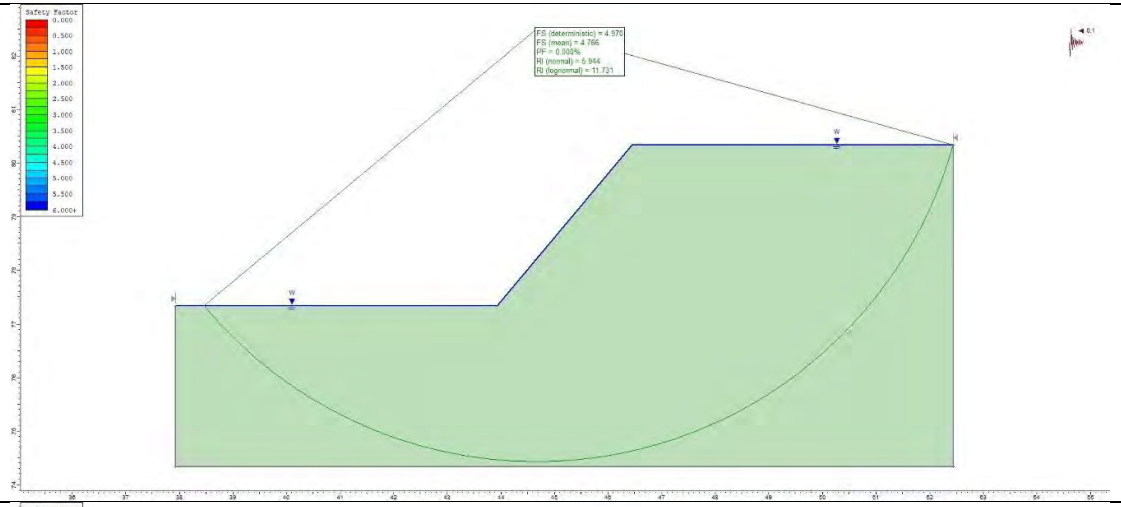
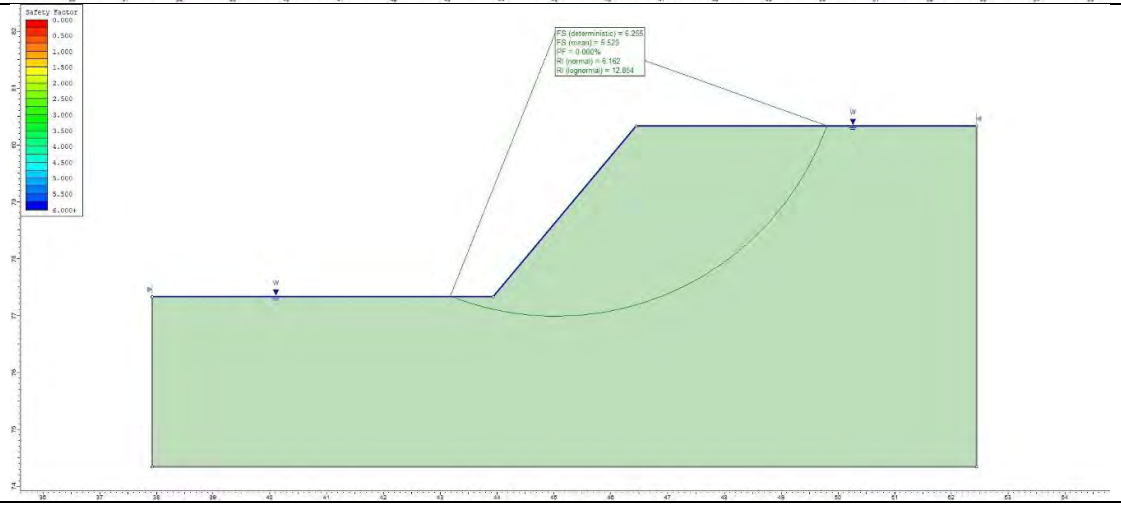
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| | Statik |  | 10,91 |

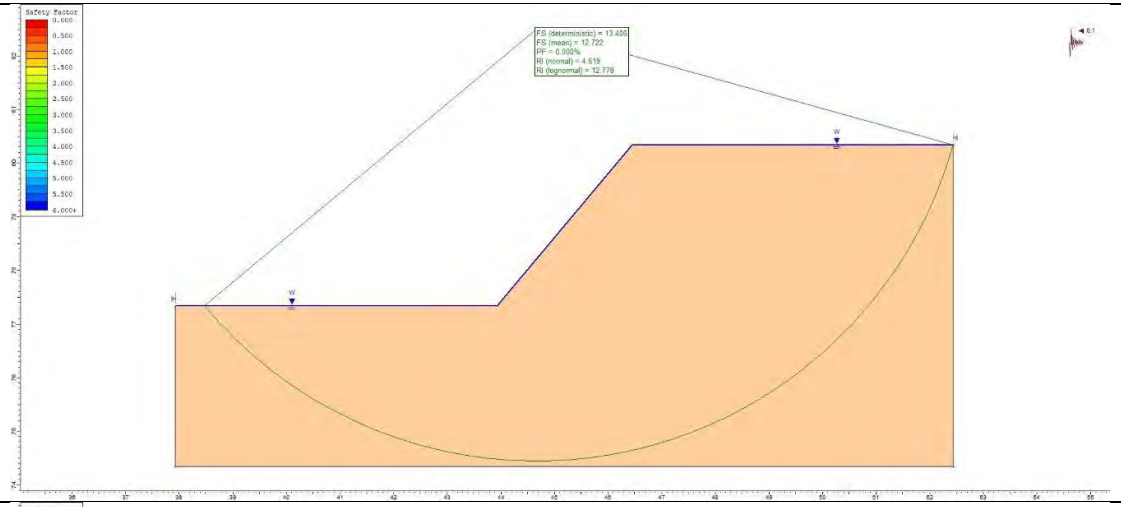
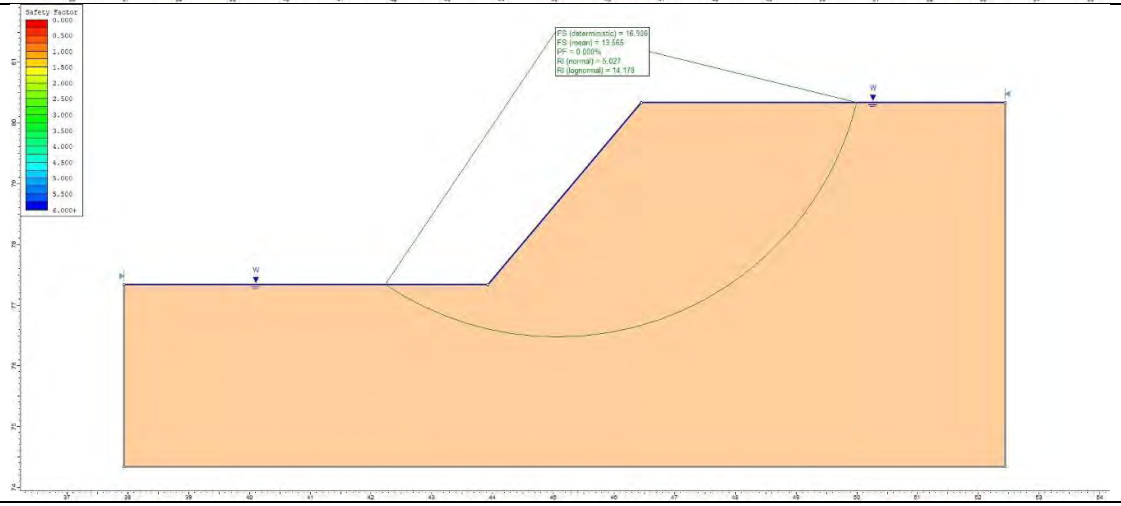
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| H=3<br>S=45 | Dinamik |  | 1,44 |
| | Statik |  | 1,68 |

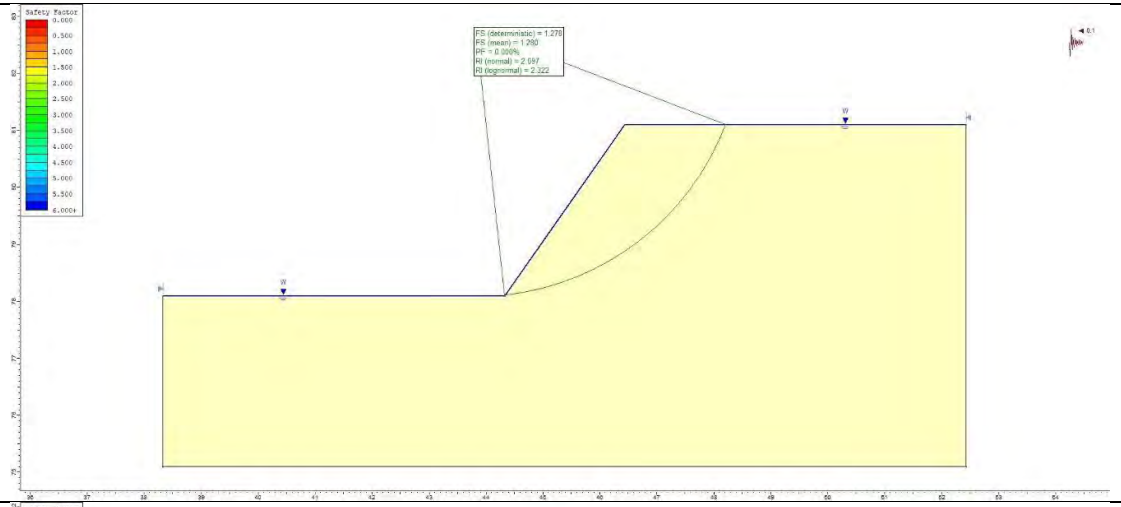
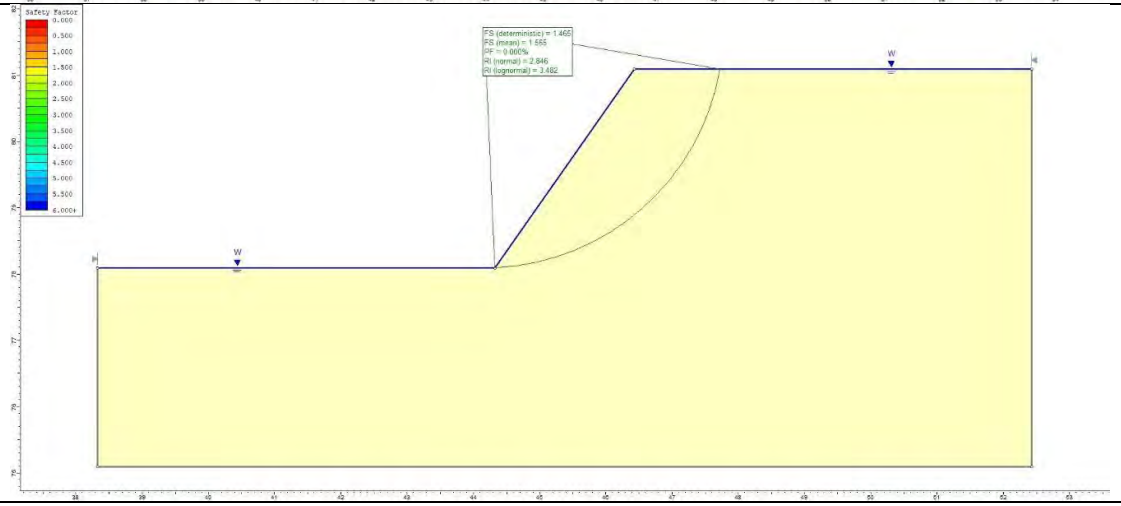
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| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=45 | Dinamik |  | 4,96 |
| | Statik |  | 6,33 |

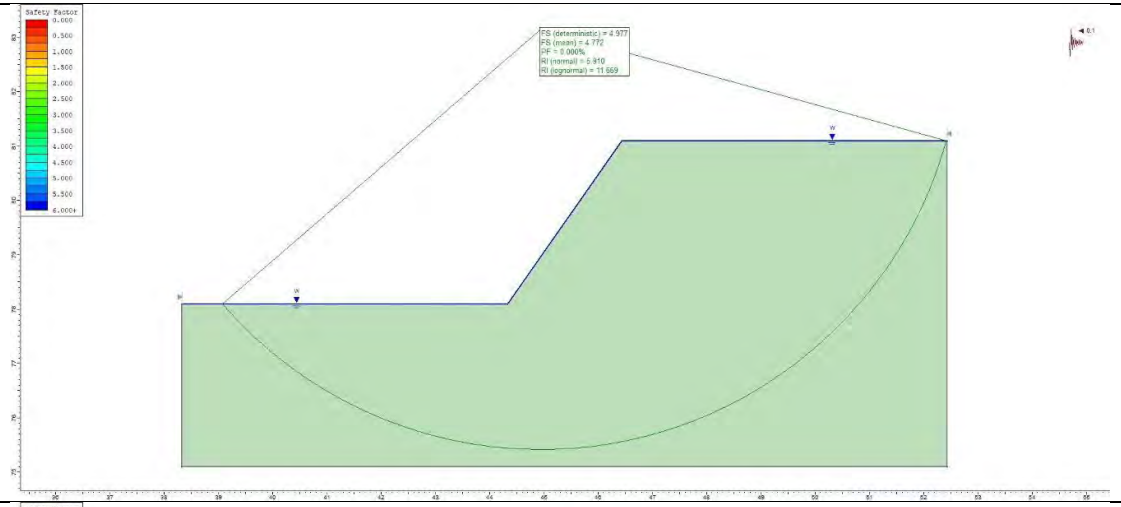
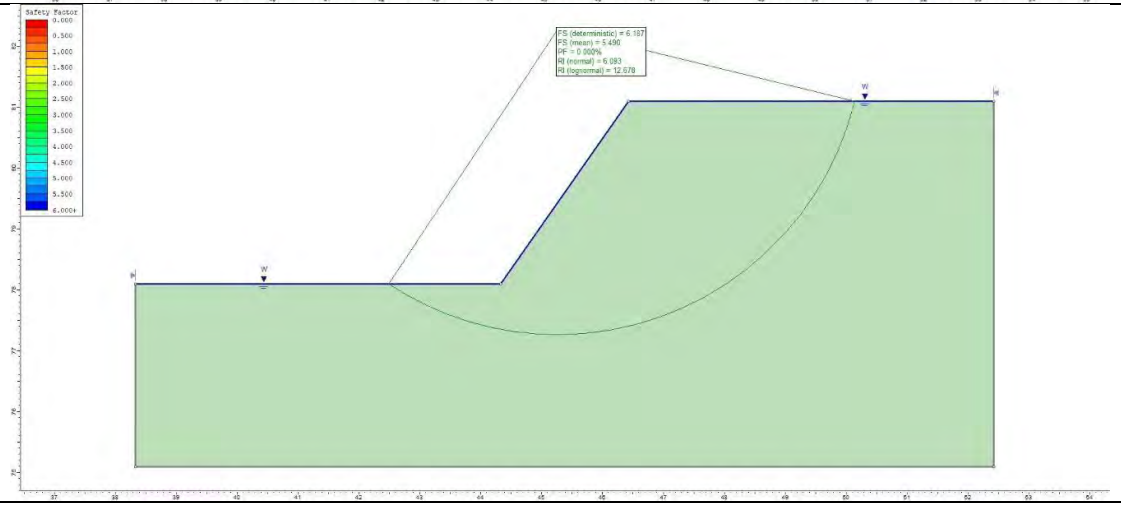
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| H=3<br>S=45 | Dinamik |  | 13,39 |
| | Statik |  | 17,13 |

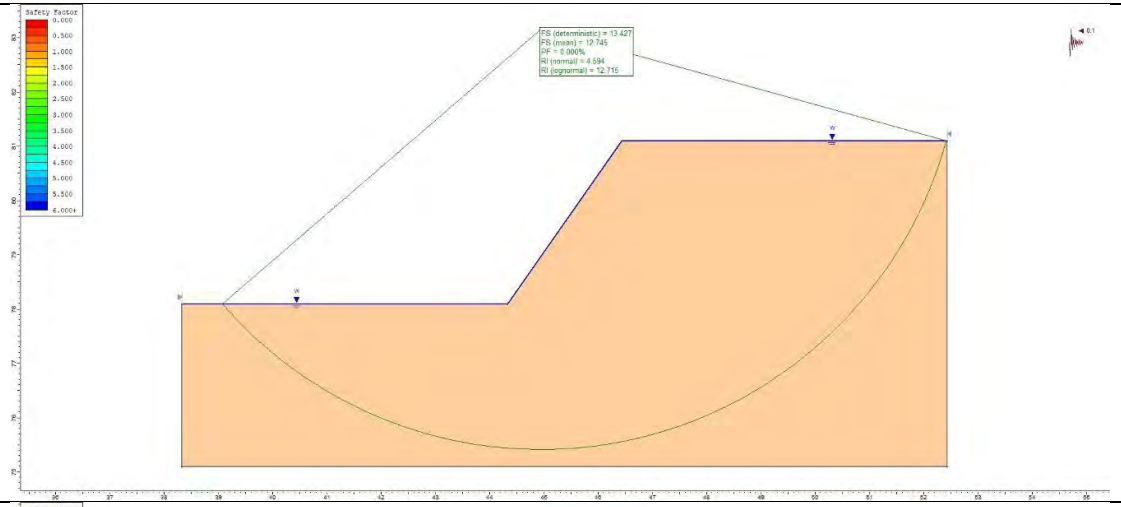
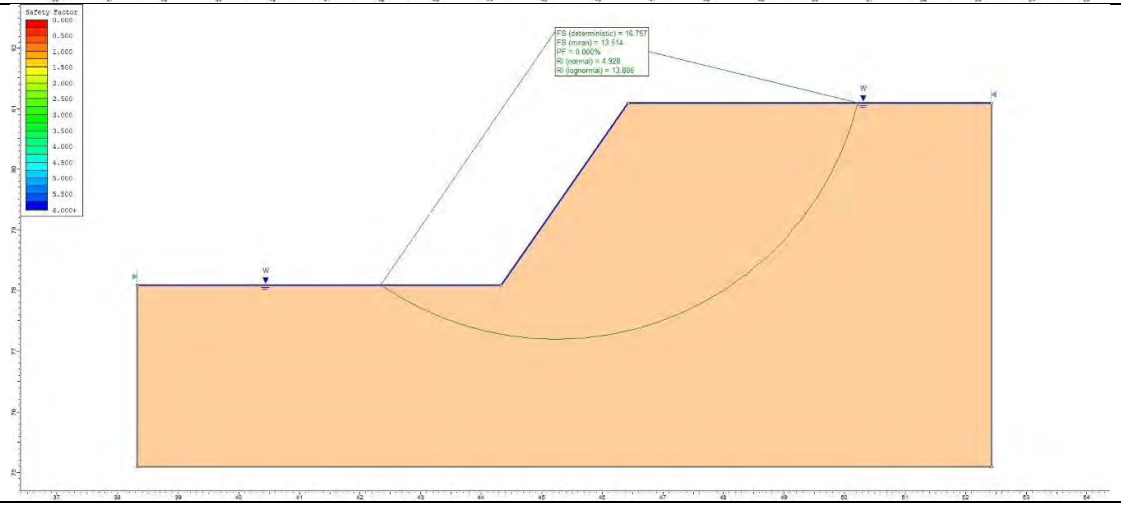
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| | Statik |  | 1,58 |

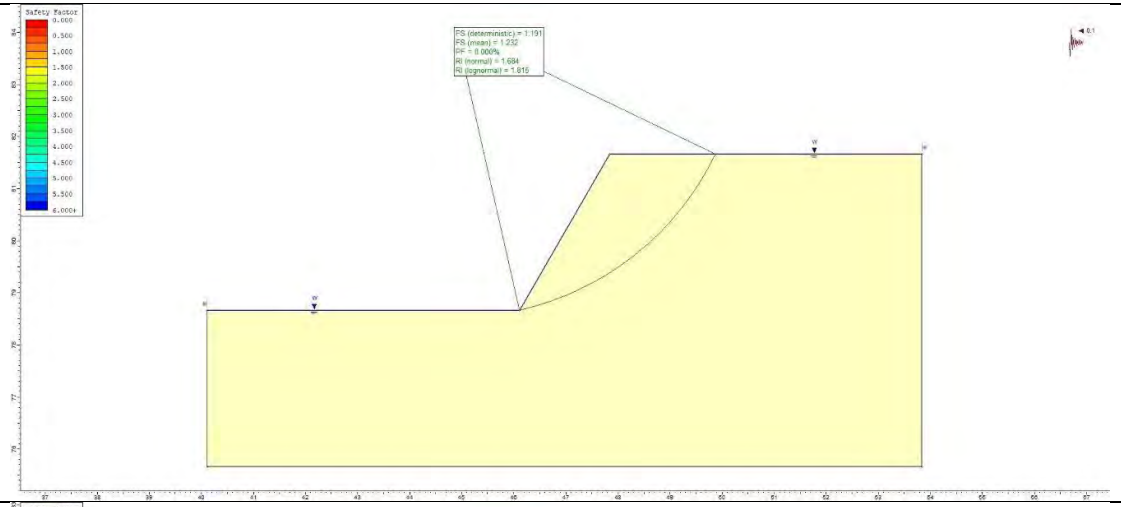
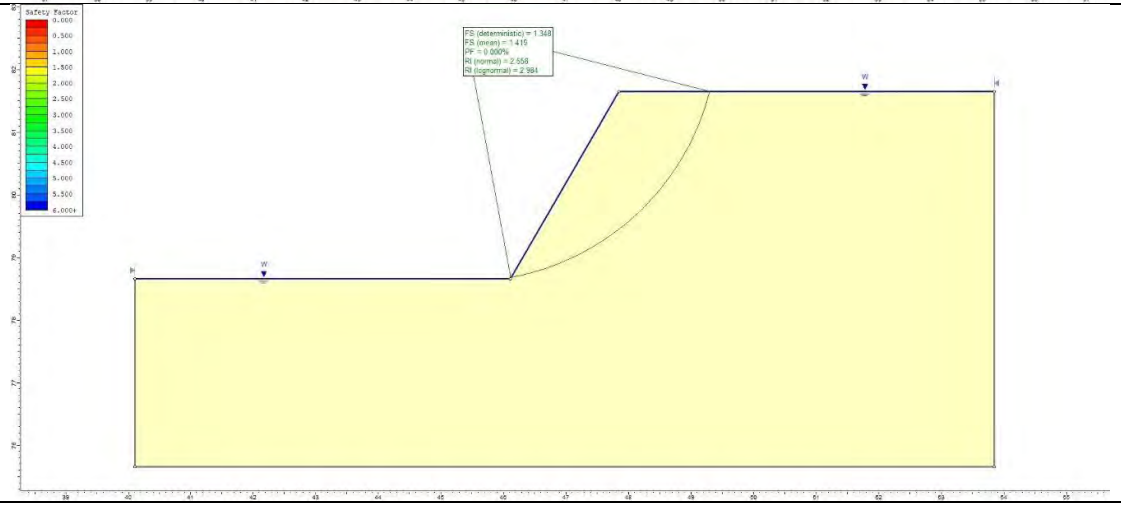
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|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=50 | Dinamik |  | 4,97 |
| | Statik |  | 6,25 |

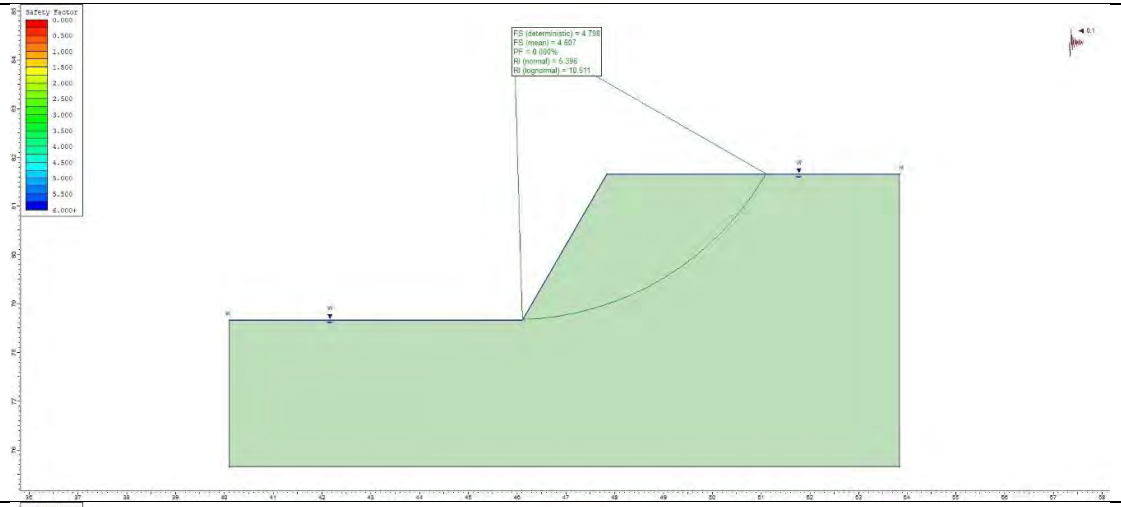
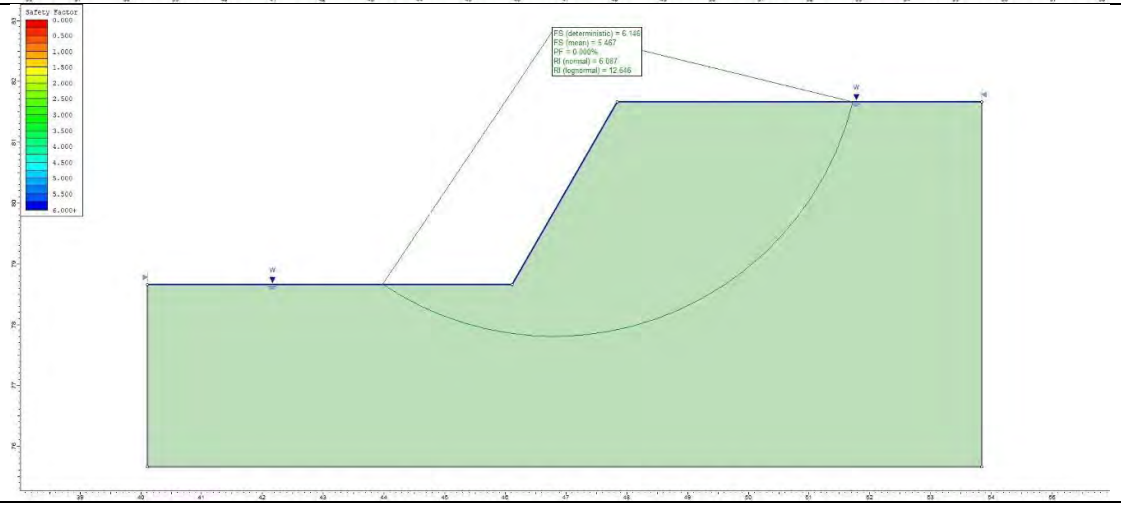
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=3<br>S=50 | Dinamik |  | 13,41 |
| | Statik |  | 16,61 |

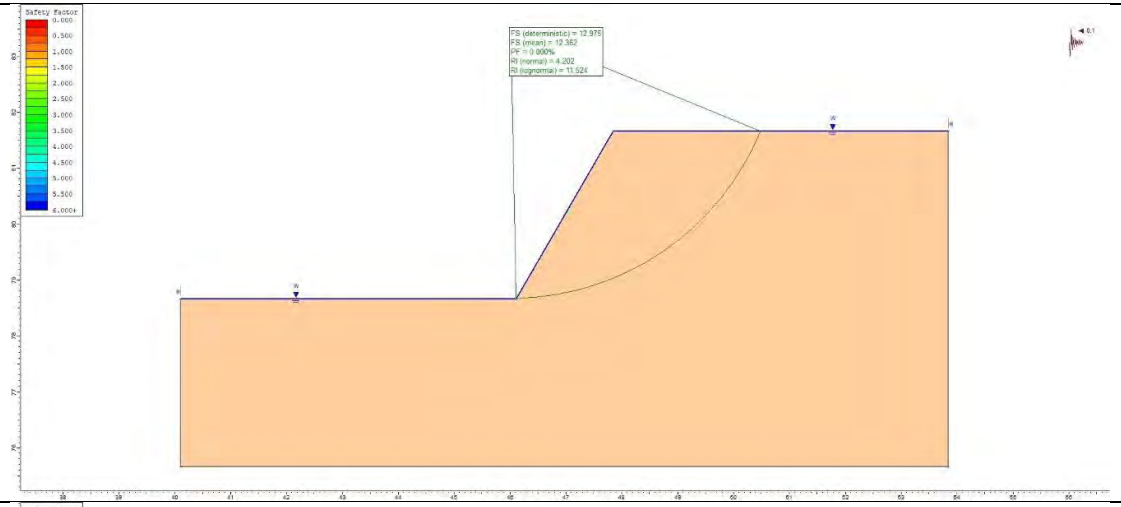
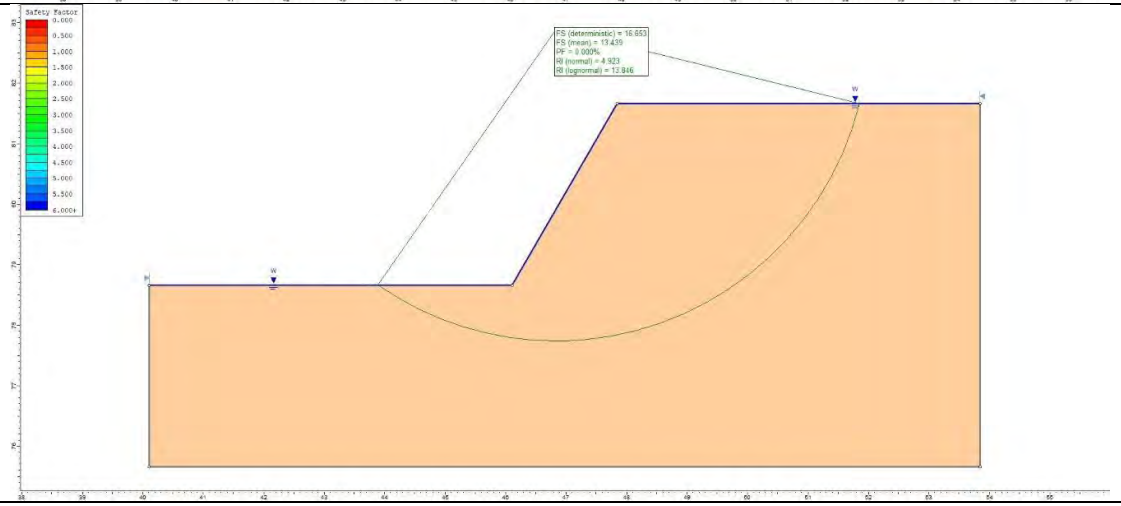
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|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
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| | Statik |  | 1,46 |

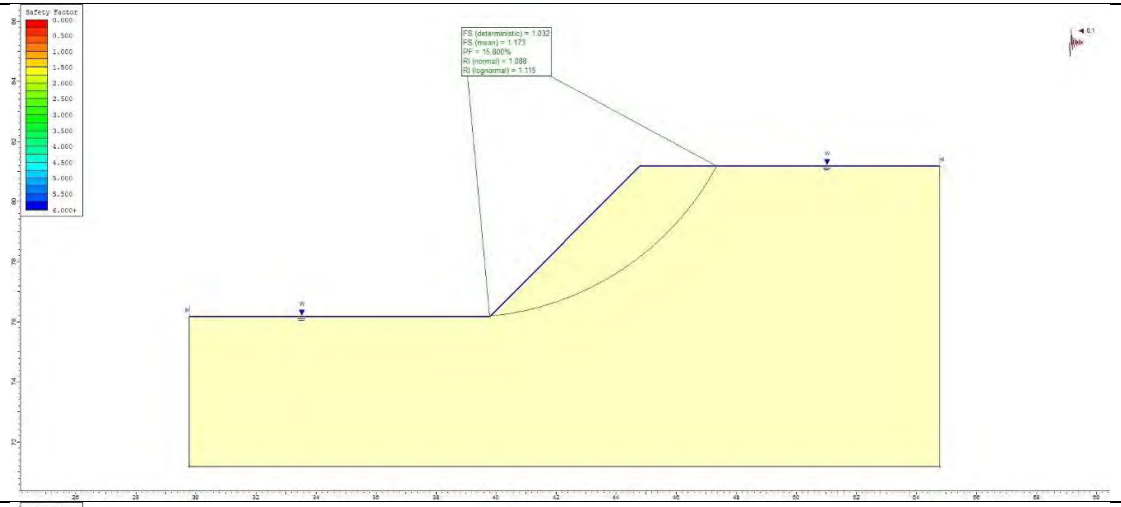
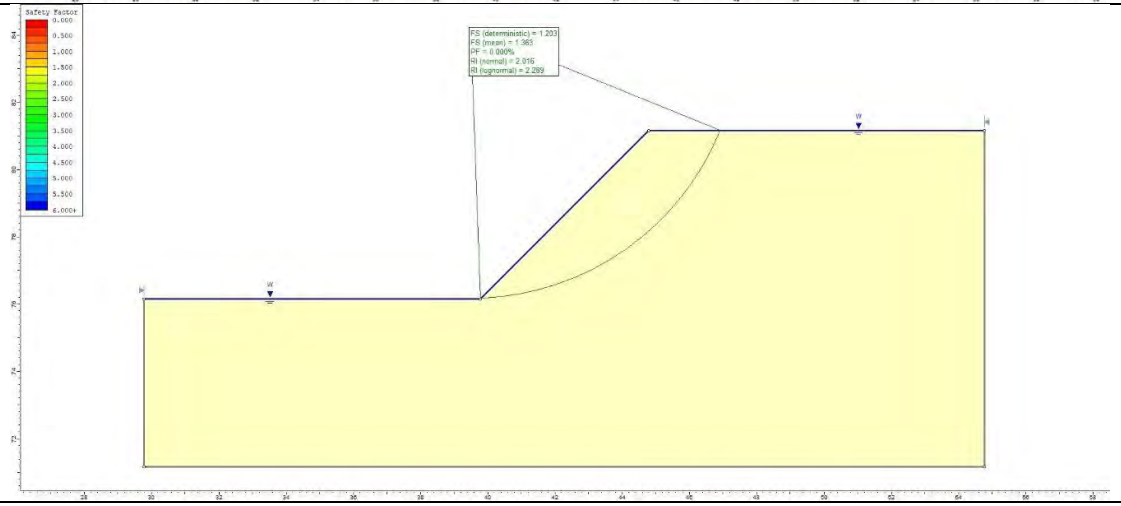
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| | Statik |  | 6,19 |

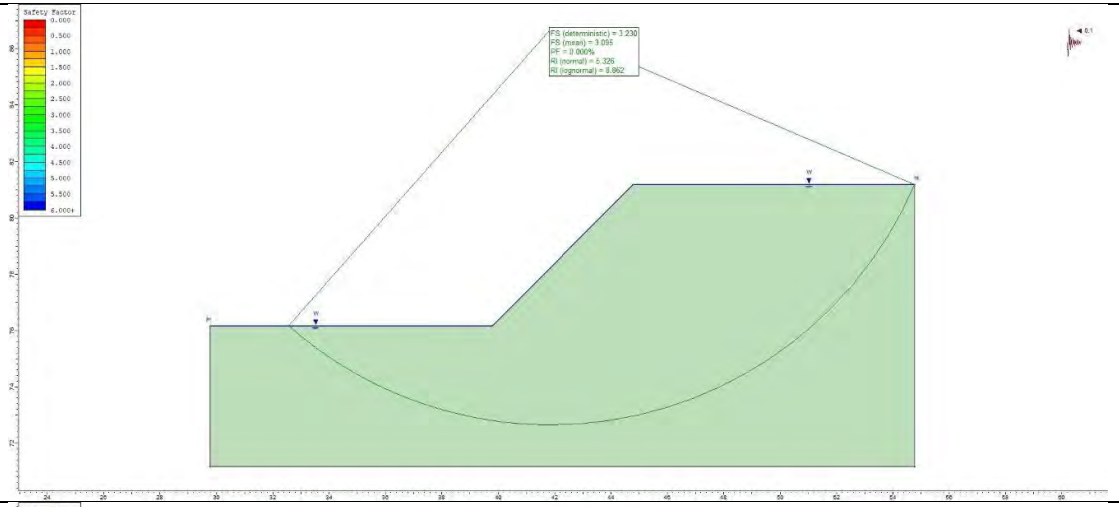
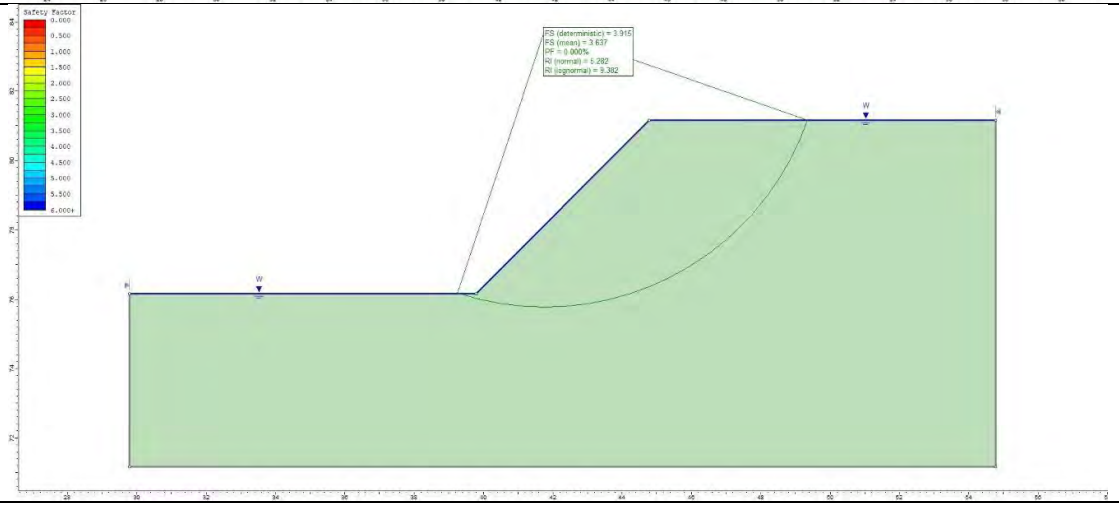
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| | Statik |  | 16,76 |

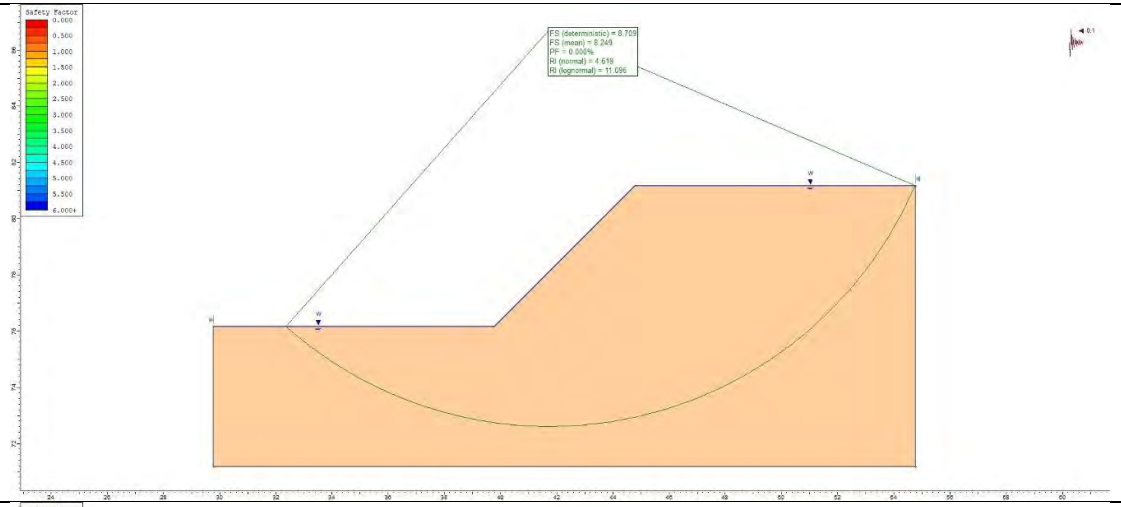
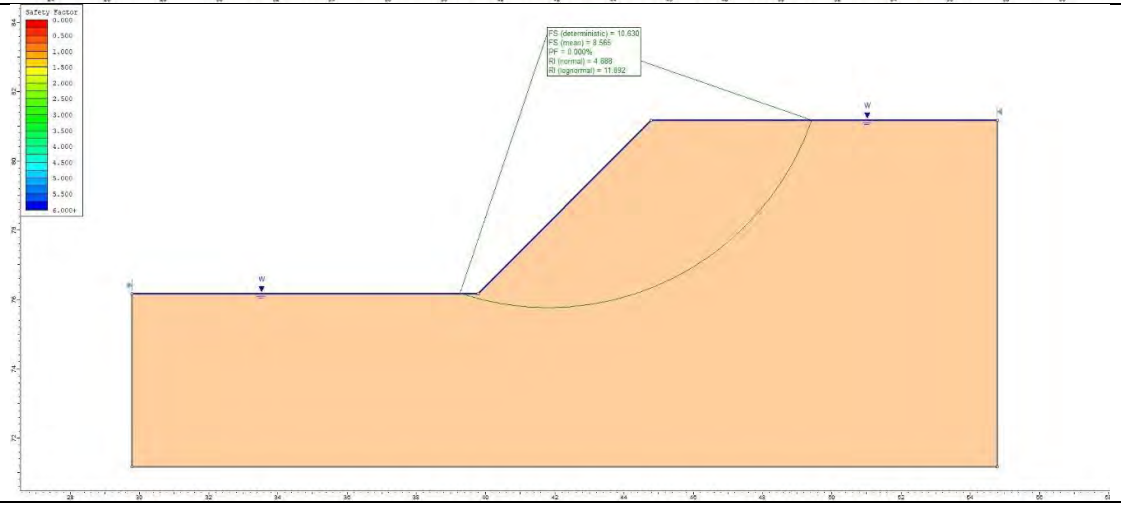
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| | Statik |  | 1,35 |

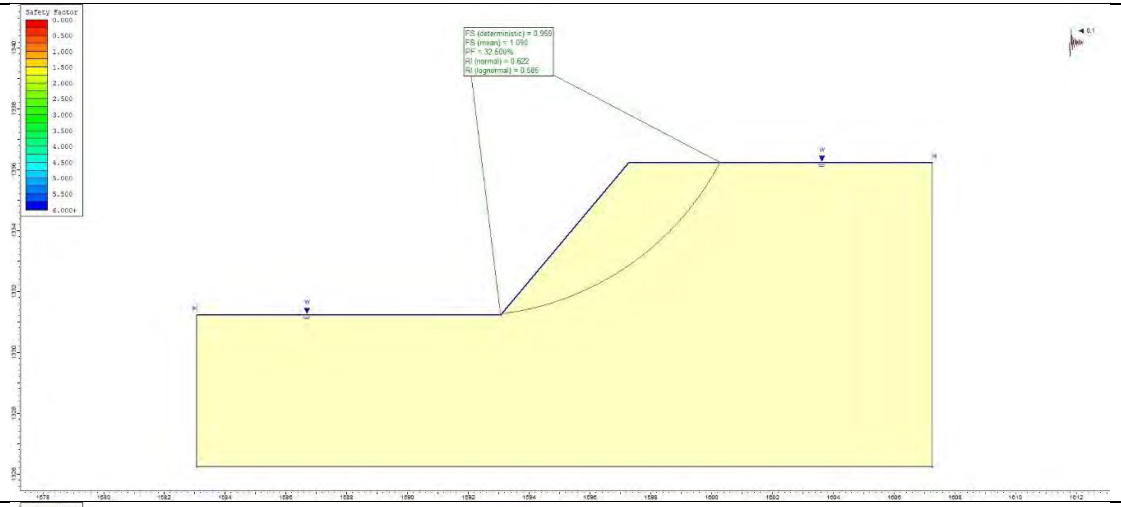
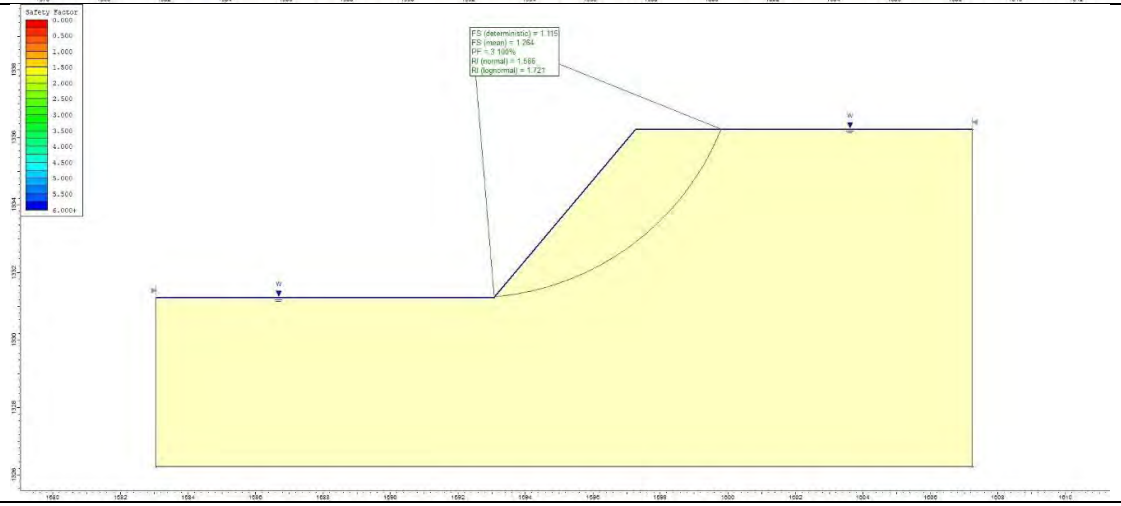
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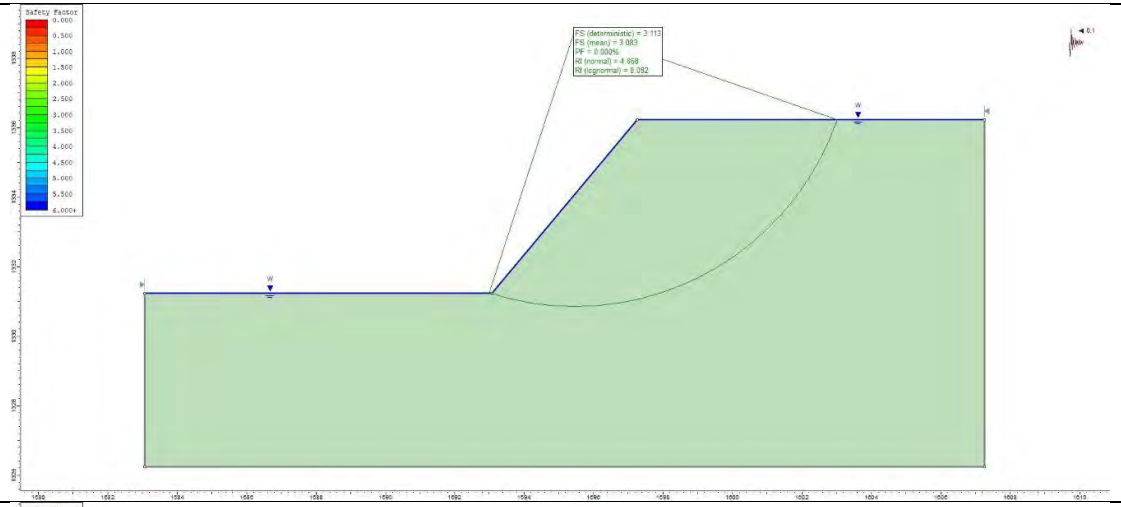
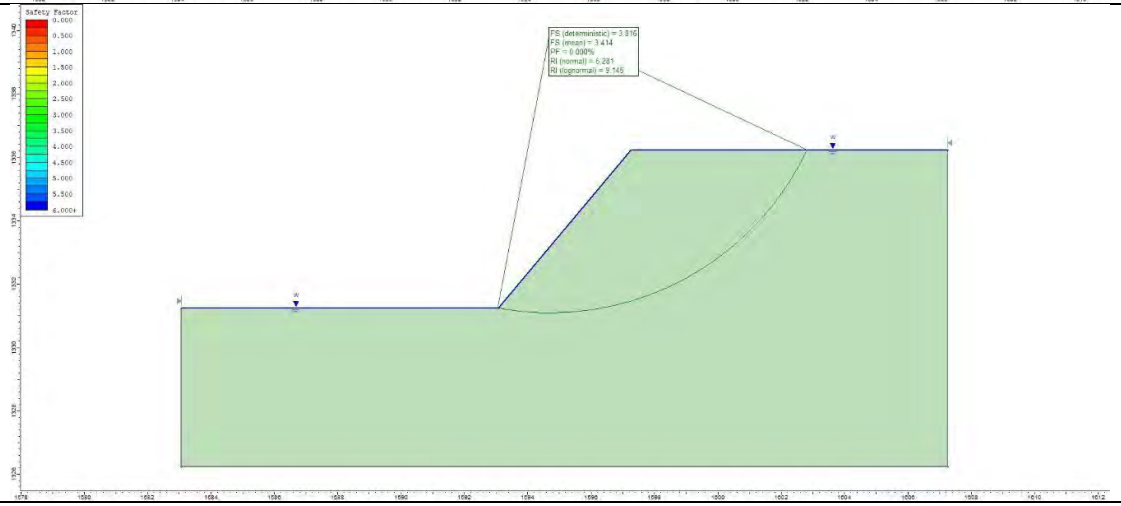
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|---|---|---|---|
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| | Statik |  | 16,65 |

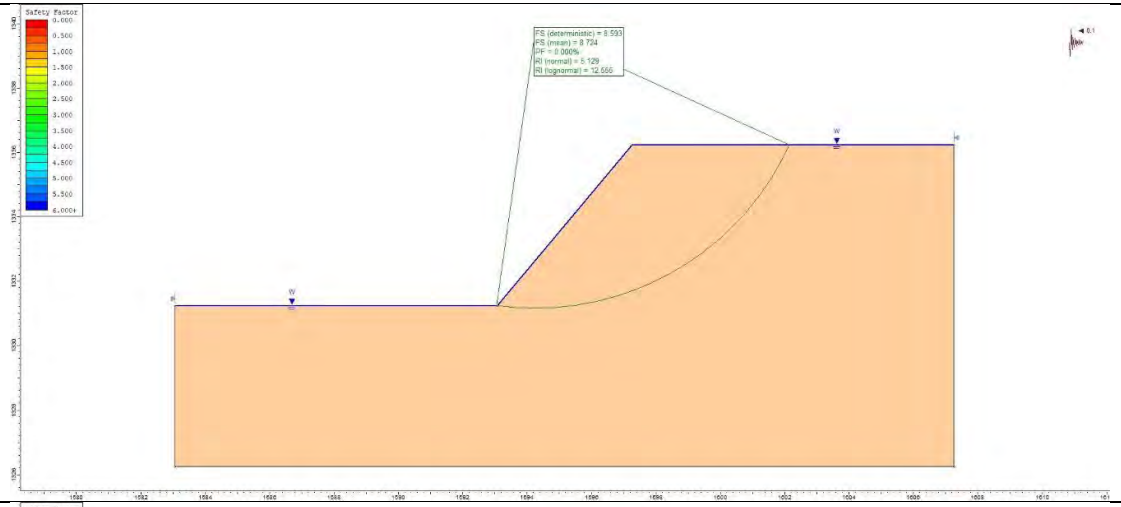
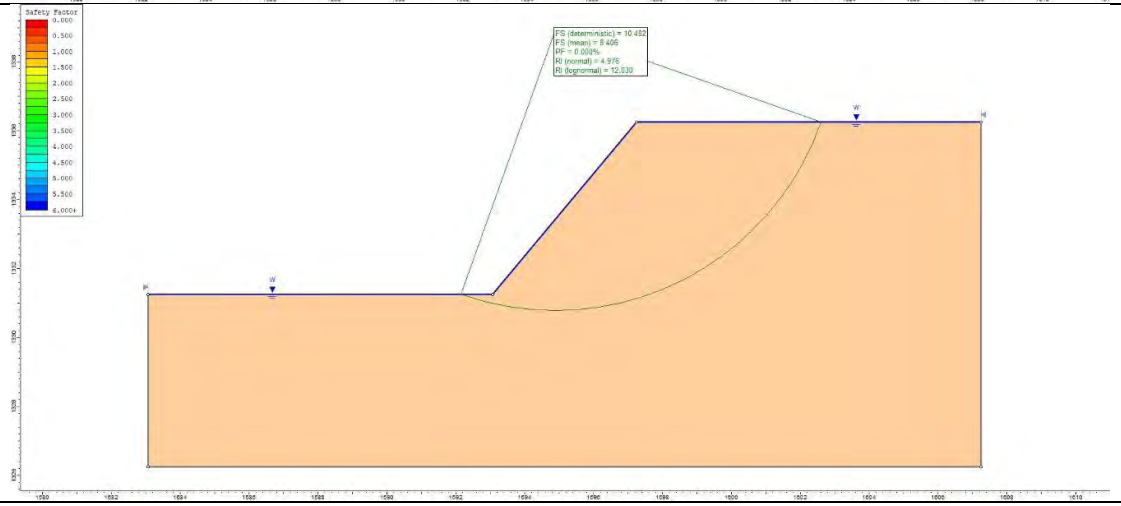
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|---|---|---|---|
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| | Statik |  | 1,20 |

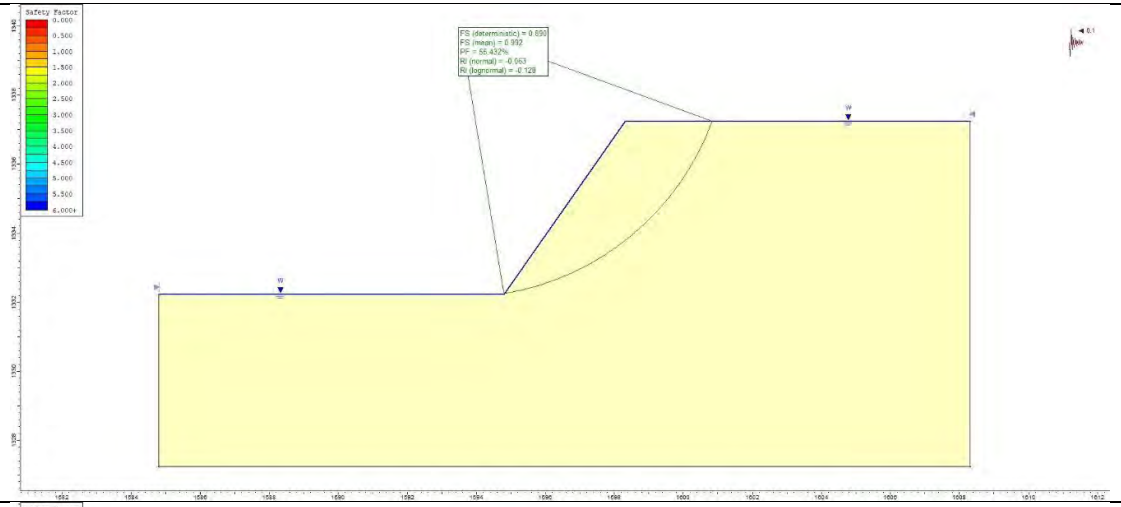
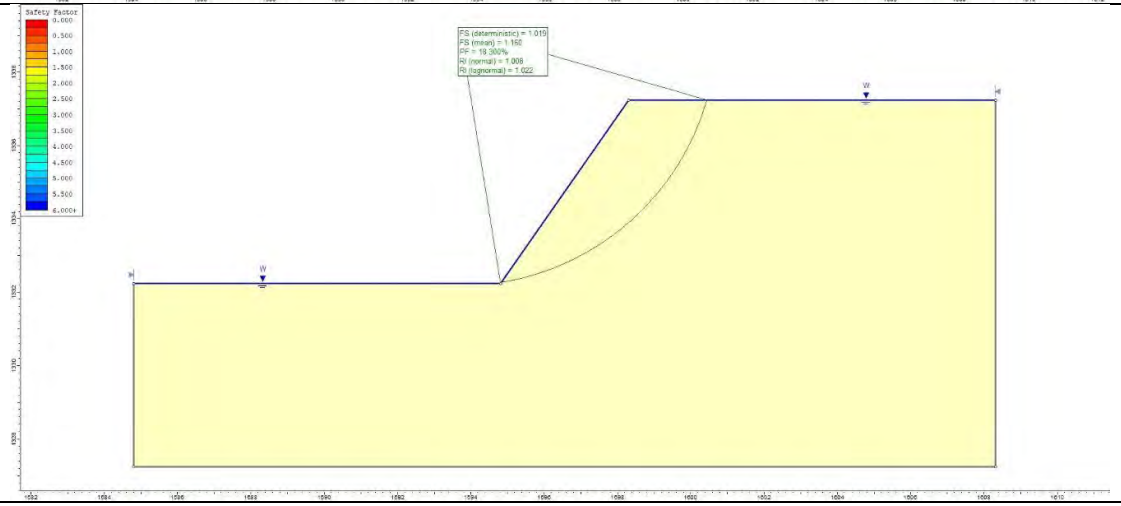
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| | Statik |  | 3,91 |

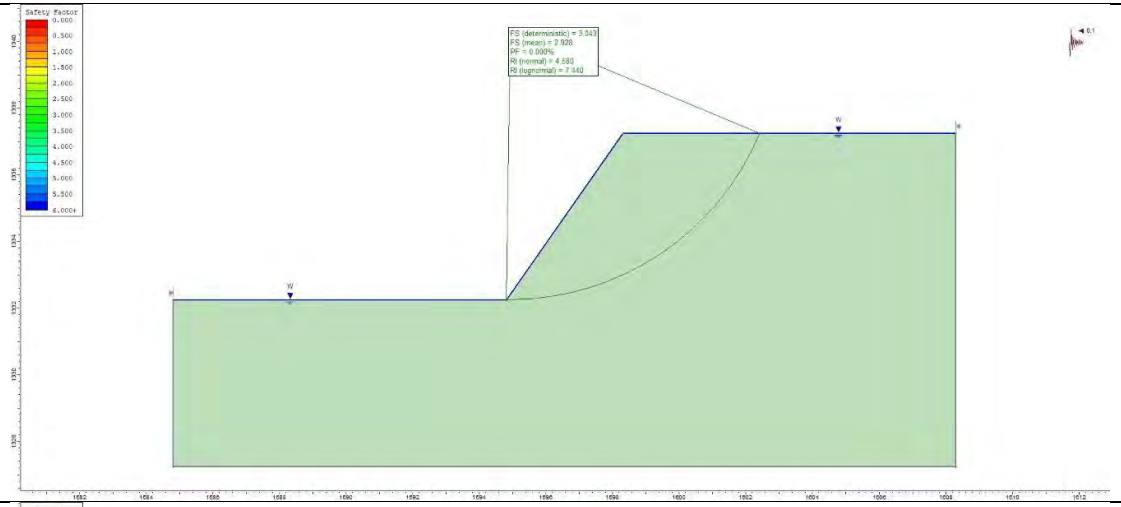
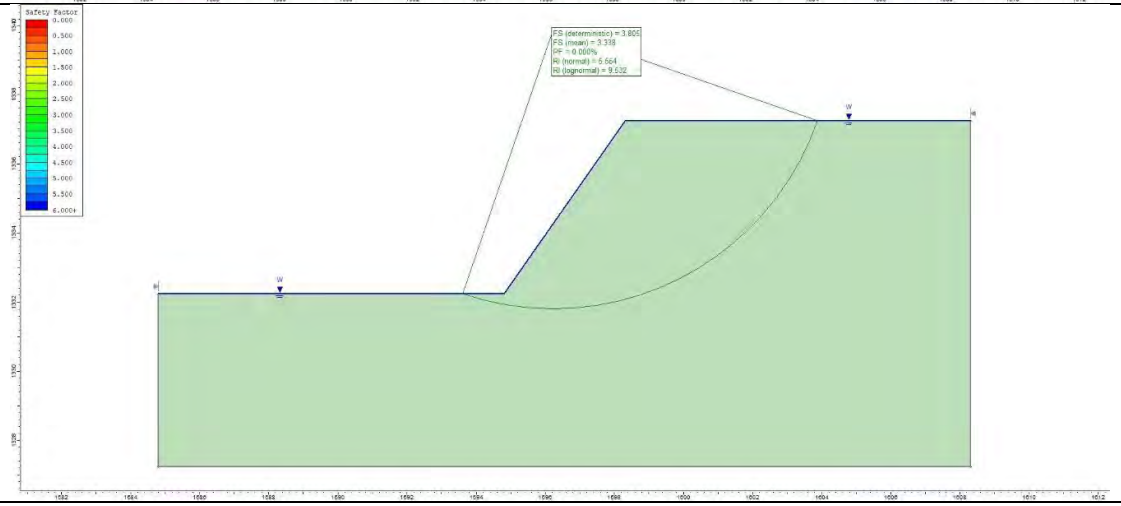
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| | Statik |  | 10,63 |

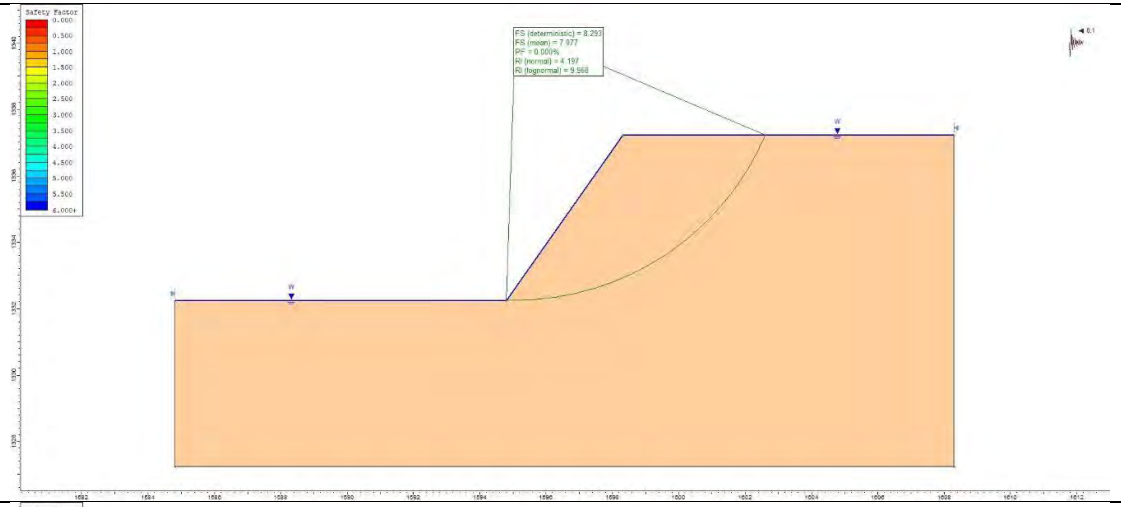
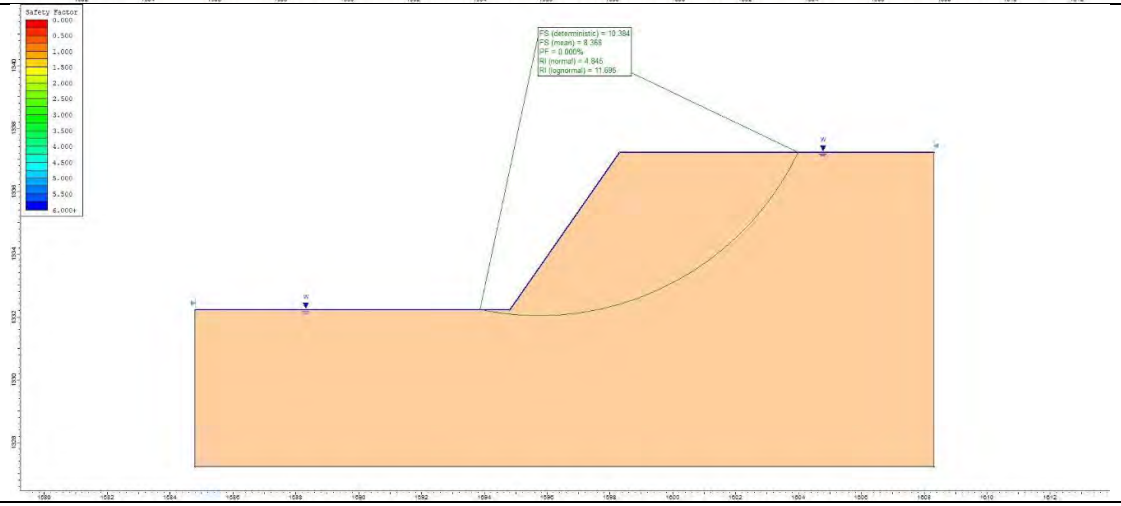
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|---|---|---|---|
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| | Statik |  | 1,11 |

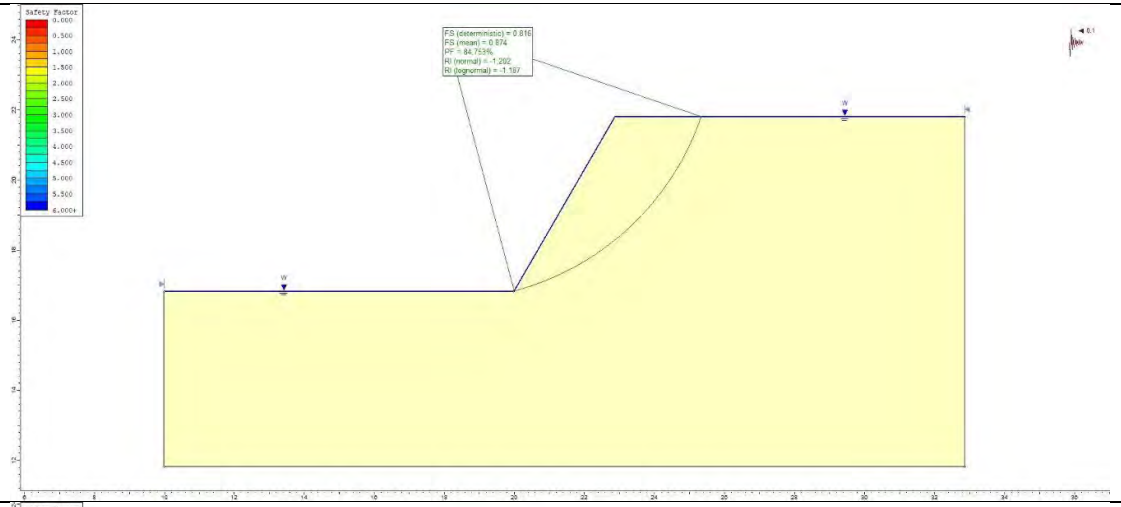
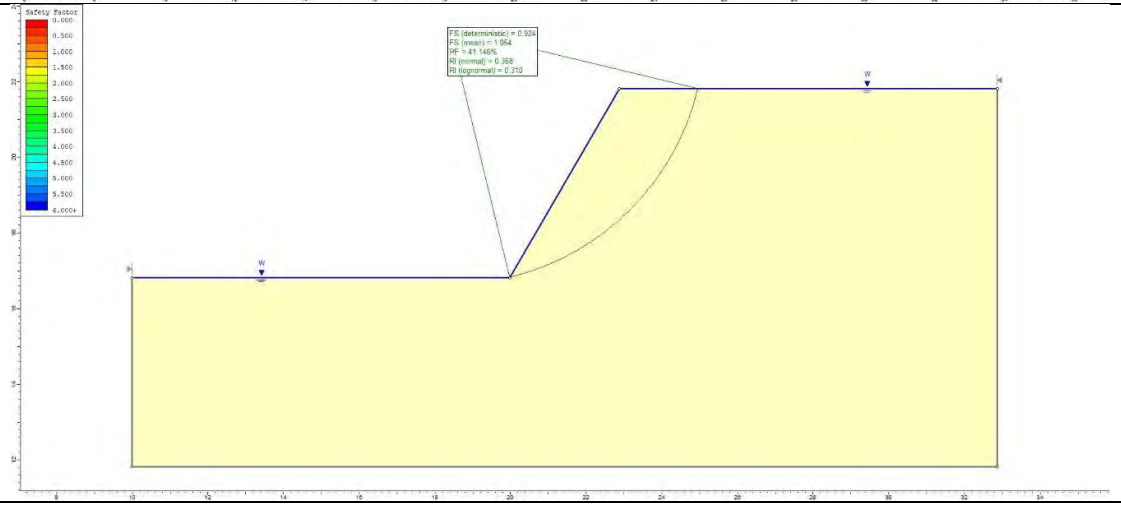
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| H=5<br>S=50 | Dinamik |  | 3,11 |
| | Statik |  | 3,82 |

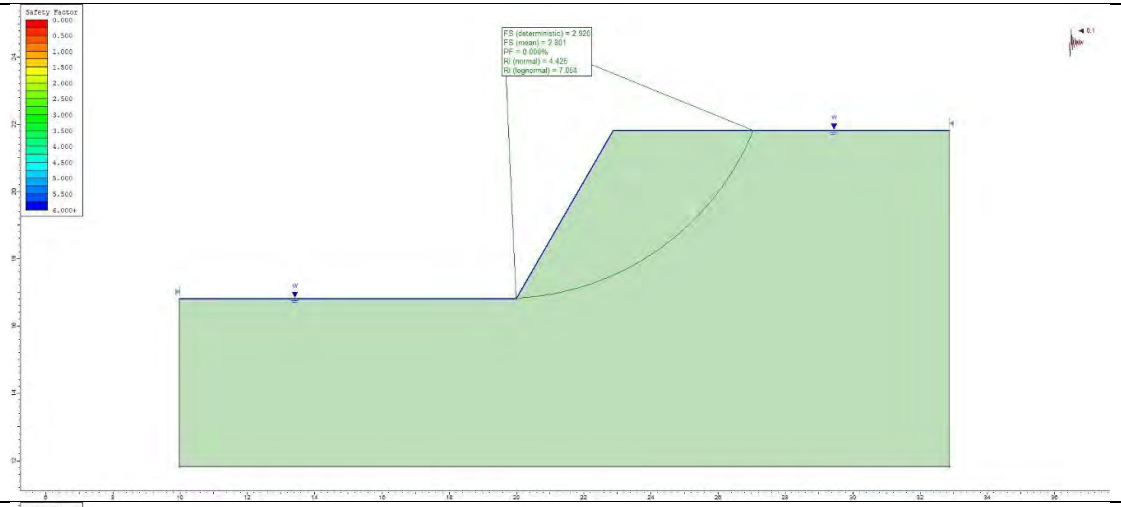
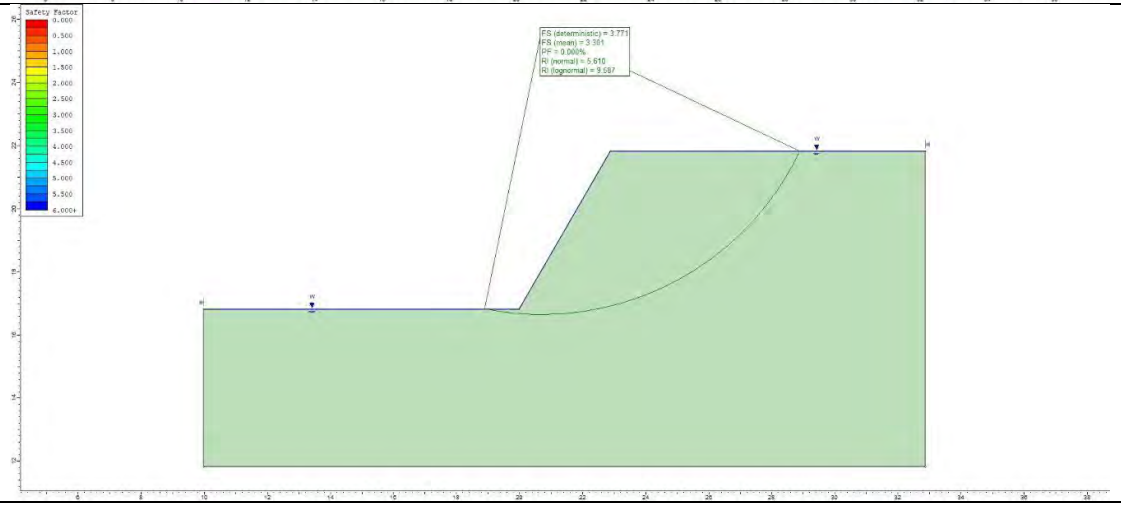
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|---|---|---|---|
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| | Statik |  | 10,48 |

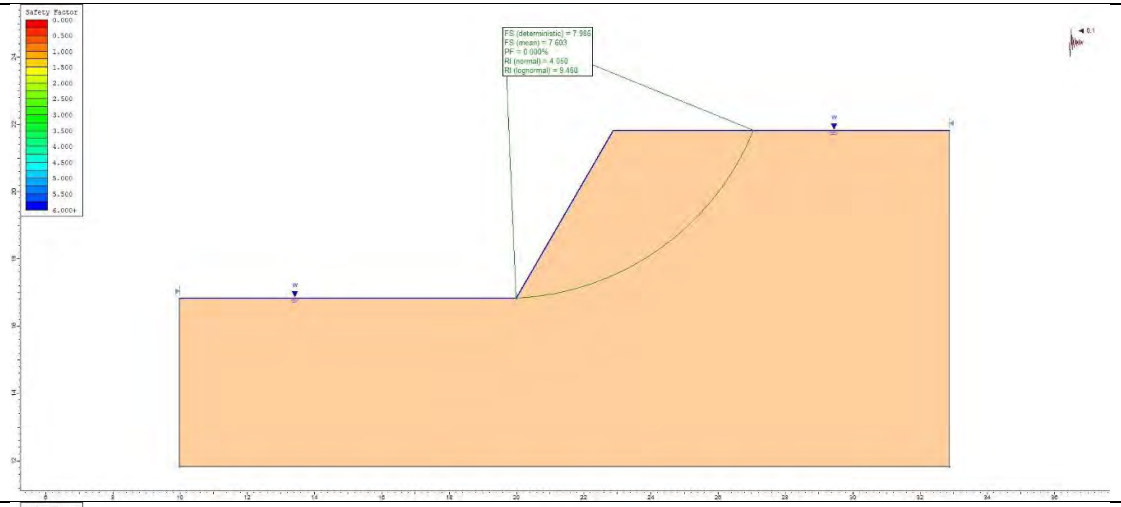
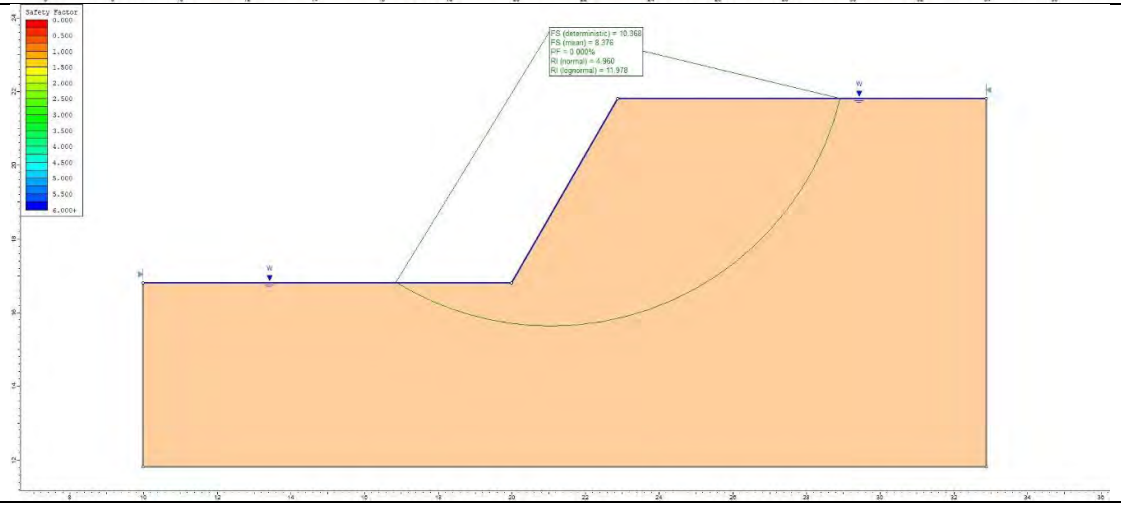
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|---|---|---|---|
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| H=5<br>S=55 | Dinamik |  | 0,89 |
| | Statik |  | 1,02 |

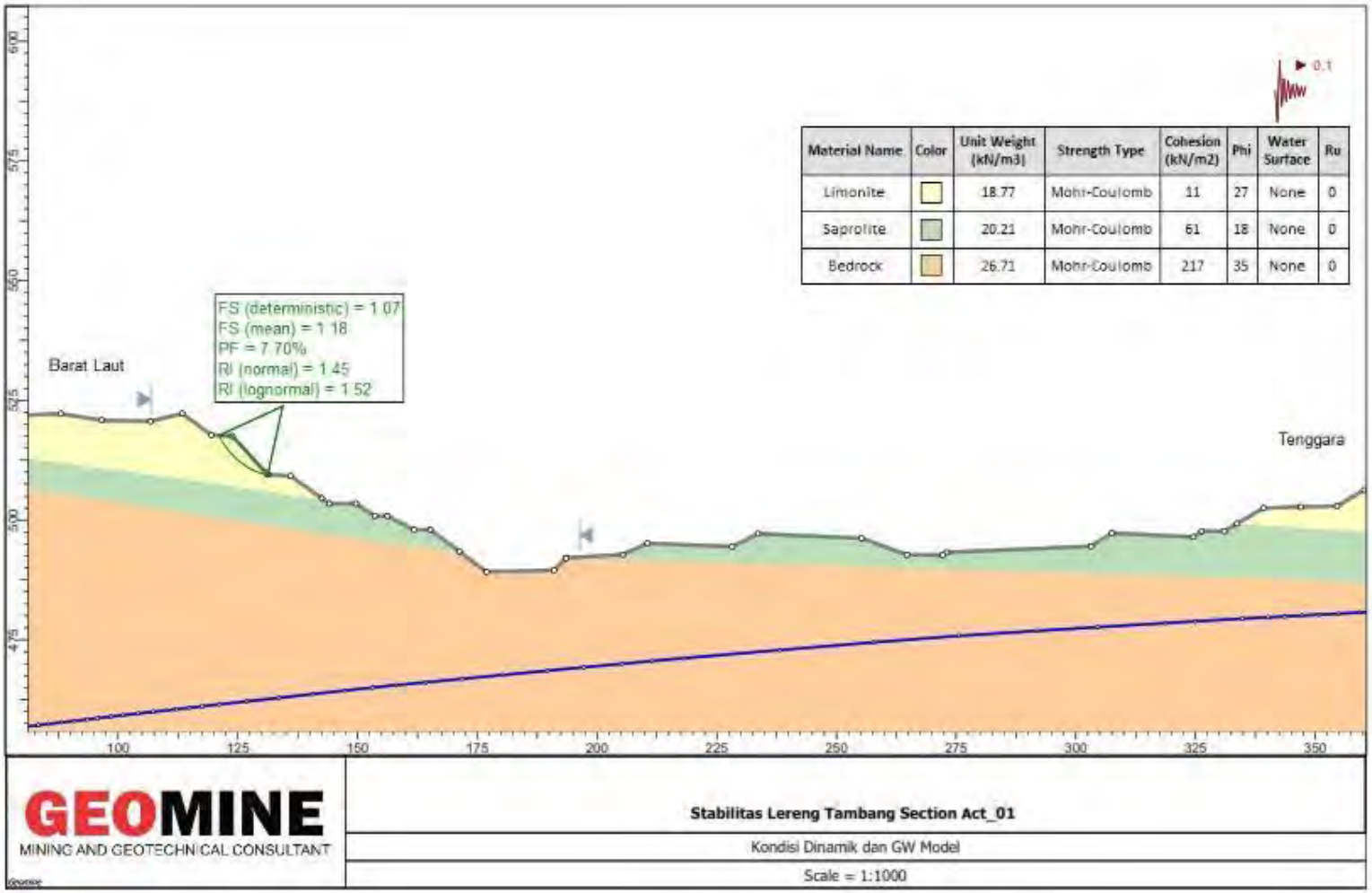
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=55 | Dinamik |  | 3,04 |
| | Statik |  | 3,80 |

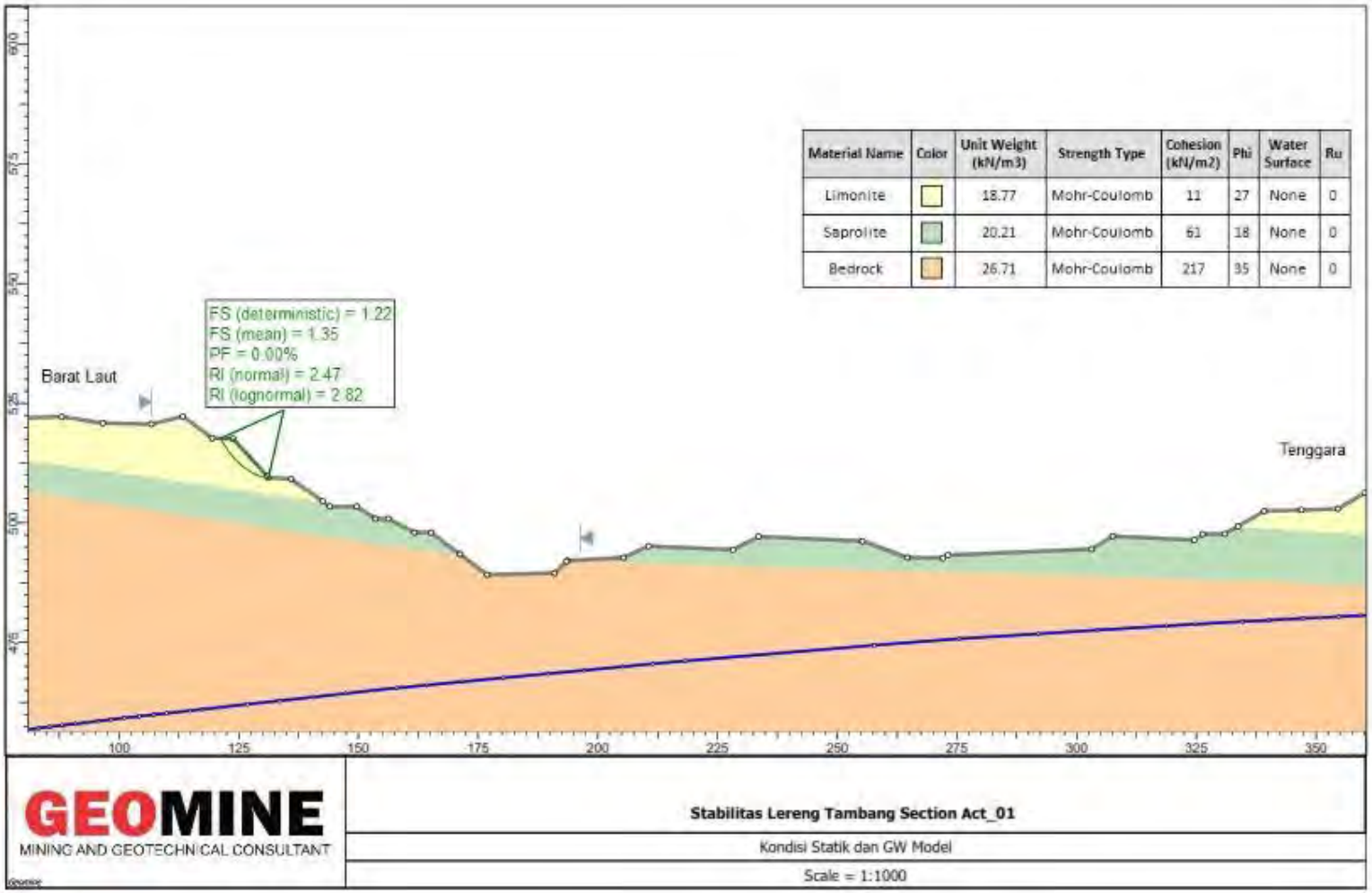
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=55 | Dinamik |  | 8,29 |
| | Statik |  | 10,38 |

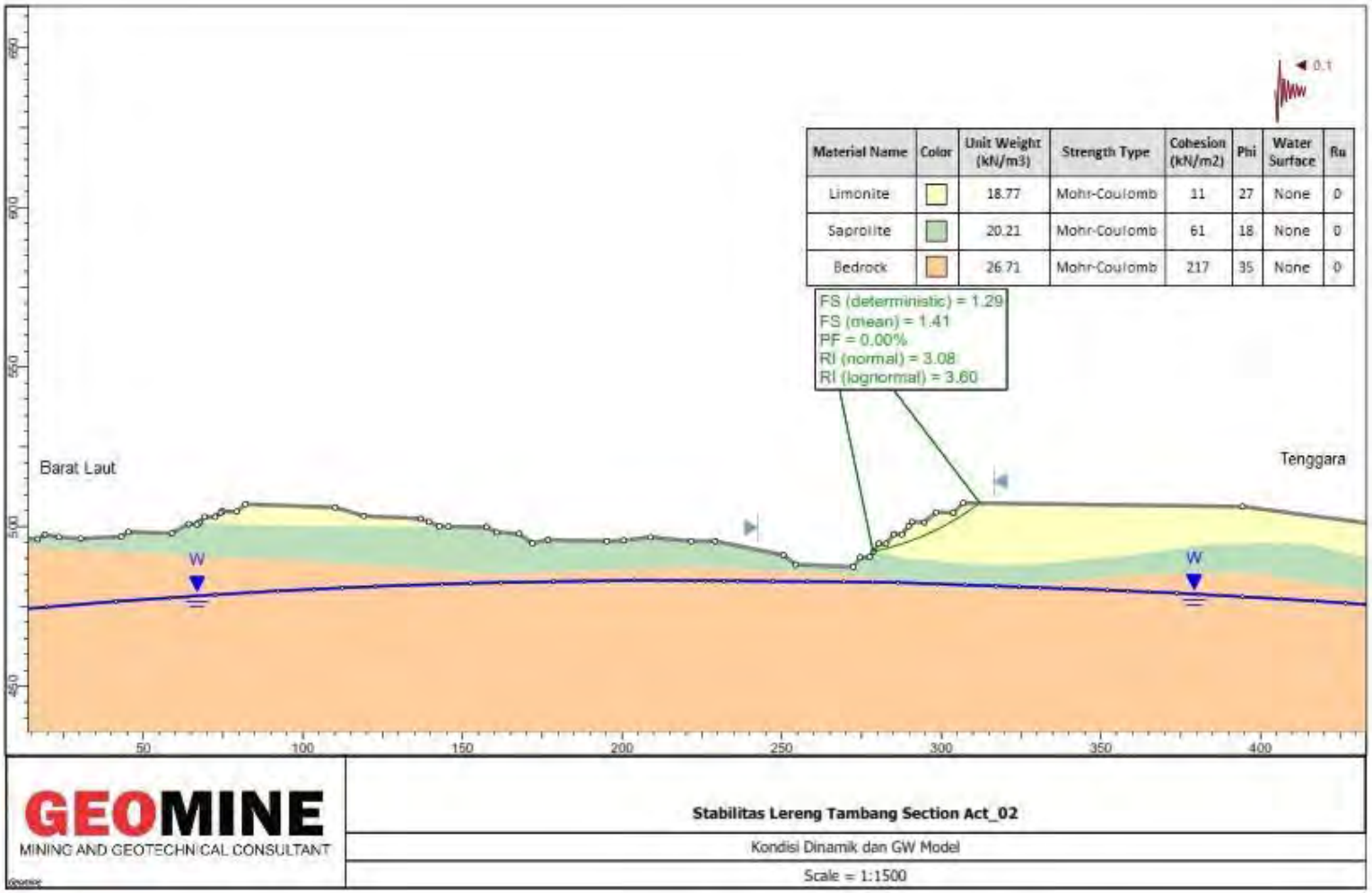
| Limonite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=60 | Dinamik |  | 0,82 |
| | Statik |  | 0,92 |

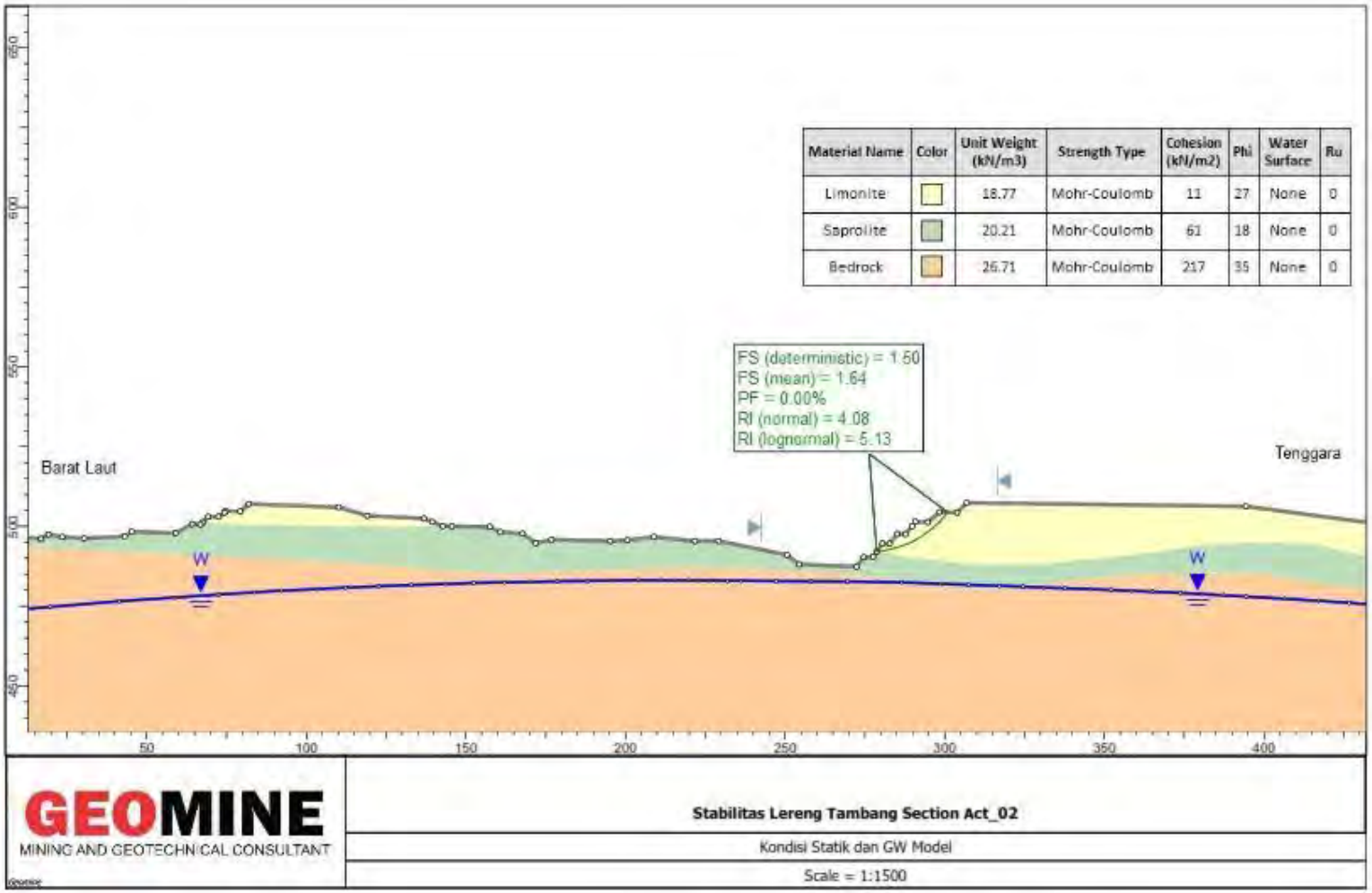
| Saprolite | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=60 | Dinamik |  | 2,92 |
| | Statik |  | 3,77 |

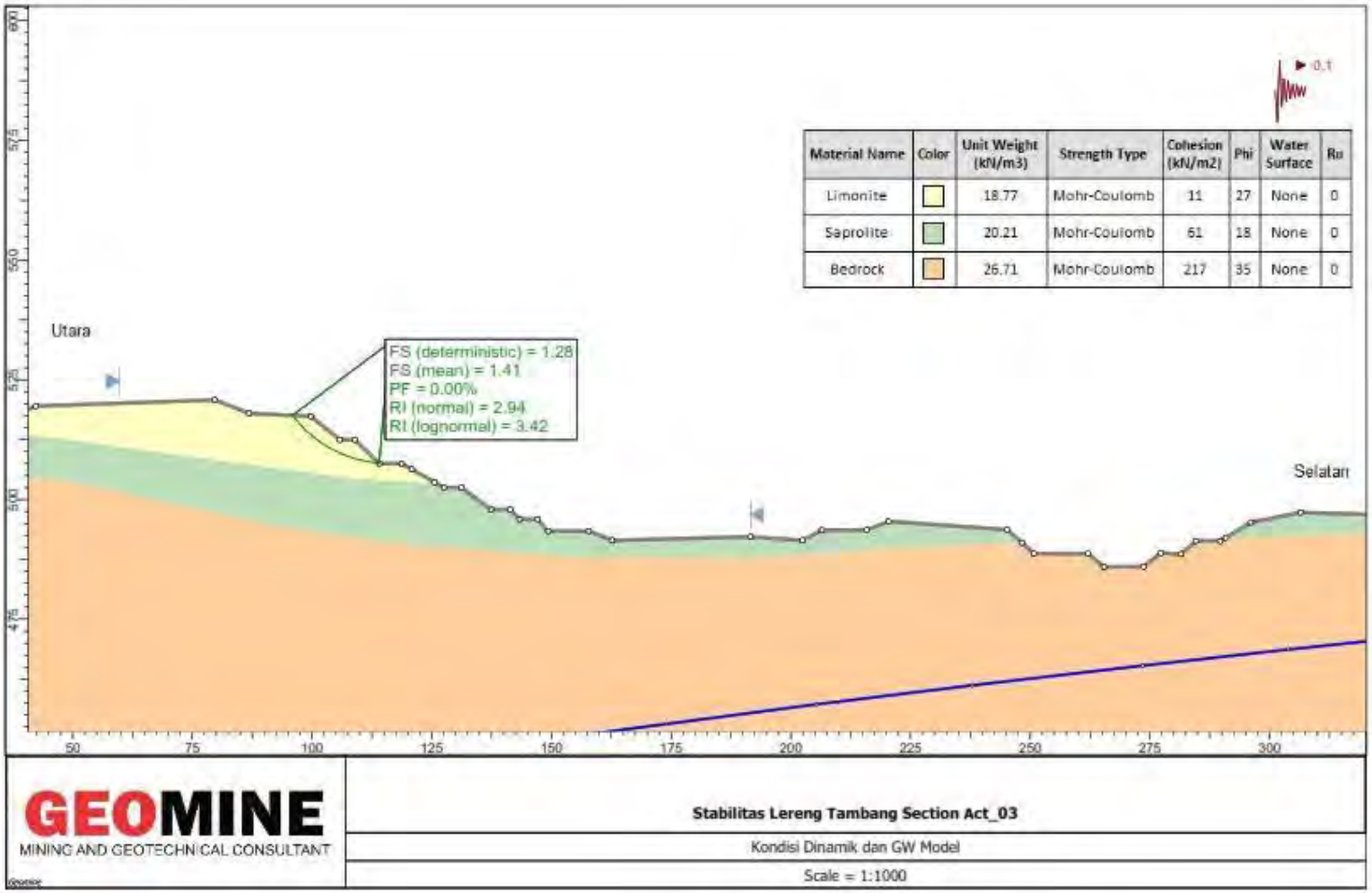
| Bedrock | | | |
|---|---|---|---|
| Lereng | Kondisi | Gambar | FK |
| H=5<br>S=60 | Dinamik |  | 7,99 |
| | Statik |  | 10,37 |

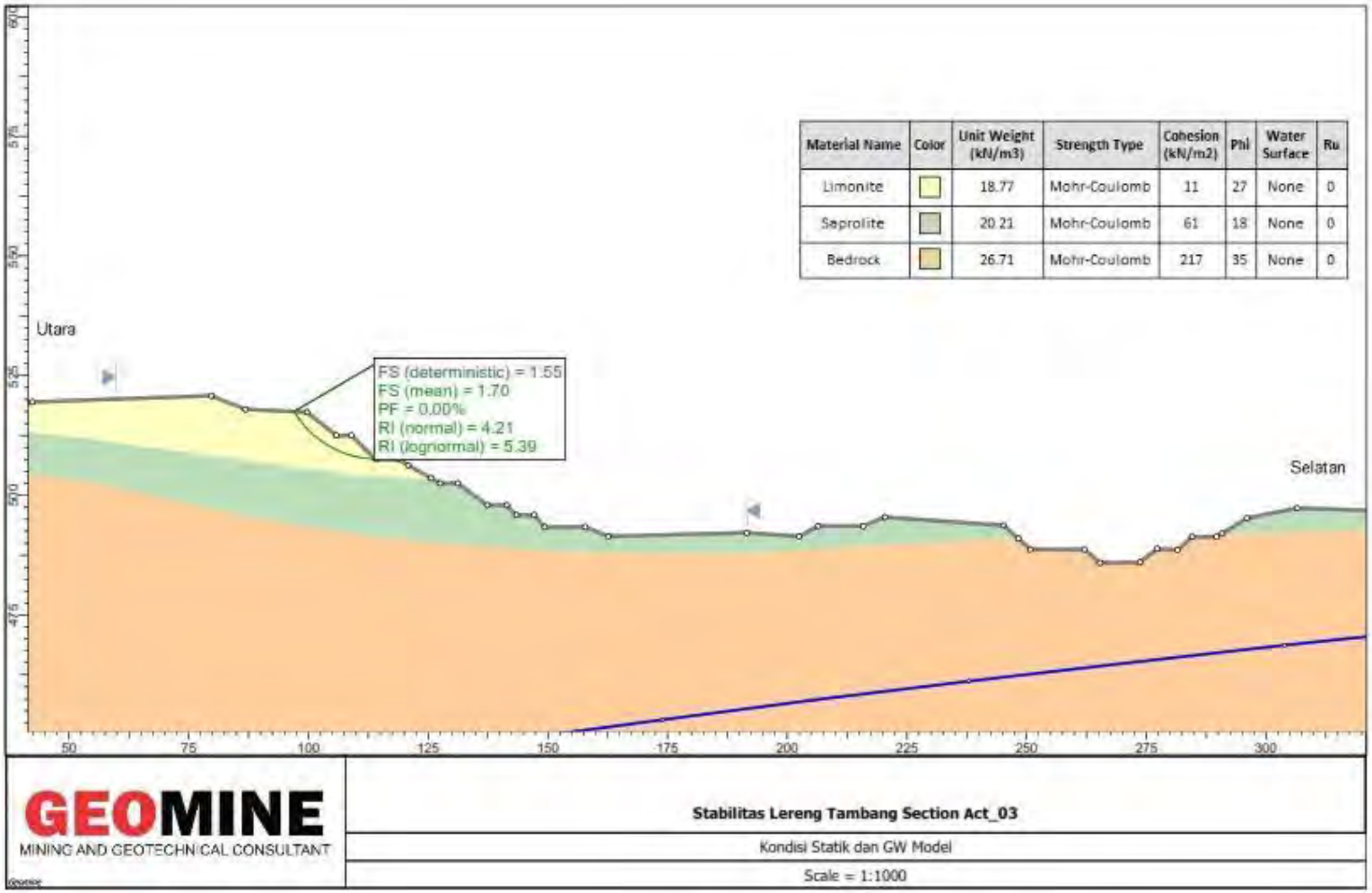

0.1
Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.07
FS (mean) = 1.18
PF = 7.70%
RI (normal) = 1.45
RI (lognormal) = 1.52
Barat Laut
Tenggara
600
575
550
525
500
475
100
125
150
175
200
225
250
275
300
325
350
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section Act_01
Kondisi Dinamik dan GW Model
Scale = 1:1000

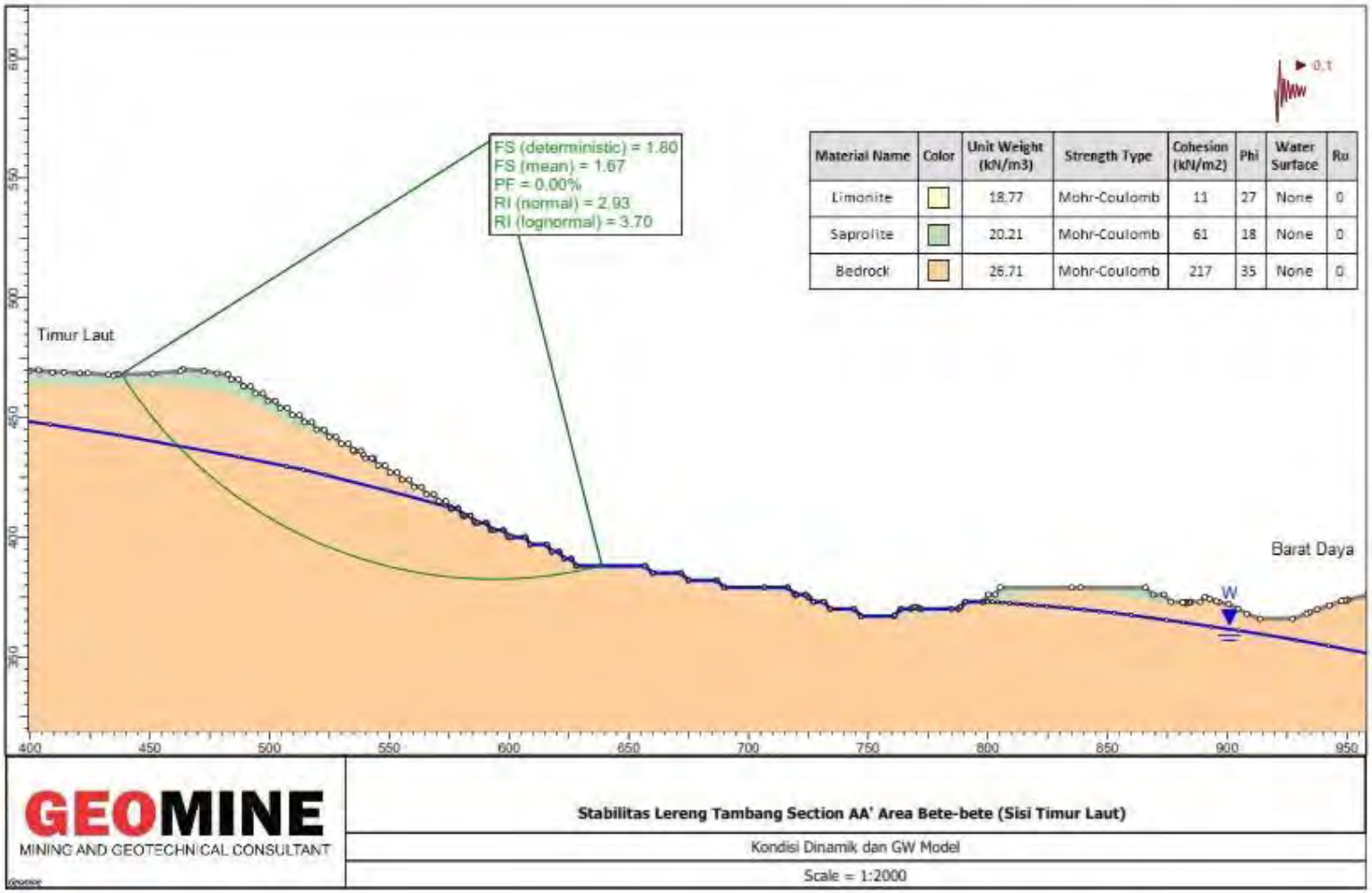

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.22
FS (mean) = 1.35
PF = 0.00%
RI (normal) = 2.47
RI (lognormal) = 2.82
Barat Laut
Tenggara
600
575
550
525
500
475
100
125
150
175
200
225
250
275
300
325
350
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section Act_01
Kondisi Statik dan GW Model
Scale = 1:1000


0.1
Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.29
FS (mean) = 1.41
PF = 0.00%
RI (normal) = 3.08
RI (lognormal) = 3.60
Barat Laut
Tenggara
W
W
650
600
550
500
450
50
100
150
200
250
300
350
400
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section Act_02
Kondisi Dinamik dan GW Model
Scale = 1:1500

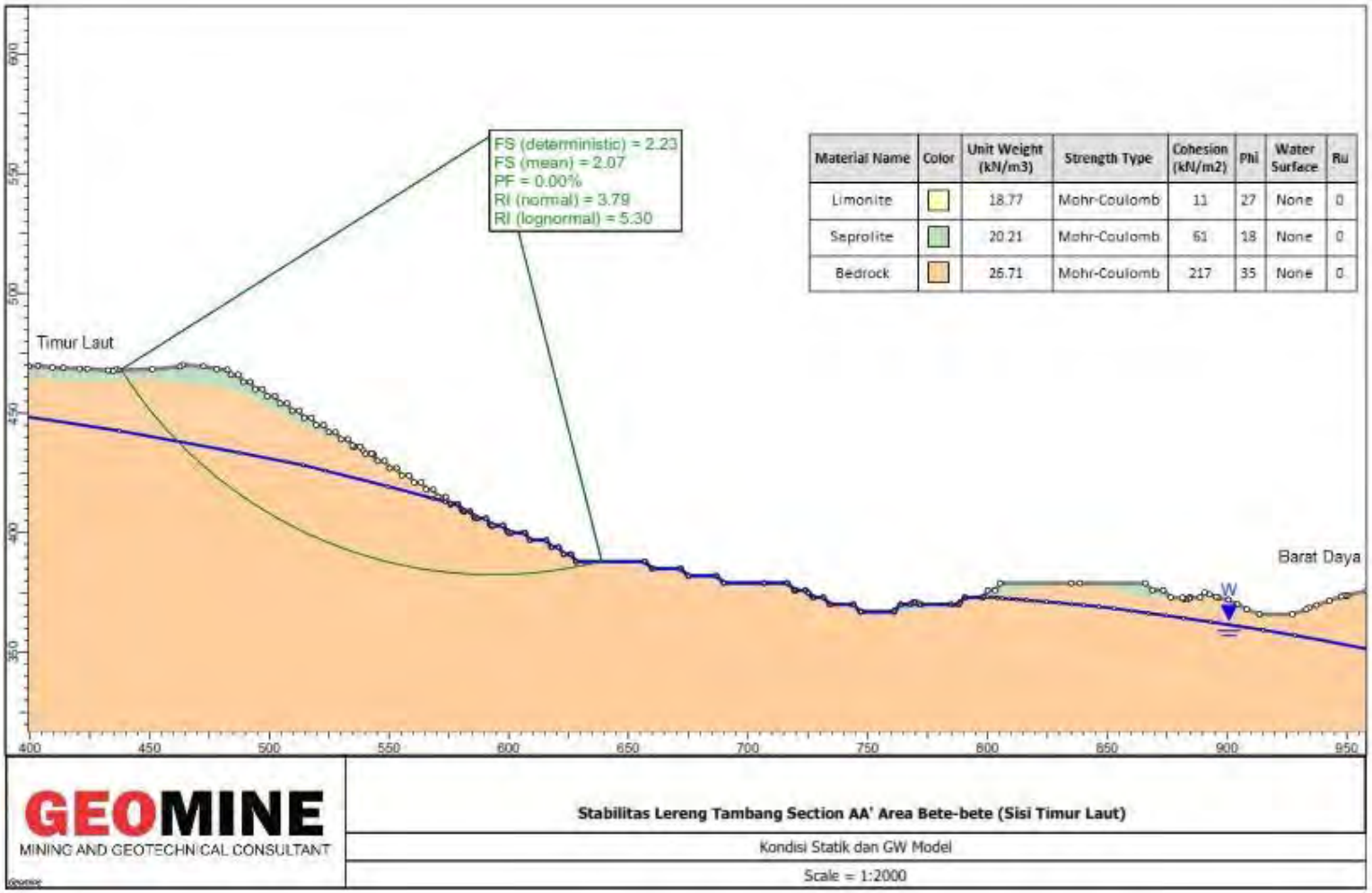

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.50
FS (mean) = 1.64
PF = 0.00%
RI (normal) = 4.08
RI (lognormal) = 5.13
Barat Laut
Tenggara
W
W
650
600
550
500
450
50
100
150
200
250
300
350
400
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section Act_02
Kondisi Statik dan GW Model
Scale = 1:1500


0.1
Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Utara
FS (deterministic) = 1.28
FS (mean) = 1.41
PF = 0.00%
RI (normal) = 2.94
RI (lognormal) = 3.42
Selatan
600
575
550
525
500
475
50
75
100
125
150
175
200
225
250
275
300
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section Act_03
Kondisi Dinamik dan GW Model
Scale = 1:1000


Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Utara
Selatan
FS (deterministic) = 1.55
FS (mean) = 1.70
PF = 0.00%
RI (normal) = 4.21
RI (lognormal) = 5.39
600
575
550
525
500
475
50
75
100
125
150
175
200
225
250
275
300
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section Act_03
Kondisi Statik dan GW Model
Scale = 1:1000




| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| Limonite | | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0 |
| Saprolite | | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0 |
| Bedrock | | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0 |



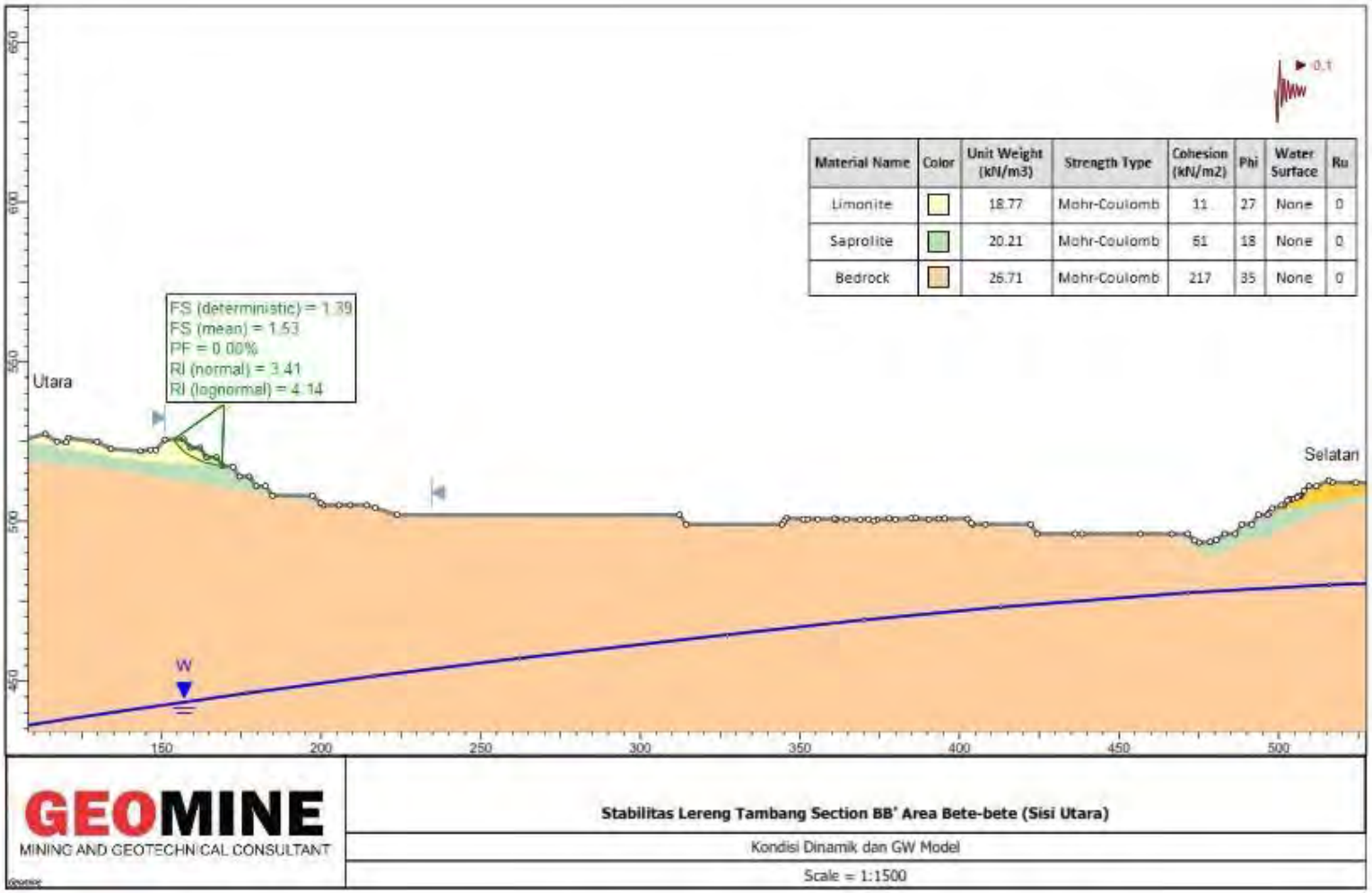

| Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru |
|---|---|---|---|---|---|---|---|
| Limonite | | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0 |
| Saprolite | | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0 |
| Bedrock | | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0 |

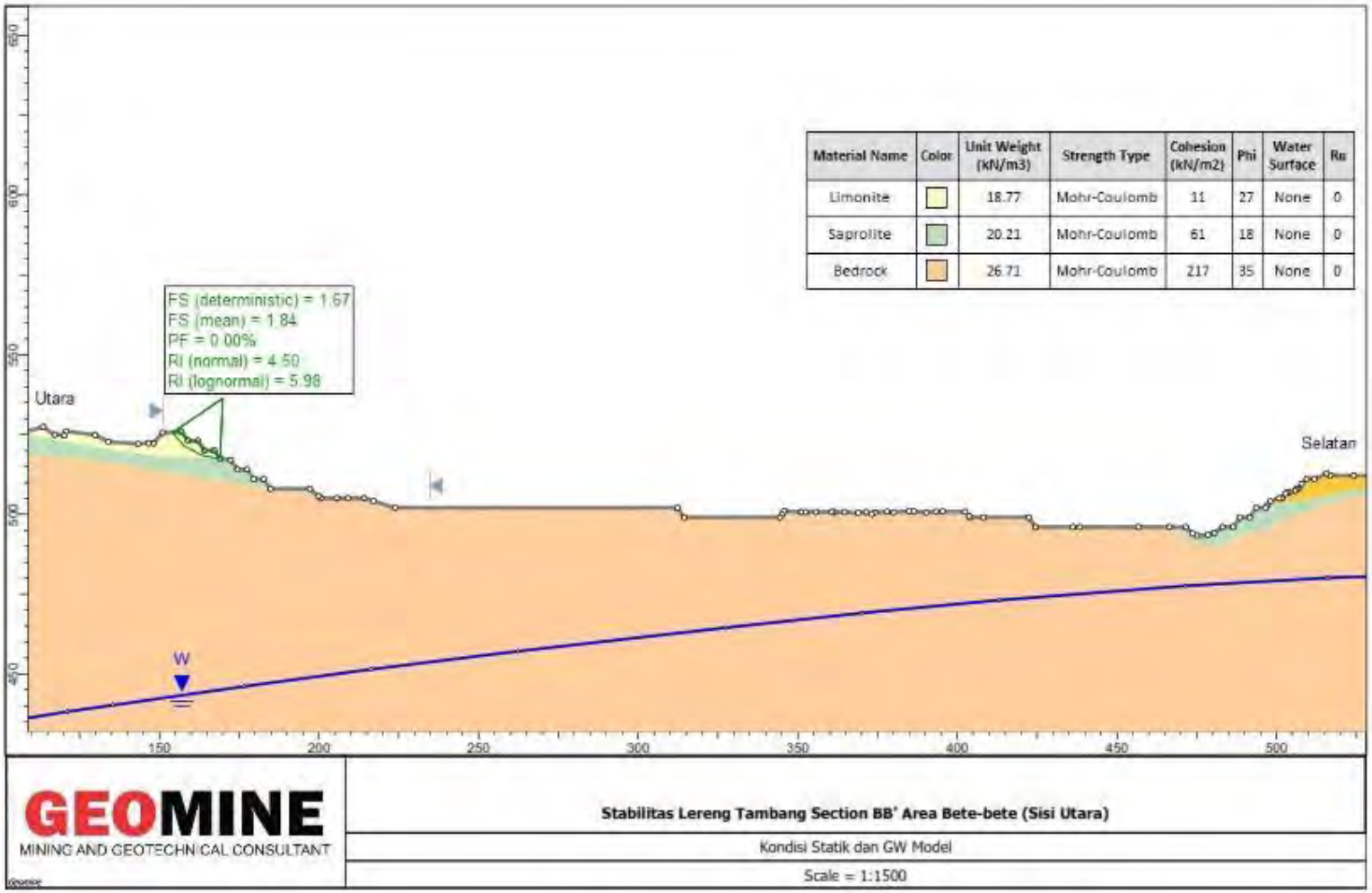
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT

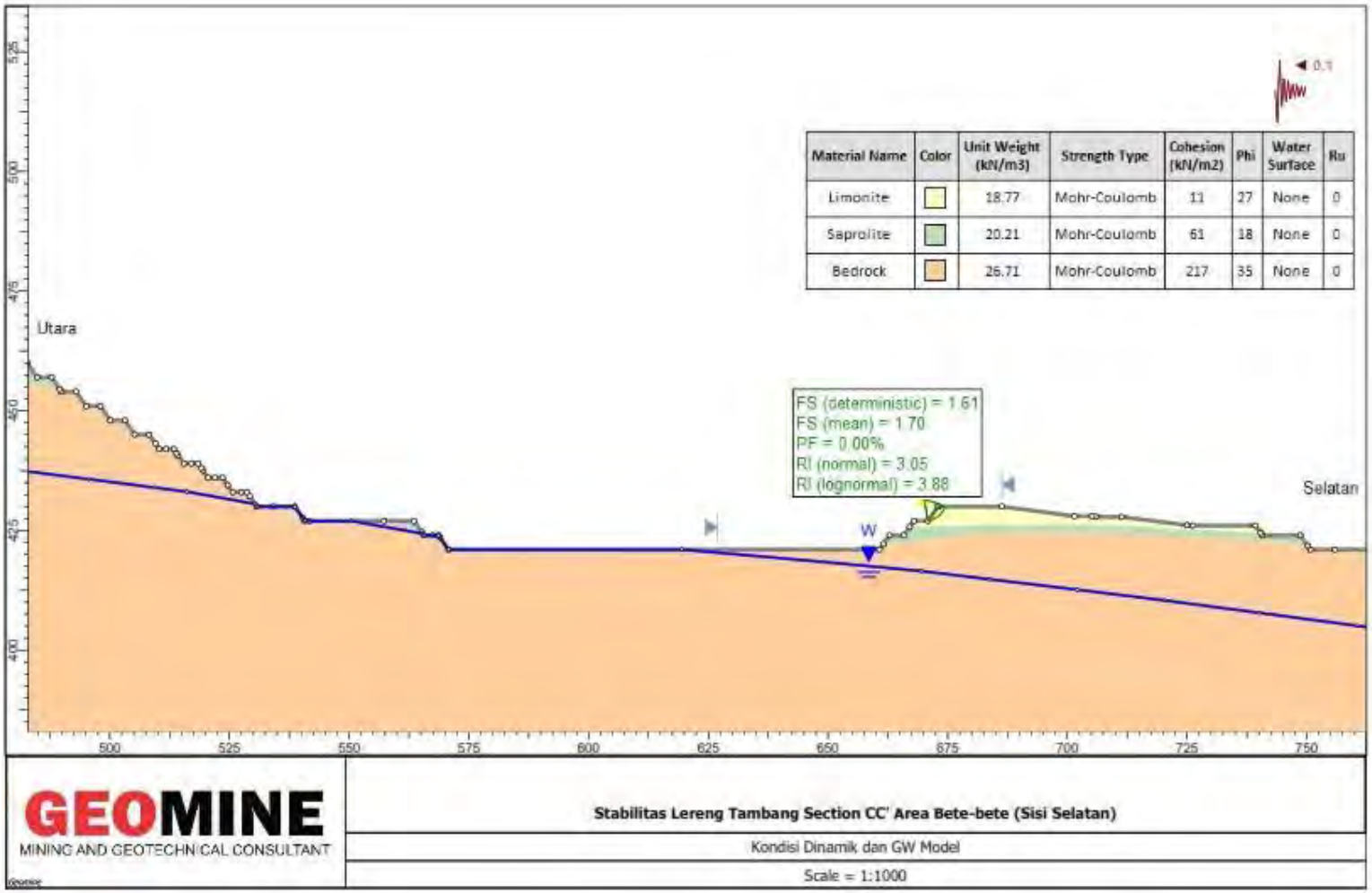
**Stabilitas Lereng Tambang Section AA' Area Bete-bete (Sisi Timur Laut)**

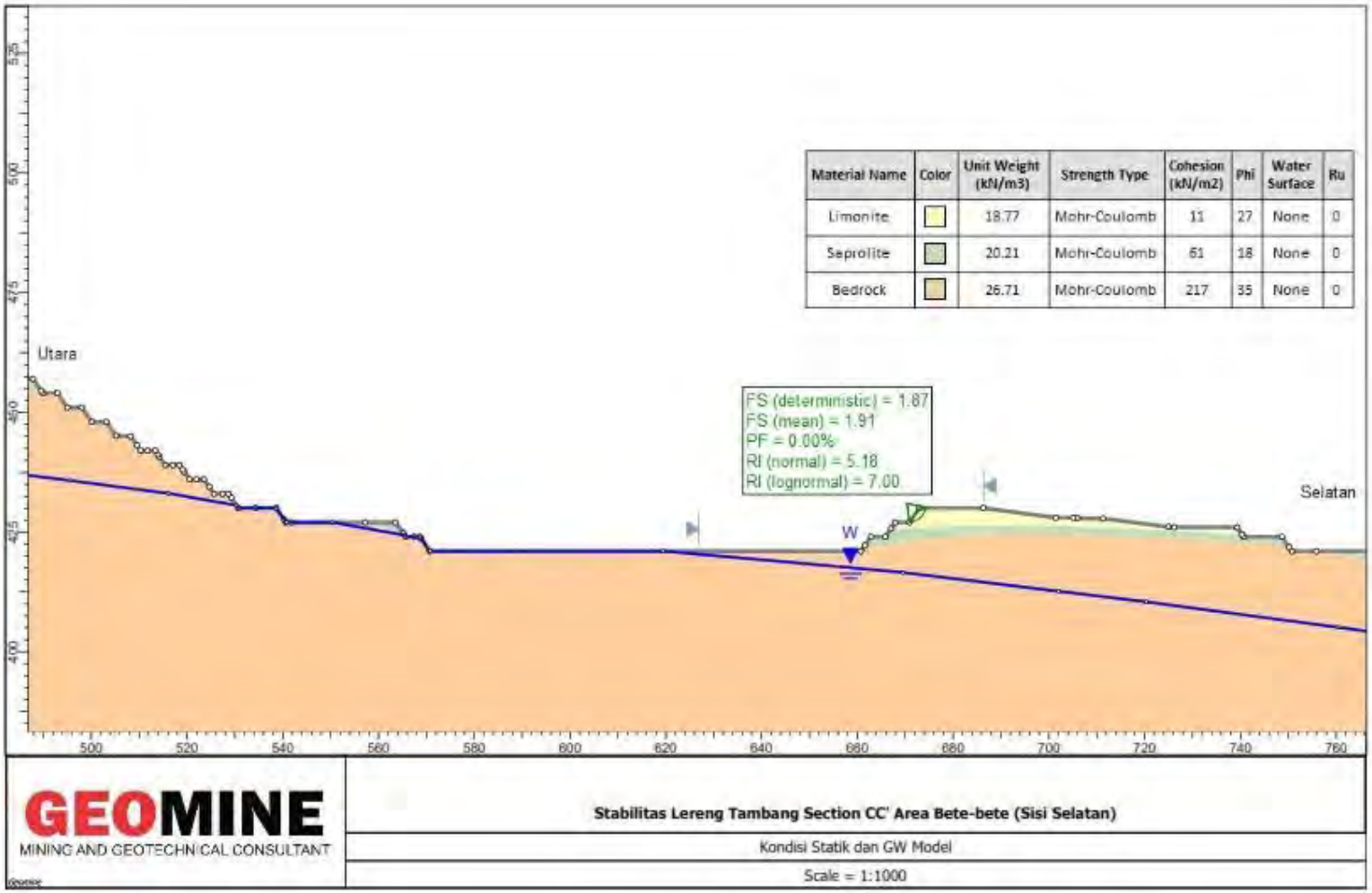
Kondisi Statik dan GW Model

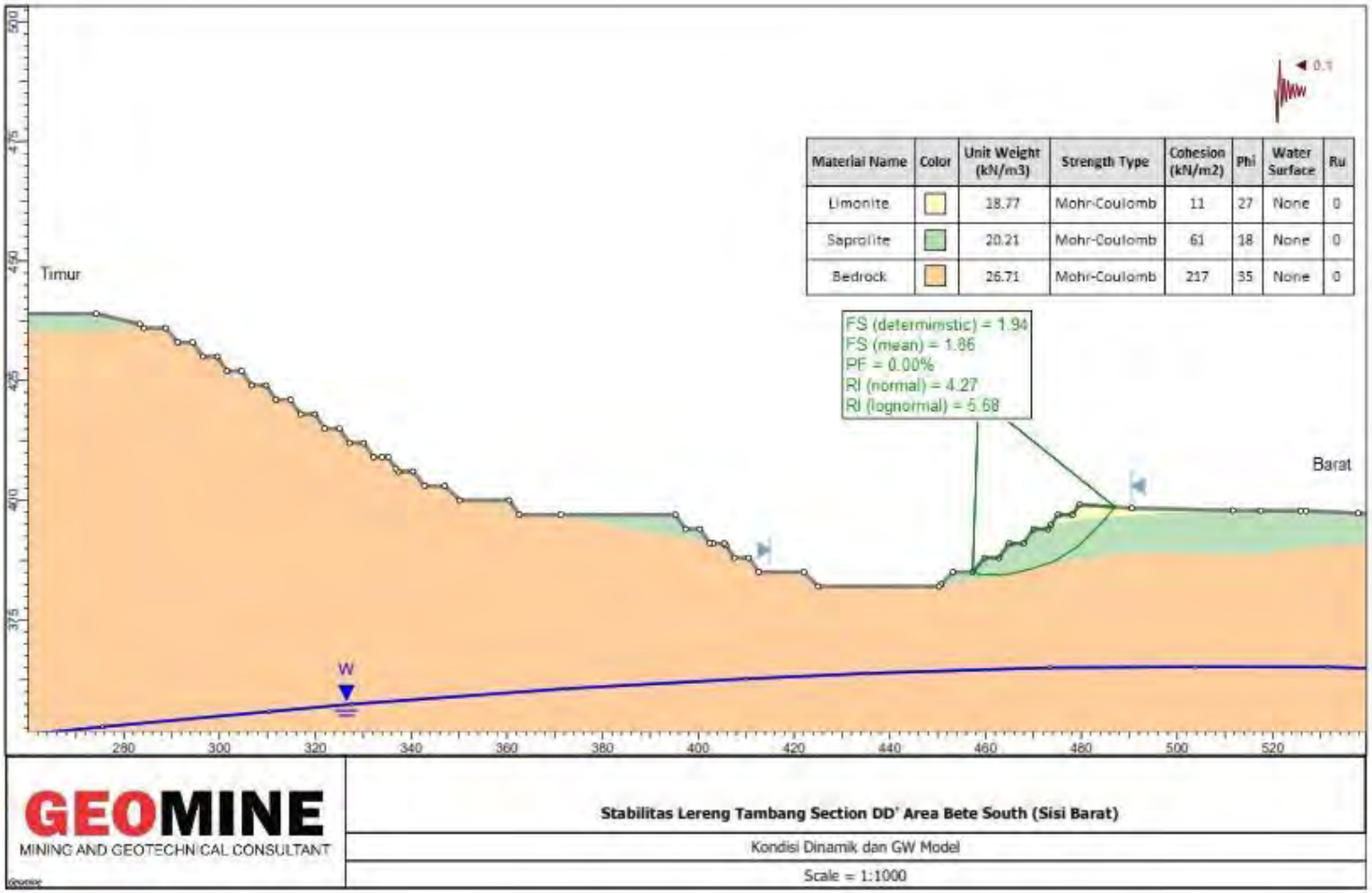
Scale = 1:2000

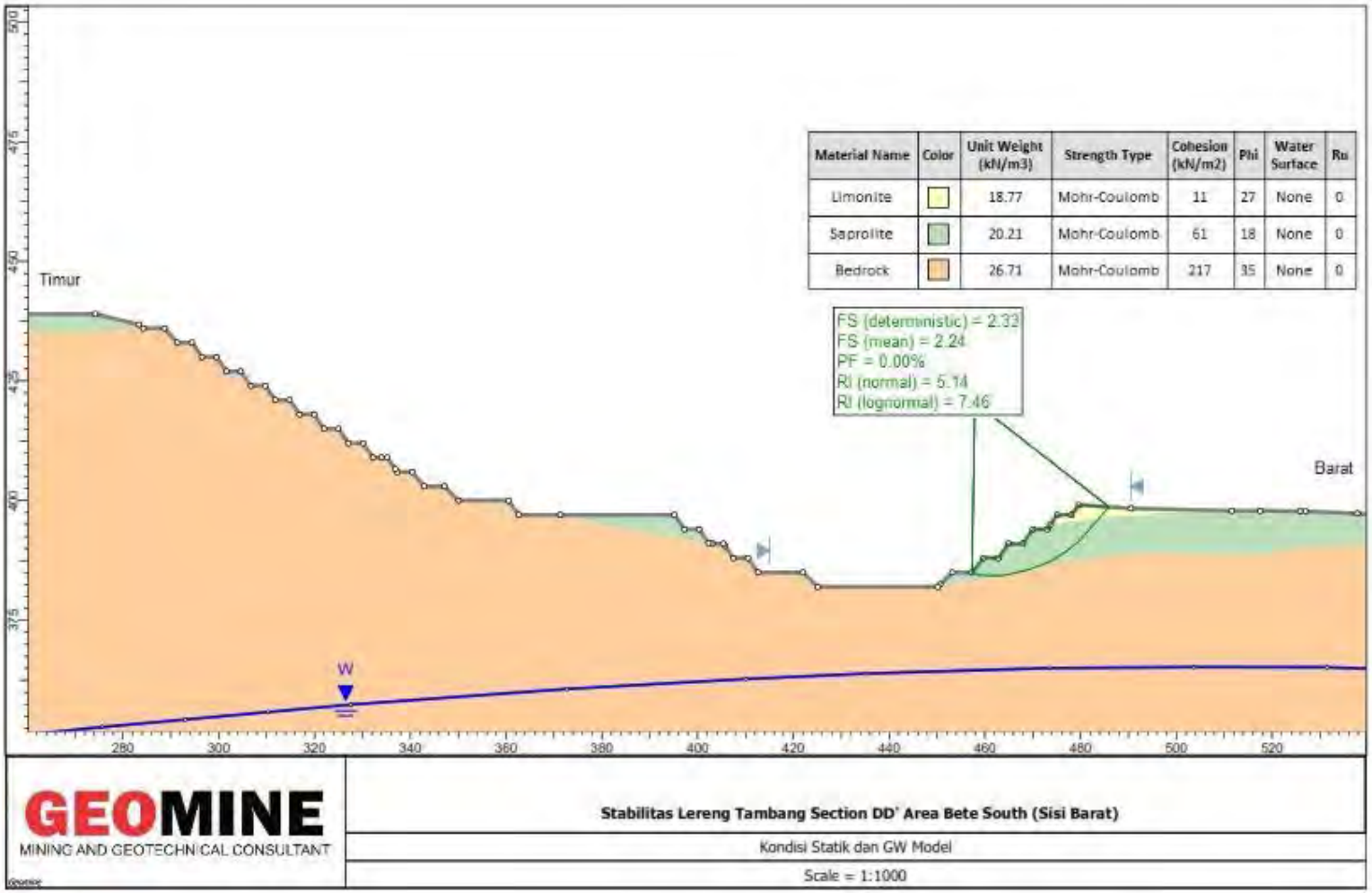

0.1
Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.39
FS (mean) = 1.53
PF = 0.00%
RI (normal) = 3.41
RI (lognormal) = 4.14
Utara
Selatan
W
650
600
550
500
450
150
200
250
300
350
400
450
500
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section BB' Area Bete-bete (Sisi Utara)
Kondisi Dinamik dan GW Model
Scale = 1:1500

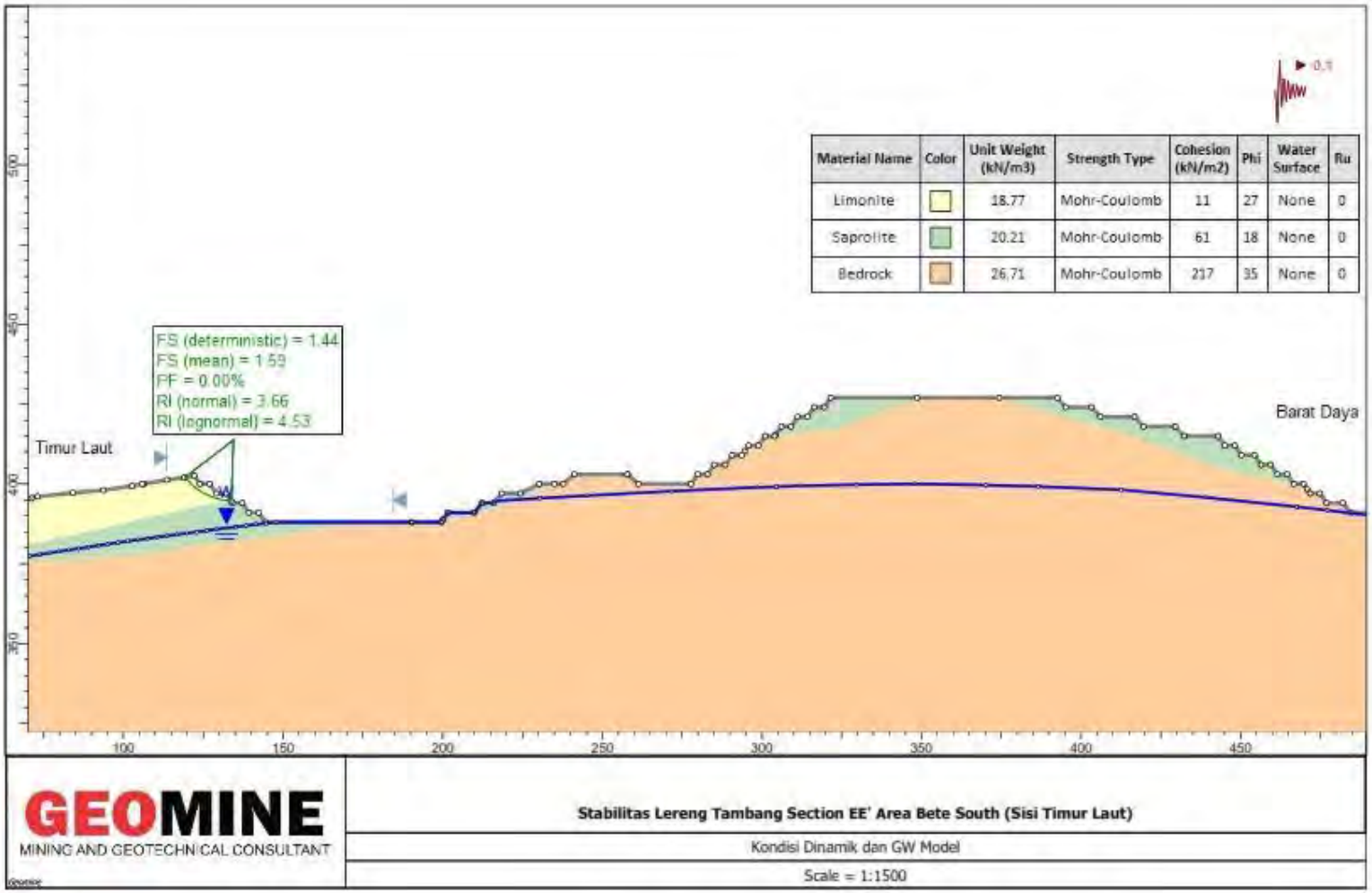

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.67
FS (mean) = 1.84
PF = 0.00%
RI (normal) = 4.50
RI (lognormal) = 5.98
Utara
Selatan
W
650
600
550
500
450
150
200
250
300
350
400
450
500
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section BB' Area Bete-bete (Sisi Utara)
Kondisi Statik dan GW Model
Scale = 1:1500

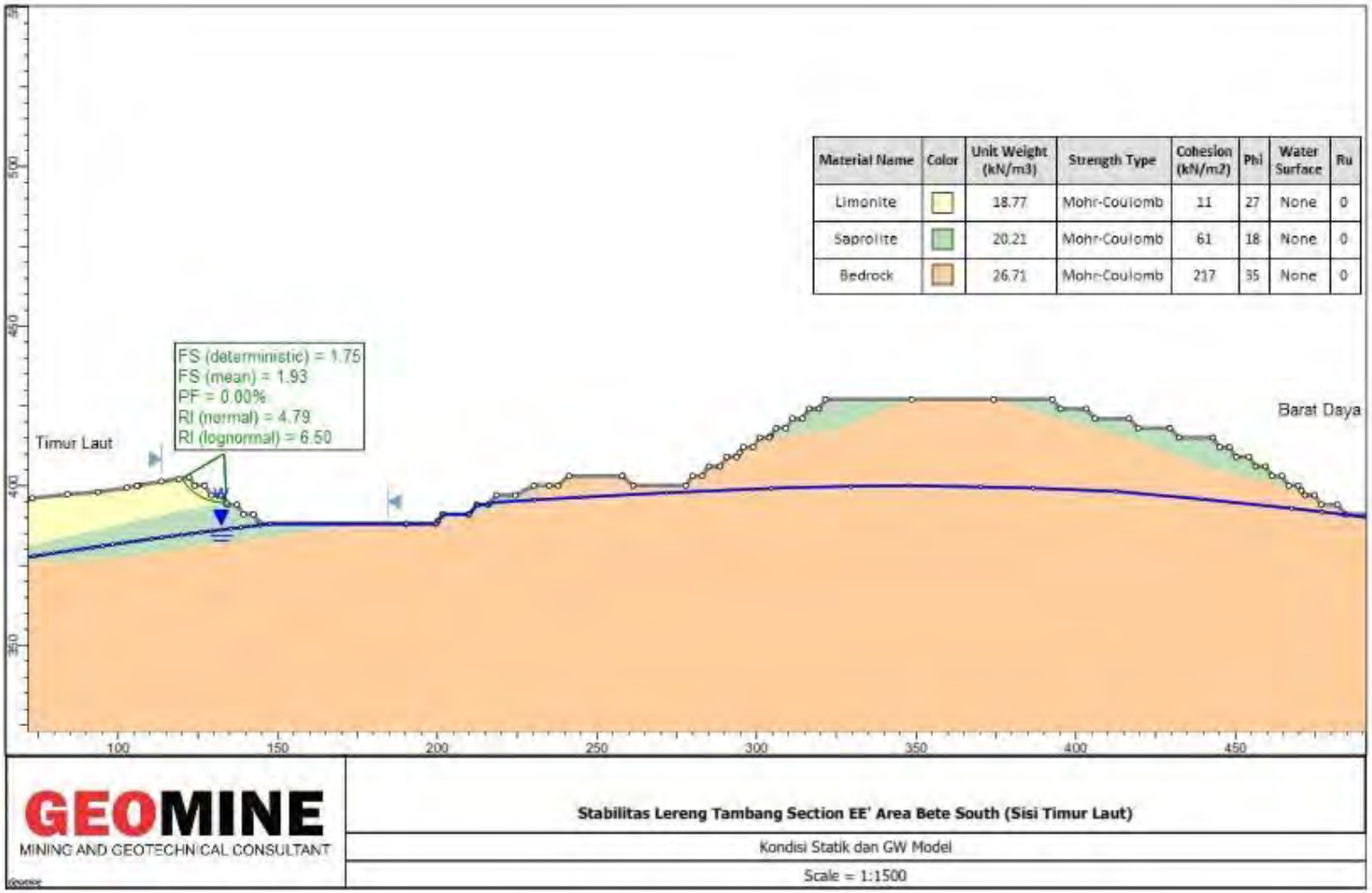

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Utara
Selatan
FS (deterministic) = 1.61
FS (mean) = 1.70
PF = 0.00%
RI (normal) = 3.05
RI (lognormal) = 3.88
W
500
525
550
575
600
625
650
675
700
725
750
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section CC' Area Bete-bete (Sisi Selatan)
Kondisi Dinamik dan GW Model
Scale = 1:1000

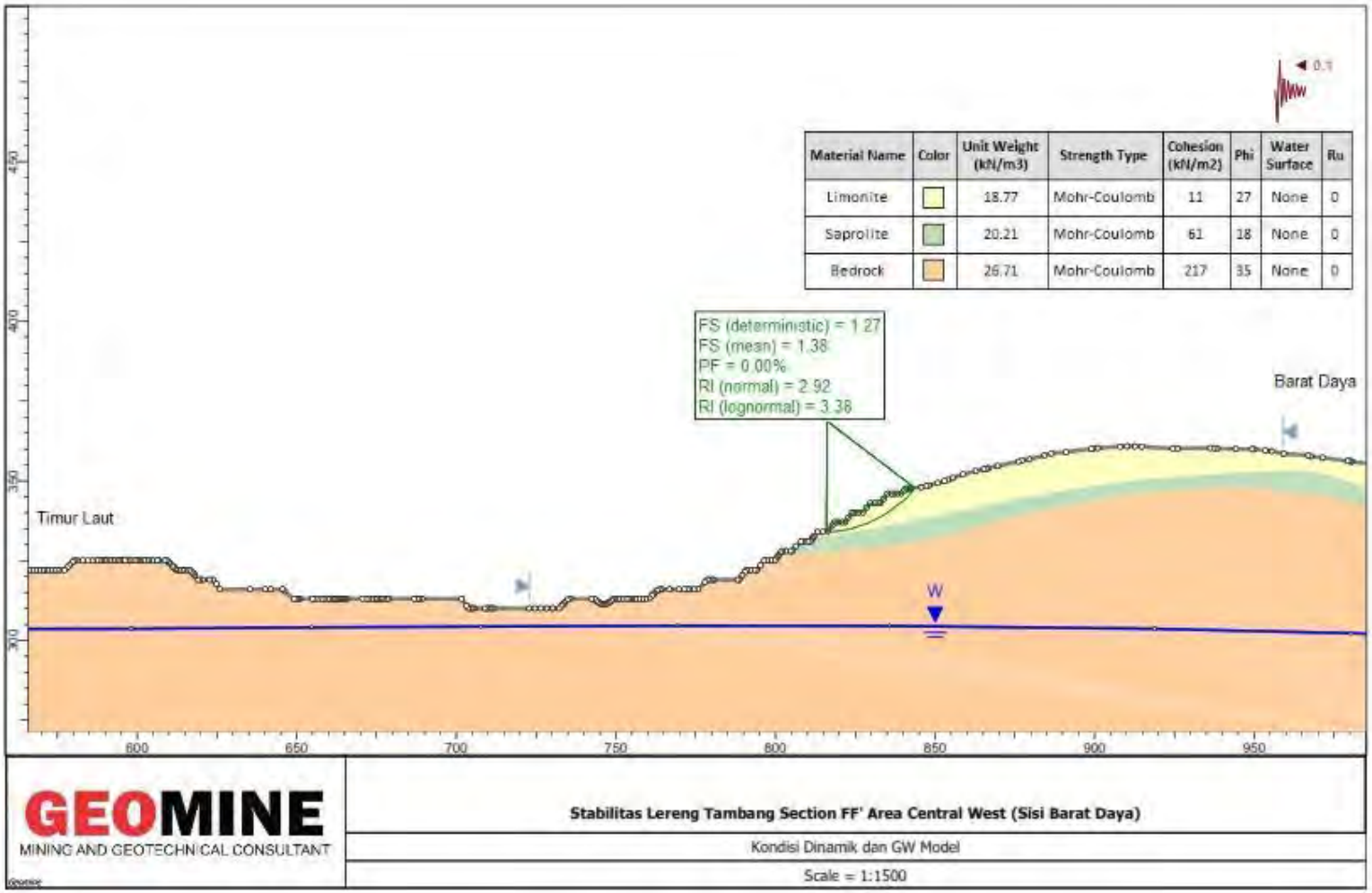

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Seprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Utara
Selatan
W
FS (deterministic) = 1.87
FS (mean) = 1.91
PF = 0.00%
RI (normal) = 5.18
RI (lognormal) = 7.00
525
500
475
450
425
400
500
520
540
560
580
600
620
640
660
680
700
720
740
760
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section CC' Area Bete-bete (Sisi Selatan)
Kondisi Statik dan GW Model
Scale = 1:1000

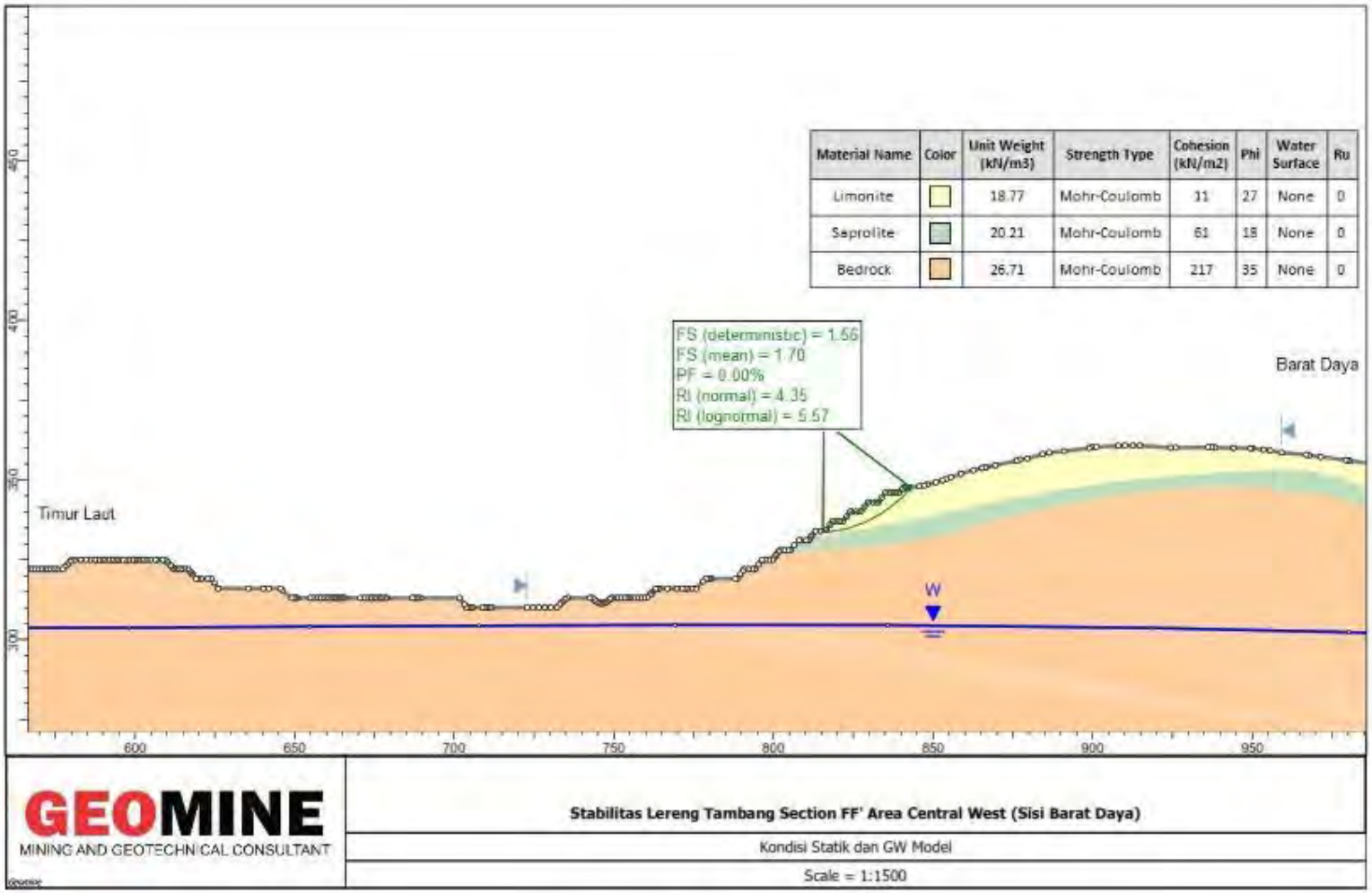

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.94
FS (mean) = 1.86
PF = 0.00%
RI (normal) = 4.27
RI (lognormal) = 5.68
Timur
Barat
W
500
475
450
425
400
375
280
300
320
340
360
380
400
420
440
460
480
500
520
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section DD' Area Bete South (Sisi Barat)
Kondisi Dinamik dan GW Model
Scale = 1:1000

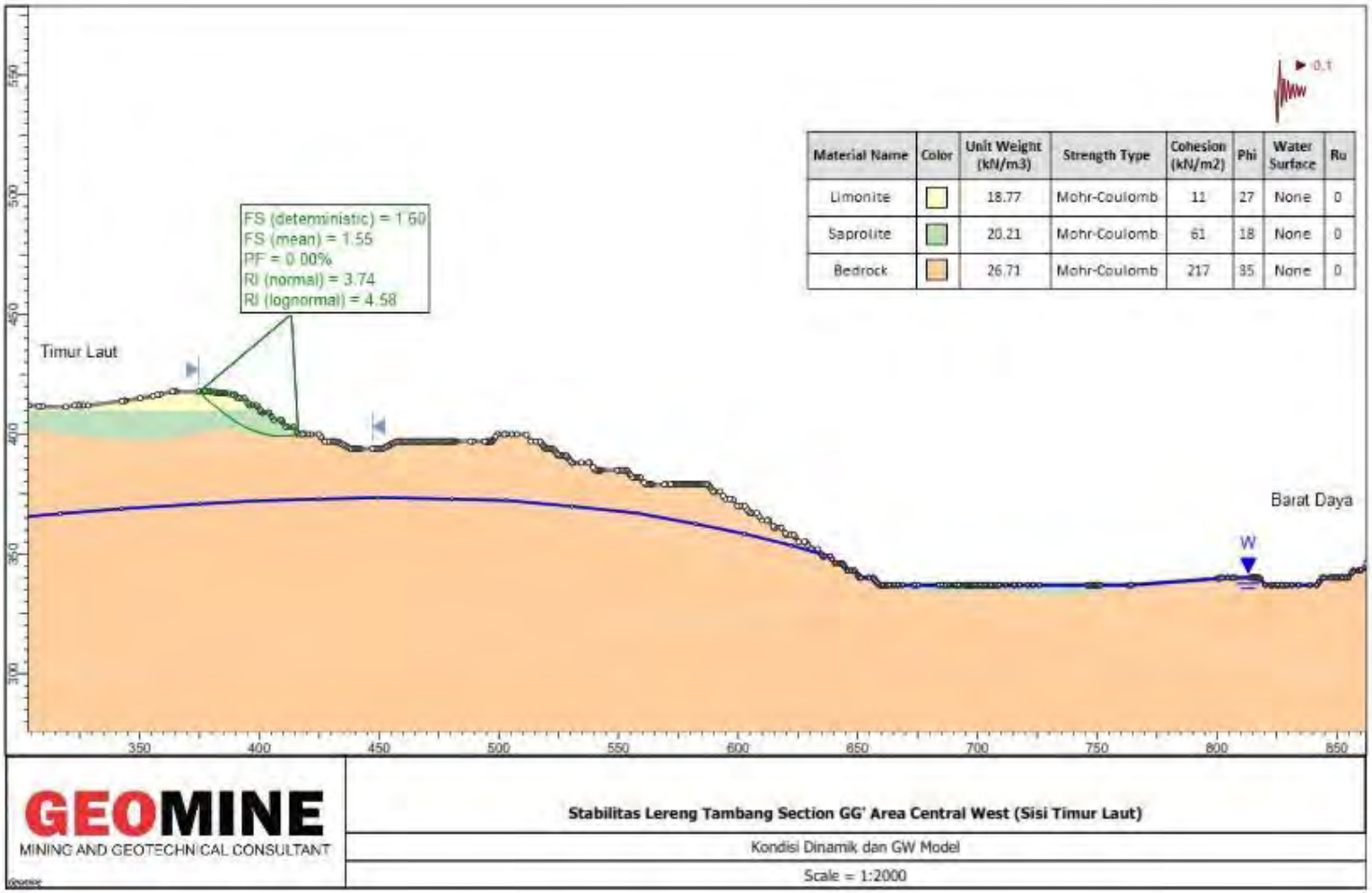

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Timur
Barat
FS (deterministic) = 2.33
FS (mean) = 2.24
PF = 0.00%
RI (normal) = 5.14
RI (lognormal) = 7.46
W
500
475
450
425
400
375
280
300
320
340
360
380
400
420
440
460
480
500
520
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section DD' Area Bete South (Sisi Barat)
Kondisi Statik dan GW Model
Scale = 1:1000

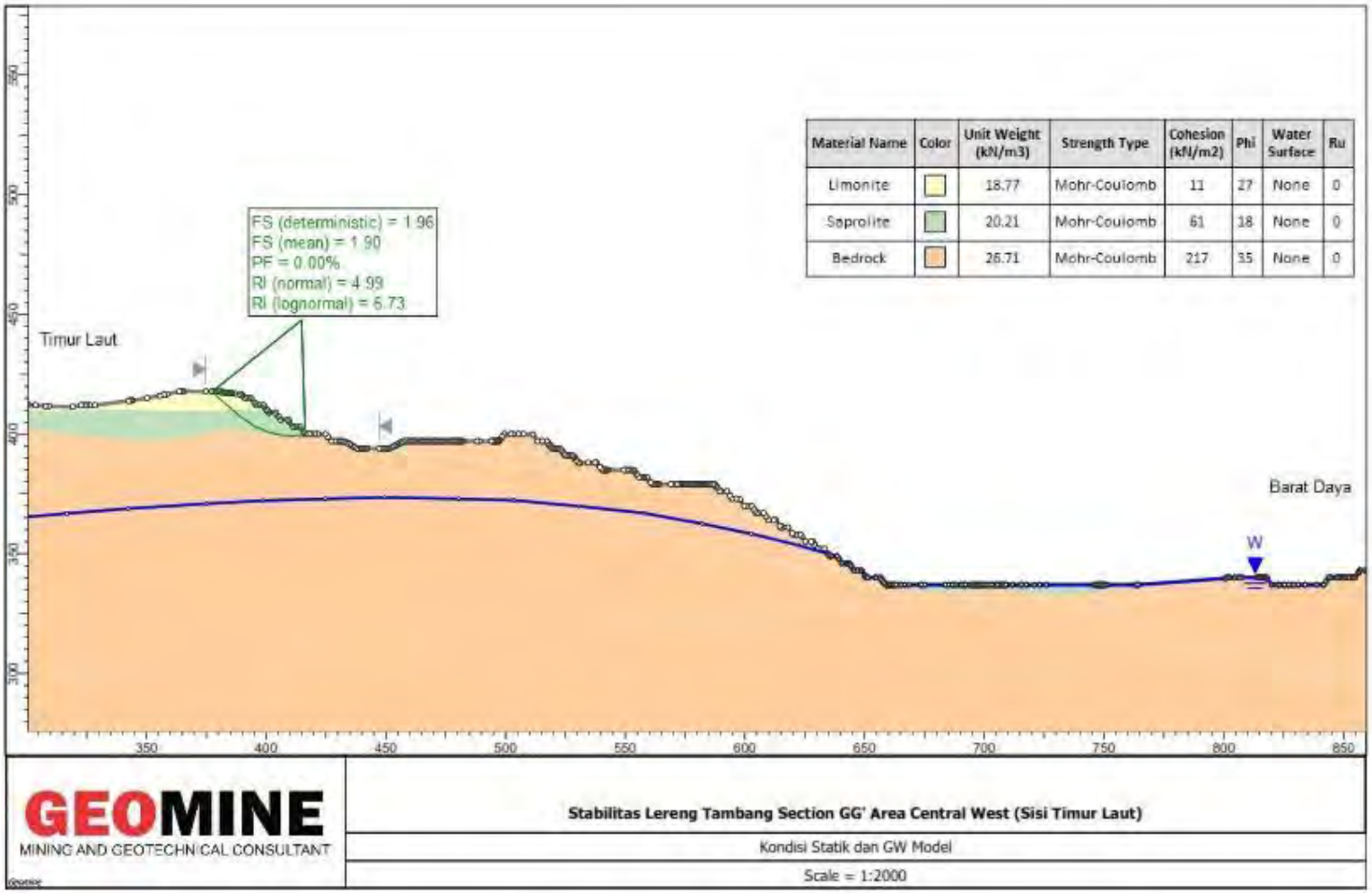

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.44
FS (mean) = 1.59
PF = 0.00%
RI (normal) = 3.66
RI (lognormal) = 4.53
Timur Laut
Barat Daya
500
450
400
350
100
150
200
250
300
350
400
450
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section EE' Area Bete South (Sisi Timur Laut)
Kondisi Dinamik dan GW Model
Scale = 1:1500

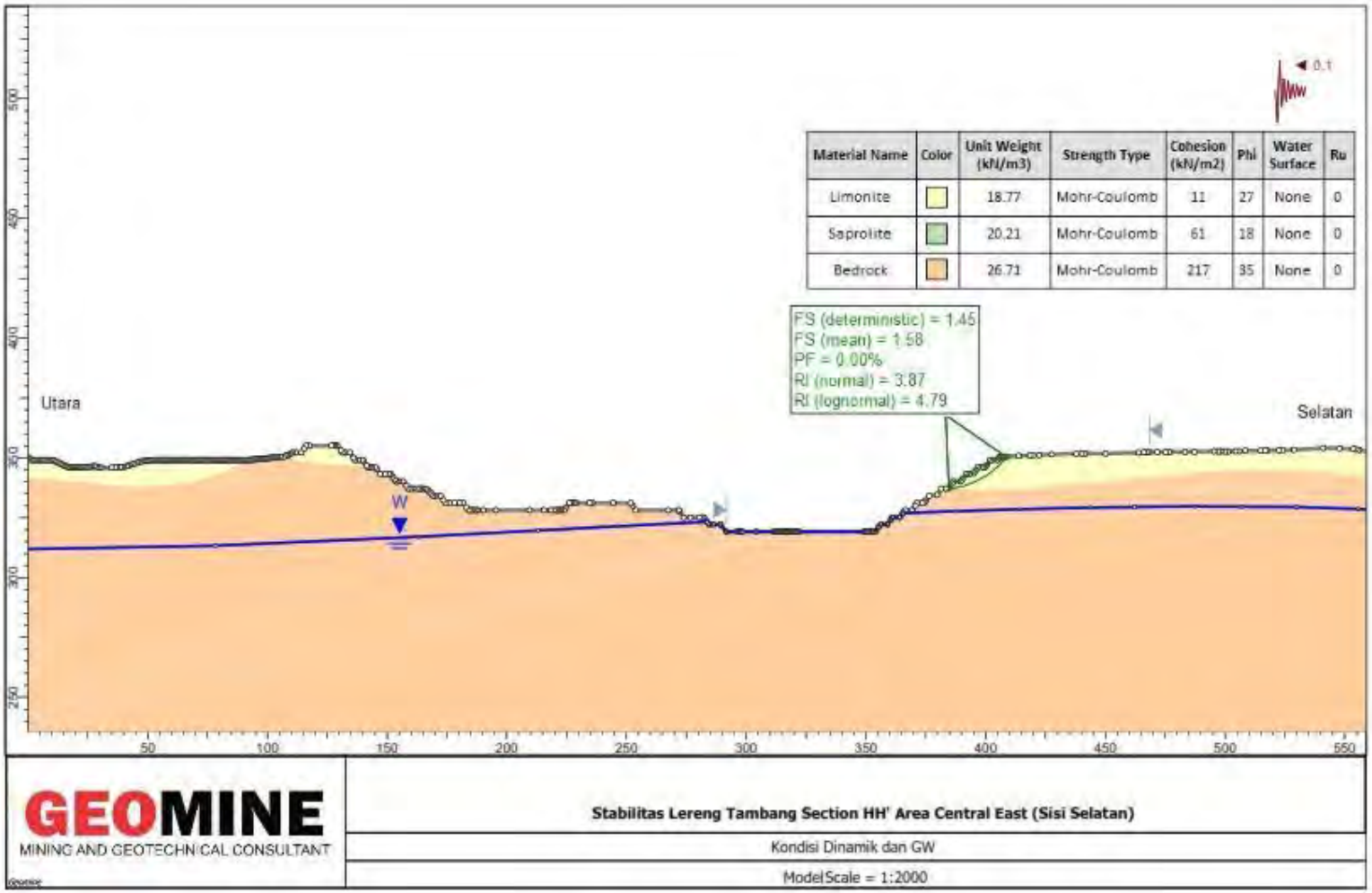

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.75
FS (mean) = 1.93
PF = 0.00%
RI (normal) = 4.79
RI (lognormal) = 6.50
Timur Laut
Barat Daya
500
450
400
350
100
150
200
250
300
350
400
450
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section EE' Area Bete South (Sisi Timur Laut)
Kondisi Statik dan GW Model
Scale = 1:1500

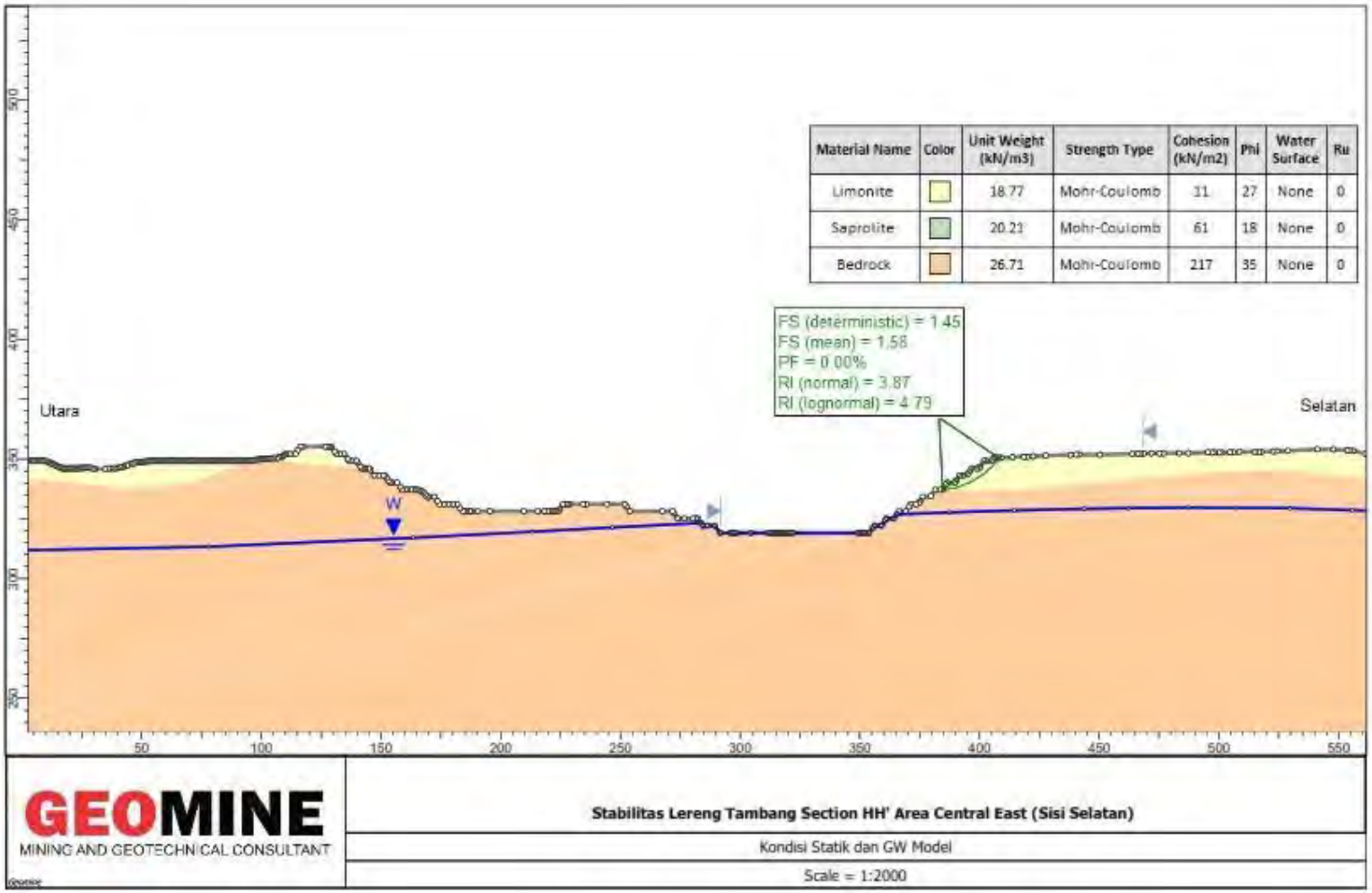

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.27
FS (mean) = 1.38
PF = 0.00%
RI (normal) = 2.92
RI (lognormal) = 3.36
Barat Daya
Timur Laut
W
600
650
700
750
800
850
900
950
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section FF' Area Central West (Sisi Barat Daya)
Kondisi Dinamik dan GW Model
Scale = 1:1500

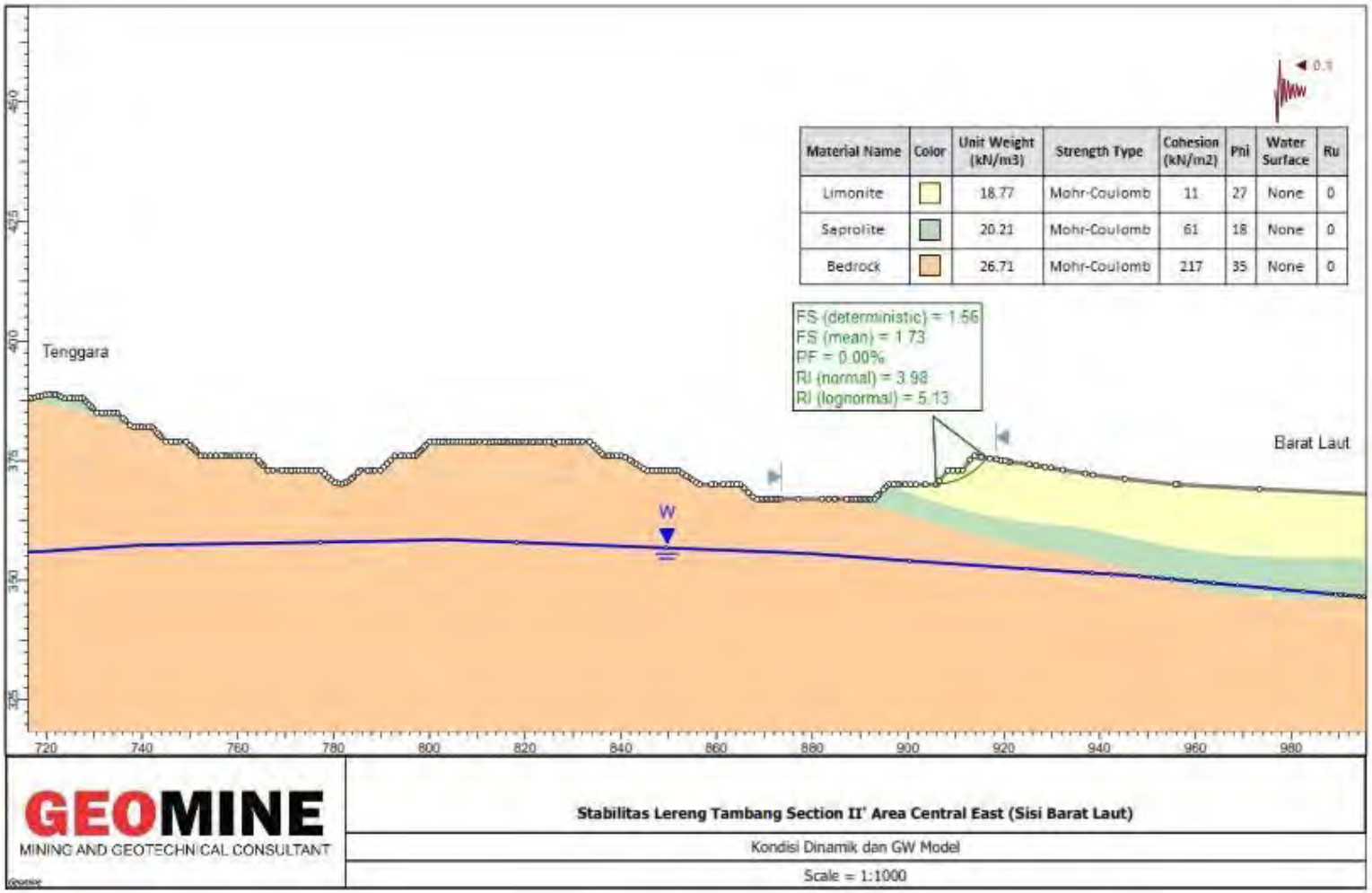

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.56
FS (mean) = 1.70
PF = 0.00%
RI (normal) = 4.35
RI (lognormal) = 5.57
Barat Daya
Timur Laut
W
450
400
350
300
600
650
700
750
800
850
900
950
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section FF' Area Central West (Sisi Barat Daya)
Kondisi Statik dan GW Model
Scale = 1:1500

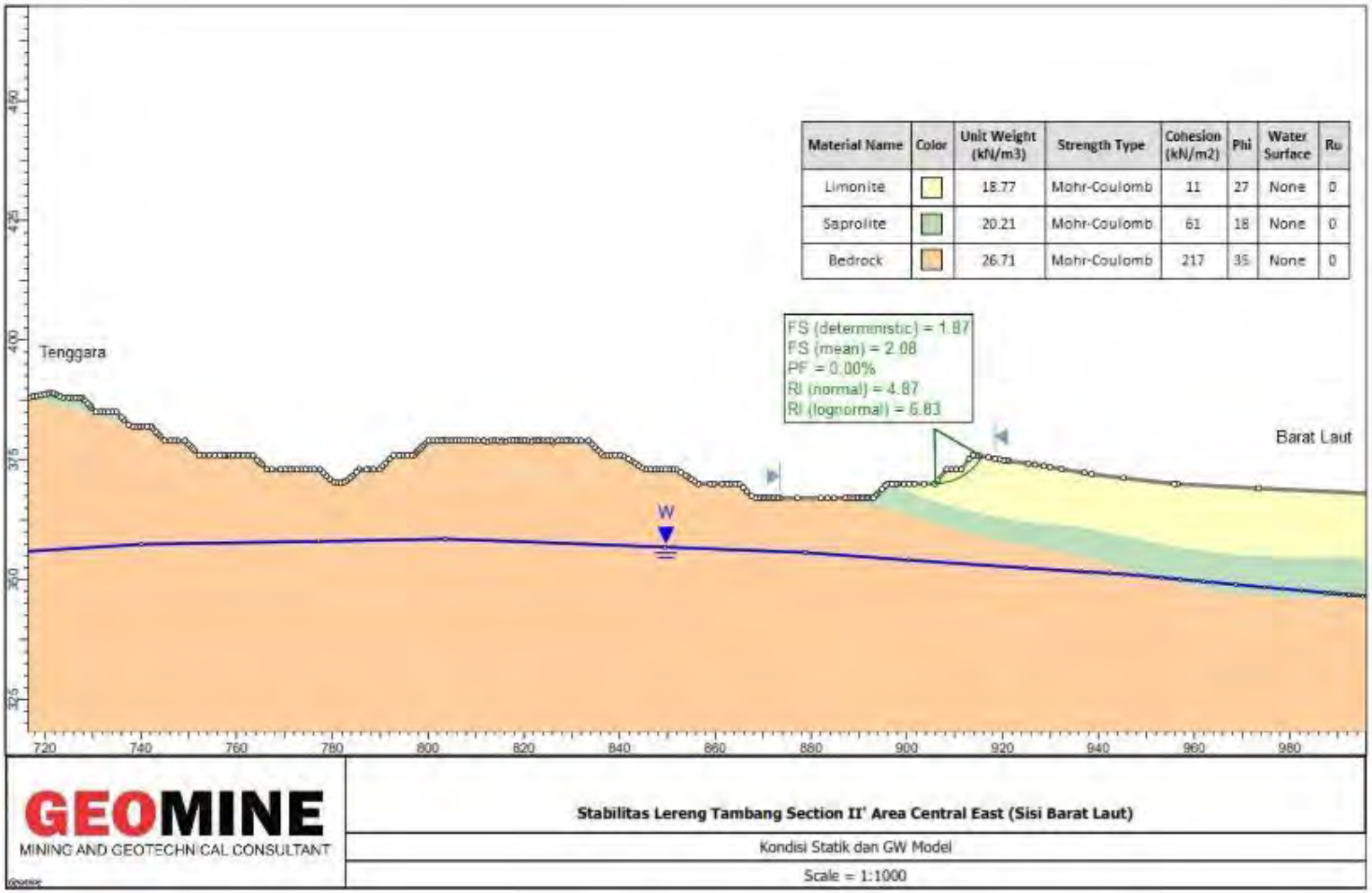

FS (deterministic) = 1.60
FS (mean) = 1.55
PF = 0.00%
RI (normal) = 3.74
RI (lognormal) = 4.58
Timur Laut
Barat Daya
W
Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section GG' Area Central West (Sisi Timur Laut)
Kondisi Dinamik dan GW Model
Scale = 1:2000

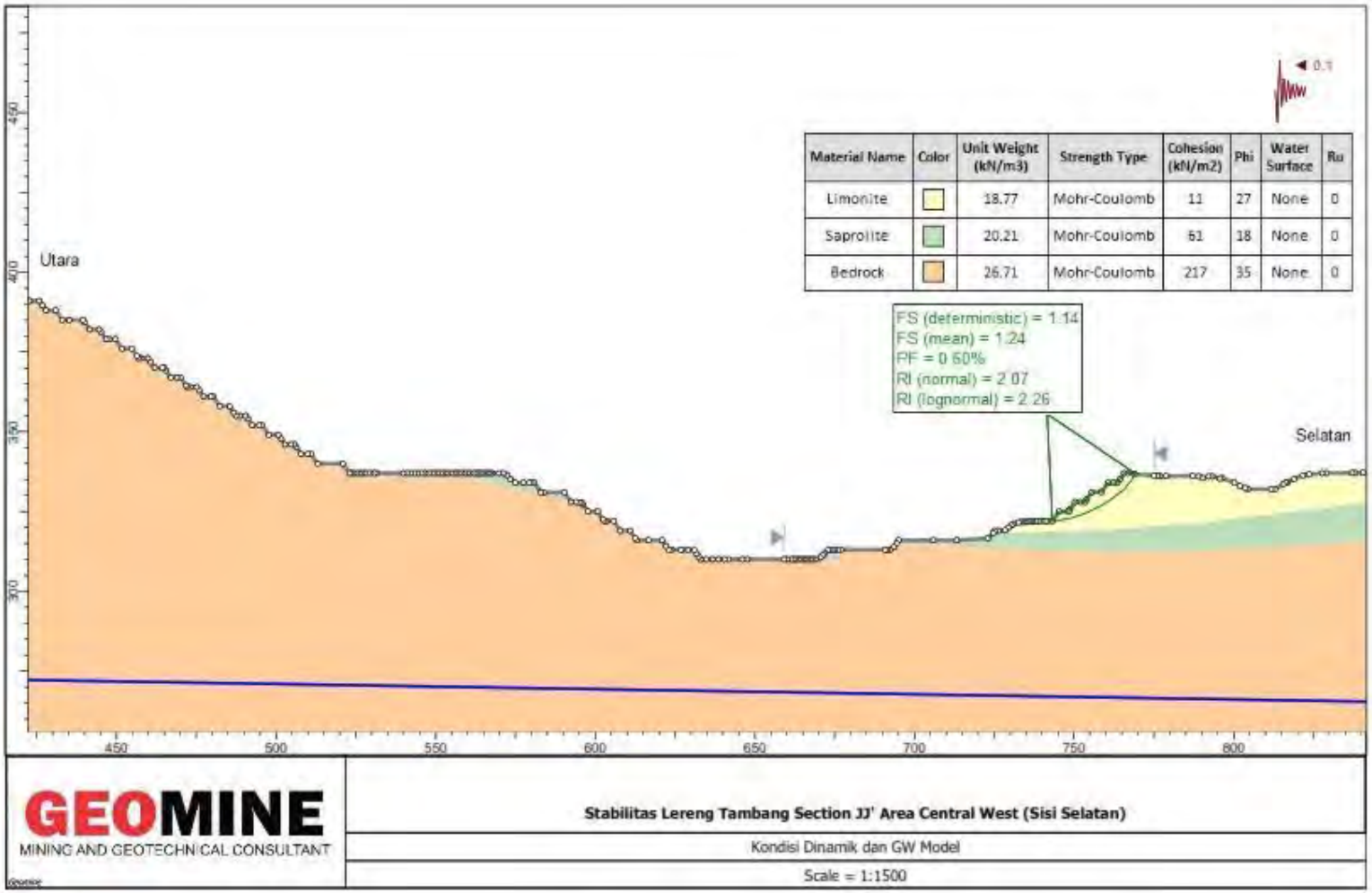

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.96
FS (mean) = 1.90
PF = 0.00%
RI (normal) = 4.99
RI (lognormal) = 6.73
Timur Laut
Barat Daya
W
300
350
400
450
500
550
600
650
700
750
800
850
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section GG' Area Central West (Sisi Timur Laut)
Kondisi Statik dan GW Model
Scale = 1:2000

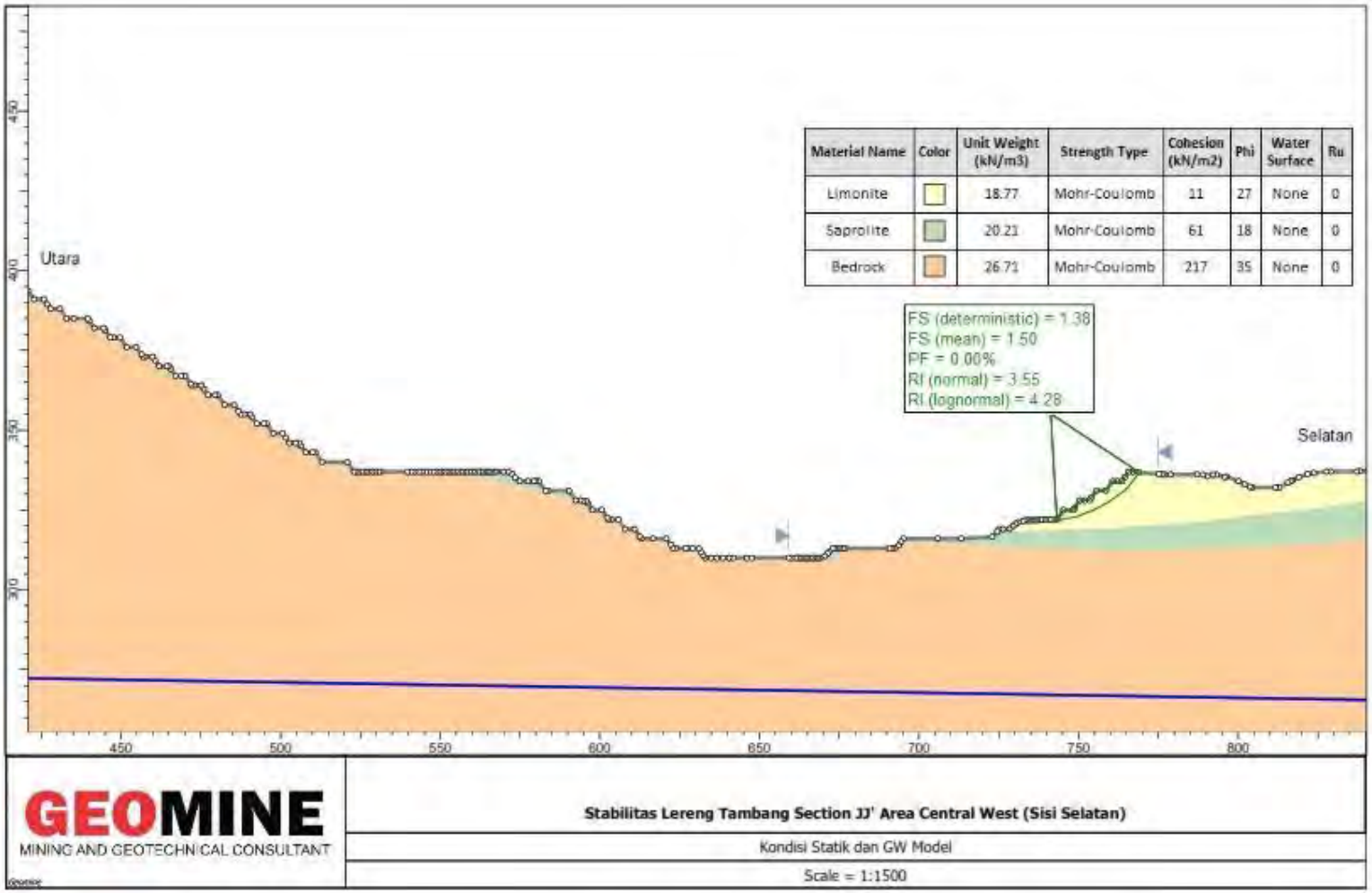

0.1
Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.45
FS (mean) = 1.58
PF = 0.00%
RI (normal) = 3.87
RI (lognormal) = 4.79
Utara
Selatan
W
500
450
400
350
300
250
50
100
150
200
250
300
350
400
450
500
550
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section HH' Area Central East (Sisi Selatan)
Kondisi Dinamik dan GW
Model Scale = 1:2000

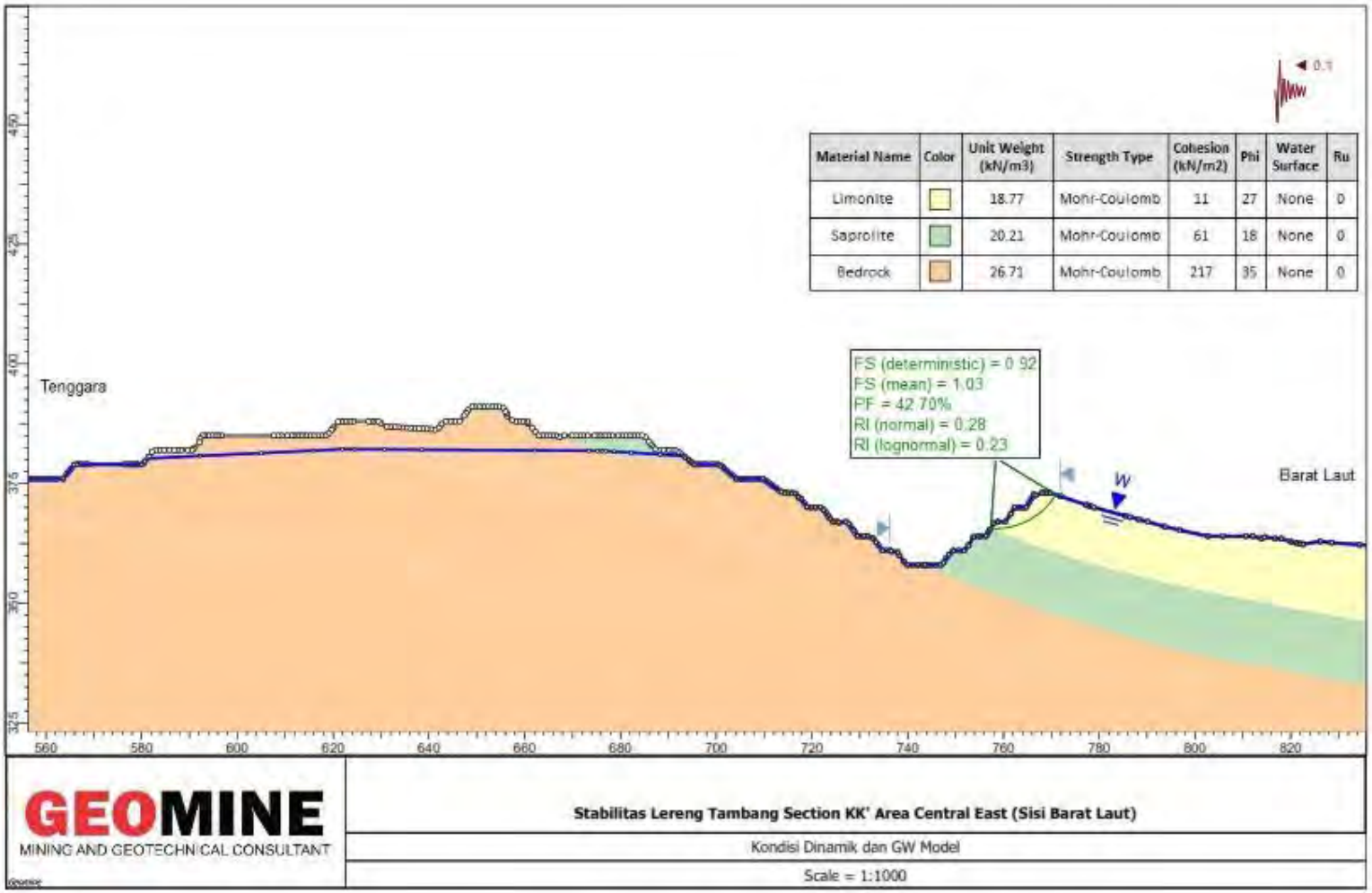

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 31 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.45
FS (mean) = 1.58
PF = 0.00%
RI (normal) = 3.87
RI (lognormal) = 4.79
Utara
Selatan
W
500
450
400
350
300
250
50
100
150
200
250
300
350
400
450
500
550
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section HH' Area Central East (Sisi Selatan)
Kondisi Statik dan GW Model
Scale = 1:2000

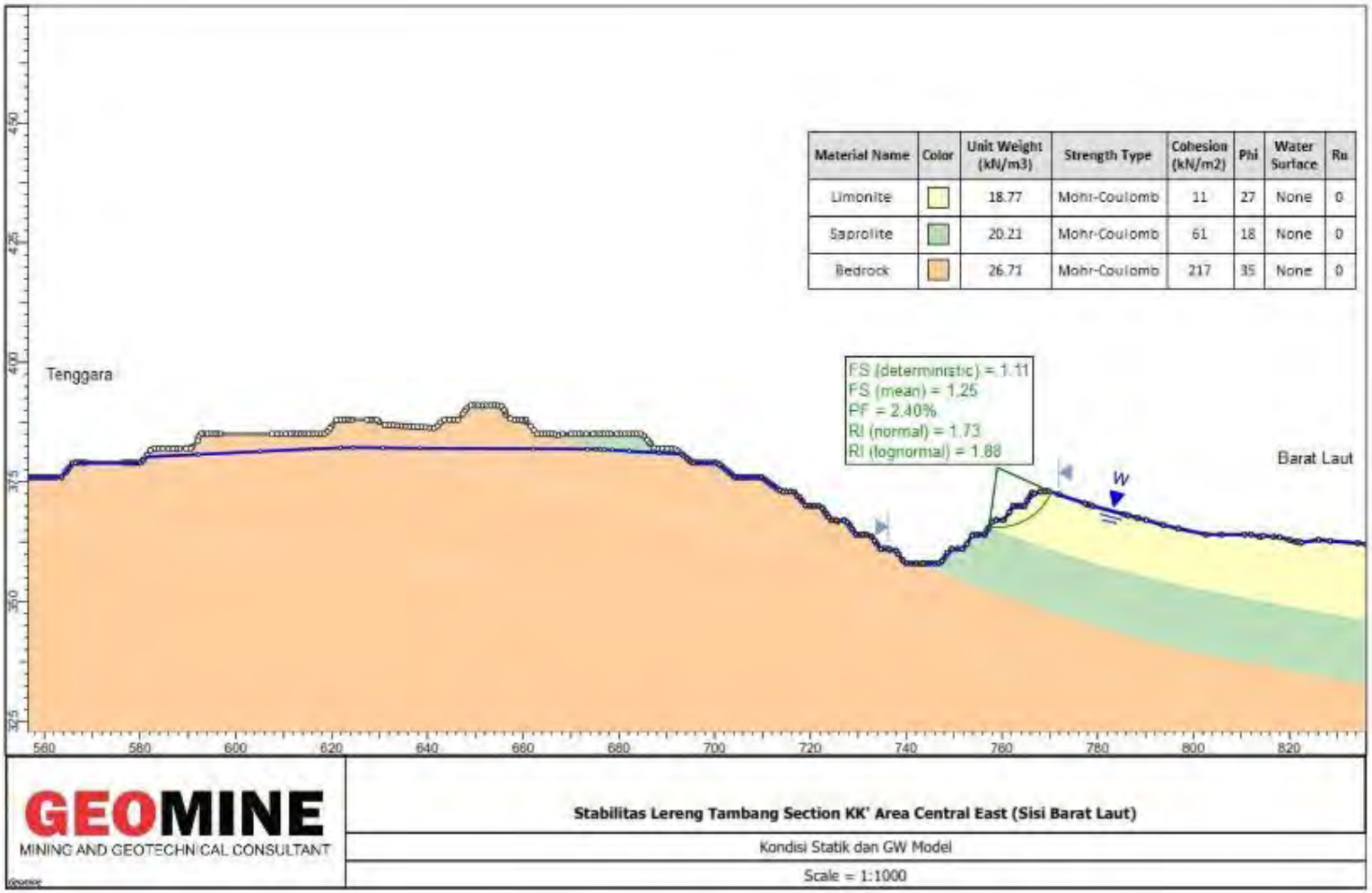

Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.56
FS (mean) = 1.73
PF = 0.00%
RI (normal) = 3.98
RI (lognormal) = 5.13
Tenggara
Barat Laut
W
410
425
410
375
350
325
720
740
760
780
800
820
840
860
880
900
920
940
960
980
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section II' Area Central East (Sisi Barat Laut)
Kondisi Dinamik dan GW Model
Scale = 1:1000


Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.87
FS (mean) = 2.08
PF = 0.00%
RI (normal) = 4.87
RI (lognormal) = 6.83
Tenggara
Barat Laut
W
490
425
400
375
350
325
720
740
760
780
800
820
840
860
880
900
920
940
960
980
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section II' Area Central East (Sisi Barat Laut)
Kondisi Statik dan GW Model
Scale = 1:1000


Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 1.14
FS (mean) = 1.24
PF = 0.60%
RI (normal) = 2.07
RI (lognormal) = 2.26
Utara
Selatan
450
400
350
300
450
500
550
600
650
700
750
800
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section JJ' Area Central West (Sisi Selatan)
Kondisi Dinamik dan GW Model
Scale = 1:1500


Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Utara
Selatan
FS (deterministic) = 1.38
FS (mean) = 1.50
PF = 0.00%
RI (normal) = 3.55
RI (lognormal) = 4.28
450
400
350
300
450
500
550
600
650
700
750
800
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section JJ' Area Central West (Sisi Selatan)
Kondisi Statik dan GW Model
Scale = 1:1500


Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
FS (deterministic) = 0.92
FS (mean) = 1.03
PF = 42.70%
RI (normal) = 0.28
RI (lognormal) = 0.23
Tenggara
Barat Laut
490
425
400
375
350
325
560
580
600
620
640
660
680
700
720
740
760
780
800
820
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section KK' Area Central East (Sisi Barat Laut)
Kondisi Dinamik dan GW Model
Scale = 1:1000


Material Name | Color | Unit Weight (kN/m3) | Strength Type | Cohesion (kN/m2) | Phi | Water Surface | Ru
Limonite | 18.77 | Mohr-Coulomb | 11 | 27 | None | 0
Saprolite | 20.21 | Mohr-Coulomb | 61 | 18 | None | 0
Bedrock | 26.71 | Mohr-Coulomb | 217 | 35 | None | 0
Tenggara
FS (deterministic) = 1.11
FS (mean) = 1.25
PF = 2.40%
RI (normal) = 1.73
RI (lognormal) = 1.88
Barat Laut
W
450
425
400
375
350
325
560
580
600
620
640
660
680
700
720
740
760
780
800
820
GEOMINE
MINING AND GEOTECHNICAL CONSULTANT
Stabilitas Lereng Tambang Section KK' Area Central East (Sisi Barat Laut)
Kondisi Statik dan GW Model
Scale = 1:1000

# APPENDIX 5

# DESCRIPTIVE STATISTICS & BLOK MODEL DATA



# PT DANMAR EXPLORINDO

# BLOCK MODEL DOCUMENTATION
# FOR
# PT HENGJAYA MINERALINDO

## 31 JANUARY 2026


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# 1 BLOCKMODEL DOCUMENTATION

## 1.1 Block Model Geometry

Table 1 Block model size and geometry block APL, BB, CE, CN, CW

| Type | X | Y | Z |
|---|---|---|---|
| Block Type | Octree Sub-blocked Model Type | | |
| Parent Block Size | 12.5 | 12.5 | 1 |
| Sub-block count | 4 | 4 | 4 |
| Minimum Block Size | 3.125 | 3.125 | 0.25 |
| Base Point | 411000 | 9670100 | 640 |
| Boundary Size | 12000.00 | 8100.00 | 712.00 |
| Azimuth | 0 | | |
| Dip | 0 | | |
| Pitch | 0 | | |
| Size In Blocks | 960 x 648 x 712 = 442,920,960 | | |

Table 2 Block model size and geometry block BBFW

| Type | X | Y | Z |
|---|---|---|---|
| Block Type | Octree Sub-blocked Model Type | | |
| Parent Block Size | 12.5 | 12.5 | 1 |
| Sub-block count | 4 | 4 | 4 |
| Minimum Block Size | 3.125 | 3.125 | 0.25 |
| Base Point | 407410.794 | 9674896.983 | 868.689 |
| Boundary Size | 2200.00 | 1662.50 | 531.00 |
| Azimuth | 0 | | |
| Dip | 0 | | |
| Pitch | 0 | | |
| Size In Blocks | 176 x 133 x 531 = 12,429,648 | | |

Table 3 Block model size and geometry block BBW

| Type | X | Y | Z |
|---|---|---|---|
| Block Type | Octree Sub-blocked Model Type | | |
| Parent Block Size | 12.5 | 12.5 | 1 |
| Sub-block count | 4 | 4 | 4 |
| Minimum Block Size | 3.125 | 3.125 | 0.25 |
| Base Point | 411025.369 | 9674375.697 | 470 |
| Boundary Size | 2150.00 | 1987.50 | 338.00 |
| Azimuth | 0 | | |
| Dip | 0 | | |
| Pitch | 0 | | |
| Size In Blocks | 172 x 159 x 338 = 9,243,624 | | |

## 1.2 Block Model Attribute

Table 4 Block model attribute

| Attribute | Type | Description |
|---|---|---|
| AvgD | Numeric | Average distance to samples of Ni |
| Blocks | Character | APL, BB, BBS, CE, CN, CW |
| BMLayer | Character | CLAY, BOULDER, BOXWORK, LIM, SAP, BRK, Unknown |
| Co | Numeric | OK interpolated grades for Cobalt (Co%) |
| Fe | Numeric | OK interpolated grades for Iron (Fe%) |
| KE | Numeric | Kriging Efficiency of Ni |
| KV | Numeric | Kriging Variance of Ni |
| MC | Numeric | Insitu lab moisture measurement (%) |
| MgO | Numeric | OK interpolated grades for Magnesium Oxide (MgO%) |
| Ni | Numeric | OK interpolated grades for Nickel (Ni%) |
| ResClass | Character | MEASURED, INDICATED, INFERRED, UNCATEGORIZED |
| SG | Numeric | Insitu lab density measurement (wet g/cm3) |
| SiO2 | Numeric | OK interpolated grades for Silica Oxide (SiO2%) |
| SoR | Numeric | Slope of Regression of Ni |
| SumN | Numeric | Sum of negative weights of Ni |

## 1.3 Extrapolatory Data Analysis

PT Hengjaya Mineralindo only has eight blocks based on topography.

### 1.3.1 Descriptive Statistics

Table 5 Descriptive Statistics of Limonite

| Parameter | Ni | Co | Fe | MgO | SiO2 |
|---|---|---|---|---|---|
| Mean | 1.04 | 0.12 | 42.70 | 1.67 | 8.85 |
| Standard deviation | 0.34 | 0.07 | 0.16 | 2.17 | 8.94 |
| Variance | 0.12 | 0.00 | 46.67 | 4.72 | 79.95 |
| Coefficient of variation | 0.33 | 0.60 | 6.83 | 1.30 | 1.01 |
| Maximum | 5.33 | 1.89 | 77.54 | 42.06 | 99.00 |
| Median | 1.03 | 0.10 | 43.61 | 1.02 | 5.32 |
| Minimum | 0.01 | 0.00 | 0.17 | 0.00 | 0.00 |

Table 6 Descriptive Statistics of Saprolite

| Parameter | Ni | Co | Fe | MgO | SiO2 |
|---|---|---|---|---|---|
| Mean | 1.46 | 0.04 | 15.22 | 18.81 | 36.71 |
| Standard deviation | 0.61 | 0.04 | 7.17 | 73.51 | 8.02 |
| Variance | 0.37 | 0.00 | 51.45 | 73.51 | 64.30 |
| Coefficient of variation | 0.41 | 0.87 | 0.47 | 0.46 | 0.22 |
| Maximum | 7.83 | 1.48 | 69.00 | 58.43 | 99.00 |
| Median | 1.40 | 0.03 | 13.32 | 19.28 | 37.46 |
| Minimum | 0.01 | 0.00 | 0.14 | 0.00 | 0.01 |

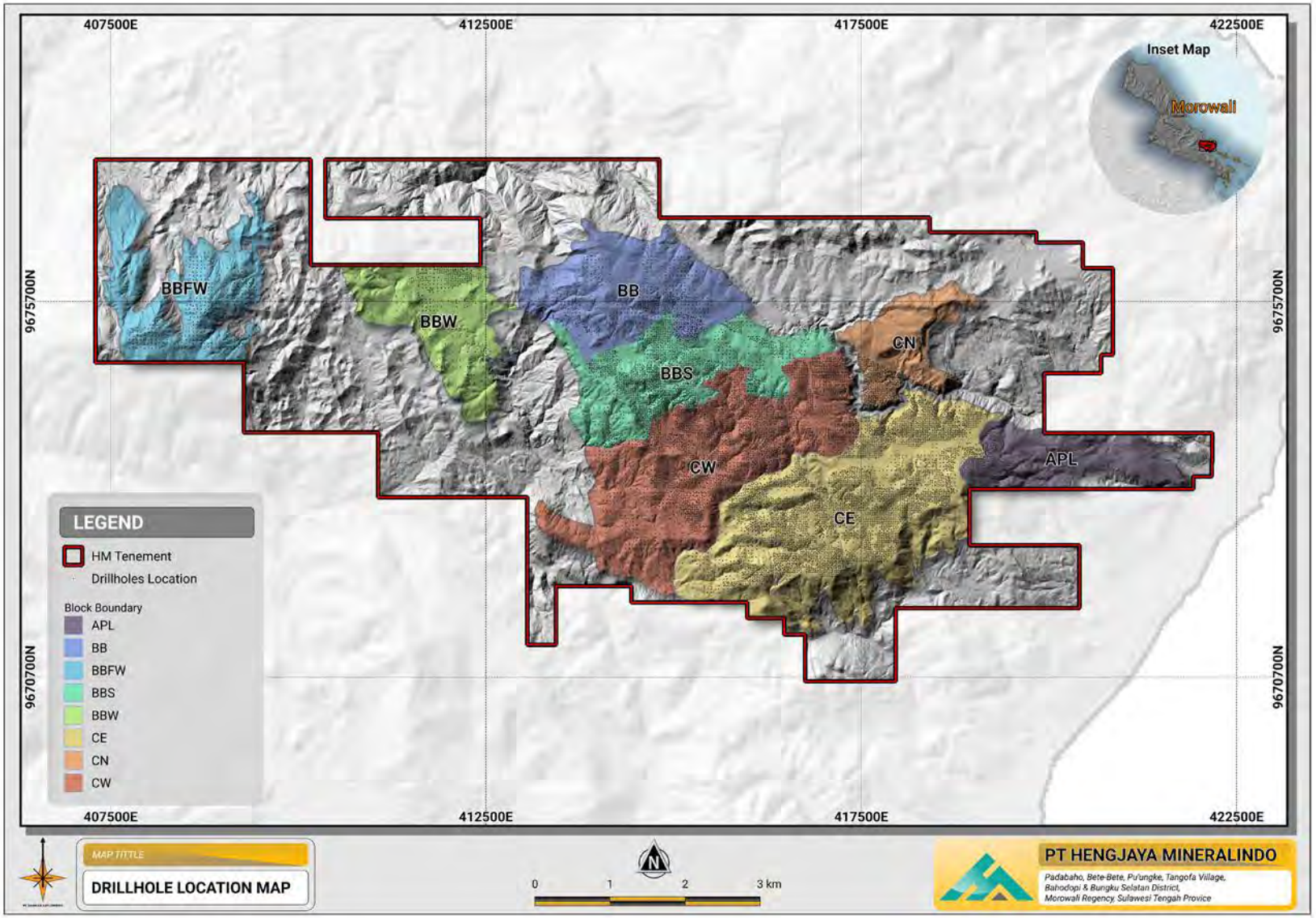
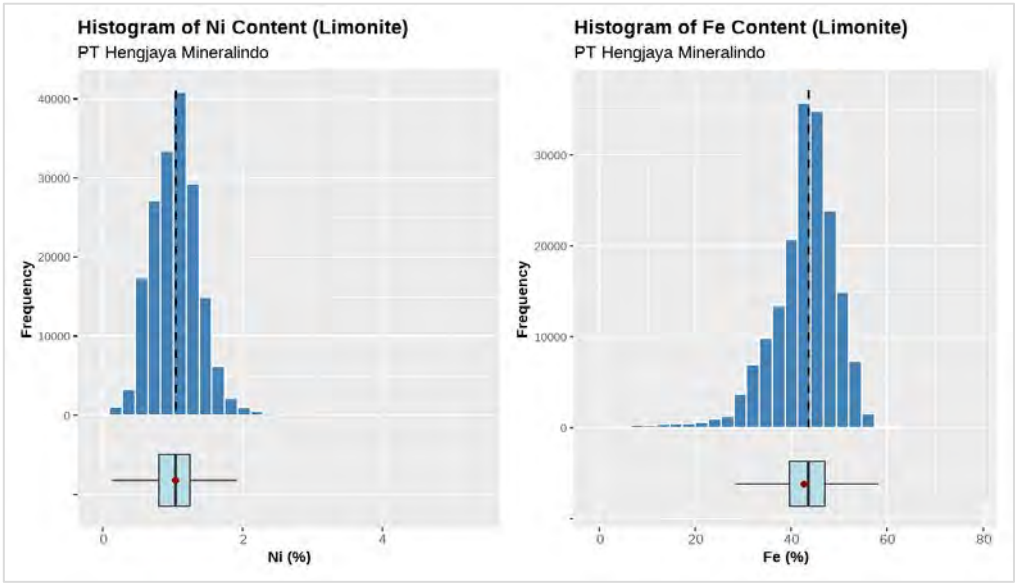
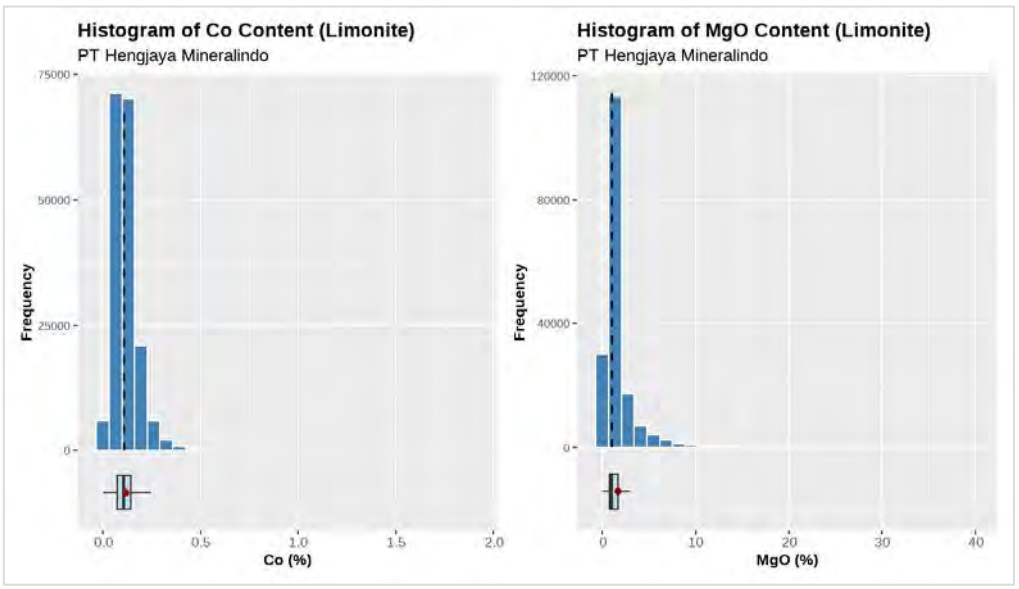
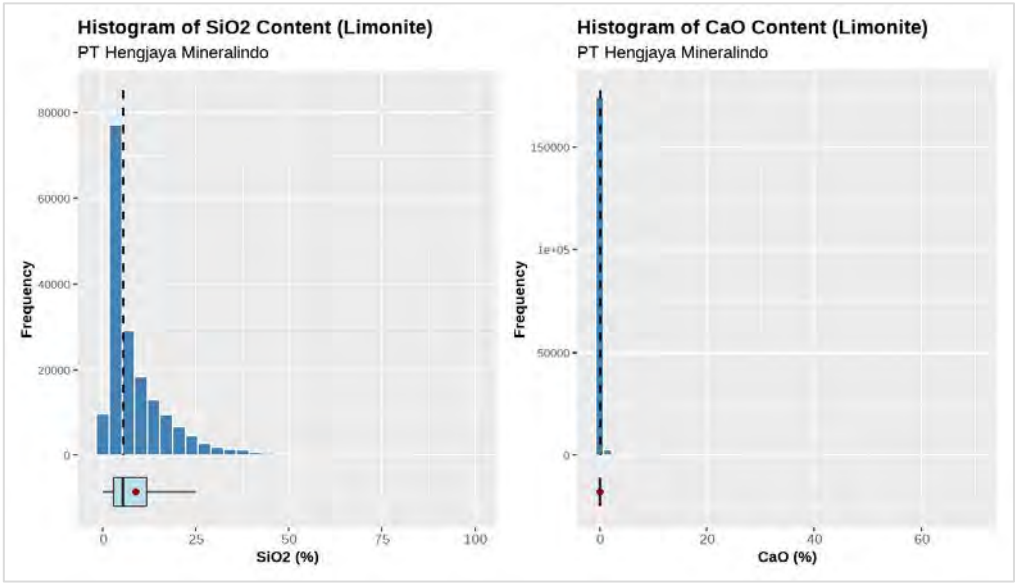


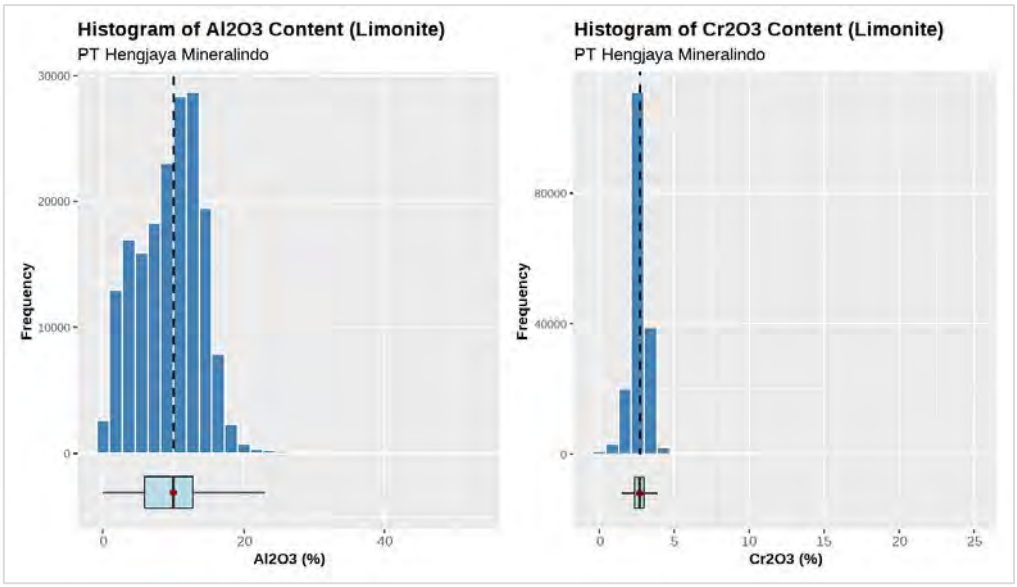

Figure 1 Drilling Location Map

### 1.3.2 Histogram





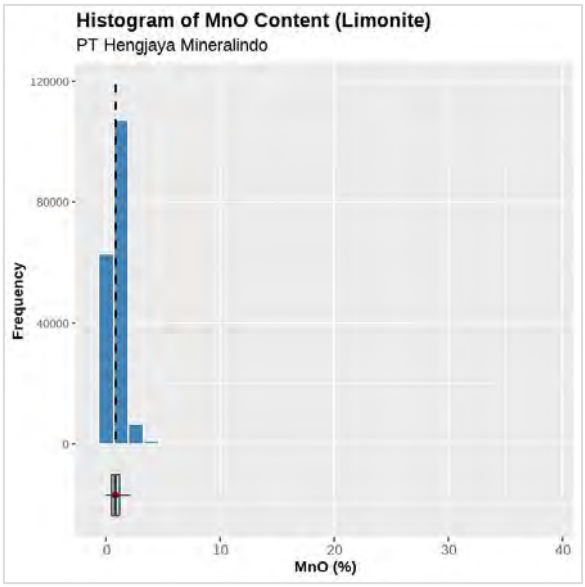
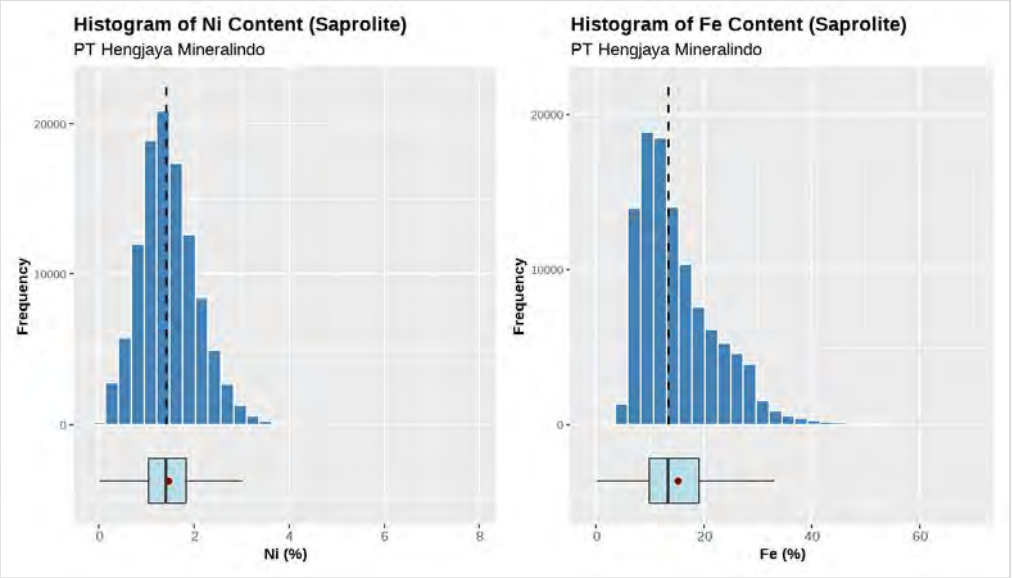
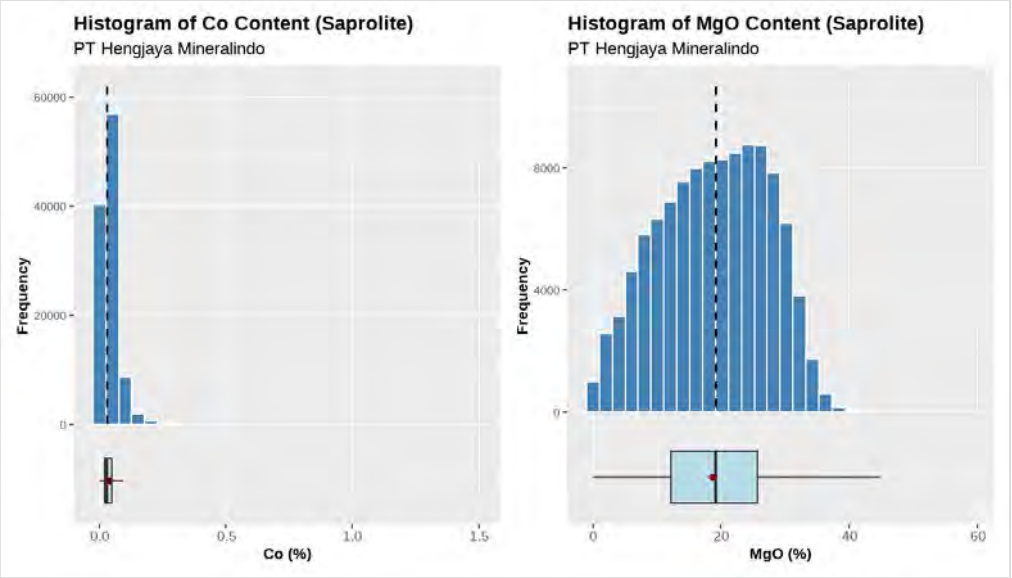
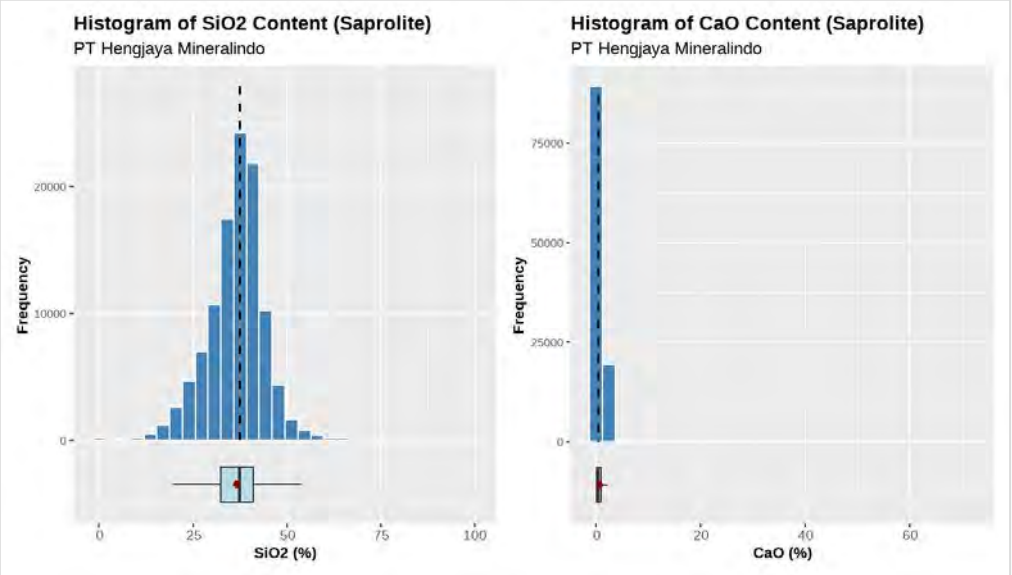




Figure 2 Histogram of Limonite


Histogram of Ni Content (Saprolite)
PT Hengjaya Mineralindo
Frequency
Ni (%)
Histogram of Fe Content (Saprolite)
PT Hengjaya Mineralindo
Frequency
Fe (%)


Histogram of Co Content (Saprolite)
PT Hengjaya Mineralindo
Frequency
Co (%)
Histogram of MgO Content (Saprolite)
PT Hengjaya Mineralindo
Frequency
MgO (%)


Histogram of SiO2 Content (Saprolite)
PT Hengjaya Mineralindo
Frequency
SiO2 (%)
Histogram of CaO Content (Saprolite)
PT Hengjaya Mineralindo
Frequency
CaO (%)

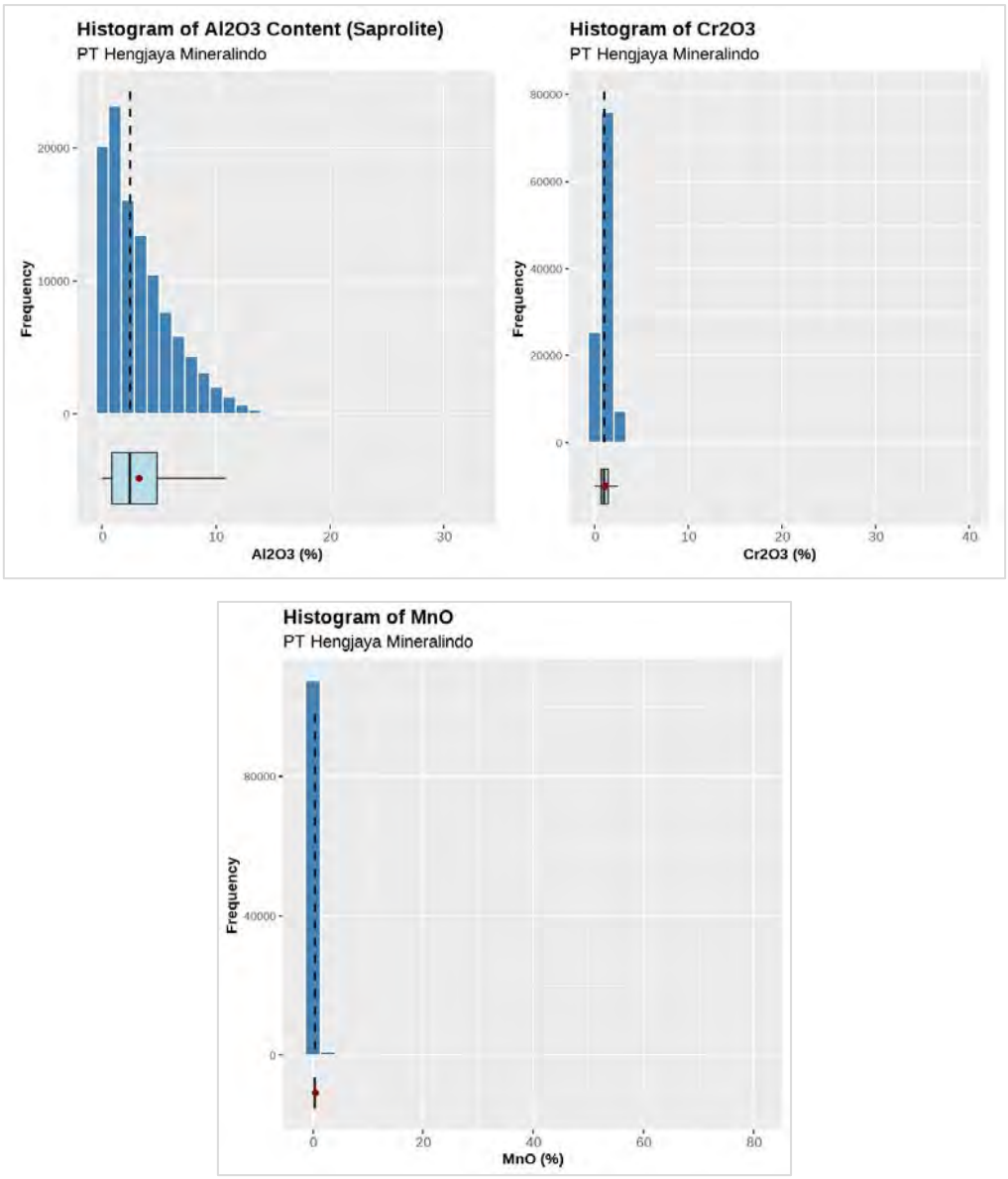
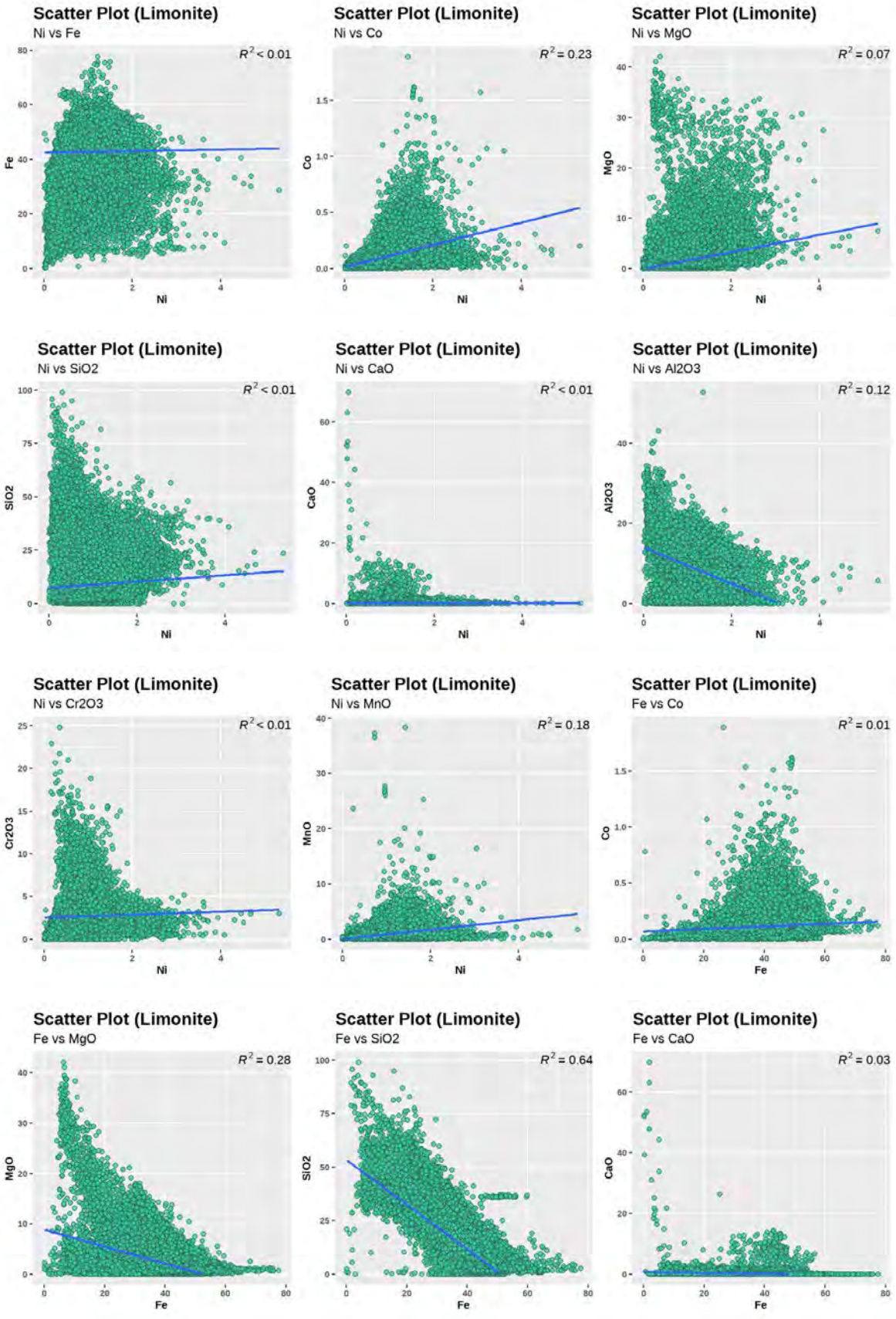
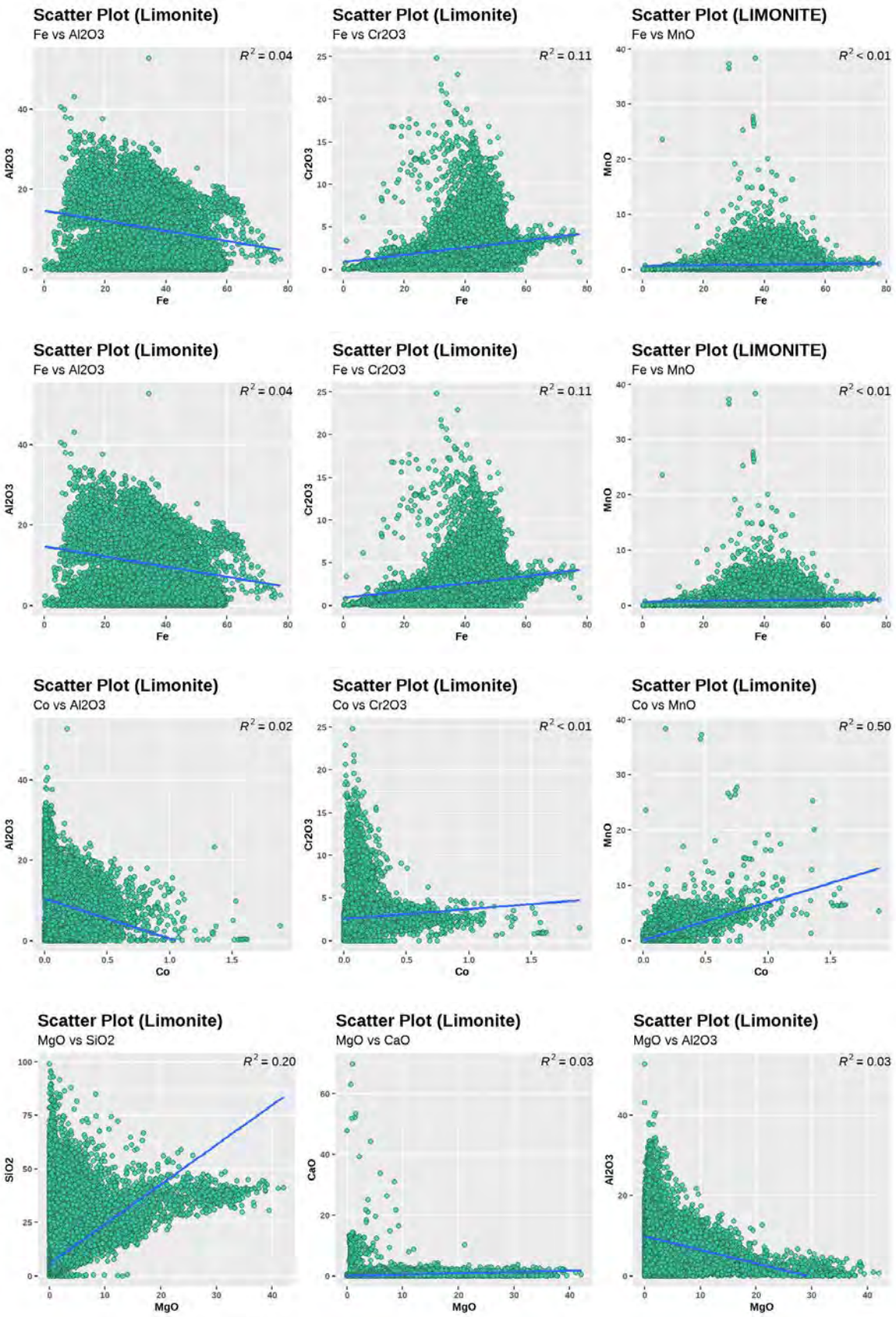



Figure 3 Histogram of Saprolite

### 1.3.3 Mineral Correlation




Scatter Plot (Limonite)
Fe vs Al2O3
$R^2$ = 0.04
Al2O3
Fe
Scatter Plot (Limonite)
Fe vs Cr2O3
$R^2$ = 0.11
Cr2O3
Fe
Scatter Plot (LIMONITE)
Fe vs MnO
$R^2$ < 0.01
MnO
Fe
Scatter Plot (Limonite)
Fe vs Al2O3
$R^2$ = 0.04
Al2O3
Fe
Scatter Plot (Limonite)
Fe vs Cr2O3
$R^2$ = 0.11
Cr2O3
Fe
Scatter Plot (LIMONITE)
Fe vs MnO
$R^2$ < 0.01
MnO
Fe
Scatter Plot (Limonite)
Co vs Al2O3
$R^2$ = 0.02
Al2O3
Co
Scatter Plot (Limonite)
Co vs Cr2O3
$R^2$ < 0.01
Cr2O3
Co
Scatter Plot (Limonite)
Co vs MnO
$R^2$ = 0.50
MnO
Co
Scatter Plot (Limonite)
MgO vs SiO2
$R^2$ = 0.20
SiO2
MgO
Scatter Plot (Limonite)
MgO vs CaO
$R^2$ = 0.03
CaO
MgO
Scatter Plot (Limonite)
MgO vs Al2O3
$R^2$ = 0.03
Al2O3
MgO

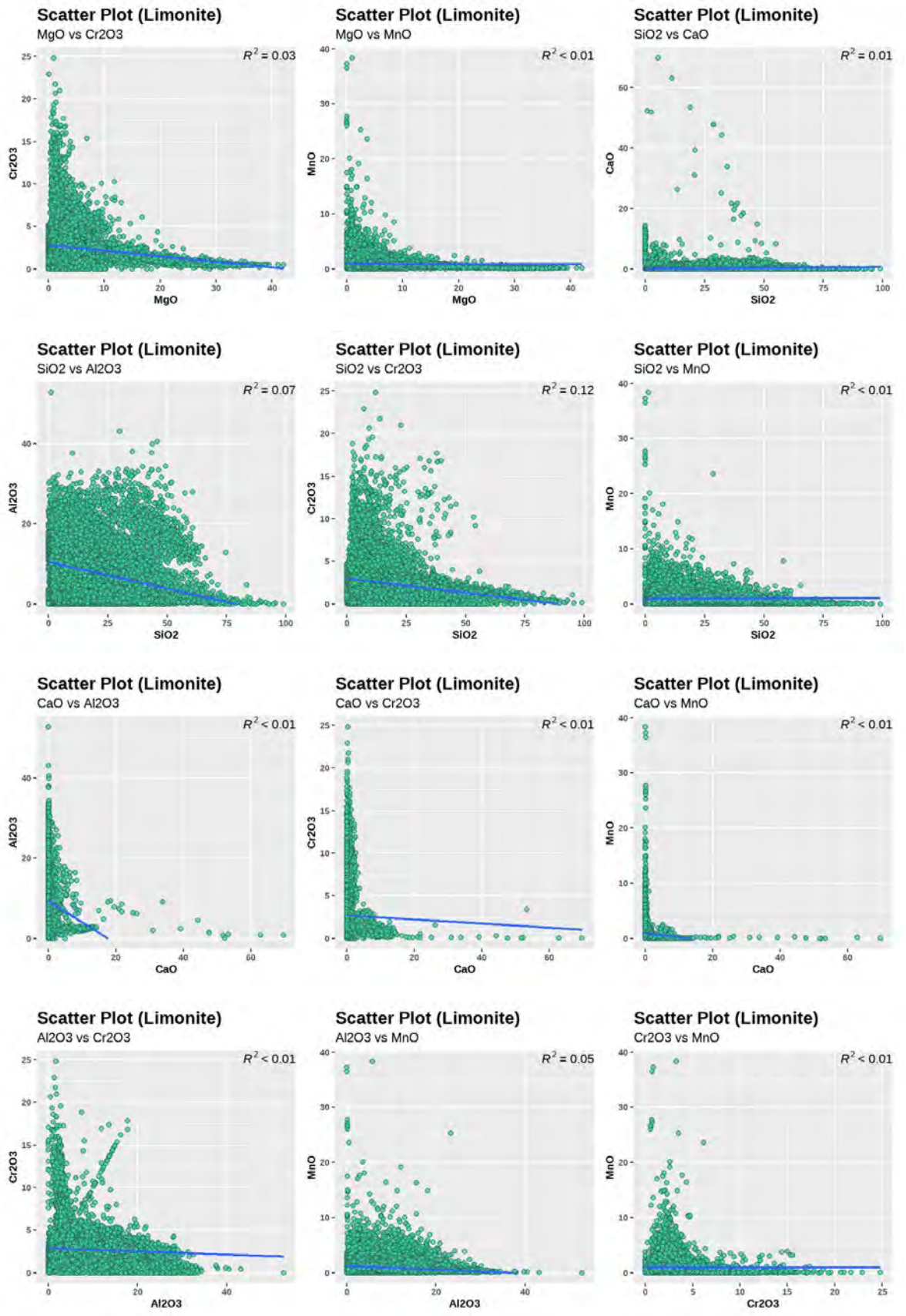
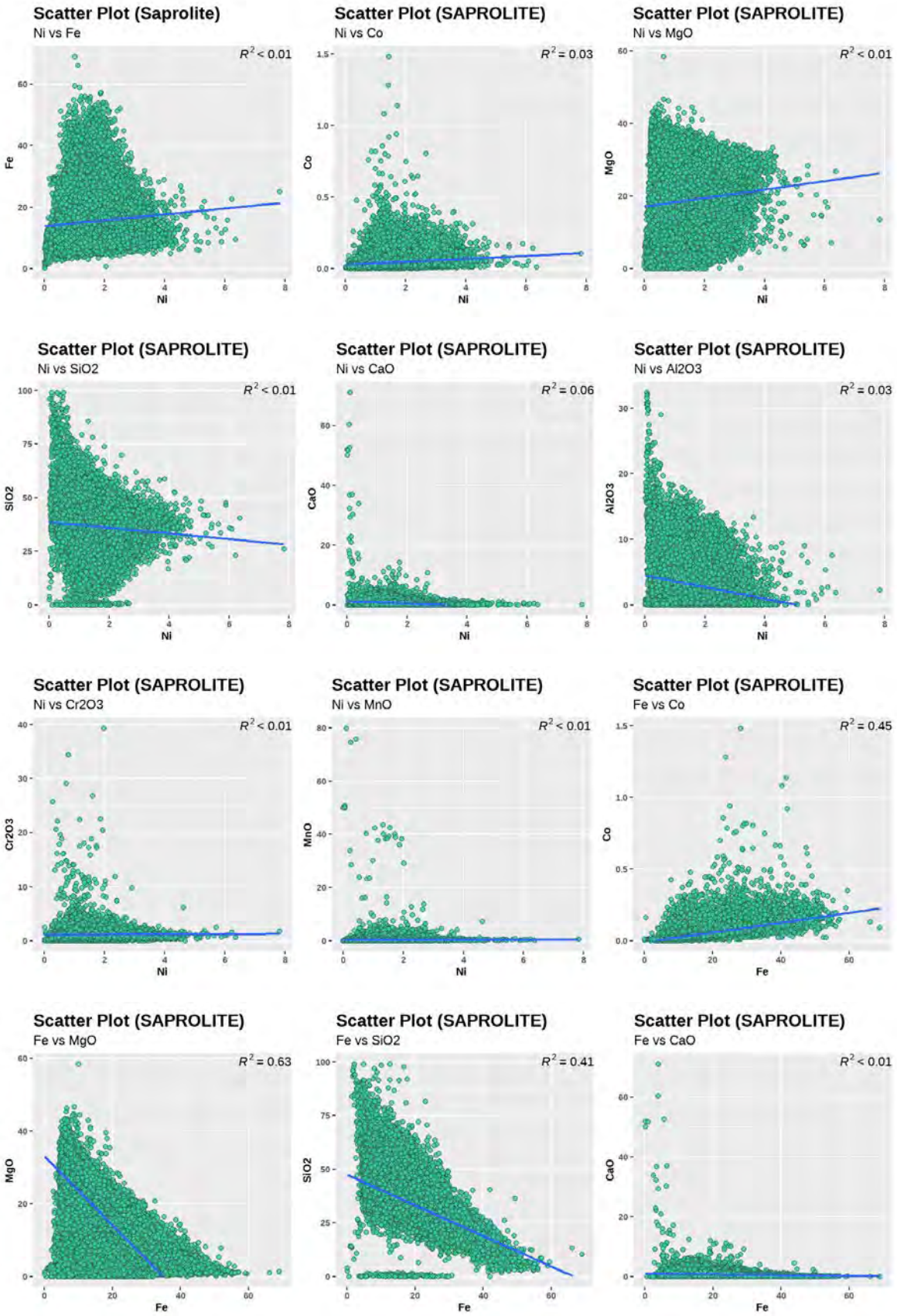
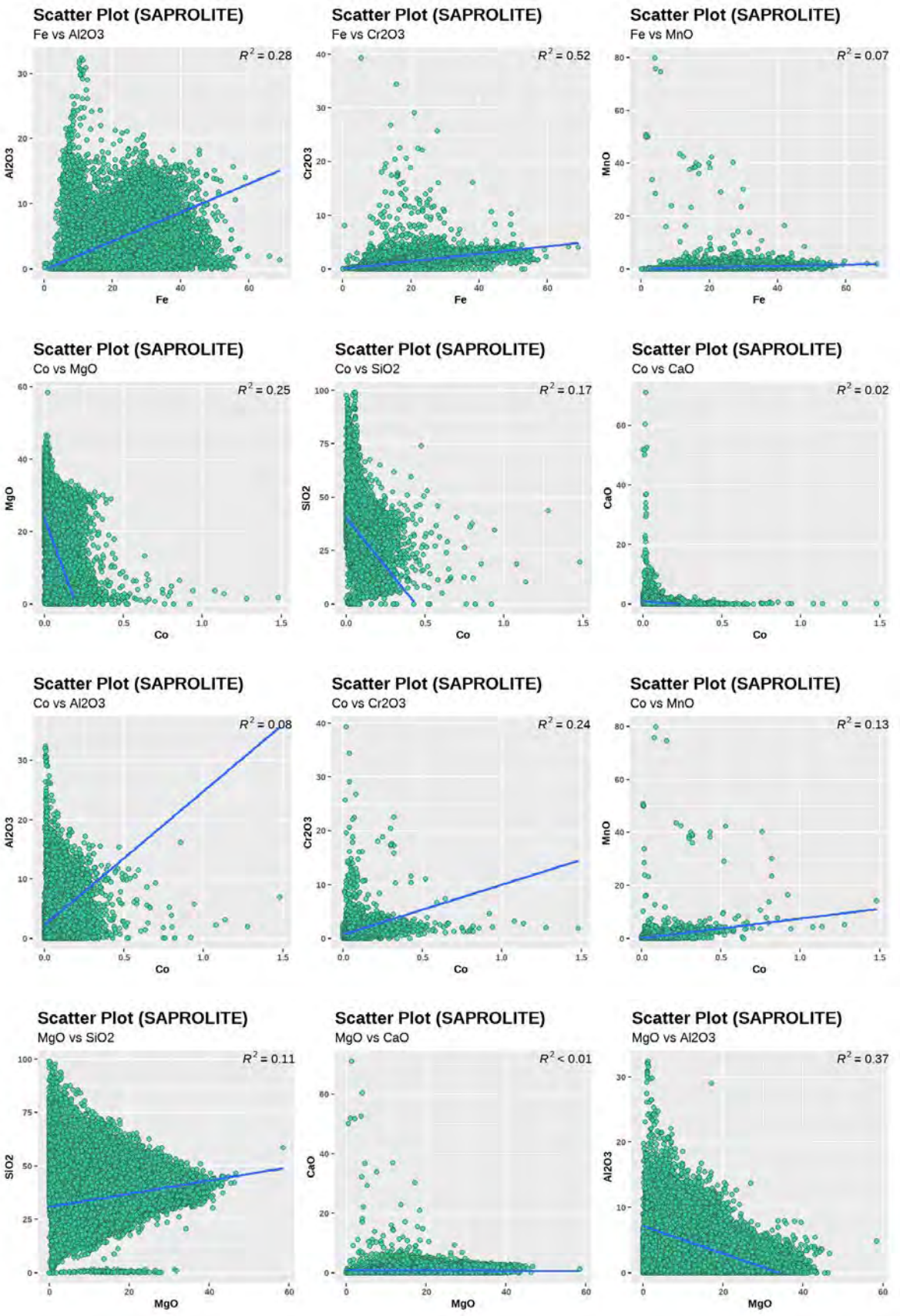



Figure 4 Mineral Correlation scatter plot for Limonite


Scatter Plot (Saprolite)
Ni vs Fe
$R^2$ < 0.01
Fe
Ni
Scatter Plot (SAPROLITE)
Ni vs Co
$R^2$ = 0.03
Co
Ni
Scatter Plot (SAPROLITE)
Ni vs MgO
$R^2$ < 0.01
MgO
Ni
Scatter Plot (SAPROLITE)
Ni vs SiO2
$R^2$ < 0.01
SiO2
Ni
Scatter Plot (SAPROLITE)
Ni vs CaO
$R^2$ = 0.06
CaO
Ni
Scatter Plot (SAPROLITE)
Ni vs Al2O3
$R^2$ = 0.03
Al2O3
Ni
Scatter Plot (SAPROLITE)
Ni vs Cr2O3
$R^2$ < 0.01
Cr2O3
Ni
Scatter Plot (SAPROLITE)
Ni vs MnO
$R^2$ < 0.01
MnO
Ni
Scatter Plot (SAPROLITE)
Fe vs Co
$R^2$ = 0.45
Co
Fe
Scatter Plot (SAPROLITE)
Fe vs MgO
$R^2$ = 0.63
MgO
Fe
Scatter Plot (SAPROLITE)
Fe vs SiO2
$R^2$ = 0.41
SiO2
Fe
Scatter Plot (SAPROLITE)
Fe vs CaO
$R^2$ < 0.01
CaO
Fe


Scatter Plot (SAPROLITE)
Fe vs Al2O3
$R^2$ = 0.28
Al2O3
Fe
Scatter Plot (SAPROLITE)
Fe vs Cr2O3
$R^2$ = 0.52
Cr2O3
Fe
Scatter Plot (SAPROLITE)
Fe vs MnO
$R^2$ = 0.07
MnO
Fe
Scatter Plot (SAPROLITE)
Co vs MgO
$R^2$ = 0.25
MgO
Co
Scatter Plot (SAPROLITE)
Co vs SiO2
$R^2$ = 0.17
SiO2
Co
Scatter Plot (SAPROLITE)
Co vs CaO
$R^2$ = 0.02
CaO
Co
Scatter Plot (SAPROLITE)
Co vs Al2O3
$R^2$ = 0.08
Al2O3
Co
Scatter Plot (SAPROLITE)
Co vs Cr2O3
$R^2$ = 0.24
Cr2O3
Co
Scatter Plot (SAPROLITE)
Co vs MnO
$R^2$ = 0.13
MnO
Co
Scatter Plot (SAPROLITE)
MgO vs SiO2
$R^2$ = 0.11
SiO2
MgO
Scatter Plot (SAPROLITE)
MgO vs CaO
$R^2$ < 0.01
CaO
MgO
Scatter Plot (SAPROLITE)
MgO vs Al2O3
$R^2$ = 0.37
Al2O3
MgO

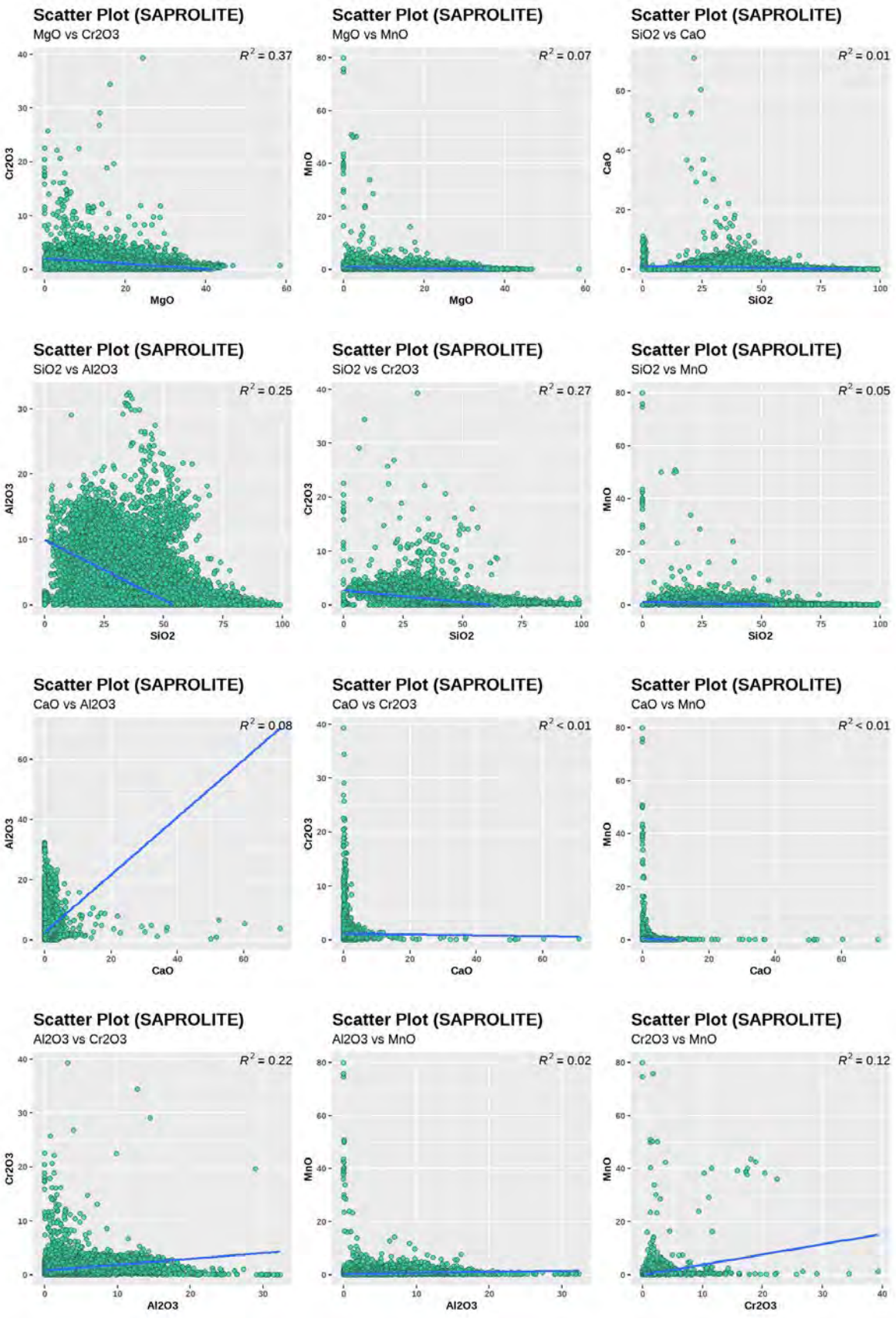



Figure 5 Mineral correlation scatter plot for Saprolite

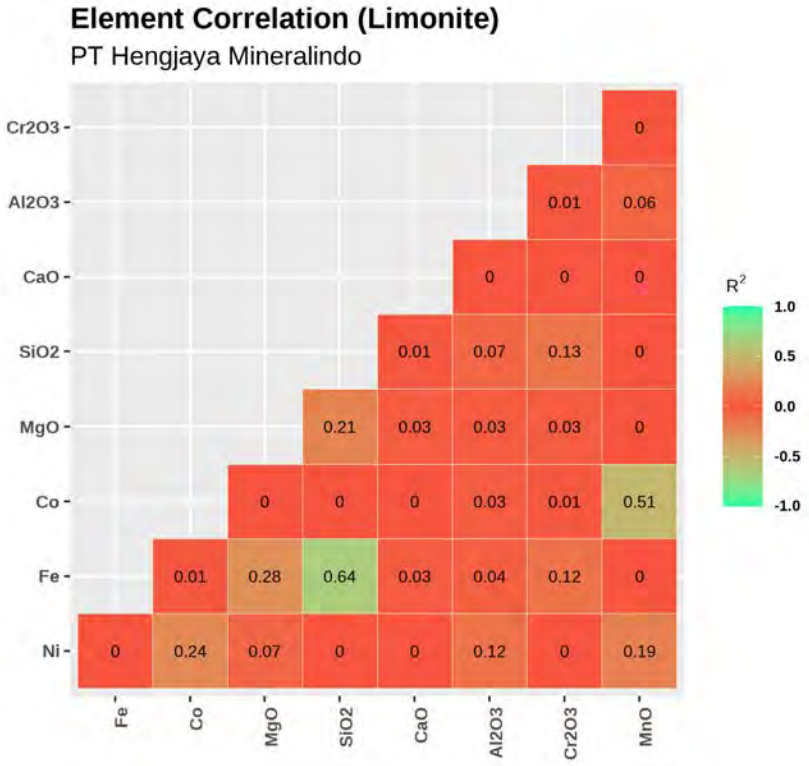



Figure 6 Summary of mineral correlation for Limonite

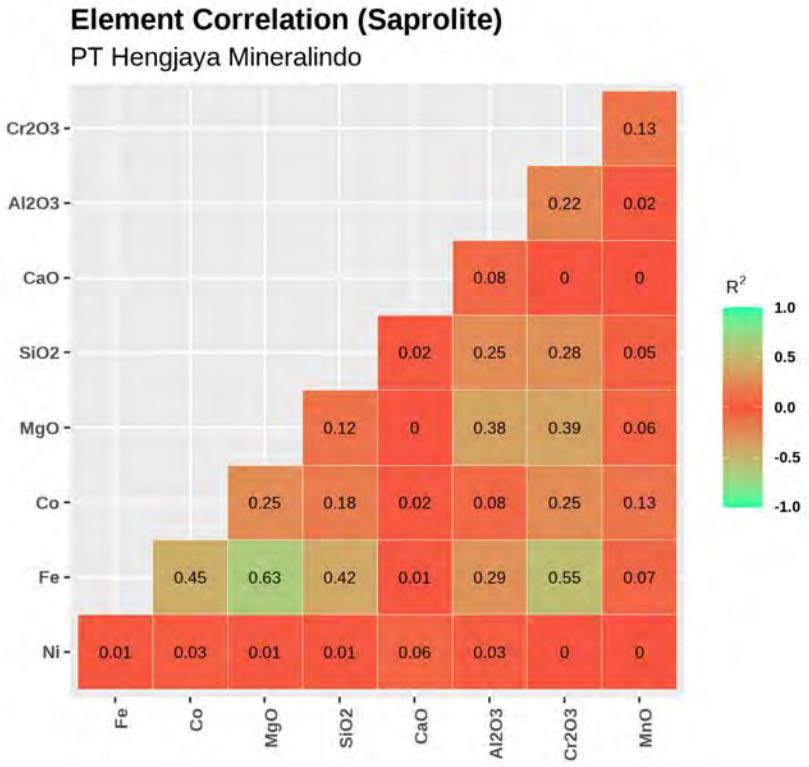



Figure 7 Summary of mineral correlation for Saprolite

### 1.3.4 Drillhole and Geological model Comparison

Table 7 Drillhole and geological model cumulative thickness comparison

| BLOCK | Drilling Lithology | Drilling Length (m) | Model Length (m) | Matching Percent (%) |
|---|---|---|---|---|
| APL, BB, BBS, CE, CN, CW | CLAY | 21 | 21 | 100 |
| | LIM | 171,939 | 171,881 | 99.97 |
| | SAP | 101,121 | 100,994 | 99.87 |
| | BOULDER | 3 | 3 | 100 |
| | BOXWORK | 2,391 | 2,383 | 99.64 |
| | BRK | 46,289 | 46,198 | 99.8 |
| BBFW | CLAY | - | - | - |
| | LIM | 1,892 | 1,891 | 99.95 |
| | SAP | 1,145 | 1,142 | 99.7 |
| | BOULDER | - | - | - |
| | BOXWORK | 12 | 12 | 99.78 |
| | BRK | 1,827 | 1,825 | 99.86 |
| BBW | CLAY | - | - | - |
| | LIM | 3,434 | 3,433 | 99.98 |
| | SAP | 1,798 | 1,794 | 99.73 |
| | BOULDER | - | - | - |
| | BOXWORK | 43 | 42 | 99.19 |
| | BRK | 1,587 | 1,585 | 99.85 |

## 1.4 Variography

### 1.4.1 Variogram of Limonite

#### 1.4.1.1 Variogram of Limonite Block APL, BB, BBS, CE, CN, CW

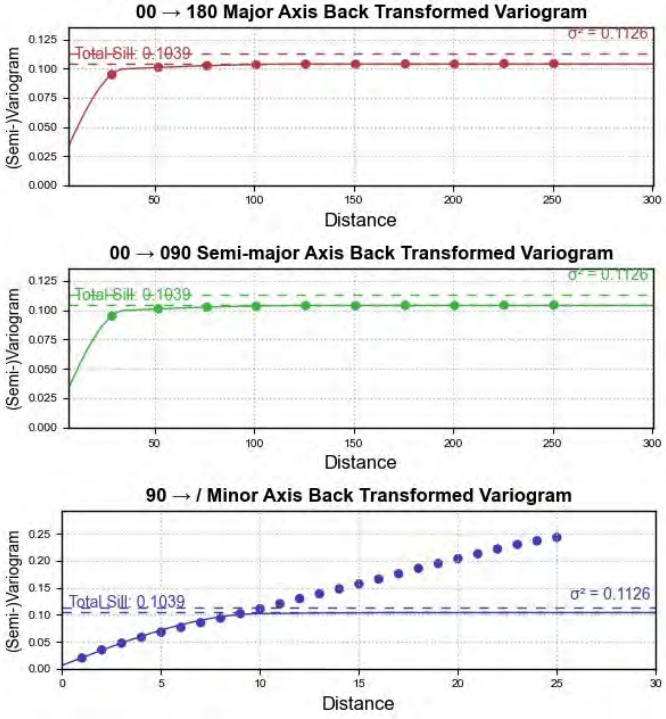



Figure 8 Variogram of Limonite Ni block APL, BB, BBS, CE, CN, CW

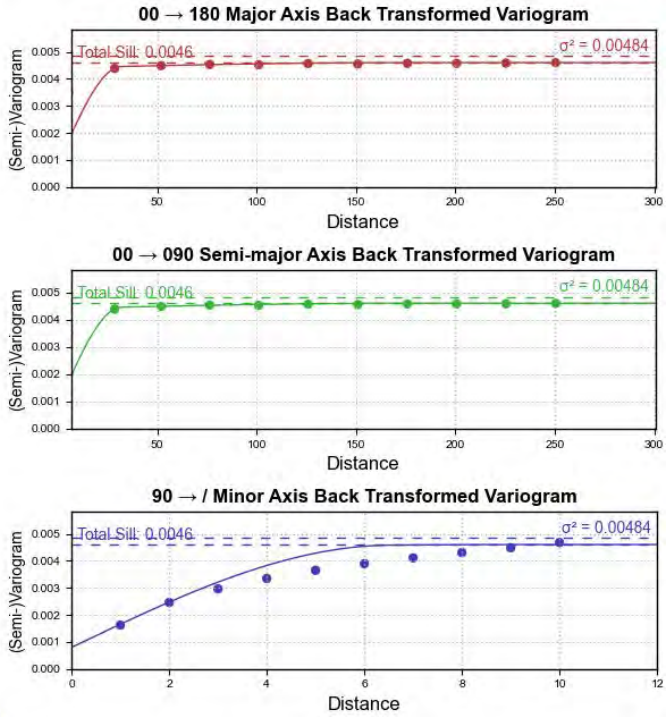



Figure 9 Variogram of Limonite Co block APL, BB, BBS, CE, CN, CW

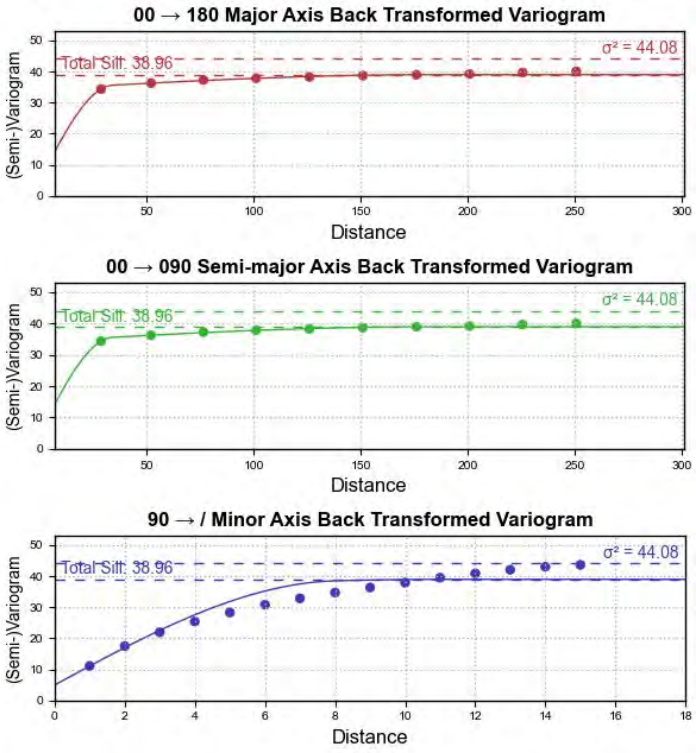



Figure 10 Variogram of Limonite Fe block APL, BB, BBS, CE, CN, CW

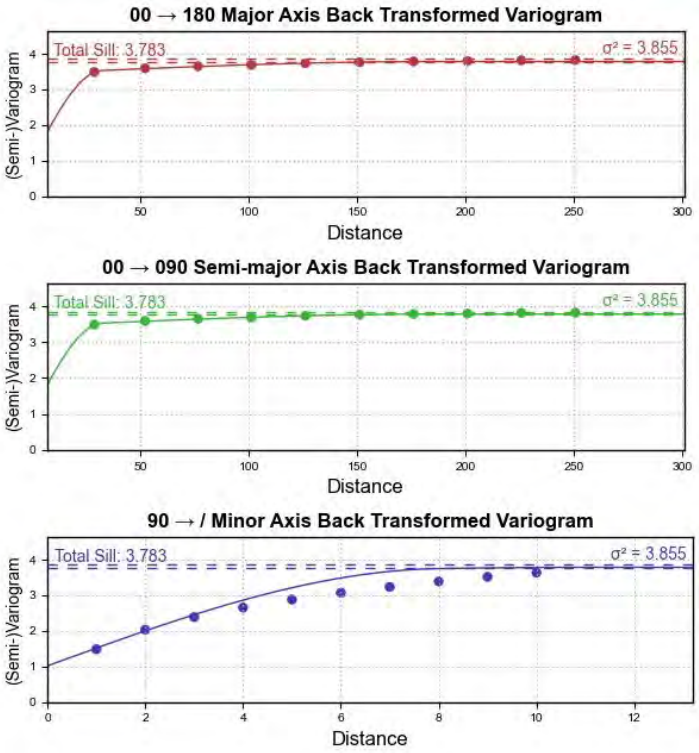



Figure 11 Variogram of Limonite MgO block APL, BB, BBS, CE, CN, CW

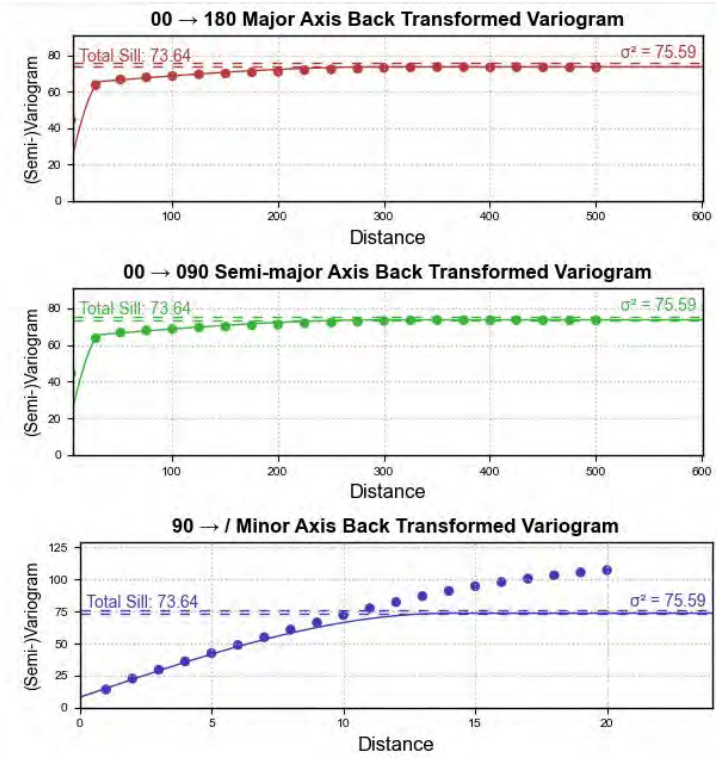



Figure 12 Variogram of Limonite $SiO_2$ block APL, BB, BBS, CE, CN, CW

Table 8 Summary of variogram model of Limonite block APL, BB, BBS, CE, CN, CW

| Variogram Name | | Ni | | Co | | Fe | | MgO | | $SiO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model space | | Data | | Data | | Data | | Data | | Data | |
| Direction | Dip | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.1126 | | 0.0048 | | 44.0800 | | 3.8550 | | 75.5900 | |
| | Nugget | 0.0063 | | 0.0008 | | 4.9760 | | 1.0190 | | 8.0810 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.0905 | 0.0071 | 0.0036 | 0.0002 | 29.3000 | 4.6850 | 2.4230 | 0.3783 | 55.9100 | 9.6450 |
| | Major | 35 | 35 | 32 | 32 | 34 | 34 | 32 | 32 | 34 | 34 |
| | Semi-major | 125 | 125 | 170 | 170 | 180 | 180 | 185 | 185 | 300 | 300 |
| | Minor | 10 | 18 | 6.5 | 9 | 8 | 11 | 8 | 11 | 14 | 14 |

### 1.4.1.2 Variogram of Limonite Block BBFW

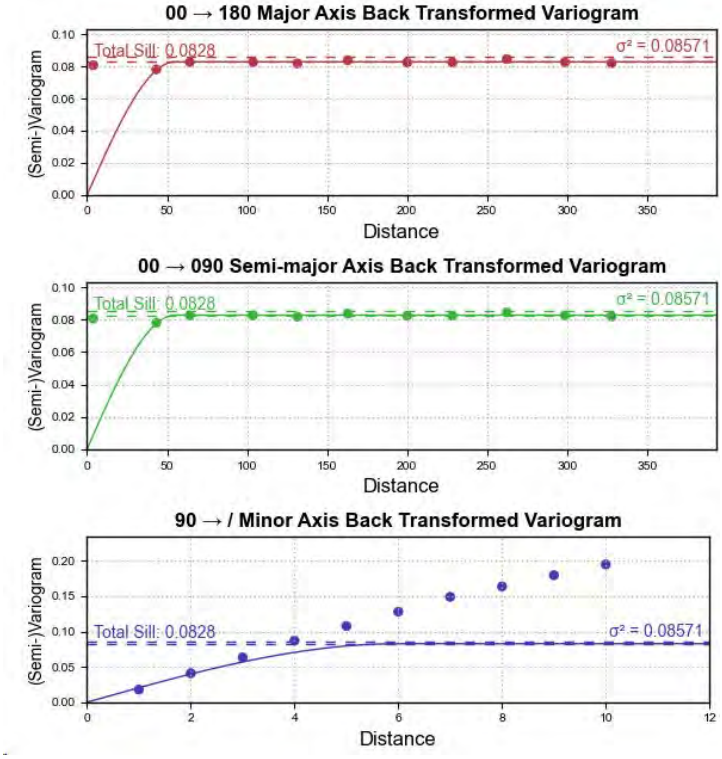



Figure 13 Variogram of Limonite Ni block BBFW

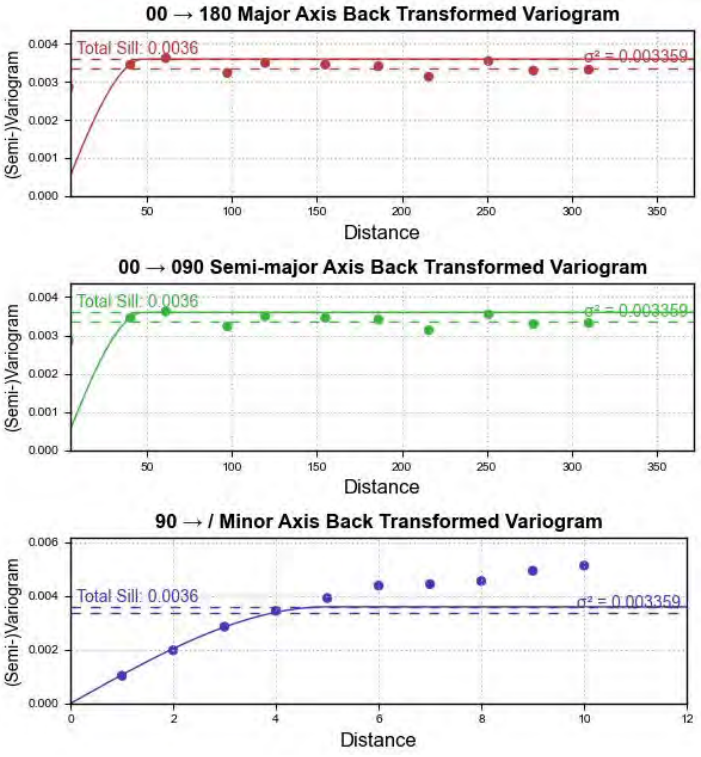



Figure 14 Variogram of Limonite Co block BBFW

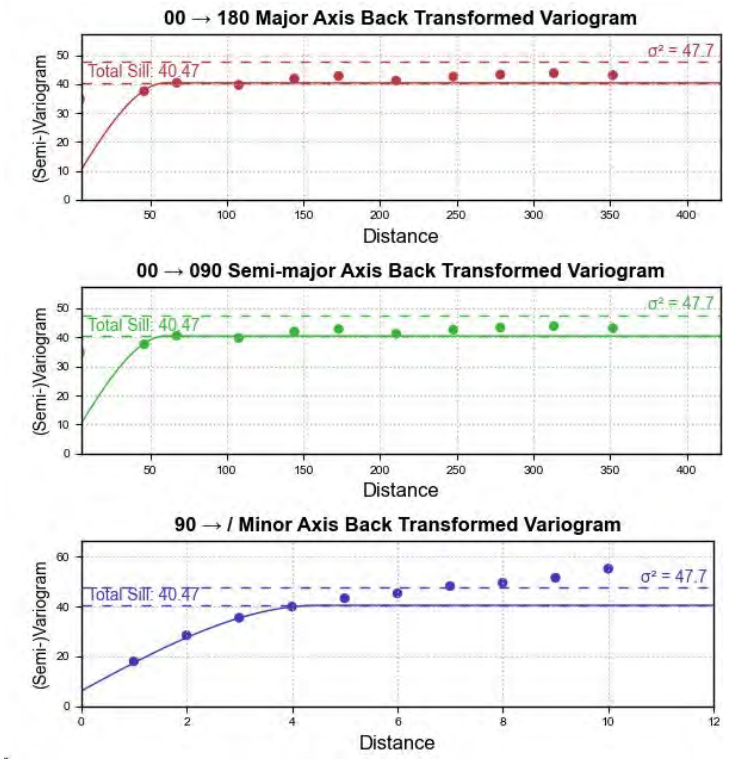



Figure 15 Variogram of Limonite Fe block BBFW

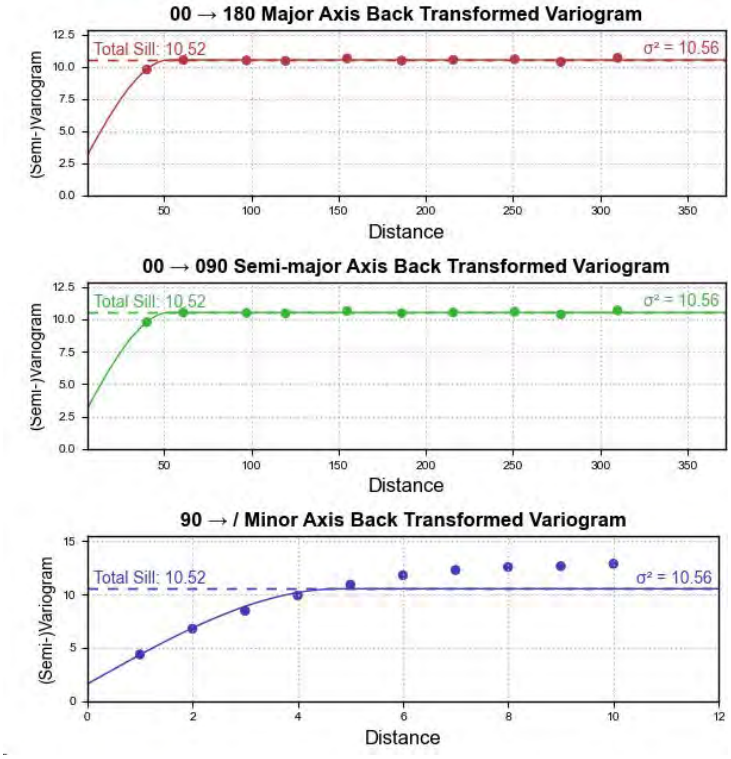



Figure 16 Variogram of Limonite MgO block BBFW

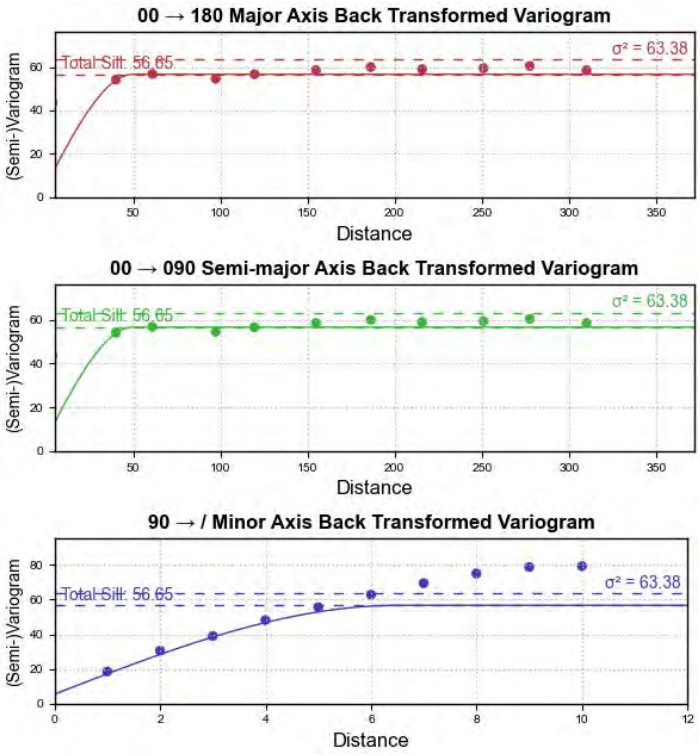



Figure 17 Variogram of Limonite $SiO_2$ block BBFW

Table 9 Summary of variogram model of Limonite block BBFW

| Variogram Name | | Ni | | Co | | Fe | | MgO | | SiO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model space | | Data | | Data | | Data | | Data | | Data | |
| Direction | Dip | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.0857 | | 0.0034 | | 47.7000 | | 10.5600 | | 63.3800 | |
| | Nugget | 0.0000 | | 0.0000 | | 6.2010 | | 1.6090 | | 5.5520 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.0828 | - | 0.0036 | - | 34.2600 | - | 8.9130 | - | 51.1000 | - |
| | Major | 55 | - | 48 | - | 60 | - | 53 | - | 50 | - |
| | Semi-major | 55 | - | 48 | - | 60 | - | 53 | - | 50 | - |
| | Minor | 6 | - | 5 | - | 4.5 | - | 4.8 | - | 6.5 | - |

#### 1.4.1.3 Variogram of Limonite Block BBW

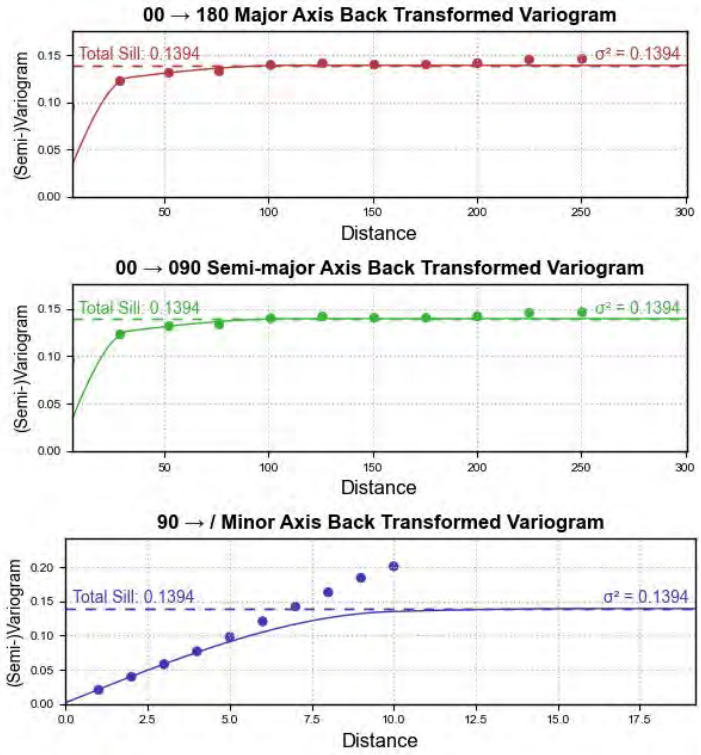



Figure 18 Variogram of Limonite Ni block BBW

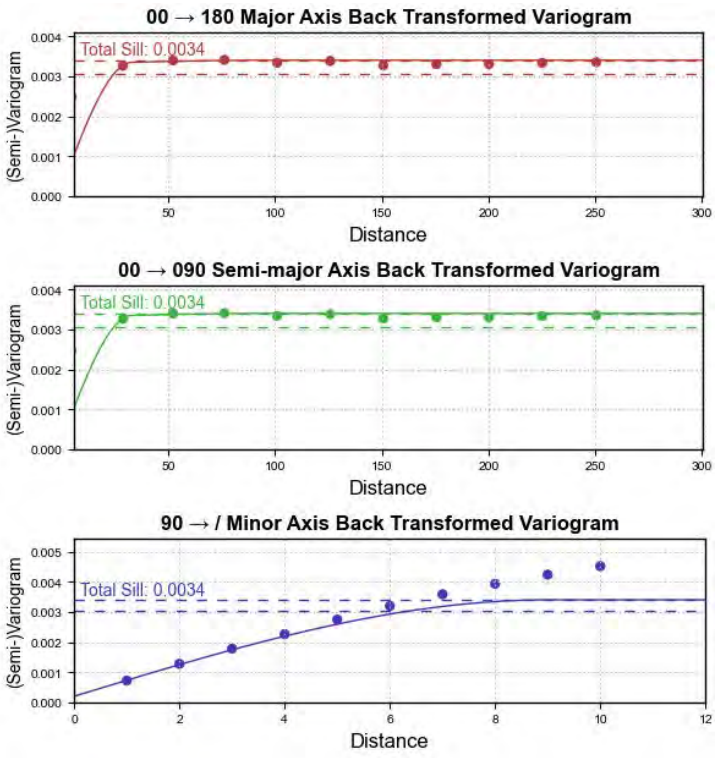



Figure 19 Variogram of Limonite Co block BBW

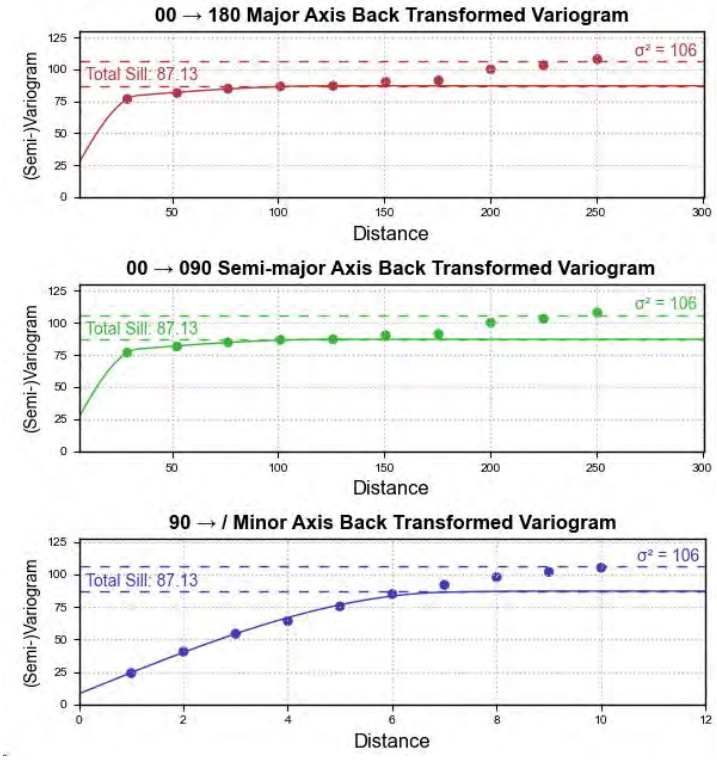



Figure 20 Variogram of Limonite Fe block BBW

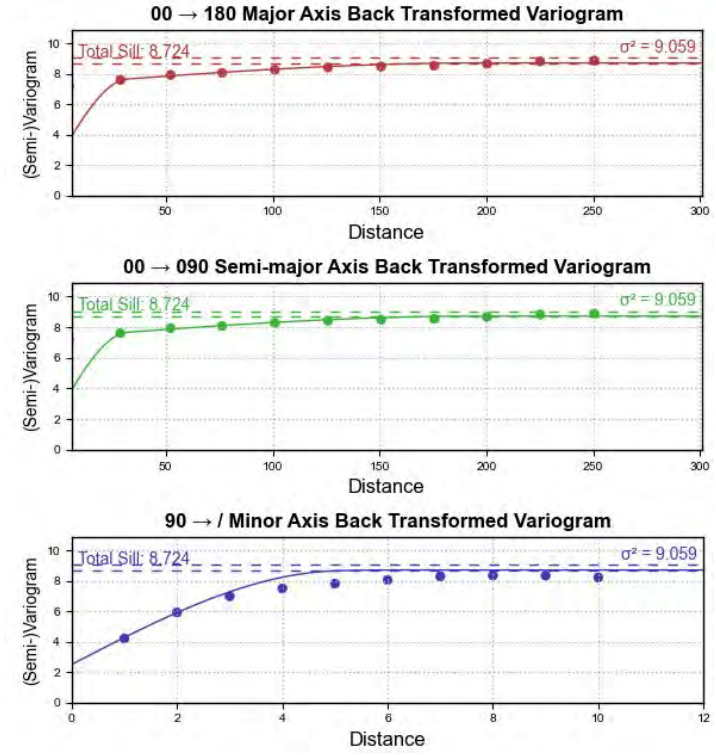



Figure 21 Variogram of Limonite MgO block BBW

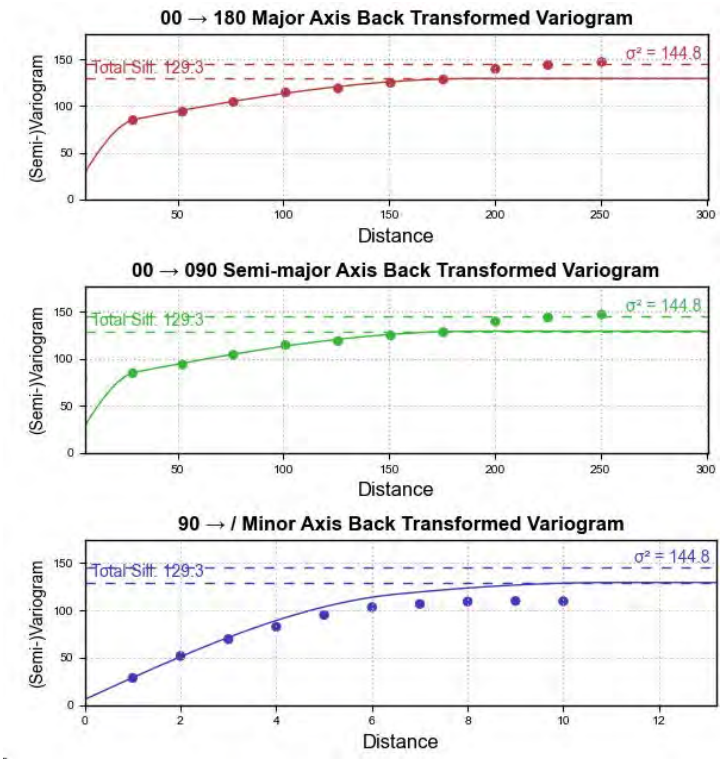



Figure 22 Variogram of Limonite $SiO_2$ block BBW

Table 10 Summary of variogram model of Limonite block BBW

| Variogram Name | | Ni | | Co | | Fe | | MgO | | SiO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model space | | Data | | Data | | Data | | Data | | Data | |
| Direction | Dip | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.1394 | | 0.0031 | | 106.0000 | | 9.0590 | | 144.8000 | |
| | Nugget | 0.0021 | | 0.0002 | | 8.2160 | | 2.5160 | | 6.1260 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.1144 | 0.0229 | 0.0031 | 0.0001 | 66.4200 | 12.4900 | 4.8130 | 1.3950 | 66.3100 | 56.8800 |
| | Major | 33 | 33 | 33 | 33 | 34 | 34 | 32 | 32 | 30 | 30 |
| | Semi-major | 110 | 110 | 95 | 95 | 125 | 125 | 195 | 195 | 190 | 190 |
| | Minor | 10 | 16 | 9 | 9 | 7 | 9 | 5 | 6 | 6.5 | 11 |

### 1.4.2 Variogram of Saprolite

#### 1.4.2.1 Variogram of Saprolite Block APL, BB, BBS, CE, CN, CW

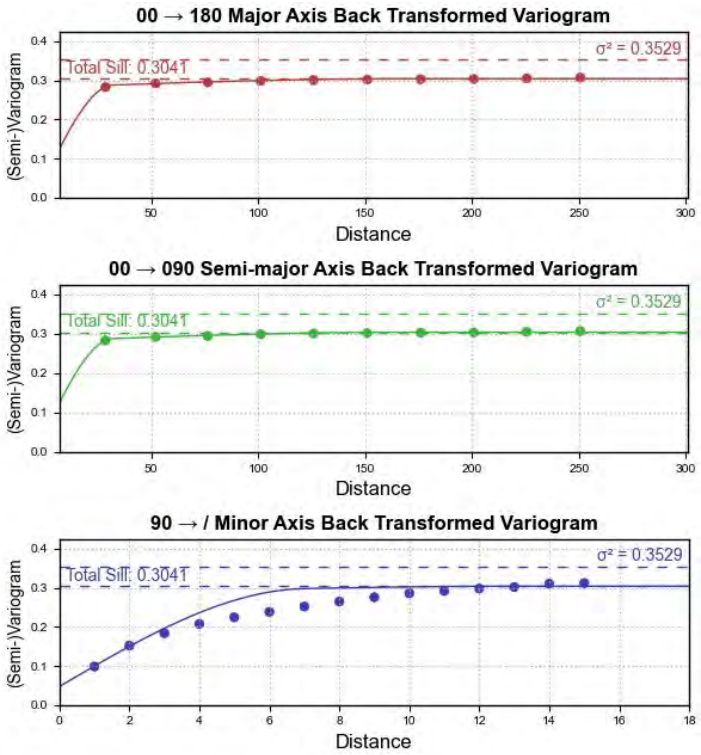



Figure 23 Variogram of Saprolite Ni block APL, BB, BBS, CE, CN, CW

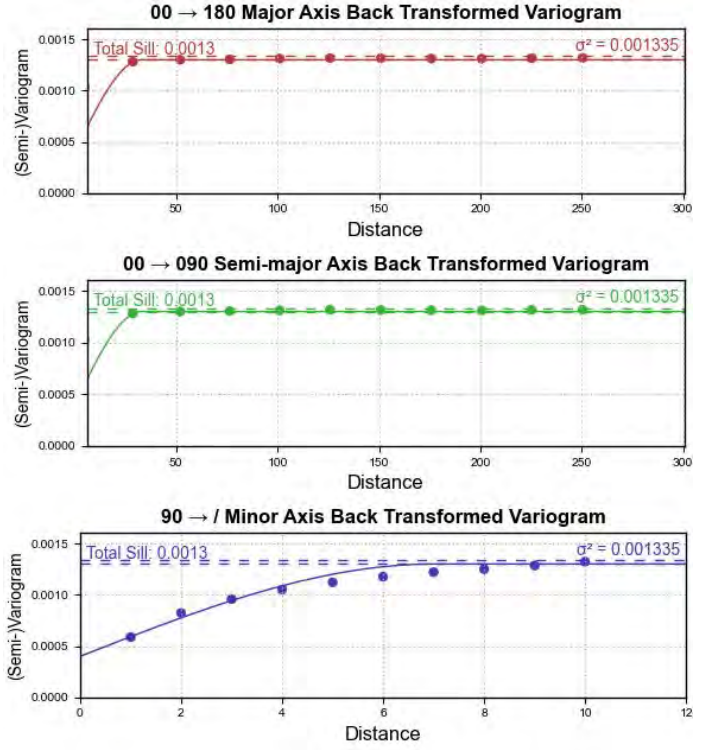



Figure 24 Variogram of Saprolite Co block APL, BB, BBS, CE, CN, CW

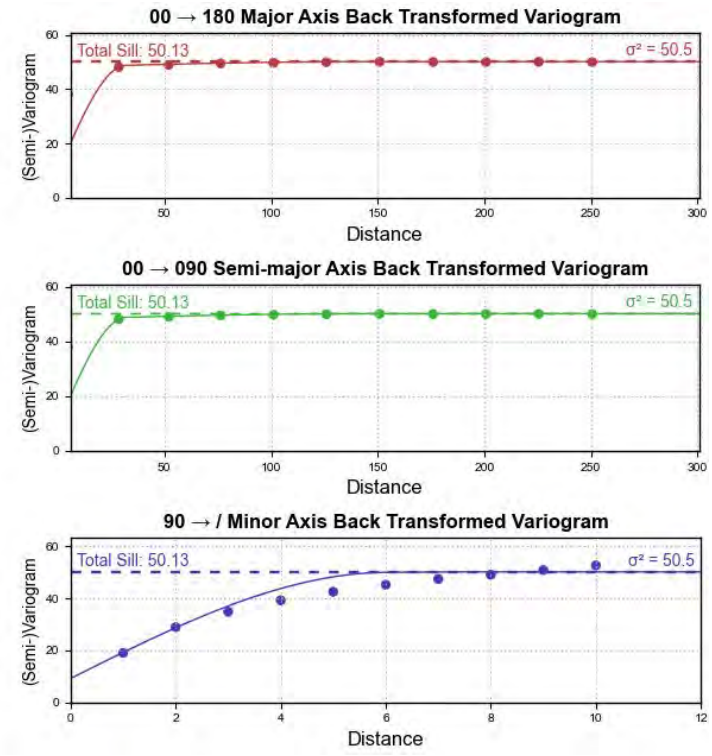



Figure 25 Variogram of Saprolite Fe block APL, BB, BBS, CE, CN, CW

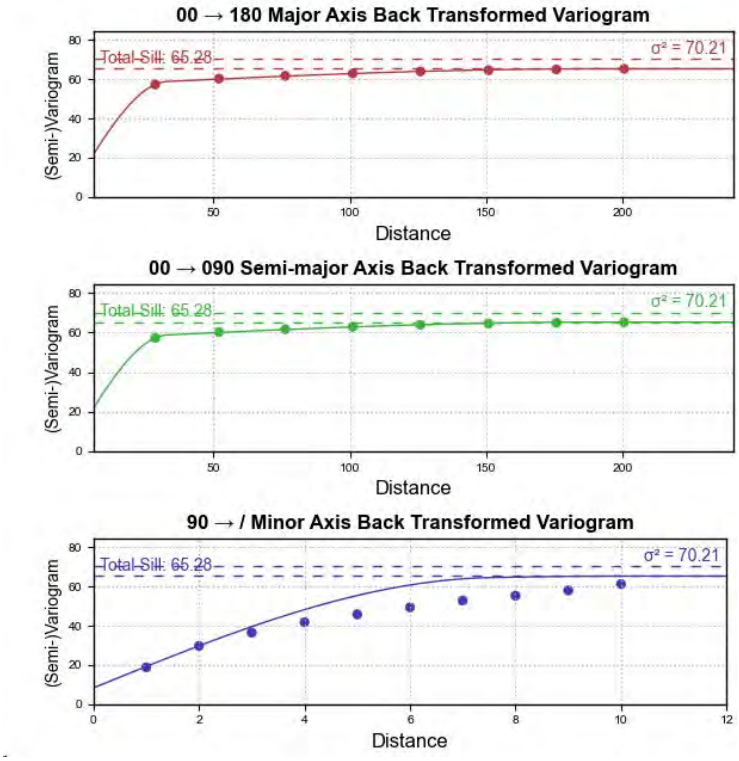



Figure 26 Variogram of Saprolite MgO block APL, BB, BBS, CE, CN, CW

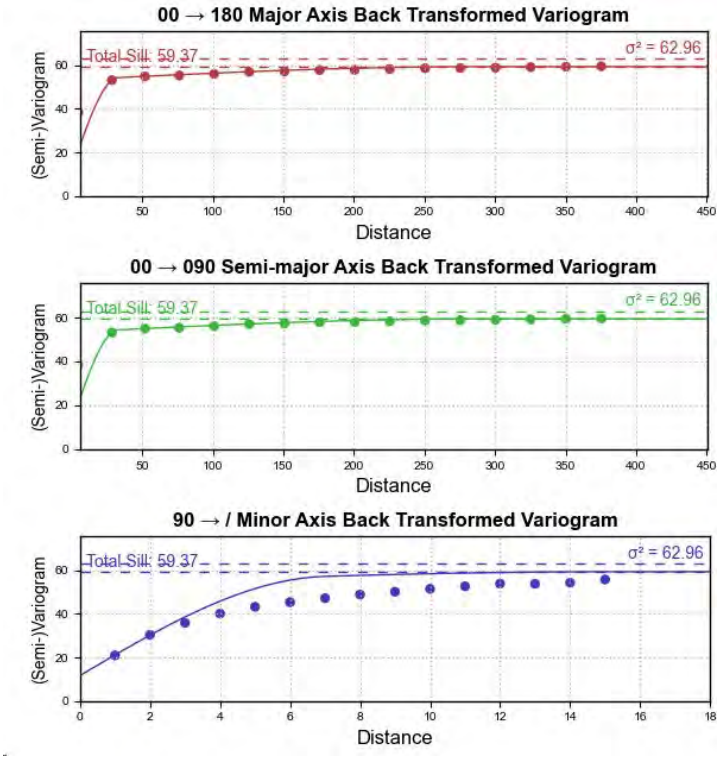



Figure 27 Variogram of Saprolite $SiO_2$ block APL, BB, BBS, CE, CN, CW

Table 11 Summary of variogram model of Saprolite block APL, BB, BBS, CE, CN, CW

| Variogram Name | | Ni | | Co | | Fe | | MgO | | SiO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model space | | Data | | Data | | Data | | Data | | Data | |
| Direction | Dip | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.3529 | | 0.0013 | | 50.5000 | | 70.2100 | | 62.9600 | |
| | Nugget | 0.0472 | | 0.0004 | | 9.2120 | | 8.3480 | | 11.7300 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.2343 | 0.0226 | 0.0009 | 0.0000 | 38.9200 | 2.0050 | 48.1800 | 8.7480 | 41.5900 | 6.0510 |
| | Major | 32 | 32 | 33 | 33 | 32 | 32 | 33 | 33 | 33 | 33 |
| | Semi-major | 165 | 165 | 150 | 150 | 145 | 145 | 190 | 190 | 285 | 285 |
| | Minor | 7 | 13 | 7 | 9 | 6 | 8 | 7.5 | 10 | 7 | 15 |

### 1.4.2.2 Variogram of Saprolite Block BBFW

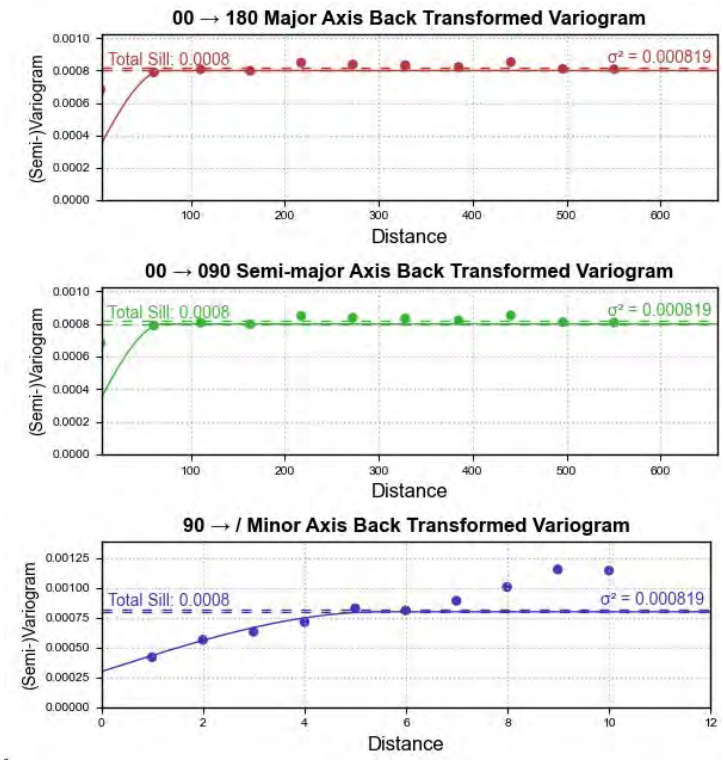



Figure 28 Variogram of Saprolite Ni block BBFW

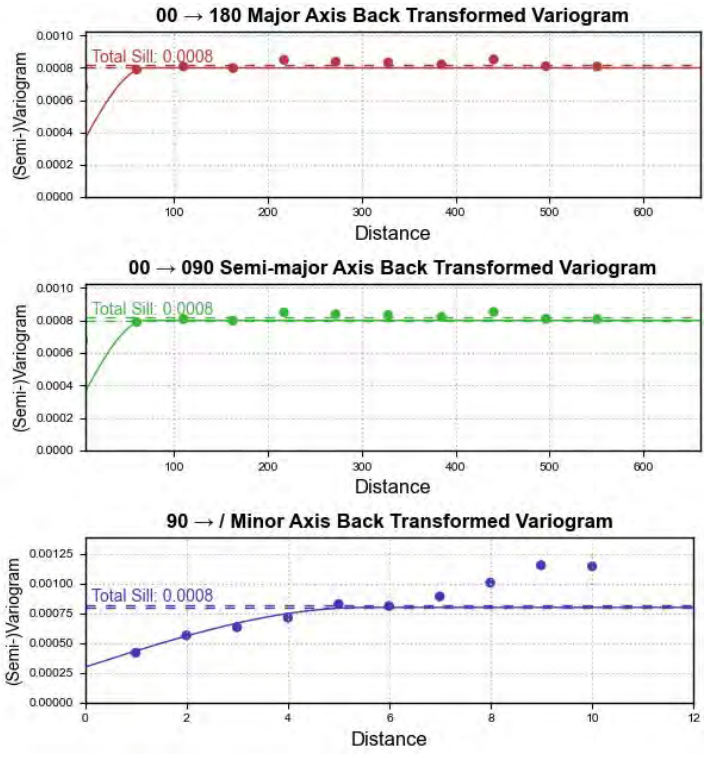



Figure 29 Variogram of Saprolite Co block BBFW

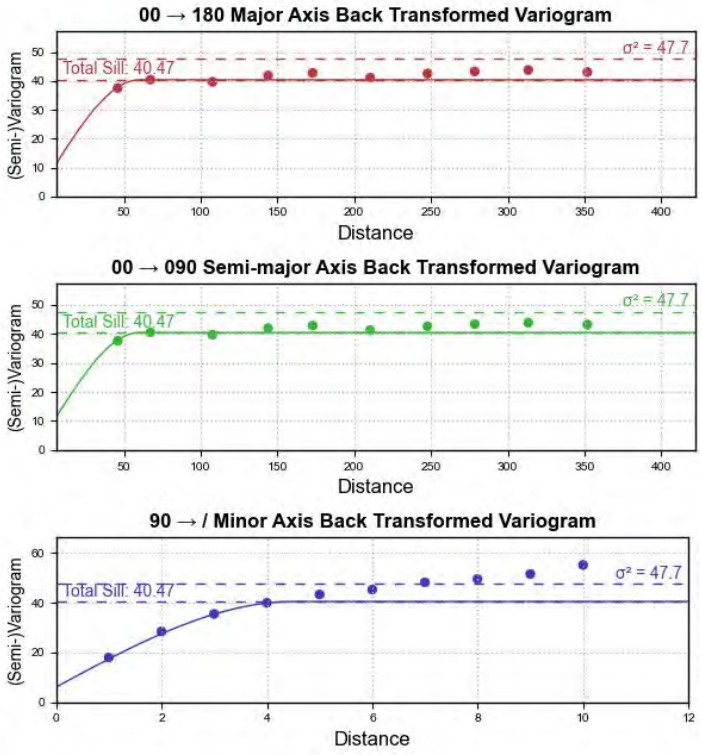



Figure 30 Variogram of Saprolite Fe block BBFW

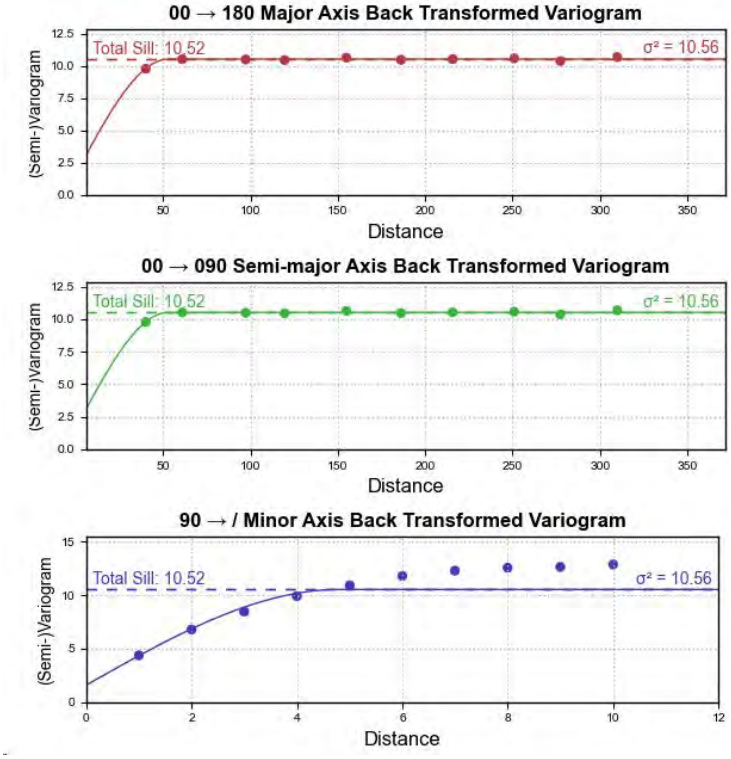



Figure 31 Variogram of Saprolite MgO block BBFW

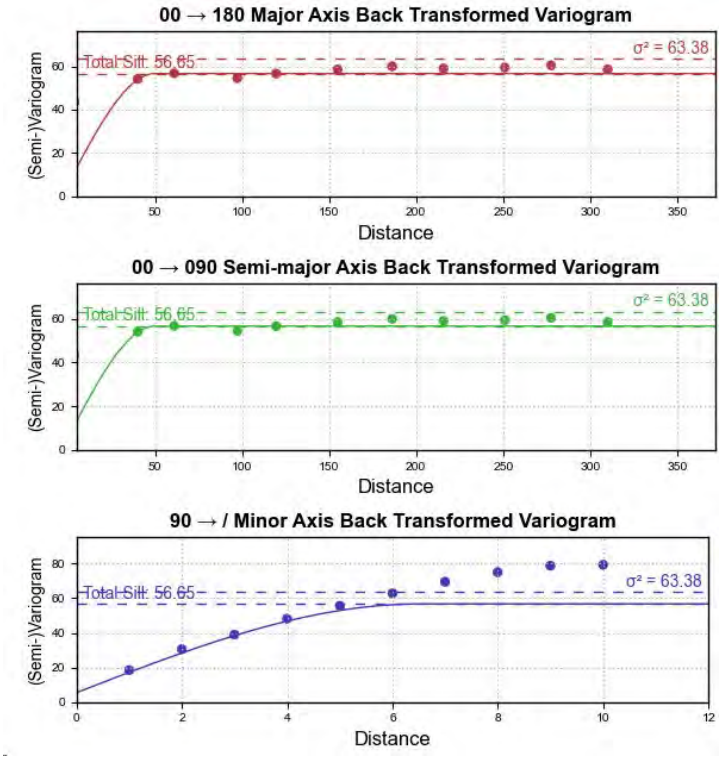



Figure 32 Variogram of Saprolite $SiO_2$ block BBFW

Table 12 Summary of variogram model of Saprolite block BBFW

| Variogram Name | | Ni | | Co | | Fe | | MgO | | SiO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model space | | Data | | Data | | Data | | Data | | Data | |
| Direction | Dip | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.1941 | | 0.0008 | | 43.0800 | | 48.9900 | | 43.9000 | |
| | Nugget | 0.0442 | | 0.0003 | | 14.8900 | | 15.1200 | | 8.2410 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.1311 | - | 0.0005 | - | 28.1900 | - | 29.0600 | - | 31.8400 | - |
| | Major | 90 | - | 70 | - | 60 | - | 50 | - | 65 | - |
| | Semi-major | 90 | - | 70 | - | 60 | - | 50 | - | 65 | - |
| | Minor | 7.5 | - | 5.5 | - | 5 | - | 5.8 | - | 4.8 | - |

### 1.4.2.3 Variogram of Saprolite Block BBW

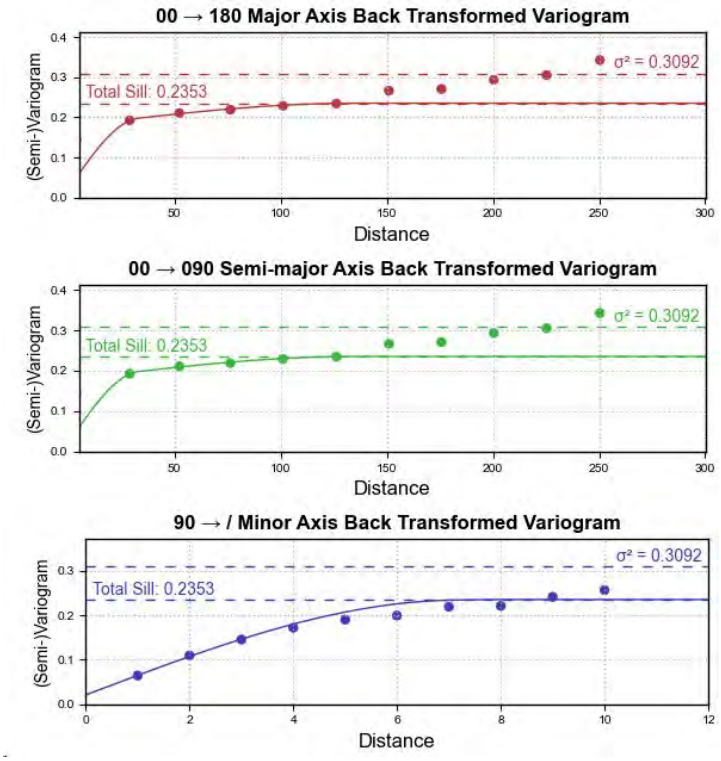



Figure 33 Variogram of Saprolite Ni block BBW

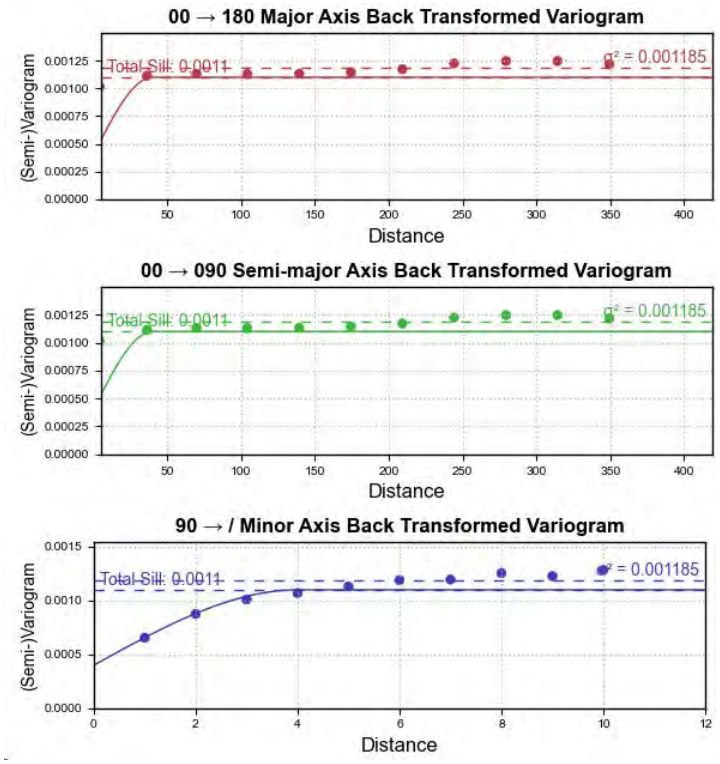



Figure 34 Variogram of Saprolite Co block BBW

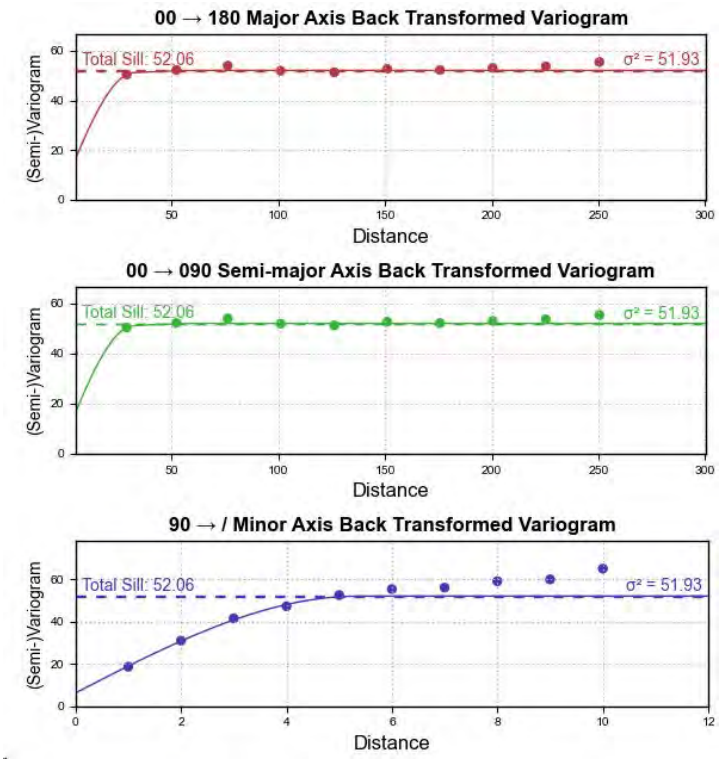



Figure 35 Variogram of Saprolite Fe block BBW

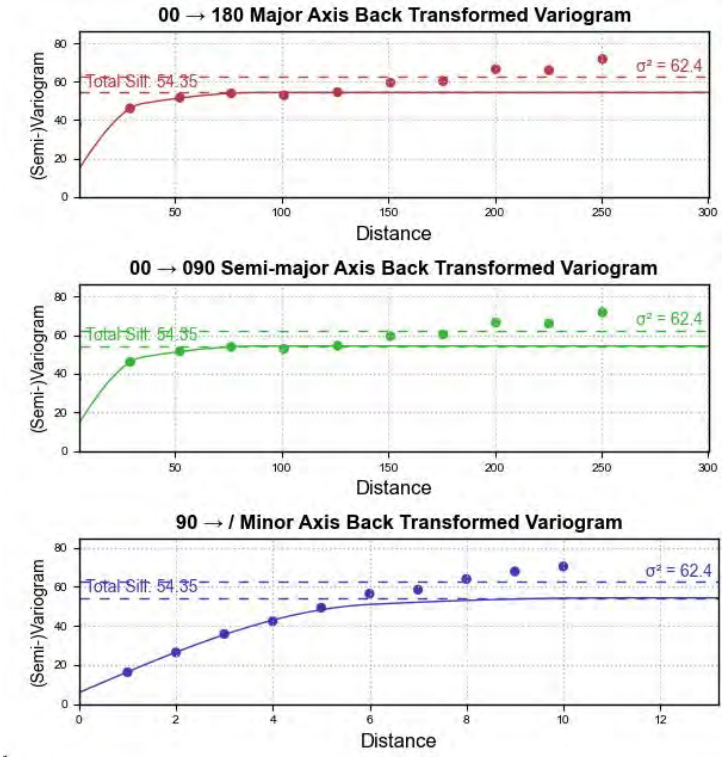



Figure 36 Variogram of Saprolite MgO block BBW

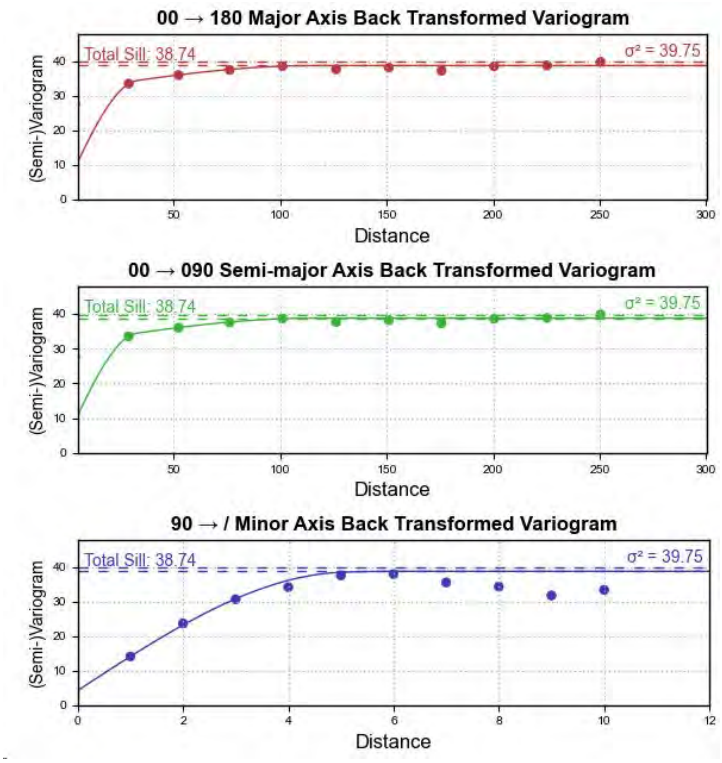



Figure 37 Variogram of Saprolite $SiO_2$ block BBW

Table 13 Summary of variogram model of Saprolite block BBW

| Variogram Name | | Ni | | Co | | Fe | | MgO | | SiO2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Model space | | Data | | Data | | Data | | Data | | Data | |
| Direction | Dip | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Dip Azimuth | 0 | | 0 | | 0 | | 0 | | 0 | |
| | Pitch | 90 | | 90 | | 90 | | 90 | | 90 | |
| Variogram Model | Variance | 0.3092 | | 0.0012 | | 51.9300 | | 62.4000 | | 39.7500 | |
| | Nugget | 0.0211 | | 0.0004 | | 6.3350 | | 5.9910 | | 4.2700 | |
| | Structure | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 | Structure 1 | Structure 2 |
| | Type | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical | Spherical |
| | Sill | 0.1558 | 0.0584 | 0.0007 | 0.0000 | 42.9000 | 2.8200 | 35.6200 | 12.7400 | 27.0600 | 7.4180 |
| | Major | 33 | 33 | 40 | 40 | 32 | 32 | 35 | 35 | 33 | 33 |
| | Semi-major | 135 | 135 | 200 | 200 | 65 | 65 | 90 | 90 | 115 | 115 |
| | Minor | 7 | 8 | 4 | 7 | 5.3 | 6 | 6 | 11 | 5 | 6 |

## 1.5 Top Cut

Top cut is a method to limit the influence of extreme values that deviate significantly from overall data distribution which can lead to over estimation and unrealistic results. A 1.5 times multiplication of Inter Quantile Range (IQR) has been applied to determine the top cuts.

Table 14 Assay Top Cut

| BLOCK | Laterite Layers | Ni Top Cut (%) | % of Top Cut Data |
|---|---|---|---|
| APL, BB, BBS, CE, CN, CW | Limonite | 2 | 0.85 |
| | Saprolite | 3 | 1.31 |
| BBFW | Limonite | 1.6 | 1.53 |
| | Saprolite | 2.3 | 2.63 |
| BBFW | Limonite | 1.7 | 2.32 |
| | Saprolite | 3 | 0.28 |

## 1.6 Variable Orientation

In simple and plainar geology, a single constant orientation for search and variogram is applied across each geological domain. This type of estimation is not appropriate to be applied in the HM project as the nickel laterite is undulating without a constant orientation. To overcome the problem, Leapfrog Edge's Variable Orientation (VO) was used to allow re-orientation of the search and variogram to better match the local structural geometry (see the illustration below).

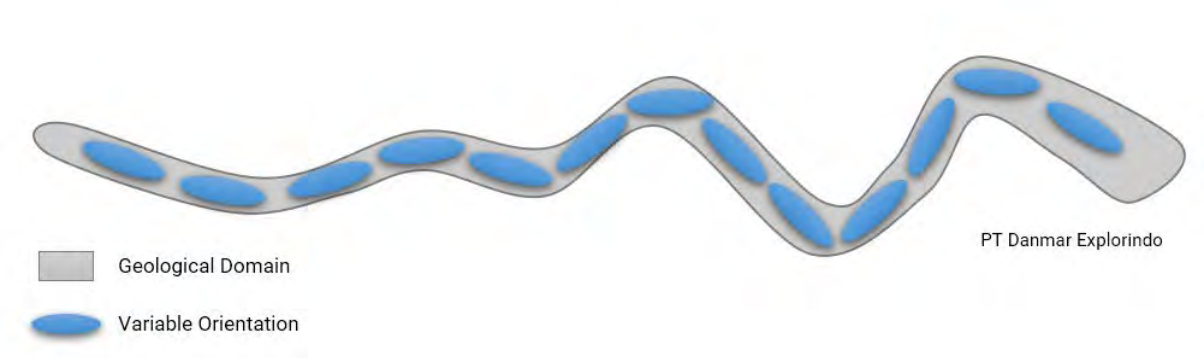



Figure 38 Variable orientation illustration

## 1.7 Kriging Neighborhood Analysis (KNA)

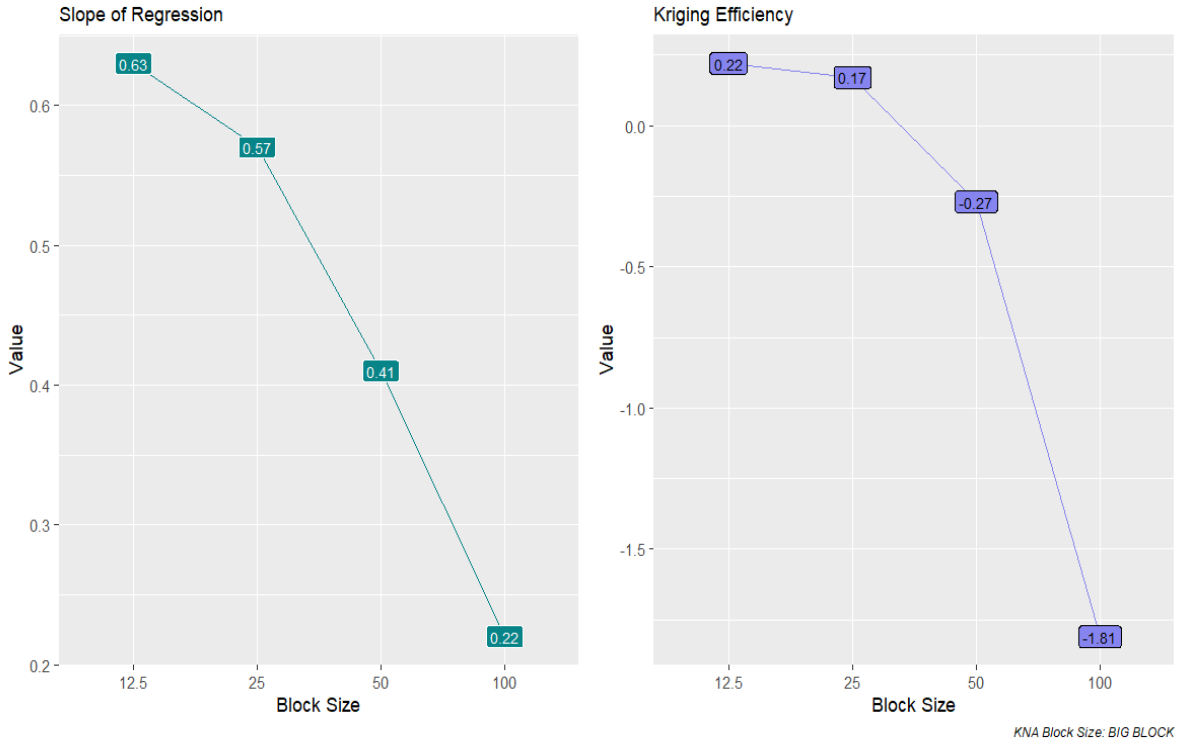



Figure 39 KNA for optimum block model size block APL, BB, BBS, CE, CN, CW

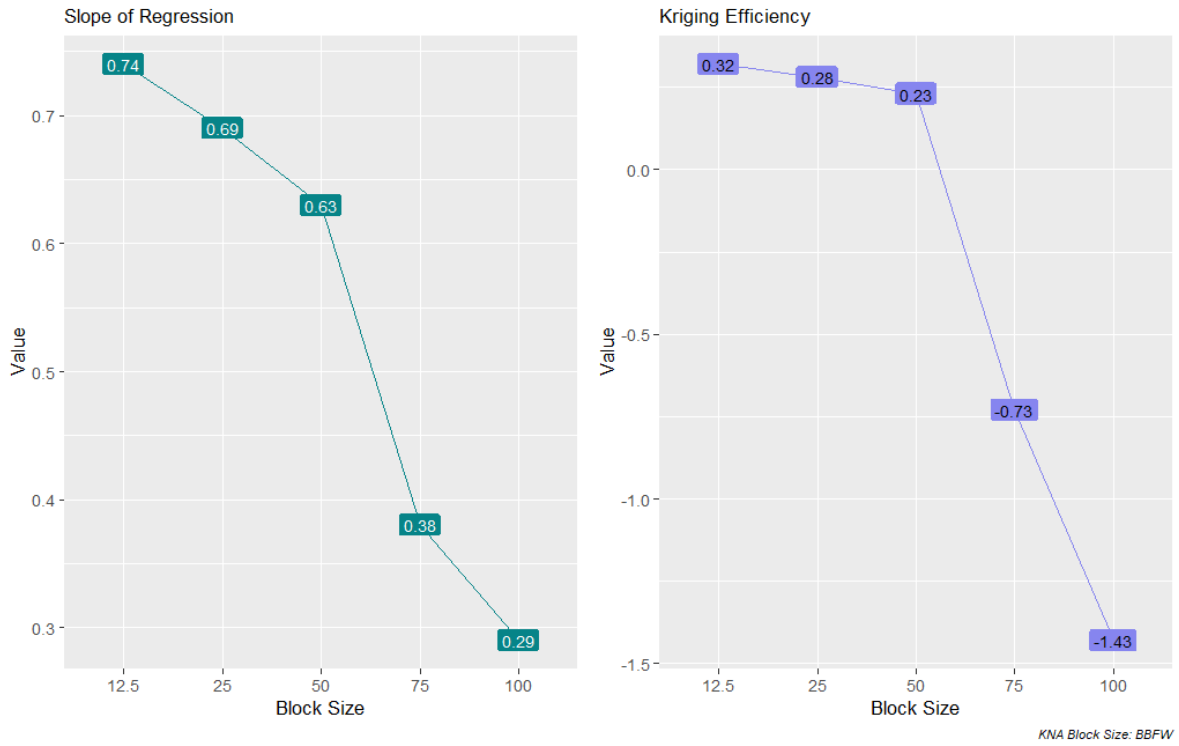



Figure 40 KNA for optimum block model size block BBFW

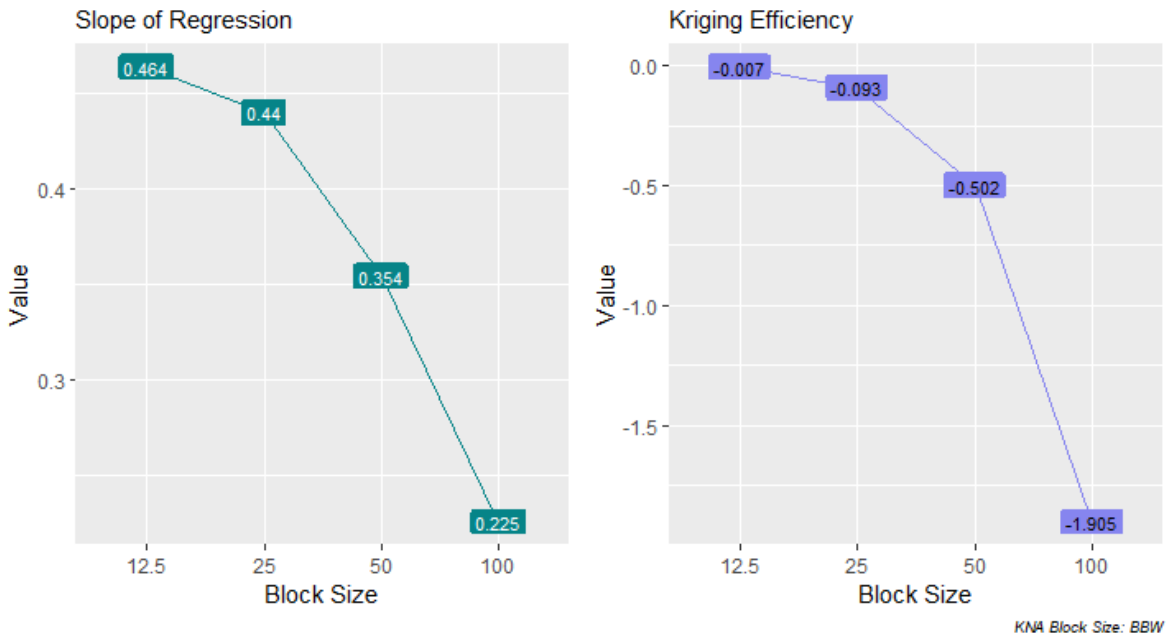



Figure 41 KNA for optimum block model size block BBW

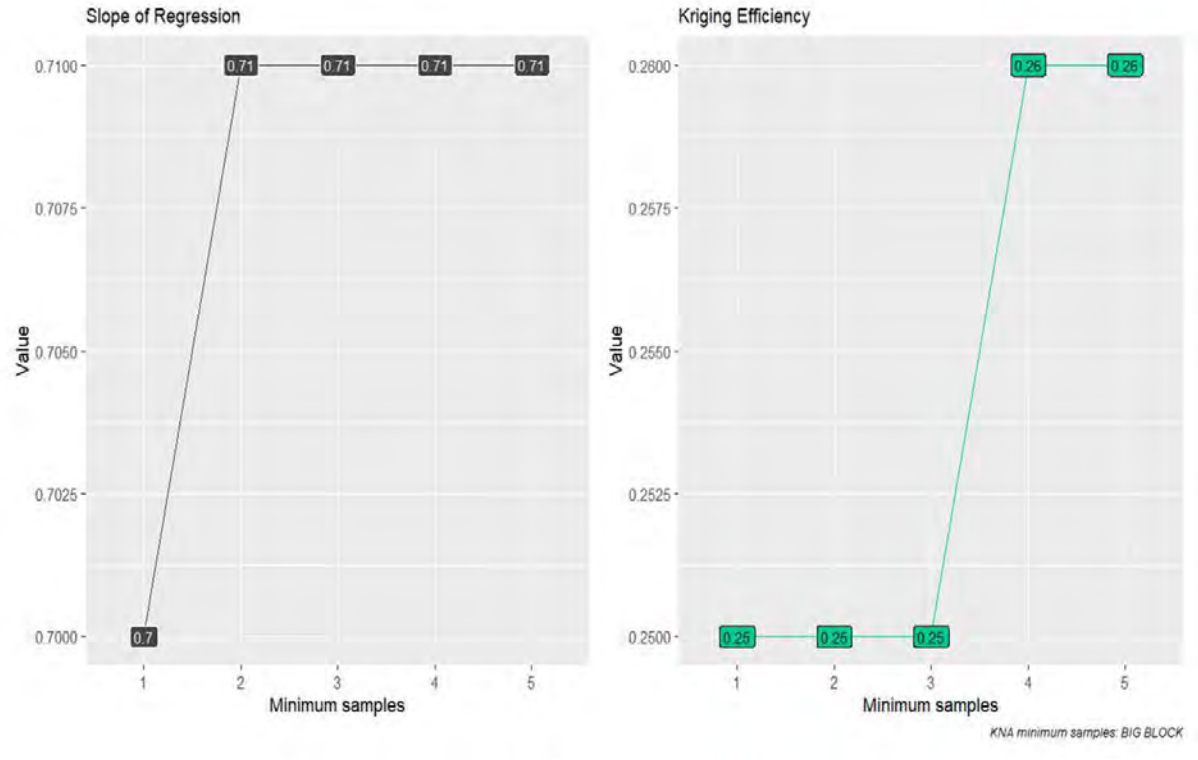



Figure 42 KNA for minimum samples Saprolite block APL, BB, BBS, CE, CN, CW

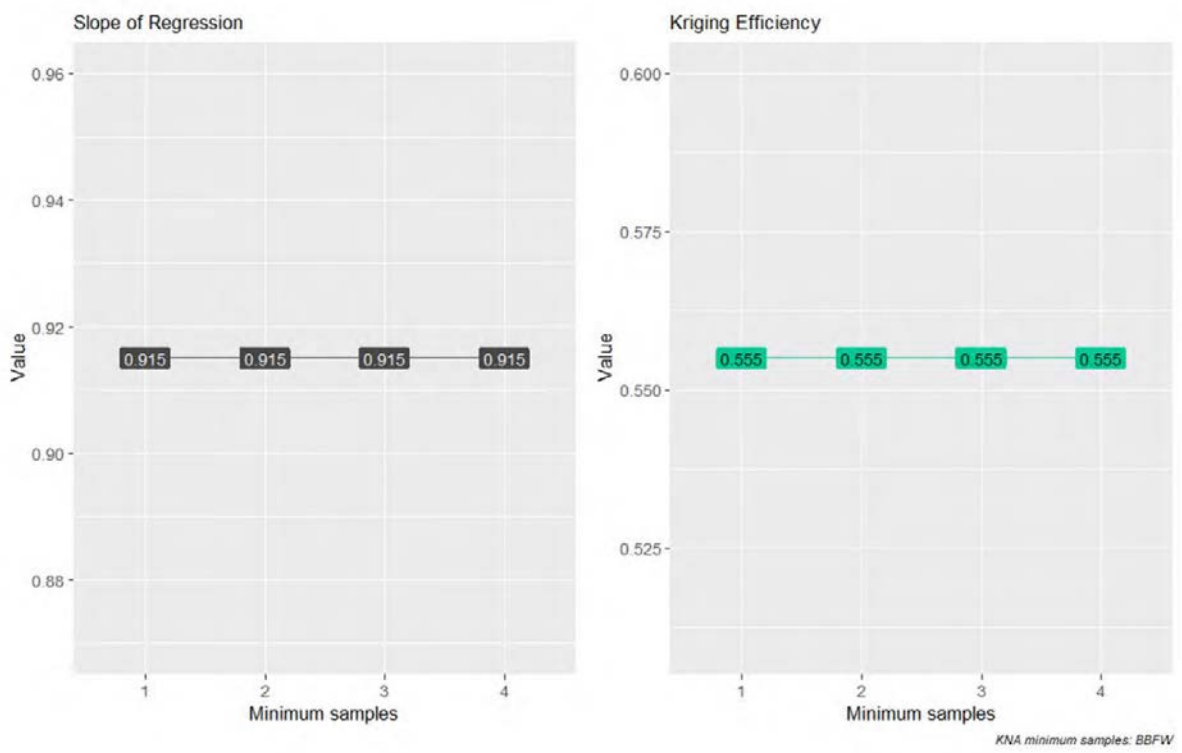



Figure 43 KNA for minimum samples Saprolite block BBFW

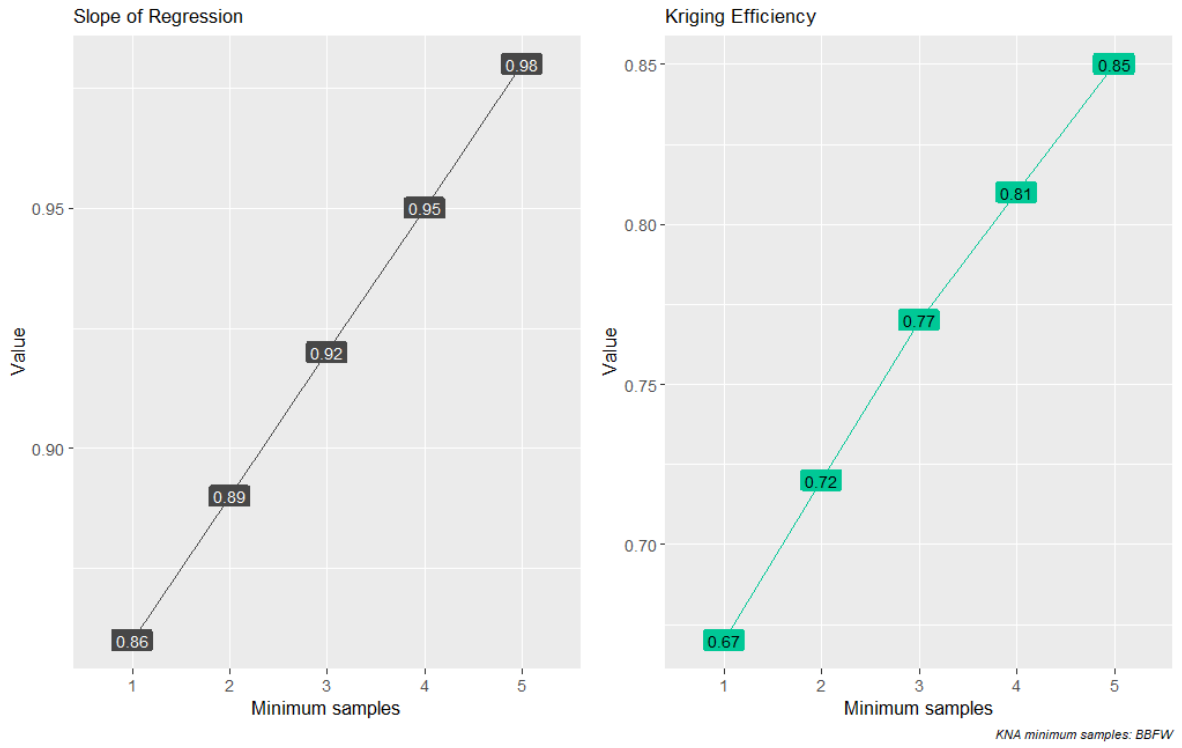



Figure 44 KNA for minimum samples Saprolite block BBW

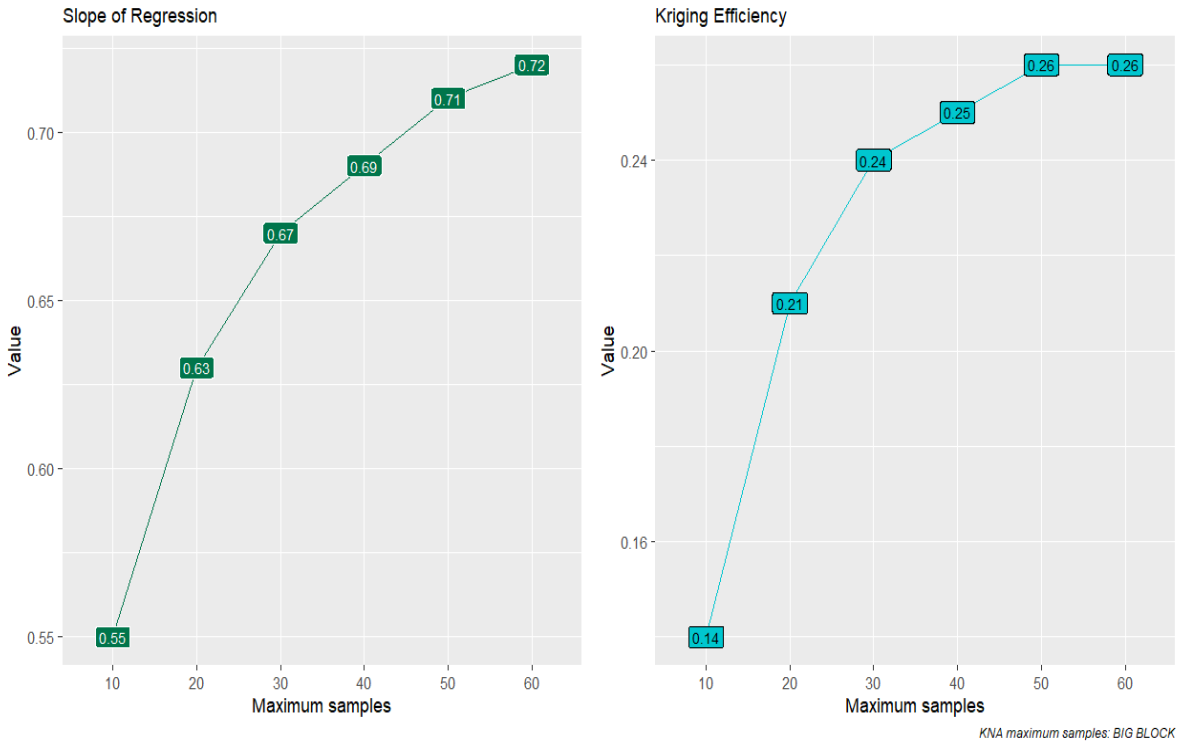



Figure 45 KNA for maximum samples Saprolite block APL, BB, BBS, CE, CN, CW

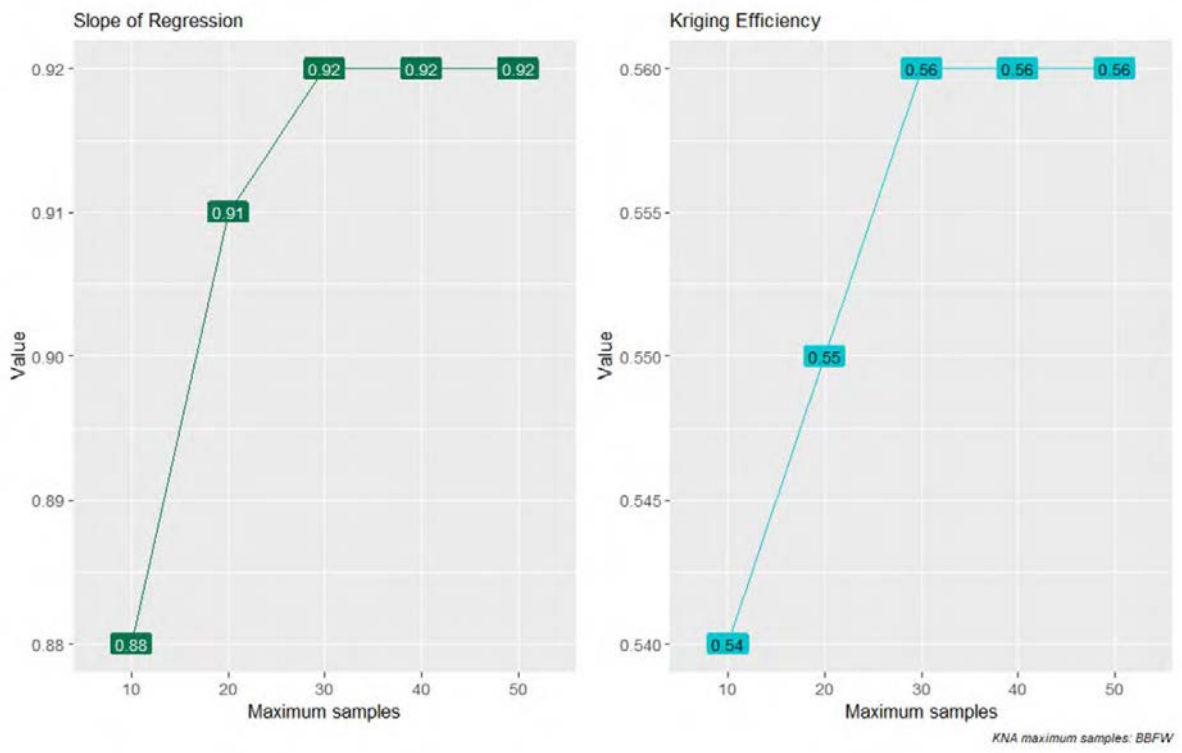



Figure 46 KNA for maximum samples Saprolite block BBFW

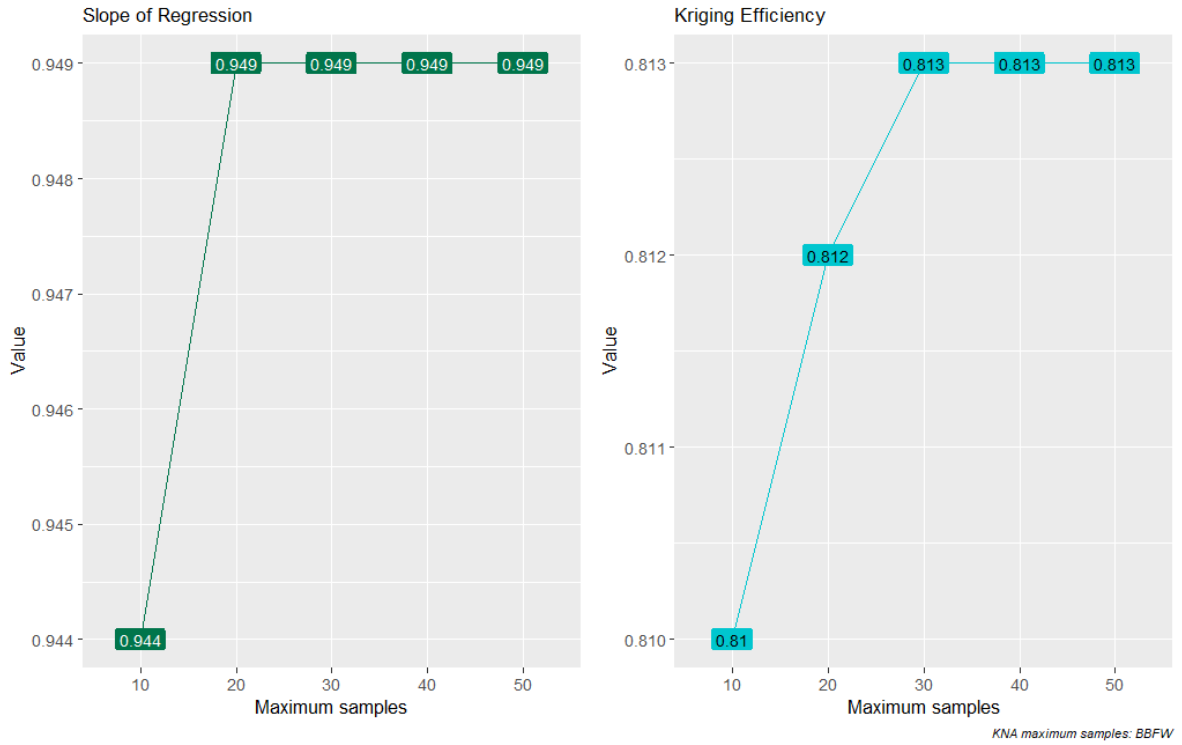



Figure 47 KNA for maximum samples Saprolite block BBW

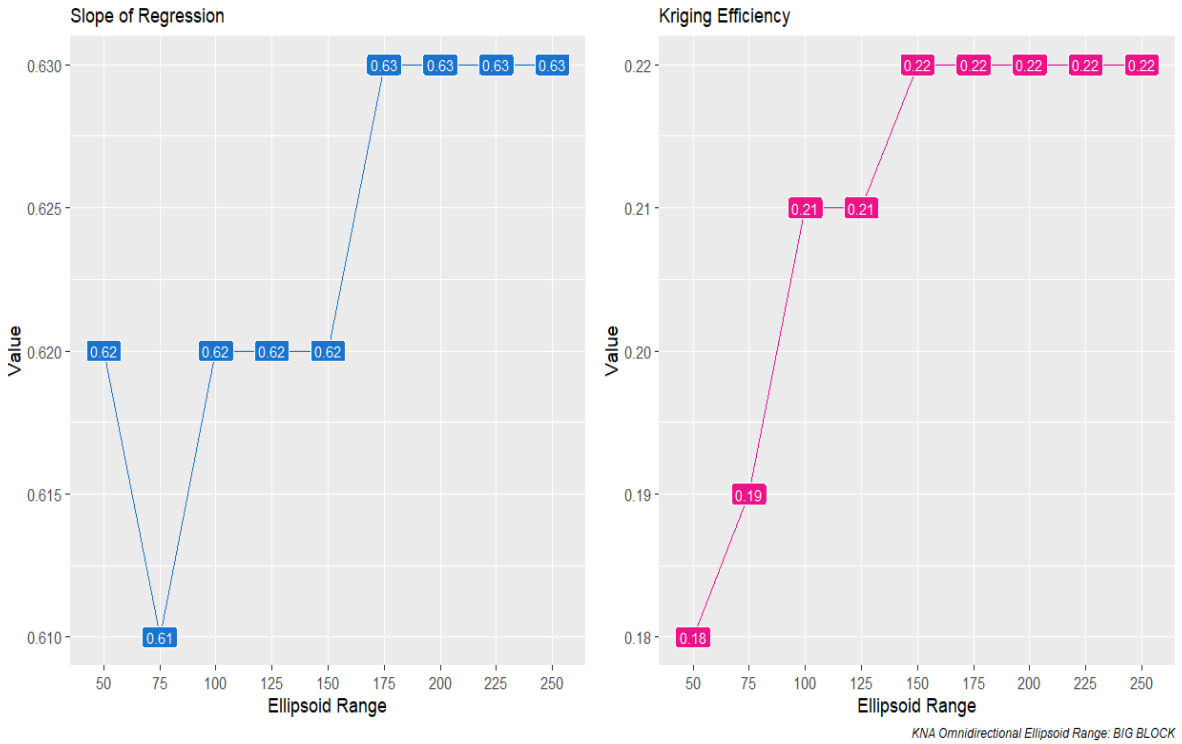



Figure 48 KNA for optimum ellipsoid range Saprolite block APL, BB, BBS, CE, CN, CW

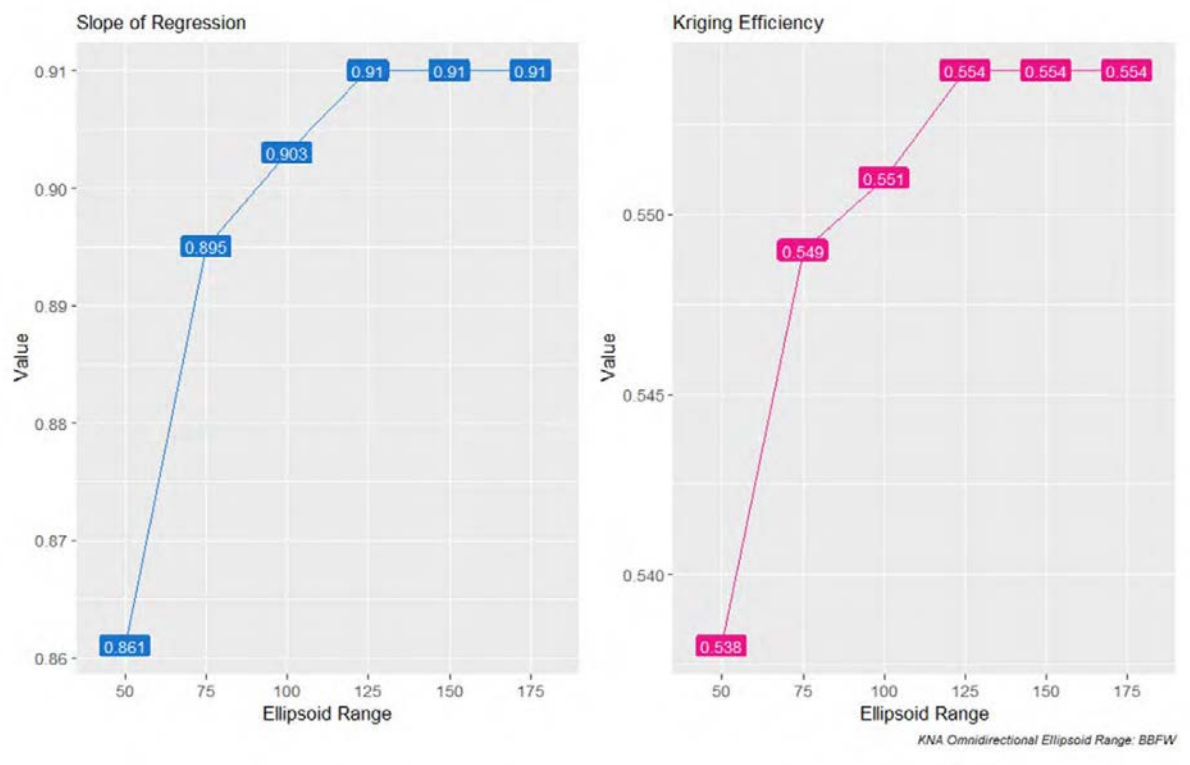



Figure 49 KNA for optimum ellipsoid range Saprolite block BBFW

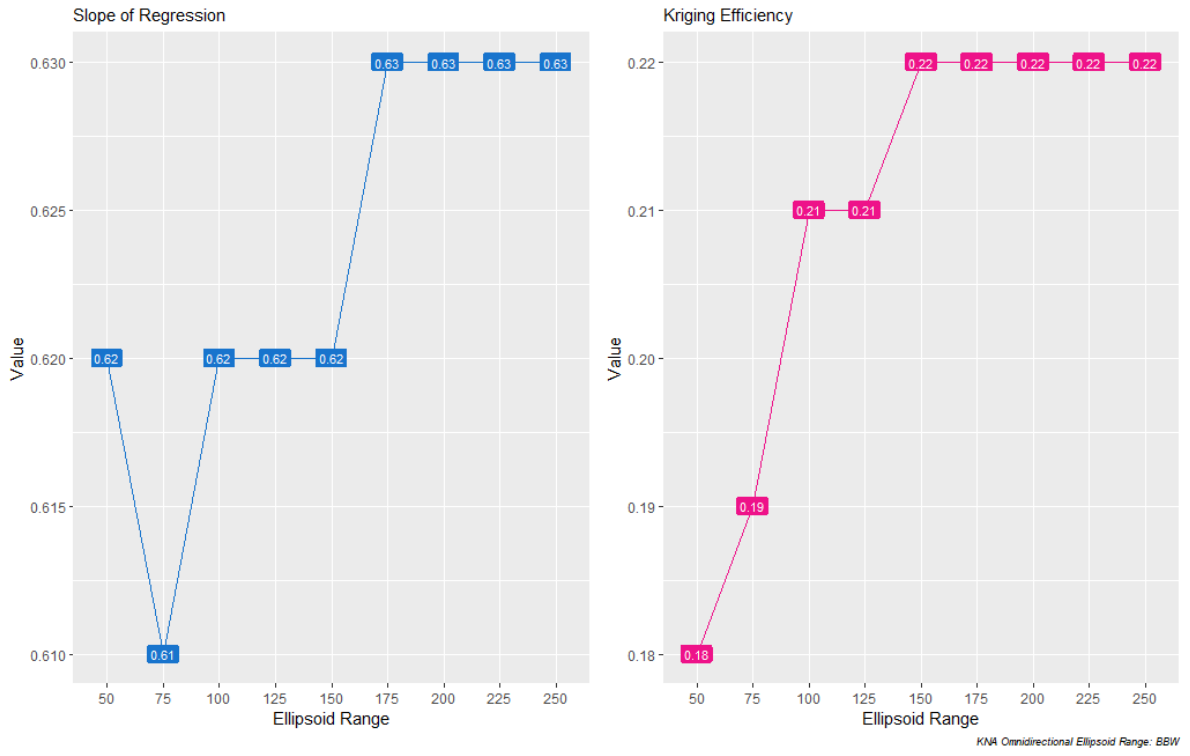



Figure 50 KNA for optimum ellipsoid range Saprolite block BBW

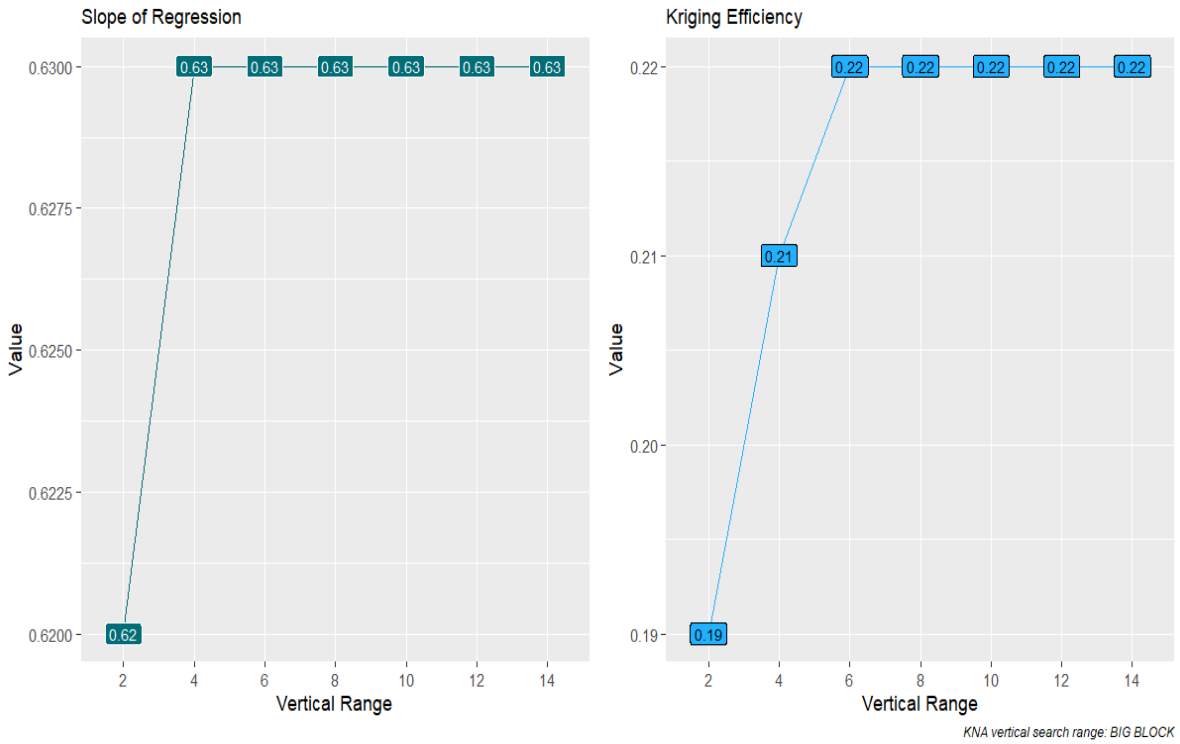



Figure 51 KNA for optimum vertical range Saprolite block APL, BB, BBS, CE, CN, CW

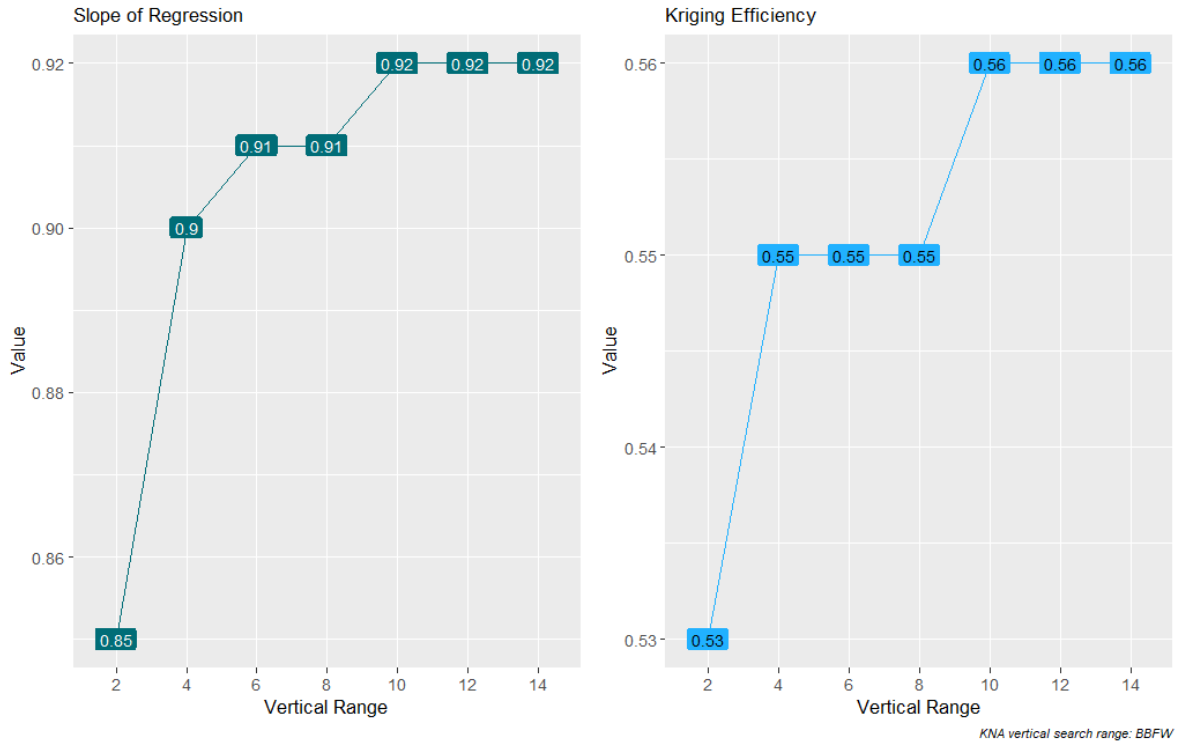



Figure 52 KNA for optimum vertical range Saprolite block BBFW

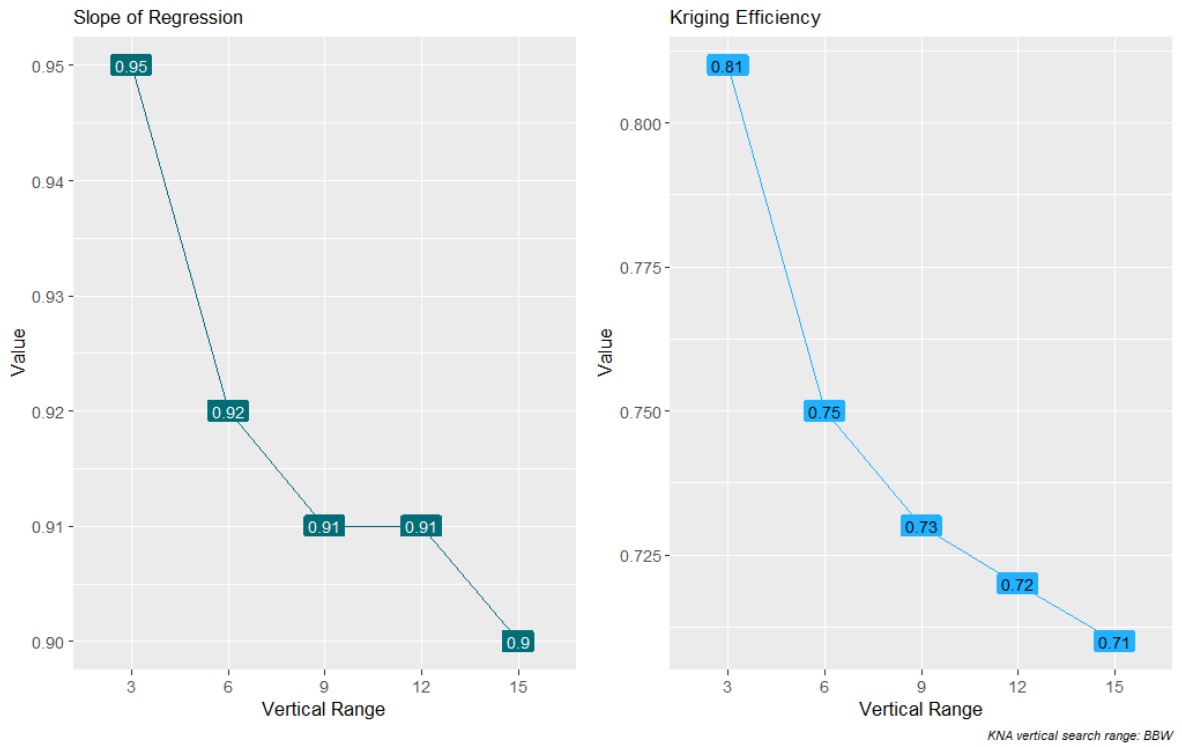



Figure 53 KNA for optimum vertical range Saprolite block BBW

Table 15 KNA summary

| Parameter | APL, BB, BBS, CE, CN, CW | | BBFW | | BBW | |
|---|---|---|---|---|---|---|
| | Limonite | Saprolite | Limonite | Saprolite | Limonite | Saprolite |
| Block Size | 12.5 x 12.5 x 1 | | 12.5 x 12.5 x 1 | | 12.5 x 12.5 x 1 | |
| Discretization Block | 5 x 5 x 2 | | 5 x 5 x 2 | | 5 x 5 x 2 | |
| Max. Horizontal Search | 175 | 175 | 125 | 125 | 225 | 225 |
| Max. Vertical Search | 6 | 6 | 10 | 10 | 12 | 12 |
| Min. Samples | 4 | 4 | 1 | 1 | 5 | 5 |
| Max. Samples | 50 | 50 | 30 | 30 | 50 | 50 |

## 1.8 Grade Estimation

Table 16 Search parameters of Limonite block APL, BB, BBS, CE, CN, CW

| Parameter | | Ni | | | Co | | | Fe | | | MgO | | | SiO2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | 2 | | | - | | | - | | | - | | | - | | |
| Interpolant | Krigging Type | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 4 | 4 | 1 | 4 | 4 | 1 | 4 | 4 | 1 | 4 | 4 | 1 | 4 | 4 | 1 |
| | Maximum Sample | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Ellipsoid Ranges | Maximum | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 |
| | Intermediate | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 |
| | Minimum | 6 | 12 | 24 | 6 | 12 | 24 | 6 | 12 | 24 | 6 | 12 | 24 | 6 | 12 | 24 |

Table 17 Search parameters of Limonite block BBFW

| Parameter | | Ni | | | Co | | | Fe | | | MgO | | | SiO2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | 1.6 | | | - | | | - | | | - | | | - | | |
| Interpolant | Krigging Type | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 1 | 1 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | - | 1 | 1 | - |
| | Maximum Sample | 30 | 30 | 30 | 30 | 30 | - | 30 | 30 | - | 30 | 30 | - | 30 | 30 | - |
| Ellipsoid Ranges | Maximum | 125 | 250 | 1,000 | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - |
| | Intermediate | 125 | 250 | 1,000 | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - |
| | Minimum | 10 | 20 | 80 | 10 | 20 | - | 10 | 20 | - | 10 | 20 | - | 10 | 20 | - |

Table 18 Search parameters of Limonite block BBW

| Parameter | | Ni | | | Co | | | Fe | | | MgO | | | SiO2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | 1.7 | | | - | | | - | | | - | | | - | | |
| Interpolant | Krigging Type | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 |
| | Maximum Sample | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Ellipsoid Ranges | Maximum | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 |
| | Intermediate | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 |
| | Minimum | 12 | 24 | 48 | 12 | 24 | 48 | 12 | 24 | 48 | 12 | 24 | 48 | 12 | 24 | 48 |

Table 19 Search parameters of Saprolite block APL, BB, BBS, CE, CN, CW

| Parameter | | Ni | | | Co | | | Fe | | | MgO | | | SiO2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | 3 | | | - | | | - | | | - | | | - | | |
| Interpolant | Krigging Type | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 4 | 4 | 1 | 4 | 4 | 1 | 4 | 4 | 1 | 4 | 4 | 1 | 4 | 4 | 1 |
| | Maximum Sample | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Ellipsoid Ranges | Maximum | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 |
| | Intermediate | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 | 175 | 350 | 700 |
| | Minimum | 6 | 12 | 24 | 6 | 12 | 24 | 6 | 12 | 24 | 6 | 12 | 24 | 6 | 12 | 24 |

Table 20 Search parameters of Saprolite block BBFW

| Parameter | | Ni | | | Co | | | Fe | | | MgO | | | SiO2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | 2.3 | | | - | | | - | | | - | | | - | | |
| Interpolant | Krigging Type | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 1 | 1 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | - | 1 | 1 | - |
| | Maximum Sample | 30 | 30 | 30 | 30 | 30 | - | 30 | 30 | - | 30 | 30 | - | 30 | 30 | - |
| Ellipsoid Ranges | Maximum | 125 | 250 | 1,000 | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - |
| | Intermediate | 125 | 250 | 1,000 | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - | 125 | 250 | - |
| | Minimum | 10 | 20 | 80 | 10 | 20 | - | 10 | 20 | - | 10 | 20 | - | 10 | 20 | - |

Table 21 Search parameters of Saprolite block BBW

| Parameter | | Ni | | | Co | | | Fe | | | MgO | | | SiO2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 | Pass 1 | Pass 2 | Pass 3 |
| Value Clipping | Lower bound | - | | | - | | | - | | | - | | | - | | |
| | Upper bound | 3 | | | - | | | - | | | - | | | - | | |
| Interpolant | Krigging Type | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | | Ordinary Krigging | | |
| | Block Discretization | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | | 5 x 5 x 2 | | |
| Number of Samples | Minimum Sample | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 | 5 | 5 | 1 |
| | Maximum Sample | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Ellipsoid Ranges | Maximum | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 |
| | Intermediate | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 | 225 | 450 | 900 |
| | Minimum | 12 | 24 | 48 | 12 | 24 | 48 | 12 | 24 | 48 | 12 | 24 | 48 | 12 | 24 | 48 |

## 1.9 Blockmodel Validation

### 1.9.1 Visual validation

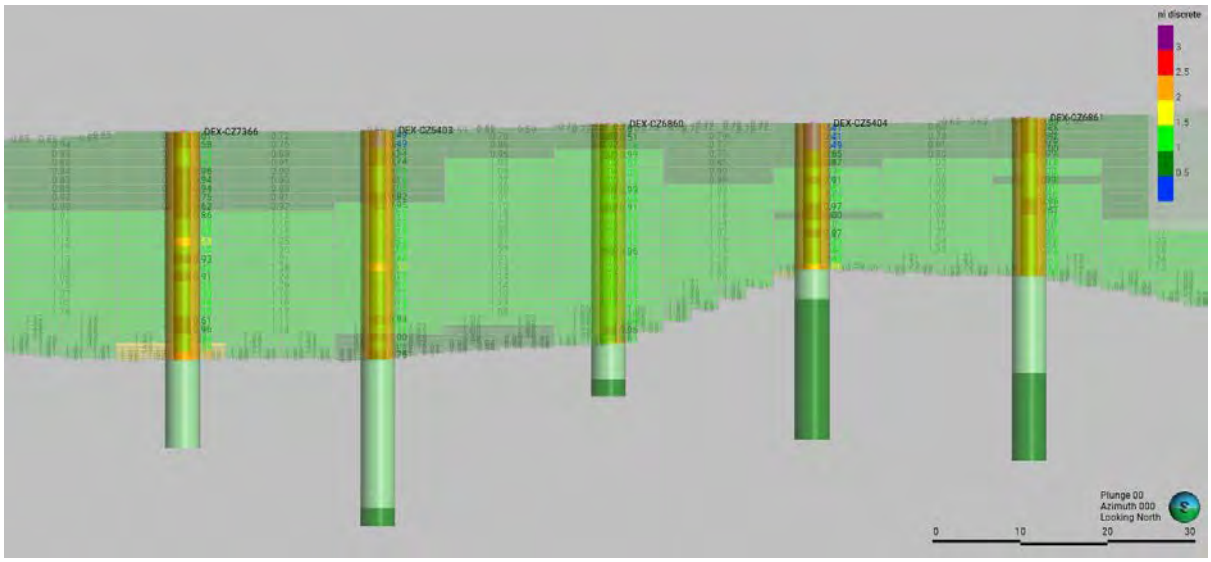



Figure 54 Visual validation for Ni Limonite

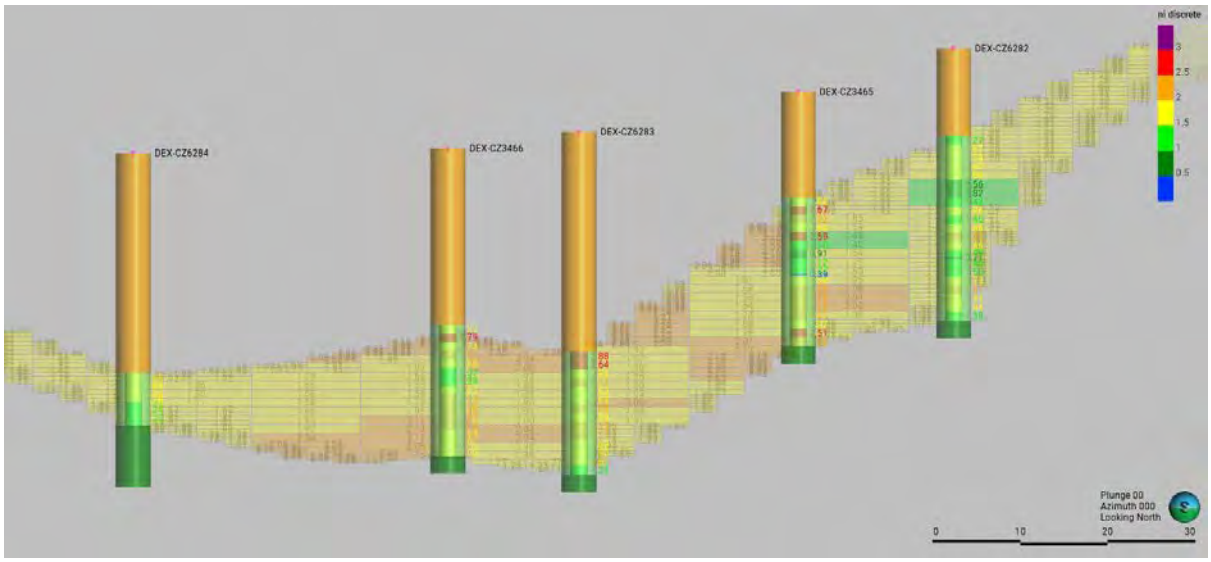



Figure 55 Visual validation for Ni Saprolite

### 1.9.2 Solid Model and Block Model Comparison

Table 22 Solid model vs block model volume

| Domain | Solid Volume ($M^3$) | Block Volume ($M^3$) | Volume Difference (%) |
|---|---|---|---|
| Limonite | 197,790,300 | 197,785,029 | 0.0 |
| Saprolite | 123,951,600 | 123,958,142 | 0.0 |
| **Total** | **321,741,900** | **321,743,171** | **0.0** |

### 1.9.3 Swath Plot

#### 1.9.3.1 Swath Plot Block APL, BB, BBS, CE, CN, CW

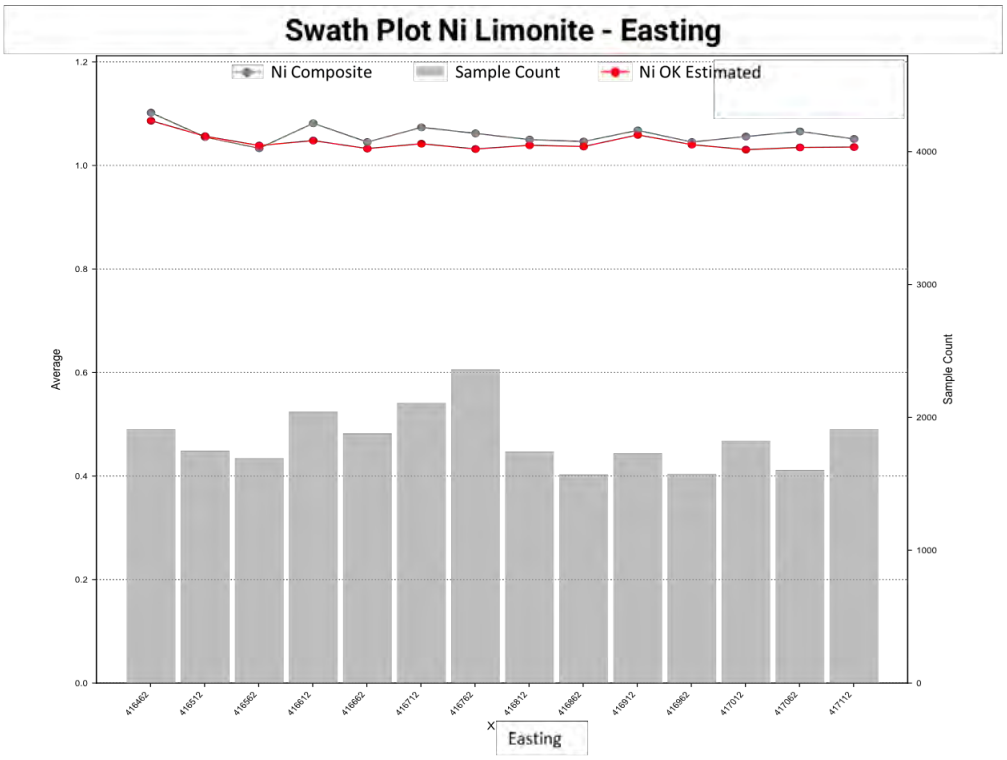



Figure 56 Swath plot of Ni Limonite – Easting block APL, BB, BBS, CE, CN, CW

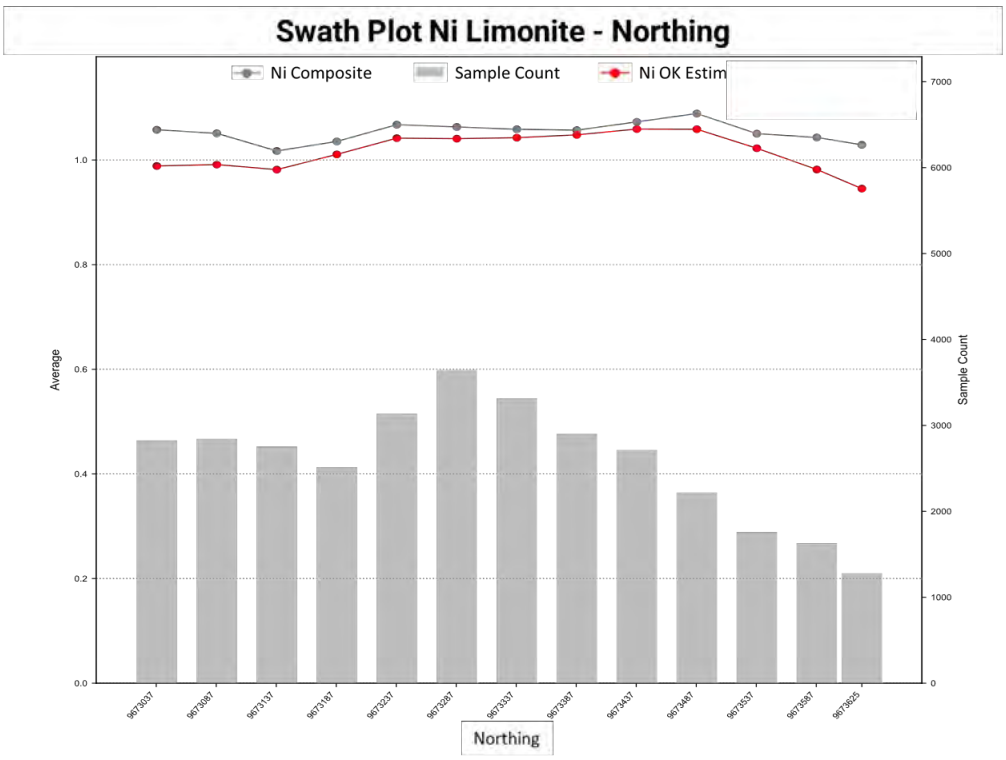



Figure 57 Swath plot of Ni Limonite – Northing block APL, BB, BBS, CE, CN, CW

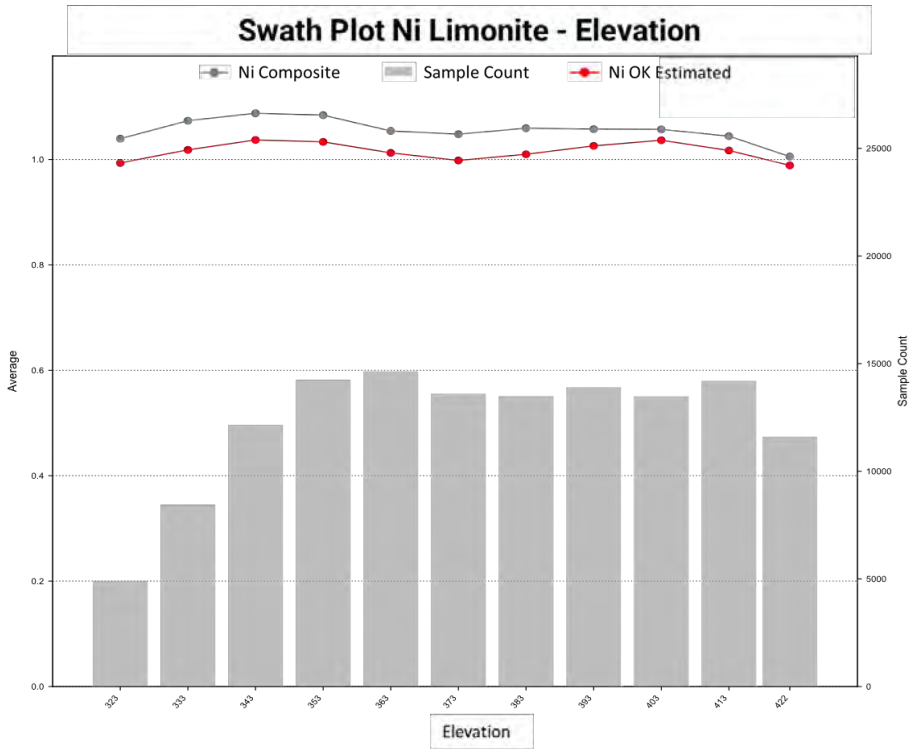



Figure 58 Swath plot of Ni Limonite – Elevation block APL, BB, BBS, CE, CN, CW

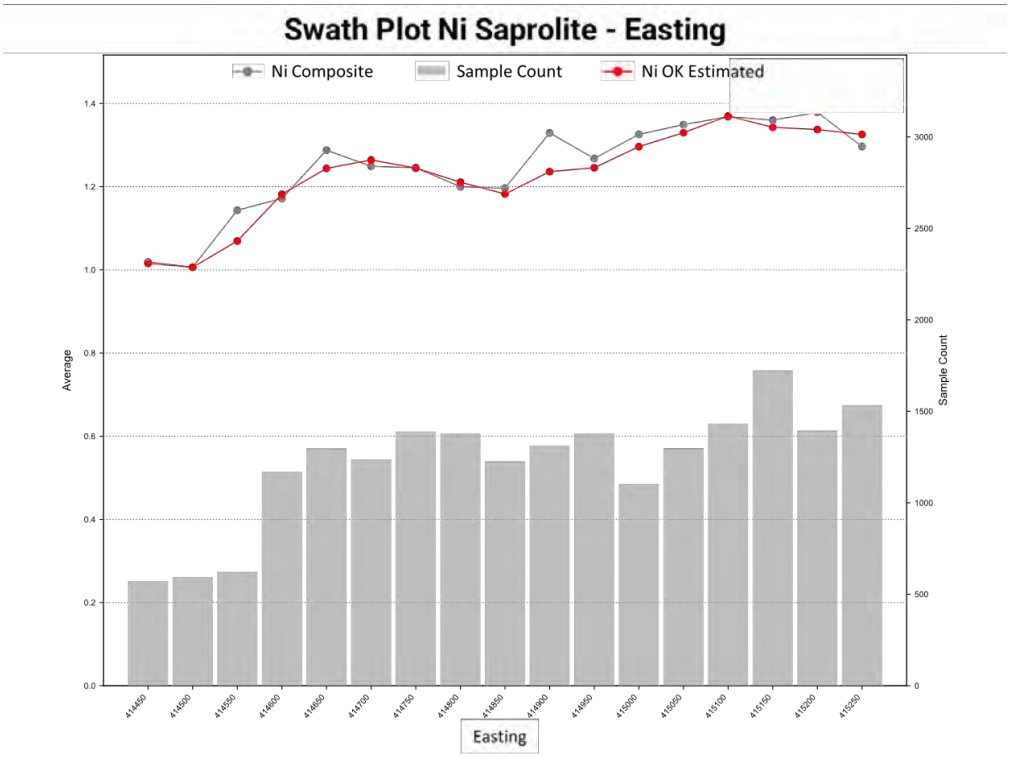



Figure 59 Swath plot of Ni Saprolite – Easting block APL, BB, BBS, CE, CN, CW

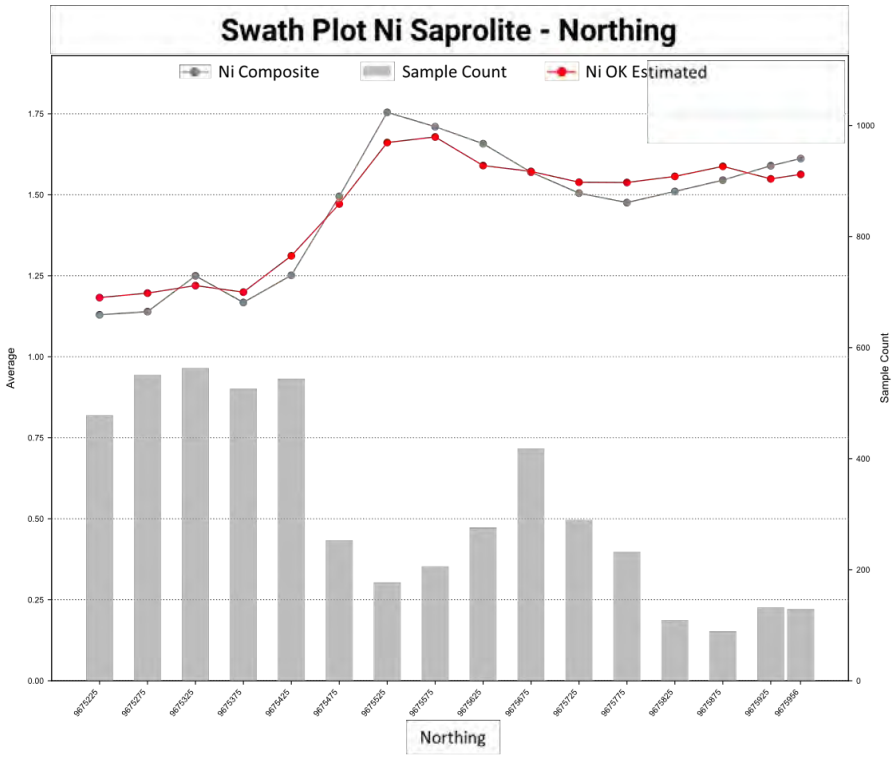



Figure 60 Swath plot of Ni Saprolite – Northing block APL, BB, BBS, CE, CN, CW

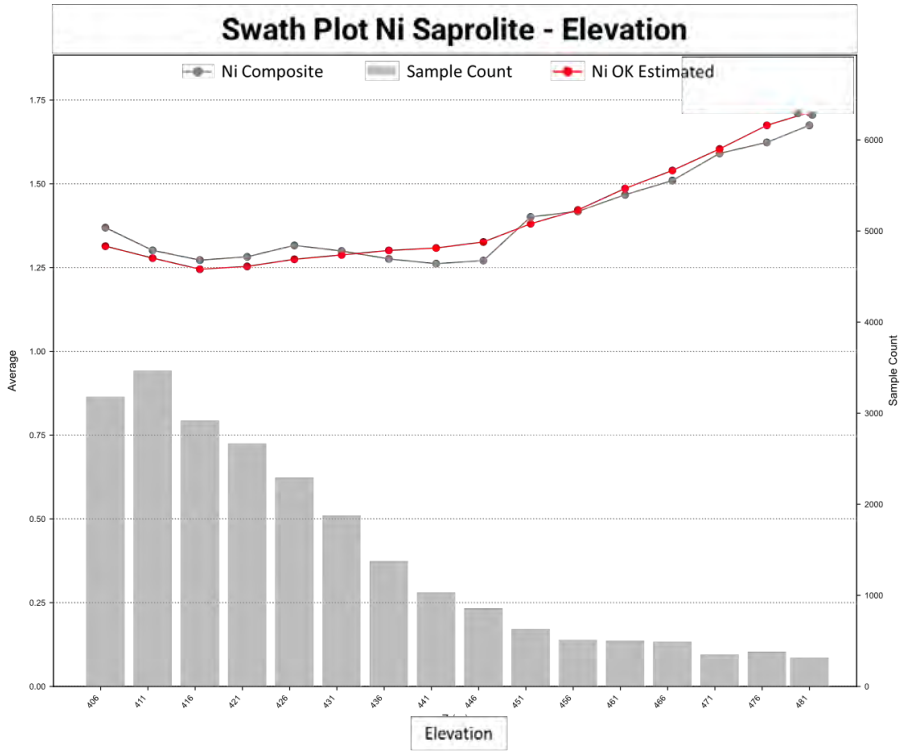



Figure 61 Swath plot of Ni Saprolite – Elevation block APL, BB, BBS, CE, CN, CW

### 1.9.3.2 Swath Plot Block BBFW

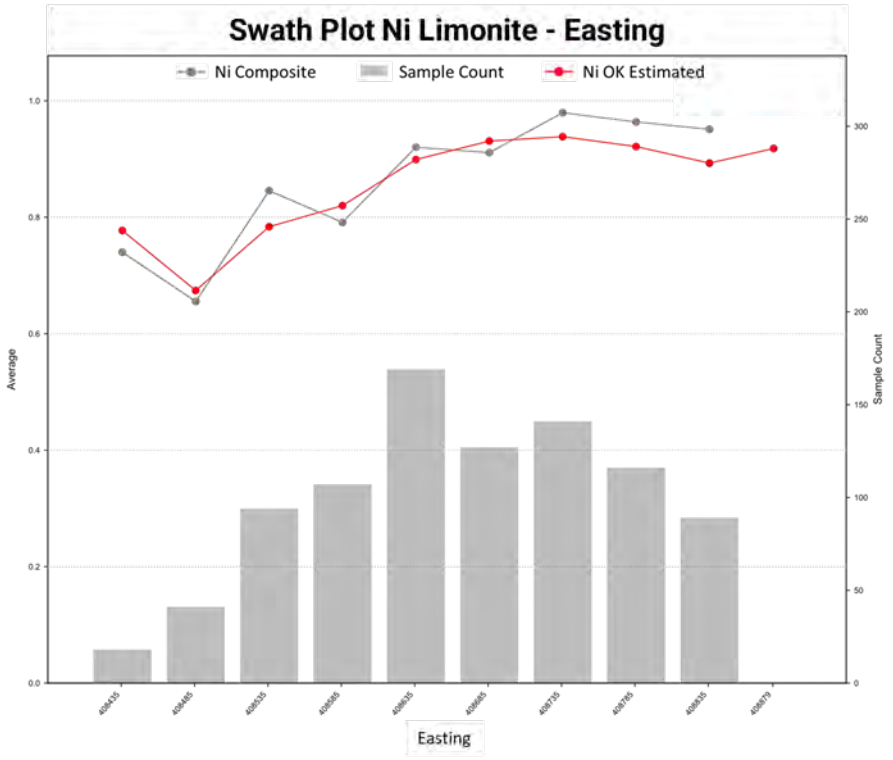



Figure 62 Swath plot of Ni Limonite – Easting block BBFW

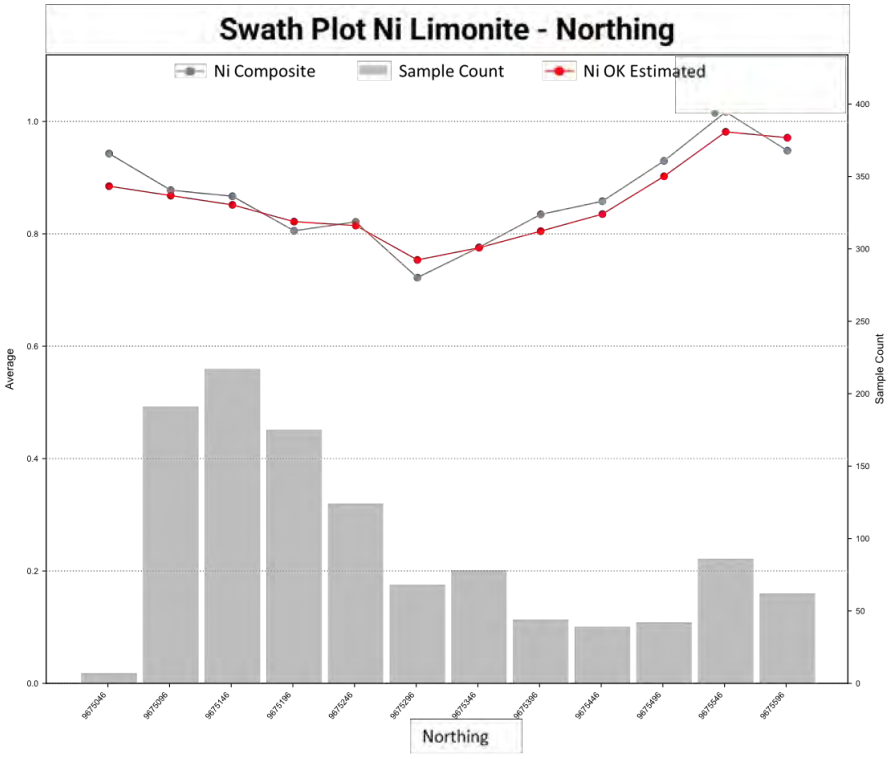



Figure 63 Swath plot of Ni Limonite – Northing block BBFW

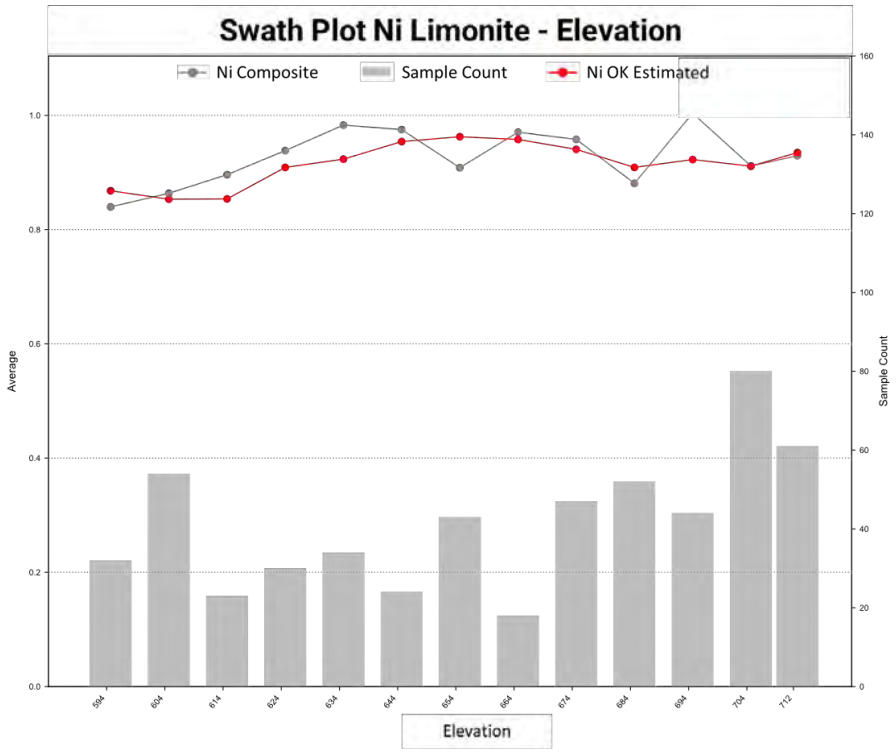



Figure 64 Swath plot of Ni Limonite – Elevation block BBFW

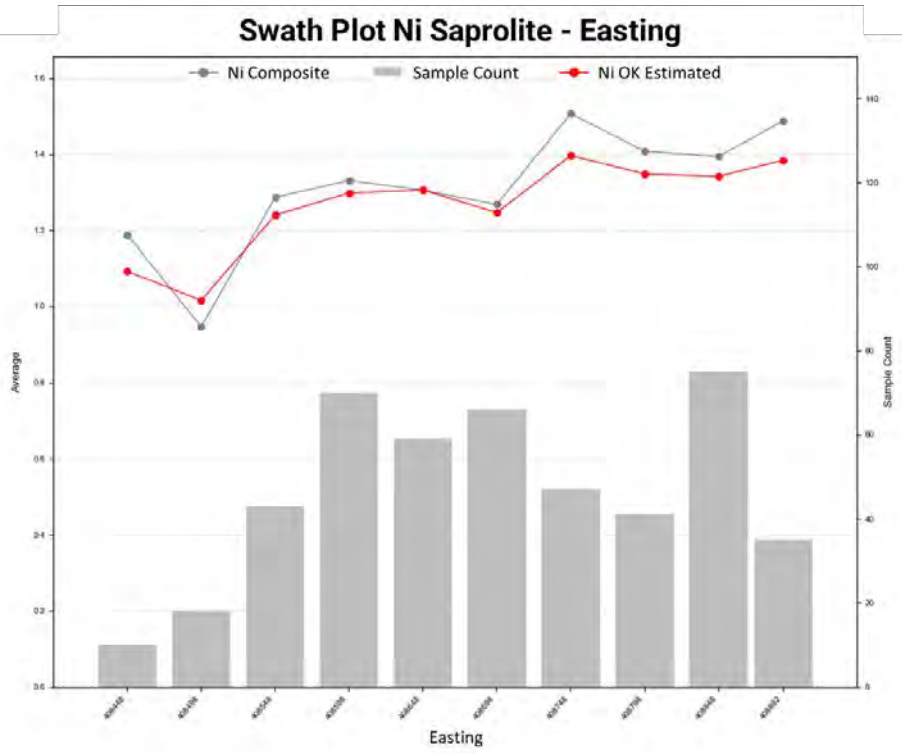



Figure 65 Swath plot of Ni Saprolite – Easting block BBFW

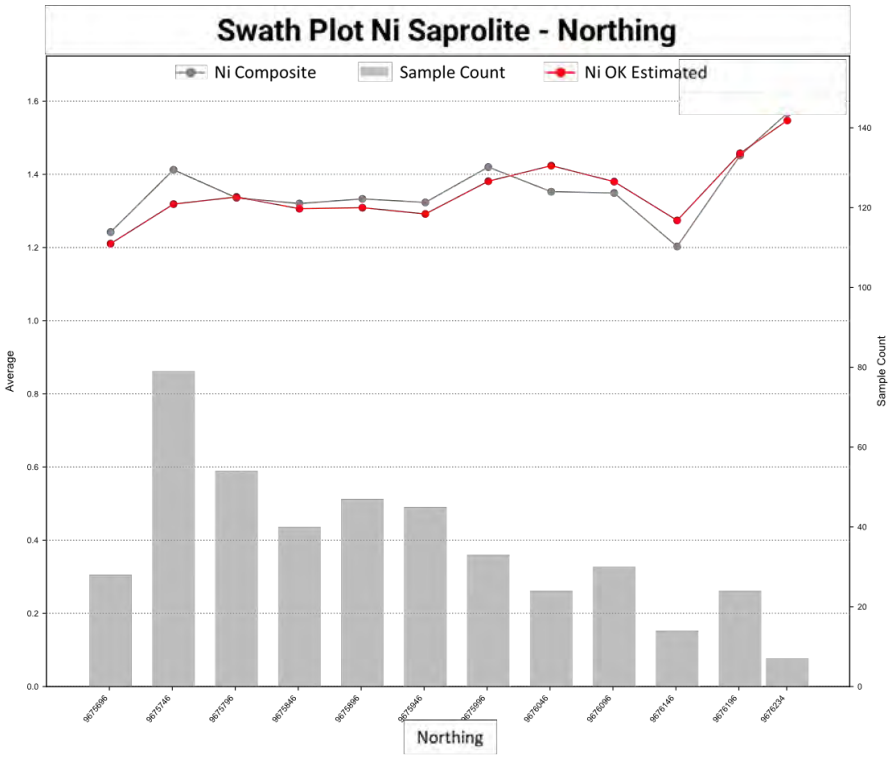



Figure 66 Swath plot of Ni Saprolite – Northing block BBFW

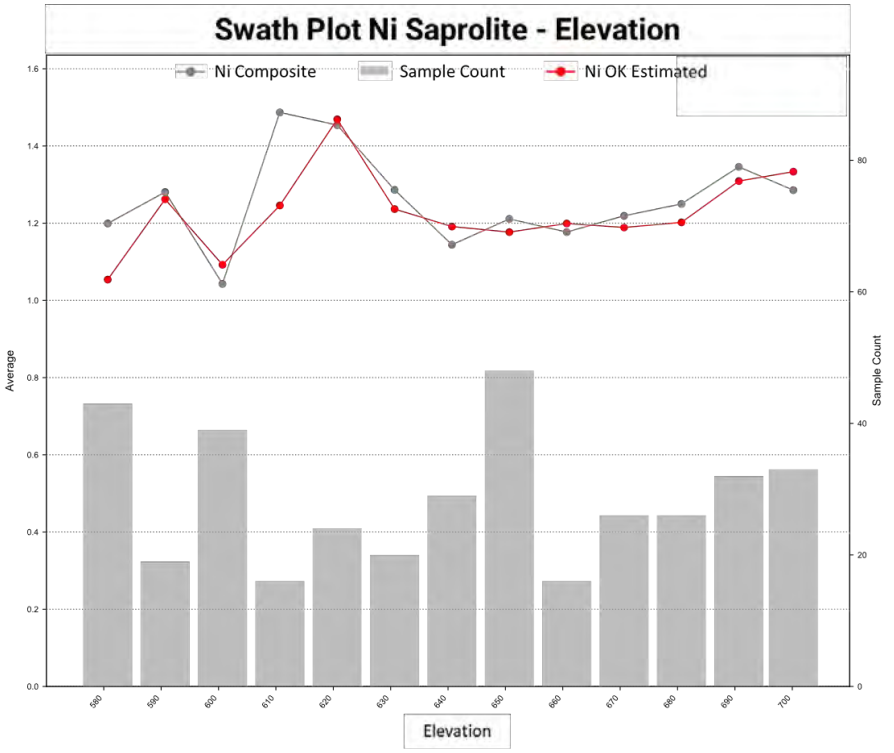



Figure 67 Swath plot of Ni Saprolite – Elevation block BBFW

### 1.9.3.3 Swath Plot Block BBW

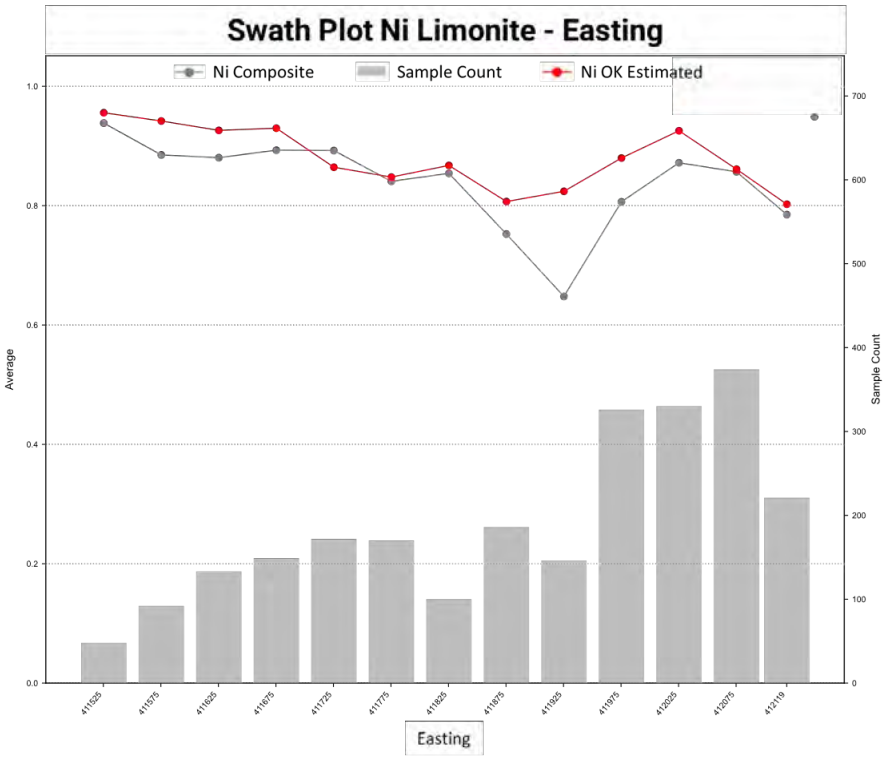



Figure 68 Swath plot of Ni Limonite – Easting block BBFW

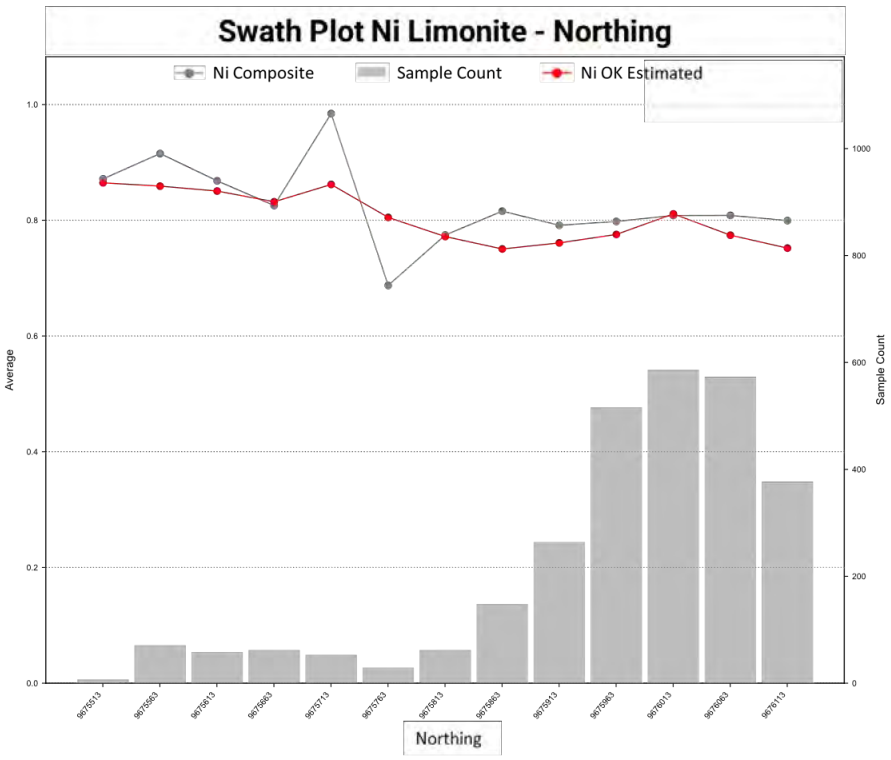



Figure 69 Swath plot of Ni Limonite – Northing block BBFW

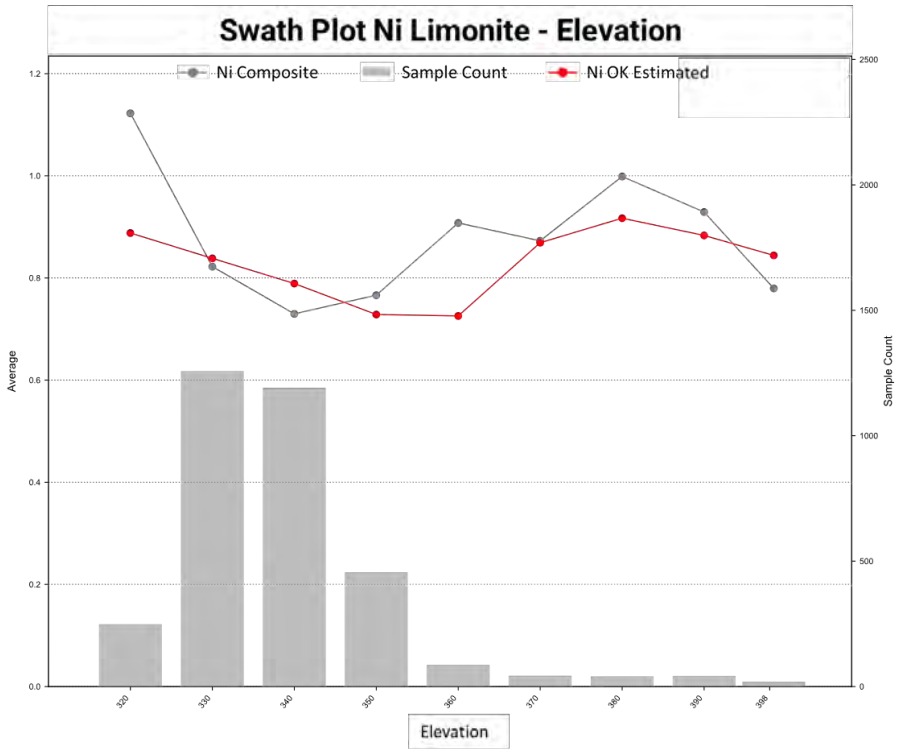



Figure 70 Swath plot of Ni Limonite – Elevation block BBFW

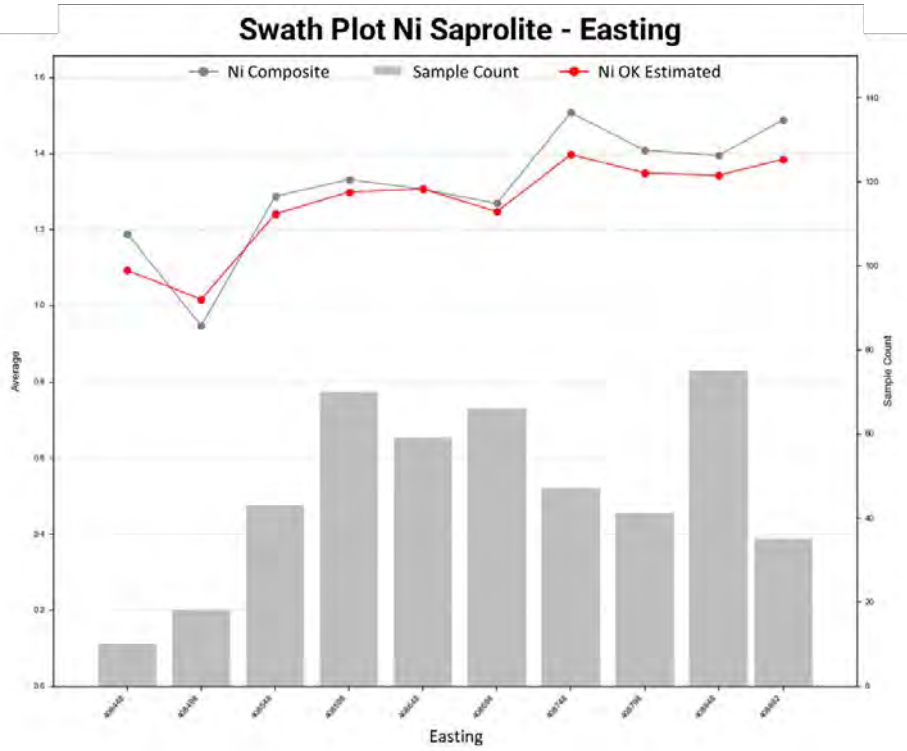



Figure 71 Swath plot of Ni Saprolite – Easting block BBFW

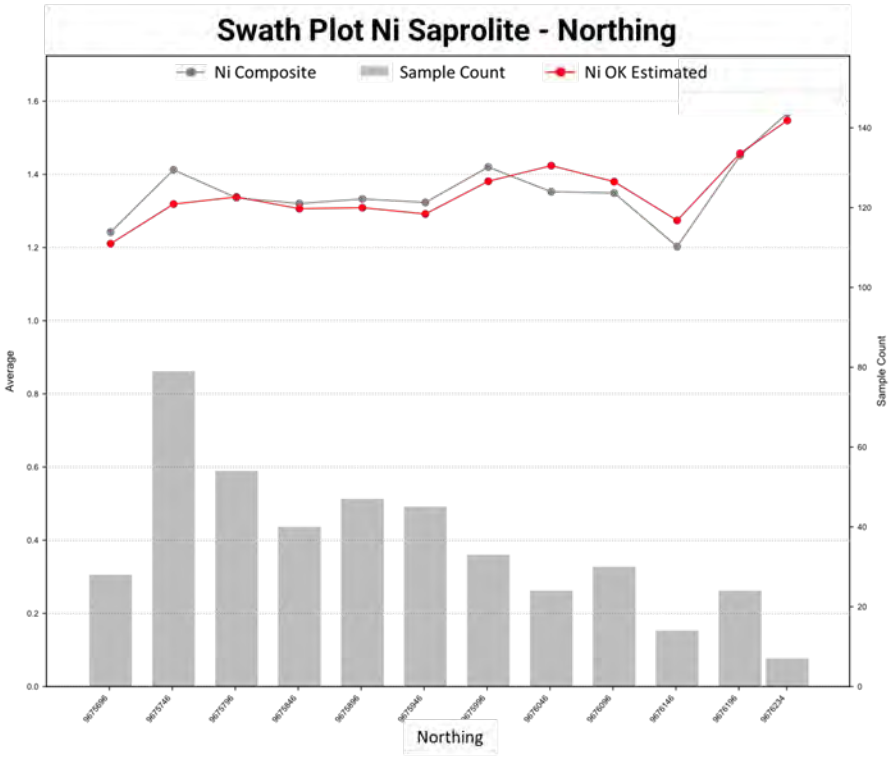



Figure 72 Swath plot of Ni Saprolite – Northing block BBFW

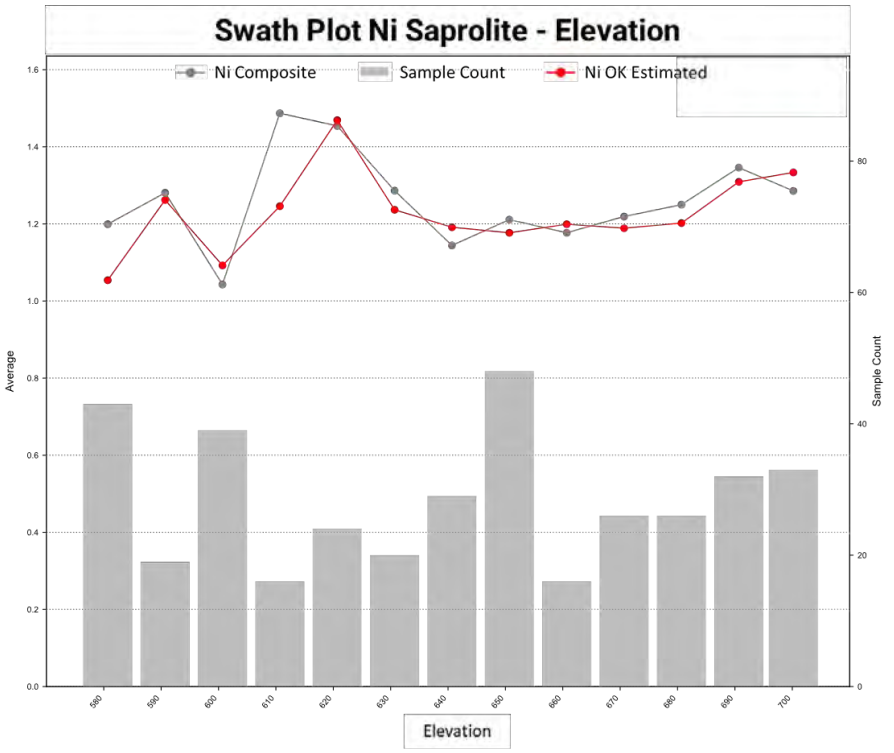



Figure 73 Swath plot of Ni Saprolite – Elevation block BBFW

## 1.10 Resource Estimation

### 1.10.1 Resource Classification

The Mineral Resource has been classified on the basis of drillhole spacing and Kriging properties with a digitized polygon boundary. The boundaries of resource polygons are also influenced by disposal areas, whether waste dumps or in-pit dumps. Resources were classified as follows;

- Measured - Area of 25m drilling spacing on the spatial continuity, with 12.5m extrapolation from the last drillhole. Geostatistical thresholds include a Kriging variance < 0.05 and a slope of regression > 0.80.
- Indicated - Area 50m drilling spacing on the spatial continuity, with 25m extrapolation from the last drillhole. Geostatistical thresholds include a Kriging variance between 0.05 and 0.13 and a slope of regression between 0.35 and 0.80.
- Inferred - Area 100m drilling spacing on the spatial continuity, with 50m extrapolation from the last drillhole. Geostatistical thresholds include a Kriging variance > 0.13 and a slope of regression < 0.35.

The Measured and Indicated Resource category were downgraded into Inferred below in-pit dump areas.

Table 23 Kriging properties to asses the Resource Classification at HM

| Kriging Variance | Slope of Regression | Category |
|---|---|---|
| KV ≤ 0.05 | SoR ≥ 0.8 | Measured |
| 0.05 < KV ≤ 0.13 | 0.35 ≤ SoR < 0.8 | Indicated |
| KV > 0.13 | SoR < 0.35 | Inferred |

### 1.10.2 Grade Tonnage

Table 24 Limonite estimated Resource breakdown (dry)

| GRADE CUT-OFF RANGE | MINERAL RESOURCE | | | | XRF (DRY ANALYSIS) | | | | | | Relative Density (sg Wet) | Moisture Content | Material Content (Dry) of Ni (Kt) | Material Content (Dry) of Co (Kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Measured Dry Mt | Indicated Dry Mt | Inferred Dry Mt | Total Dry Mt | Ni % | Co % | Fe % | MgO % | SiO2 % | SM Ratio | | | | |
| ≥0.2 | 79.09 | 47.29 | 42.20 | **168.58** | 0.98 | 0.11 | 41.52 | 1.90 | 10.52 | 5.54 | 1.77 | 40.26 | 1,658 | 183 |
| ≥0.3 | 79.02 | 46.70 | 41.16 | **166.88** | 0.99 | 0.11 | 41.76 | 1.89 | 10.21 | 5.42 | 1.77 | 40.26 | 1,650 | 182 |
| ≥0.4 | 78.83 | 46.29 | 40.55 | **165.67** | 0.99 | 0.11 | 41.89 | 1.88 | 10.07 | 5.36 | 1.77 | 40.26 | 1,648 | 181 |
| ≥0.5 | 78.18 | 45.82 | 39.83 | **163.83** | 1.00 | 0.11 | 41.99 | 1.88 | 9.98 | 5.32 | 1.77 | 40.26 | 1,636 | 179 |
| ≥0.6 | 76.04 | 44.79 | 38.58 | **159.41** | 1.01 | 0.11 | 42.08 | 1.88 | 9.93 | 5.27 | 1.77 | 40.26 | 1,613 | 174 |
| ≥0.7 | 71.56 | 42.29 | 36.12 | **149.97** | 1.04 | 0.11 | 42.15 | 1.89 | 9.94 | 5.25 | 1.77 | 40.27 | 1,553 | 168 |
| ≥0.8 | 64.44 | 37.44 | 30.97 | **132.85** | 1.07 | 0.12 | 42.20 | 1.92 | 10.01 | 5.22 | 1.77 | 40.26 | 1,424 | 158 |
| ≥0.9 | 55.21 | 30.15 | 22.70 | **108.06** | 1.12 | 0.12 | 42.23 | 1.92 | 10.09 | 5.25 | 1.77 | 40.27 | 1,212 | 132 |
| ≥1.0 | 44.17 | 21.52 | 14.49 | **80.18** | 1.18 | 0.13 | 42.24 | 1.93 | 10.14 | 5.25 | 1.77 | 40.27 | 947 | 106 |
| ≥1.1 | 31.65 | 13.04 | 8.29 | **52.98** | 1.25 | 0.13 | 42.19 | 1.99 | 10.22 | 5.13 | 1.77 | 40.26 | 662 | 71 |
| ≥1.2 | 19.76 | 6.18 | 3.96 | **29.90** | 1.33 | 0.14 | 42.06 | 2.10 | 10.40 | 4.94 | 1.77 | 40.26 | 397 | 43 |
| ≥1.3 | 10.62 | 2.27 | 1.63 | **14.51** | 1.41 | 0.15 | 41.69 | 2.30 | 10.85 | 4.72 | 1.77 | 40.27 | 205 | 22 |
| ≥1.4 | 4.91 | 0.70 | 0.58 | **6.19** | 1.50 | 0.16 | 41.12 | 2.57 | 11.56 | 4.50 | 1.77 | 40.27 | 93 | 10 |
| ≥1.5 | 2.02 | 0.19 | 0.21 | **2.42** | 1.59 | 0.17 | 40.47 | 2.90 | 12.33 | 4.26 | 1.77 | 40.27 | 39 | 4 |
| ≥1.6 | 0.72 | 0.04 | 0.08 | **0.83** | 1.68 | 0.17 | 39.78 | 3.24 | 13.15 | 4.06 | 1.77 | 40.26 | 14 | 1 |
| ≥1.7 | 0.23 | 0.01 | 0.03 | **0.26** | 1.77 | 0.17 | 39.31 | 3.50 | 13.62 | 3.89 | 1.77 | 40.28 | 5 | 0 |
| ≥1.8 | 0.05 | 0.00 | 0.01 | **0.06** | 1.84 | 0.19 | 38.78 | 3.77 | 13.88 | 3.68 | 1.77 | 40.26 | 1 | 0 |
| ≥1.9 | 0.00 | 0.00 | 0.00 | **0.01** | 1.93 | 0.21 | 39.16 | 3.28 | 12.77 | 3.90 | 1.76 | 40.21 | 0 | 0 |

Table 25 Saprolite estimated Resource breakdown (dry)

| GRADE CUT-OFF RANGE | MINERAL RESOURCE | | | | XRF (DRY ANALYSIS) | | | | | | Relative Density (sg Wet) | Moisture Content | Material Content (Dry) of Ni (Kt) | Material Content (Dry) of Co (Kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Measured Dry Mt | Indicated Dry Mt | Inferred Dry Mt | Total Dry Mt | Ni % | Co % | Fe % | MgO % | SiO2 % | SM Ratio | | | | |
| ≥0.2 | 50.06 | 34.20 | 35.63 | **119.89** | 1.37 | 0.04 | 15.60 | 18.04 | 36.76 | 2.04 | 1.67 | 34.87 | 1,642 | 49 |
| ≥0.3 | 50.05 | 34.14 | 35.02 | **119.22** | 1.38 | 0.04 | 15.64 | 18.08 | 36.69 | 2.03 | 1.67 | 34.87 | 1,642 | 48 |
| ≥0.4 | 50.04 | 33.94 | 34.75 | **118.72** | 1.38 | 0.04 | 15.66 | 18.12 | 36.65 | 2.02 | 1.67 | 34.87 | 1,639 | 48 |
| ≥0.5 | 50.00 | 33.67 | 34.53 | **118.20** | 1.38 | 0.04 | 15.68 | 18.14 | 36.61 | 2.02 | 1.67 | 34.88 | 1,635 | 48 |
| ≥0.6 | 49.90 | 33.45 | 34.19 | **117.55** | 1.39 | 0.04 | 15.70 | 18.16 | 36.59 | 2.02 | 1.67 | 34.88 | 1,633 | 48 |
| ≥0.7 | 49.64 | 33.20 | 33.80 | **116.64** | 1.40 | 0.04 | 15.73 | 18.16 | 36.56 | 2.01 | 1.67 | 34.88 | 1,631 | 47 |
| ≥0.8 | 49.08 | 32.73 | 33.09 | **114.91** | 1.41 | 0.04 | 15.76 | 18.16 | 36.53 | 2.01 | 1.67 | 34.89 | 1,616 | 47 |
| ≥0.9 | 47.89 | 31.62 | 31.84 | **111.35** | 1.42 | 0.04 | 15.79 | 18.17 | 36.50 | 2.01 | 1.67 | 34.91 | 1,584 | 45 |
| ≥1.0 | 45.59 | 29.79 | 29.63 | **105.01** | 1.45 | 0.04 | 15.81 | 18.20 | 36.48 | 2.00 | 1.67 | 34.94 | 1,522 | 43 |
| ≥1.1 | 42.09 | 26.92 | 25.98 | **94.99** | 1.49 | 0.04 | 15.76 | 18.32 | 36.55 | 1.99 | 1.67 | 34.99 | 1,416 | 39 |
| ≥1.2 | 37.60 | 23.02 | 21.86 | **82.48** | 1.55 | 0.04 | 15.66 | 18.53 | 36.64 | 1.98 | 1.67 | 35.04 | 1,274 | 34 |
| ≥1.3 | 32.46 | 18.25 | 17.52 | **68.23** | 1.60 | 0.04 | 15.55 | 18.78 | 36.69 | 1.95 | 1.67 | 35.09 | 1,095 | 28 |
| ≥1.4 | 27.01 | 13.25 | 13.20 | **53.46** | 1.67 | 0.04 | 15.44 | 19.09 | 36.67 | 1.92 | 1.67 | 35.13 | 895 | 23 |
| ≥1.5 | 21.52 | 8.92 | 9.64 | **40.07** | 1.75 | 0.04 | 15.34 | 19.44 | 36.64 | 1.88 | 1.67 | 35.18 | 701 | 17 |
| ≥1.6 | 16.37 | 5.60 | 6.82 | **28.80** | 1.83 | 0.04 | 15.25 | 19.83 | 36.58 | 1.85 | 1.67 | 35.23 | 527 | 13 |
| ≥1.7 | 11.93 | 3.24 | 4.68 | **19.86** | 1.91 | 0.05 | 15.17 | 20.17 | 36.53 | 1.81 | 1.67 | 35.29 | 380 | 10 |
| ≥1.8 | 8.28 | 1.77 | 2.98 | **13.04** | 2.00 | 0.05 | 15.11 | 20.45 | 36.48 | 1.78 | 1.67 | 35.32 | 261 | 6 |
| ≥1.9 | 5.51 | 0.88 | 1.72 | **8.11** | 2.09 | 0.05 | 15.04 | 20.67 | 36.42 | 1.76 | 1.67 | 35.30 | 169 | 4 |

Table 26 All nickel laterite estimated Resource breakdown (dry)

| GRADE CUT-OFF RANGE | MINERAL RESOURCE | | | | XRF (DRY ANALYSIS) | | | | | | Relative Density (sg Wet) | Moisture Content | Material Content (Dry) of Ni (Kt) | Material Content (Dry) of Co (Kt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Measured Dry Mt | Indicated Dry Mt | Inferred Dry Mt | Total Dry Mt | Ni % | Co % | Fe % | MgO % | SiO2 % | SM Ratio | | | | |
| ≥0.2 | 129.47 | 81.46 | 77.54 | **288.48** | 1.14 | 0.08 | 31.29 | 8.27 | 20.88 | 2.52 | 1.73 | 38.13 | 3,279 | 241 |
| ≥0.3 | 129.40 | 80.81 | 75.90 | **286.12** | 1.14 | 0.08 | 31.42 | 8.30 | 20.70 | 2.49 | 1.73 | 38.12 | 3,269 | 239 |
| ≥0.4 | 129.20 | 80.19 | 75.02 | **284.41** | 1.15 | 0.08 | 31.49 | 8.32 | 20.61 | 2.48 | 1.73 | 38.12 | 3,265 | 238 |
| ≥0.5 | 128.50 | 79.45 | 74.07 | **282.03** | 1.15 | 0.08 | 31.52 | 8.35 | 20.59 | 2.46 | 1.73 | 38.12 | 3,248 | 236 |
| ≥0.6 | 126.25 | 78.22 | 72.50 | **276.97** | 1.17 | 0.08 | 31.44 | 8.45 | 20.68 | 2.45 | 1.73 | 38.09 | 3,227 | 233 |
| ≥0.7 | 121.50 | 75.47 | 69.64 | **266.61** | 1.18 | 0.08 | 31.15 | 8.67 | 21.03 | 2.43 | 1.73 | 38.02 | 3,157 | 224 |
| ≥0.8 | 113.83 | 70.16 | 63.77 | **247.75** | 1.22 | 0.09 | 30.50 | 9.10 | 21.75 | 2.39 | 1.73 | 37.89 | 3,021 | 215 |
| ≥0.9 | 103.48 | 61.75 | 54.18 | **219.42** | 1.27 | 0.09 | 29.38 | 9.82 | 22.93 | 2.34 | 1.72 | 37.66 | 2,786 | 190 |
| ≥1.0 | 90.21 | 51.25 | 43.72 | **185.18** | 1.33 | 0.08 | 27.81 | 10.81 | 24.52 | 2.27 | 1.72 | 37.36 | 2,464 | 153 |
| ≥1.1 | 74.18 | 39.85 | 33.93 | **147.96** | 1.40 | 0.08 | 25.75 | 12.15 | 26.60 | 2.19 | 1.71 | 36.98 | 2,074 | 114 |
| ≥1.2 | 57.74 | 29.06 | 25.57 | **112.37** | 1.48 | 0.07 | 23.12 | 13.88 | 29.22 | 2.11 | 1.70 | 36.52 | 1,665 | 78 |
| ≥1.3 | 43.34 | 20.40 | 19.00 | **82.74** | 1.57 | 0.07 | 20.46 | 15.68 | 31.84 | 2.03 | 1.69 | 36.06 | 1,296 | 56 |
| ≥1.4 | 32.06 | 13.88 | 13.71 | **59.65** | 1.66 | 0.06 | 18.31 | 17.25 | 33.87 | 1.96 | 1.68 | 35.70 | 990 | 35 |
| ≥1.5 | 23.59 | 9.07 | 9.82 | **42.49** | 1.74 | 0.05 | 16.89 | 18.43 | 35.14 | 1.91 | 1.68 | 35.49 | 740 | 21 |
| ≥1.6 | 17.11 | 5.63 | 6.89 | **29.63** | 1.82 | 0.05 | 16.00 | 19.32 | 35.87 | 1.86 | 1.67 | 35.39 | 540 | 14 |
| ≥1.7 | 12.17 | 3.24 | 4.71 | **20.12** | 1.91 | 0.05 | 15.51 | 19.93 | 36.20 | 1.82 | 1.67 | 35.36 | 384 | 10 |
| ≥1.8 | 8.33 | 1.77 | 2.99 | **13.09** | 2.00 | 0.05 | 15.23 | 20.37 | 36.37 | 1.79 | 1.67 | 35.35 | 261 | 6 |
| ≥1.9 | 5.52 | 0.88 | 1.72 | **8.12** | 2.09 | 0.05 | 15.06 | 20.66 | 36.40 | 1.76 | 1.67 | 35.31 | 170 | 4 |

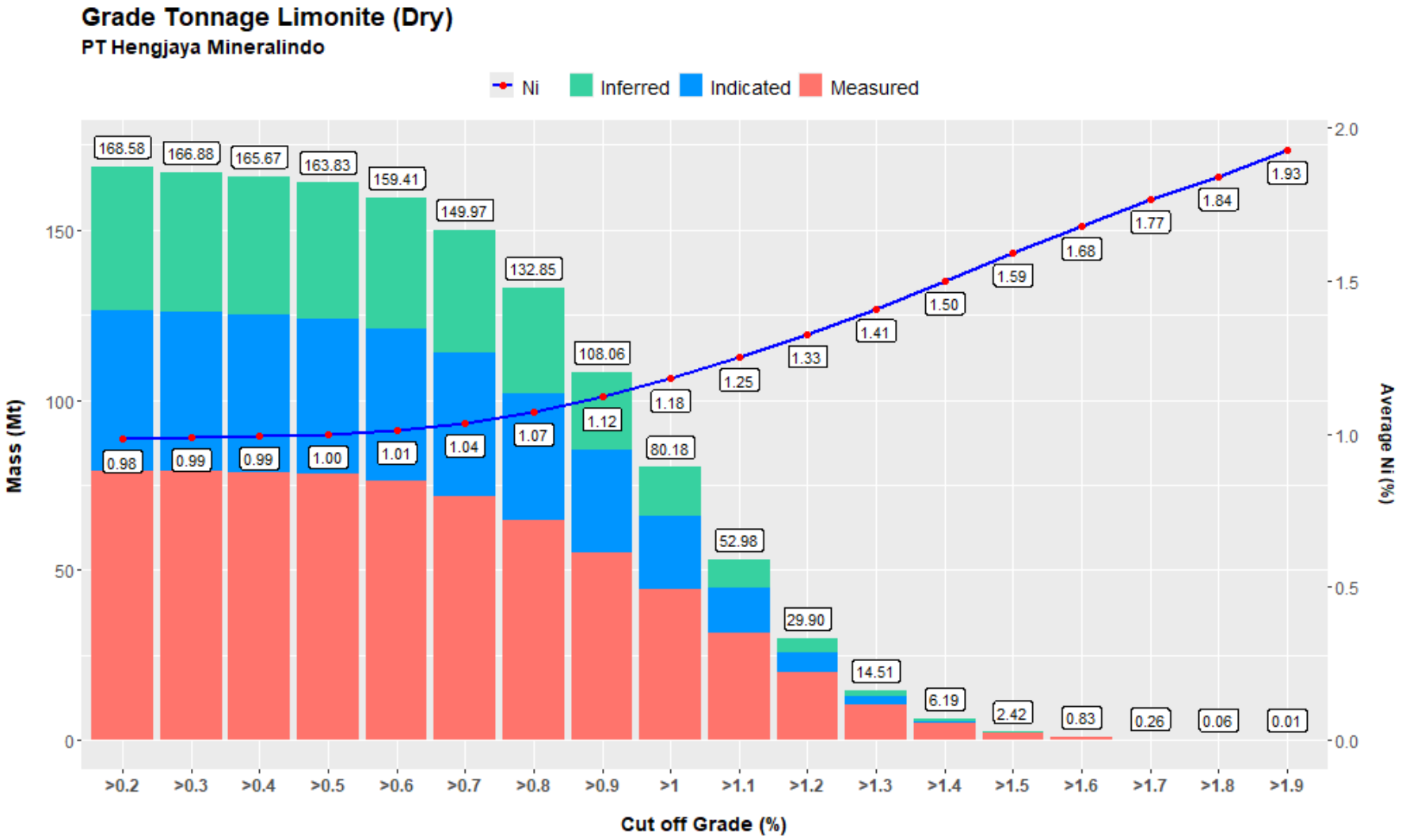



Figure 74 Grade Tonnage of Limonite (dry)

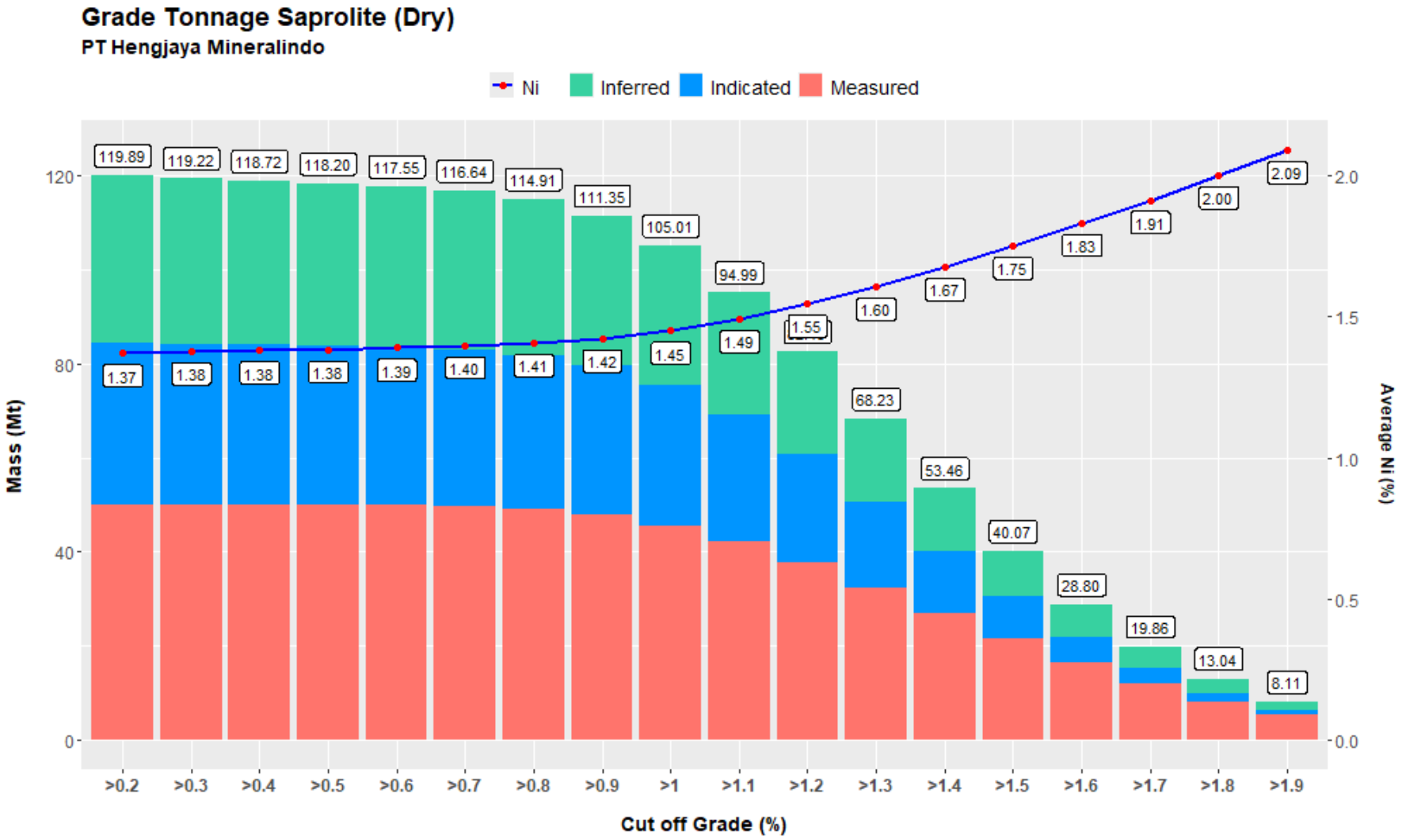



Figure 75 Grade Tonnage of Saprolite (dry)

### 1.10.3 Remaining Resource Estimation

Table 27 Resource summary estimated (dry) for HM Nickel Project

| Laterite | Measured | Indicated | Inferred | Total | Ni | Co | Fe | SM Ratio | Ni Metal | Co Metal |
|---|---|---|---|---|---|---|---|---|---|---|
| CoG 0.7% | Dry Mt | Dry Mt | Dry Mt | Dry Mt | % | % | % | % | Dry Kt | Dry Kt |
| LIMONITE | 71.56 | 42.29 | 36.12 | 149.97 | 1.04 | 0.11 | 42.15 | 5.25 | 1,553 | 168 |
| SAPROLITE | 49.64 | 33.20 | 33.80 | 116.64 | 1.40 | 0.04 | 15.73 | 2.01 | 1,631 | 47 |
| **Total Insitu** | **121.50** | **75.47** | **69.64** | **266.61** | **1.18** | **0.08** | **31.15** | **2.43** | **3,157** | **224** |
| STOCKPILE | - | - | 18.76 | 18.76 | 1.00 | 0.09 | 38.98 | 2.17 | 187 | 17 |
| **Grand Total** | **121.50** | **75.47** | **88.40** | **285.37** | **1.17** | **0.09** | **31.66** | **2.41** | **3,344** | **241** |

# APPENDIX 6

# LABORATORY QAQC

# Quality Assurance and Quality Control at the PT Hengjaya Assay Lab July 2024 to June 2025




**C.E. Watson**

**January 2026**

**For:**

Tony Green – Chief Operations Officer
Hal Morris – Operations Manager
Daniel Madre – Competent Person (JORC)

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**Quality Assurance and Quality Control at the PT Hengjaya**
**Sample Preparation and Assay Laboratory**
**Appendix for a JORC Compliant Report**
**January 2026**

## 1. Introduction

This report on the Quality Assurance and Quality Control at the PT Hengjaya Mineralindo (HM) Sample Preparation and Sample Assay laboratory at their Tangofa Camp in Sulawesi, Indonesia, has been compiled for inclusion as an Appendix to a JORC compliant report for the ASX, and according to the guiding principles of the JORC Code, 2012 Edition, which states: *"Transparency and Materiality are the guiding principles of the Code, and the Competent Person must provide explanatory commentary on the material assumptions underlying the declaration of Exploration Results, Mineral Resources or Ore Reserves."*

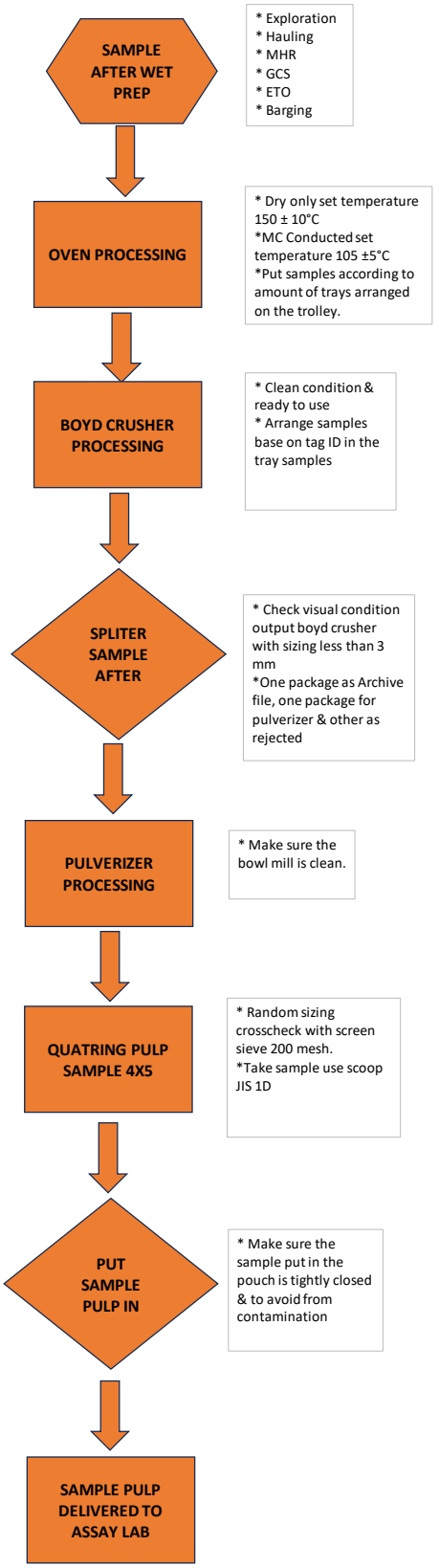
The report covers the twelve month period from July 2024 through to June 2025 and covers the sample preparation and sample assaying procedures used to prepare and assay the drill samples collected in the HM exploration drilling programme during this period. Drill samples are collected by drilling teams contracted from PT Danmar Exploration using Jackro 200 drill rigs and submitted from the drilling operations in plastic sample bags weighing between 6-8 Kgs per bag, with each bag representing a one meter drill advance in the drill hole. Samples are submitted to the PT HM Sample Preparation and Sample Assay Lab at Tangofa in batches of 92 original samples, with 4 x blank samples and 4 x OREAS Standards (CRM's) for a total of 100 samples per consignment.

Bags of 6 - 8 kg bags of wet drillhole sample are first weighed, dried, weighed, crushed, split, crushed, split and pulverised to produce - 200# (-75 micron) pulp samples, with a portion of between 50 gm and 80 gms are carefully taken and packed into brown paper geochemical envelopes and then taken through to the HM Assay Laboratory for analysis, as the individual Jobsheets (consignments) are completed, on a regular schedule varying between 100 to 400 samples per day.

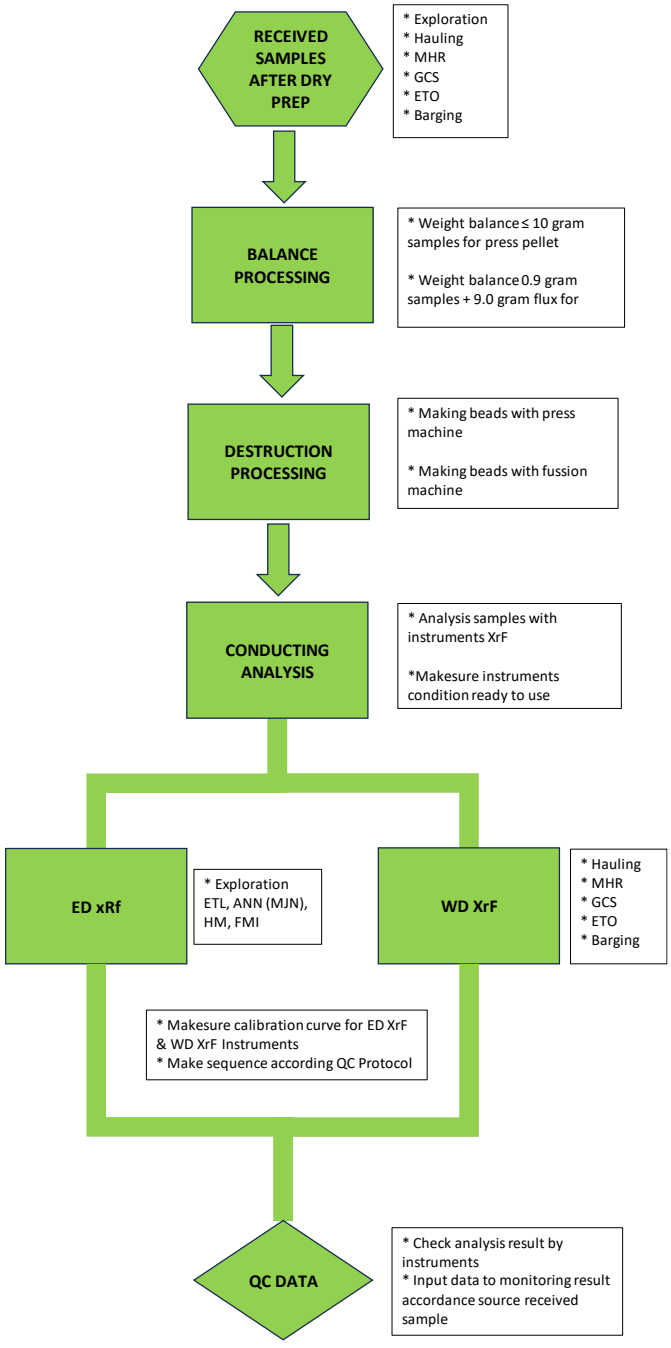
On arrival at the Hengjaya Assay laboratory, the pulp samples are unpacked and a 10 gm portion of each pulp sample is processed into a pressed pellet using a 15 ton manual hydraulic press, and this pressed pellet is assayed using Malvern Panalytical Epsilon 4 EDXRF's, to provide the elemental composition of the drill samples, in particular, the weight percent of nickel, iron, silicon dioxide and magnesium oxide, to be used in calculating the grade of the valuable elements, nickel, iron and cobalt.

The purpose of sampling and sample preparation is described in the AusIMM Field Geologist's Manual, Fifth Edition, 2011, as being *"….the reduction in particle size, through crushing and pulverising, and its sample size, through splitting, while retaining the representativeness of the medium being sampled. Samples of 10 – 30 kgs are presented for preparation and the final analysis is of a portion as little as 50 gms, and the expectation is that the result obtained from this 50 gm sample is, within acceptable limits, representative of the original drill sample."*

## Figure 1
## Sample Preparation Laboratory Flowsheets




## Figure 2
## Assay Laboratory Flowsheets




Figures 1 and 2 above are Flowsheets showing how the drill samples are prepared in the Sample Preparation Laboratory and then how they are prepared for and assayed in the Sample Assay Laboratory.

Table 1 gives the details of the number of original drill samples submitted by the Danmar Drilling programme during the period July 2024 through June 2025. It shows the numbers of original samples submitted, along with the different sample sub-types such as Blanks, OREAS Certified Reference Materials (CRM's), Duplicate Rejects, Pulp Rejects, Replicates and Inter Laboratory Checks samples assayed as part of the HM Quality Control Programme for this period.

The table shows the Total HM Assay Laboratory monthly production for the period, and then the corresponding number of samples sent off to a Certified Commercial Laboratory as Inter Lab Check Samples which ranges between 3.5% and 4.9% per month, for a monthly average of 3.9%, close to the 4% recommended and will be discussed further in the section on Inter Laboratory Check Samples.

## TABLE 1: HM Original, Check Samples & Standards – July 2024 to June 2025

| Month | Number Original Samples | Number Blanks | Number OREAS CRM's | Number Duplicate Rejects | Number Duplicate Pulps | Number Replicates | Total Assay Production | Inter Lab Check Samples | Inter Lab as % Total |
|---|---|---|---|---|---|---|---|---|---|
| **Jul-24** | 4,416 | 192 | 192 | 96 | 96 | 192 | 5,184 | 204 | **3.9%** |
| **Aug-24** | 4,140 | 180 | 180 | 90 | 90 | 180 | 4,860 | 185 | **3.8%** |
| **Sept-24** | 4,048 | 176 | 176 | 88 | 88 | 176 | 4,752 | 172 | **3.6%** |
| **Oct-24** | 2,668 | 116 | 116 | 58 | 58 | 116 | 3,132 | 114 | **3.6%** |
| **Nov-24** | 2,024 | 88 | 88 | 44 | 44 | 88 | 2,376 | 99 | **4.2%** |
| **Dec-24** | 2,116 | 92 | 92 | 46 | 46 | 92 | 2,484 | 81 | **3.3%** |
| **Jan-25** | 1,564 | 68 | 68 | 34 | 34 | 68 | 1,836 | 86 | **4.7%** |
| **Feb-25** | 1,104 | 48 | 48 | 24 | 24 | 48 | 1,296 | 64 | **4.9%** |
| **Mar-25** | 2,024 | 88 | 88 | 44 | 44 | 88 | 2,376 | 82 | **3.5%** |
| **Apr-25** | 1,104 | 48 | 48 | 24 | 24 | 48 | 1,296 | 62 | **4.8%** |
| **May-25** | 1,288 | 56 | 56 | 28 | 28 | 56 | 1,512 | 68 | **4.5%** |
| **Jun-25** | 1,472 | 64 | 64 | 32 | 32 | 64 | 1,728 | 60 | **3.5%** |
| **Total:** | **27,968** | **1,216** | **1,216** | **608** | **608** | **1,216** | **32,832** | **1,277** | **3.9%** |

# 2. Quality Assurance and Quality Control

## 2.1. Overview & definitions

Quality Assurance and Quality Control (QAQC) are two separate processes, but are often combined and referred to as QAQC. The purpose of QAQC is determining the quantity and concentration of the economic element of interest and providing the confidence we have in these numbers to allow us to put them in context with where we are in the mining value chain. It ensures that the data we are going to collect and the data we are collecting are of suitable quality (Sterk, 2019).

Quality Assurance (QA) refers to the procedures and protocols (i.e. the processes) put in place to maintain data quality within a mineral exploration or resource definition programme (Smee et al, 2024). By contrast, Quality Control (QC) refers to the specific checks undertaken at various stages of data collection to test whether data quality expectation have been met, and this is done by using test materials known as controls or QC samples.

Sterk summarizes the above by saying Quality Assurance is about the prevention of errors, and it occurs before sampling or measurement, while Quality Control is about the detection and correction/rejection of errors as they occur during the sampling or measurement process.

QA/QC programmes should be accompanied by clear and concise documentation in the form of standard operating procedures (SOP's) that are periodically reviewed and updated as changes are made to the programme. At the HM Sample Preparation and Sample Assay Laboratory, the principal Standard Operating Procedure (SOP) for the samples submitted by the exploration and mining operations at PT HM is the "JIS Method for Sampling and Method of Determination of Moisture Content of Garnierite Nickel Ore" JIS M-8109-1996, by H.Kanazawa, August 1996. This JIS standard addresses the reduction in particle size and of the sample size through incremental sample reduction according to different sized scoops depending upon the particle size of the material being sampled.

The AusIMM Field Geologist's Manual, Fifth Edition, Monograph 9, (2011) – Chapter 11 - Sampling, Analysis and Quality Control provides a glossary of meanings under the heading Terminology, and some of the meanings of these terms used in QA/QC are as follows:

Accuracy – *the closeness of agreement between a test result and the 'true' value or accepted reference value. When applied to a set of test results, the term involves a combination of random components and a common systematic error or bias component.*

Accuracy is assessed by using Certified Reference Materials, eg OREAS 193, and by inserting these CRMs into the sample stream, it is possible to assess the performance of the assay lab undertaking the assay work for internal control. When sent to commercial laboratories as Interlaboratory Check samples it allows comparison of the HM Assay Lab performance against commercial laboratories and assess for any bias.
Accuracy is treated as a qualitative attribute, ie low or lower accuracy, high or higher accuracy, and should not be given a quantitative value. Accuracy is measured through the bias, which is the difference between the expectation of the test results and an accepted reference value. There is an inverse relationship between accuracy and bias, the higher the absolute value of the bias, the lower the accuracy, and vice versa.

Precision **–** *the closeness of agreement between independent test results obtained under stipulated conditions. Precision depends only on the distribution of random errors and does not relate to the true or the specified value.*

*The measure of precision is usually expressed in term of imprecision and computed as a standard deviation of the test results.*

Precision is quantified by the use of preparation and pulp duplicates.

Accuracy and precision are the two key elements in understanding data quality, and are illustrated using the Dartboard Diagram, a schematic diagram illustrating the relationship between trueness, precision and accuracy (after Flynn and Holdsworth, 2009). We need to quantify the precision and accuracy (bias). Sampling or analysis is said to be accurate when the mean error approaches zero. Sampling or analysis is said to be precise when there is a small spread of errors around the mean sampling error.

Data with "good" accuracy and "good" precision can be regarded as "Good Quality" and as such, will be "fit for purpose". We also use the terminology "representative", when the precision and accuracy are within acceptable tolerances. The importance of good quality data is that it provides us with the confidence that our data is fit for purpose in calculating the resources of any ore body at a project.

*Bias – the difference between a test result or the mean of a series of test results and the accepted reference value. Bias is either expressed in absolute terms in the reporting unit of measure or as relative percent (positive or negative).*

*Certified reference material (CRM) – a reference material for which one or more parameters have been certified by a technically valid and recognised procedure and for which a certificate or other valid documentation has been issued by a certifying body.*

*Geological blank – a field sample or prepared pulp sample that contains very low or undetectable concentration of the element being sought, eg Ni. The field blank measures contamination in both the sample preparation and analytical stages, while the pulp blank measures contamination in the analytical stage only.*

## 3. Quality Control at HM Sample Preparation Laboratory

The Quality Control programme at HM ensures that checks and balances are implemented during the sample preparation and sample assaying stages and are constantly reviewed and assessed, in order to identify whether the sampling /measuring systems and the laboratory are providing quality assays, ie are "in control". In the minerals industry, the checks and balances commonly used to monitor the sample preparation and assaying processes includes standards, blanks and duplicates.

At the Hengjaya Mineralindo Sample Preparation Laboratory, the monitoring of sample quality and measurement of precision is quantified by the insertion of blanks and duplicates into the sample stream, and the screen size testing of pulverized samples. The laboratory uses Coarse Blanks to measure contamination, Coarse Duplicates/Duplicate Rejects/ Coarse Rejects measure sub-sampling precision at the crushing and incremental splitting stages in the reduction of the sample size from +10 mm to – 3 mm in crushing stages, and the effectiveness of the pulverising process in producing a suitable sized homogenous sample for assay through the – 200 # Screen Particle Sizing Test.

### 3.1.Coarse Blanks

Contamination is assessed by using coarse blank samples. These are barren samples of crushed limestone used to test for potential cross-contamination, or carry-over, between samples across the entire sample preparation process of crushing, splitting and pulverising. The coarse blanks are inserted into the sample stream by the Drill Contractor, Danmar, and four coarse blanks are inserted into the consignment of 92 original samples, along with four CRMs, and the sample stream of 100 samples arrive at the HM Tangofa Sample Prep Laboratory for assay.

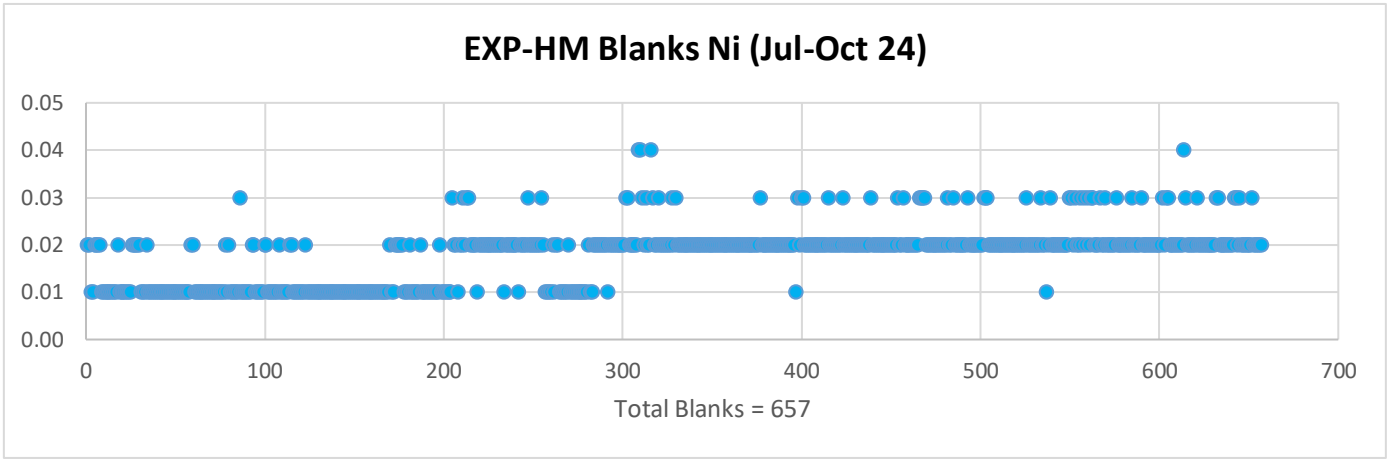
Coarse blanks are most beneficial in testing for contamination after high grade nickel ore samples have been prepared, but at the HM Prep Laboratory each consignment of 100 drill samples consists of a random mixture of exploration drill samples and the Ni content of the samples is dependent upon the geology being drilled, so there is little way of knowing if the previous sample had come from a barren, low grade or high grade horizon.

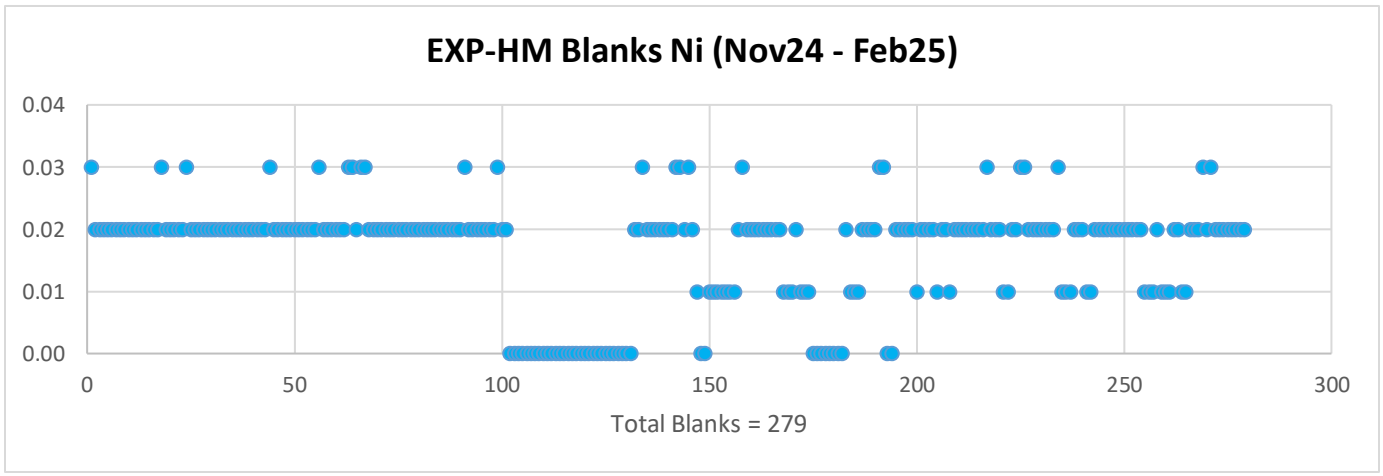
The three graphics below show the results of assaying the coarse blank samples for Ni over the three periods, Jul to Oct 2024 – 657 samples, Nov 2024 to Feb 2025 – 279 samples, and Mar to Jun 2025 – 257 samples.

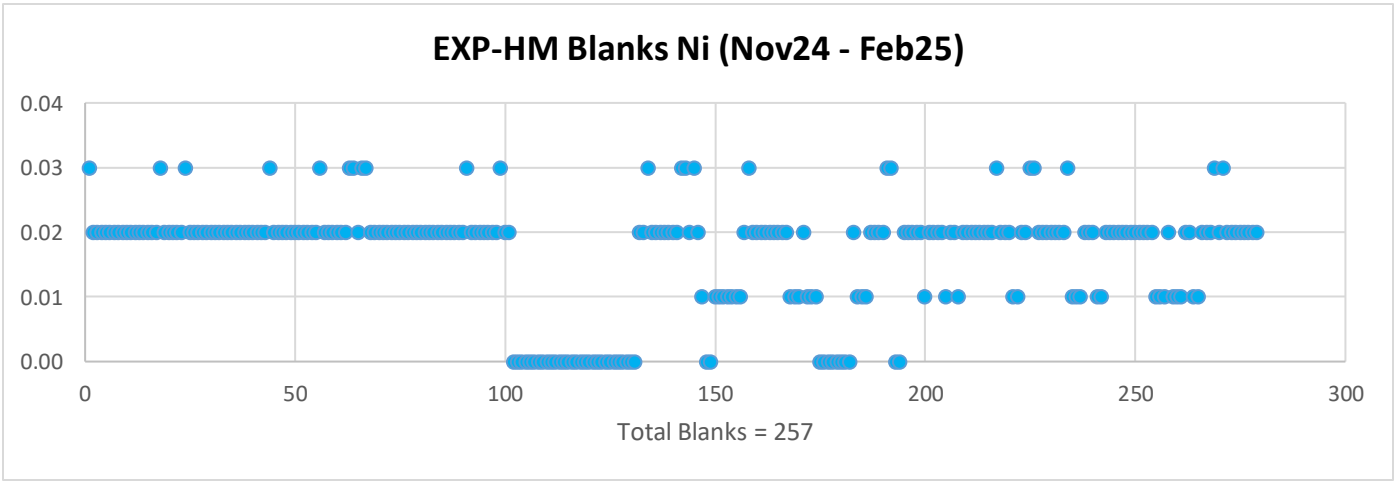
The graphs show sample assays of 0.00, 0.01, 0.02, 0.03, 0.04, 0.05 ppm Ni, with one assay of 0.06 ppm occurring in the batch of samples assayed in Mar – Jun 2025.

The highest number of values recorded are 0.02, with lesser numbers returning 0.03 and 0.01 ppm occurring in the three different periods of four month.

**Figure 3**
**Graphic for Coarse Blanks – July 2024 to October 2024**




This constancy of results of the coarse blanks returning values of 0.02 % Ni, and then 0.03 % Ni or 0.01 % Ni over the 12 month period is indicative of the coarse blank samples indicating the laboratory is not experiencing significant issues of cross contamination in the sample preparation stages of the sample processing.

## 3.2.Coarse Duplicates

Coarse duplicate samples, also known as Coarse Rejects, or at the PT Hengjaya Mineralindo Assay Laboratory as Duplicate Rejects, or DR samples. They are collected from the Boyd RSD (Rotary Splitting Device Waste drawer, at the same time as the sample is incrementally split into the two x 25% Product drawers, with one split sample being sent to the pulveriser, and the other representative sample being collected for storage. Coarse duplicate samples are used for testing the sub-sampling precision of the first crushing and splitting stages of the sample preparation process, where the sample size decreases from +/- 100 mm to +3 mm. They are submitted to the same primary laboratory for assaying, in the same sample consignment, with a different sample number, in order that the two samples follow identical pulverizing and assaying procedures.

552 Coarse Duplicates (Coarse Rejects) were collected at the HM Sample Preparation Laboratory for Quality Control purposes between July 2024 and June 2025, from a total of 27,968 Original Samples, a percentage figure of 1.97%. This number is very close to the figure of 2% suggested by Mendez, in his paper “A Discussion on Current Quality Control Practices” (2011).

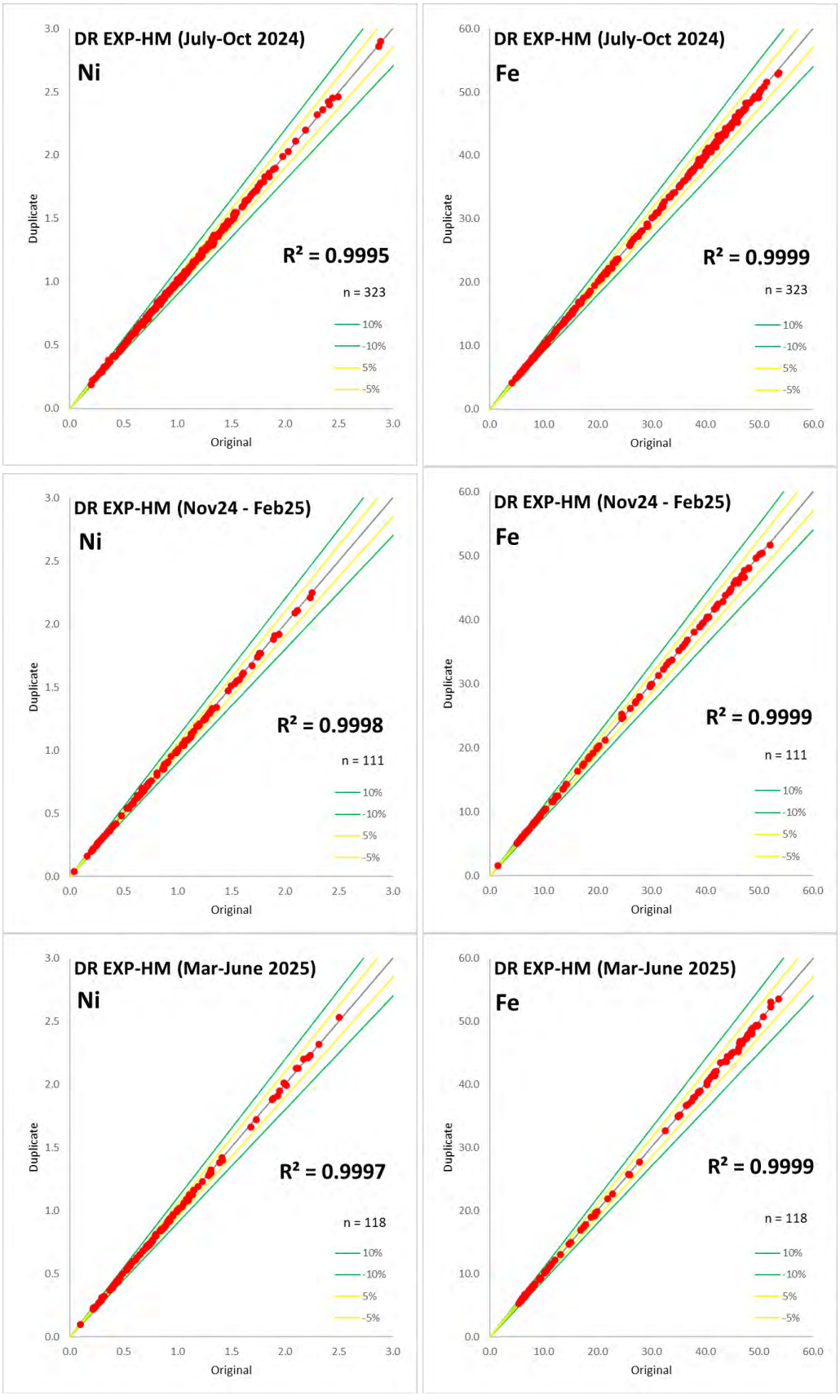
Figure 2 is a scatterplot of the duplicate data results for the two elements Ni and Fe from the 552 original and Coarse Reject (Duplicate Reject – DR) samples assayed during the three four-month periods, July to Oct 2024, Nov 2024 to Feb 2025 and Mar 2025 to Jun 2025. The values are plotted in red, on a grey linear regression line. Two yellow lines are plotted either side of the linear line, above and below, and these lines represent the +5% and -5% variance, and the two outer two green lines represent the variance between the duplicate values of +10% and -10%. Scatterplots where the results plot on a slope from lower left to upper right as shown on these scatterplots indicate a positive correlation, $R^2$.

Correlation coefficients ($R^2$) of 0.999 for Ni and 0.999 for Fe on each of the three different scatterplots for the three 4 monthly periods from Jul 2024 to Jun 2025 are very good results, and show the high precision of the crushing and splitting using the Boyd Mid Crusher RSD units in the sample preparation stages. It is also encouraging to observe the results are similar for the three four-month periods whish shows excellent reproducibility over the twelve-month period.

In the interests of transparency, I wish to report that the numbers shown on the Scatterplots in this report will vary slightly from the numbers shown in the Production Table 1, with Table Blanks 1216 and Graph Blanks 1193, Table Inter Lab Checks 1277 and Inter Lab Graphs 1280, Table CRM’s 1216 and Graph CRM’s 1218, whilst the Table DR 608 and Graph DR 552, Table DA 608 and Graph DA 552 and Table Rep 1216 and Graph Rep at 1101 show wider variation.

This difference between the table and graph numbers is because the data listed in the tables is the total of sample sub-type received during the month, while the graph numbers show the actual samples assayed during the month. The samples listed as Inter Lab Check samples is the number of Original, Blank, DR, DA, OREAS CRM and Replicates sent for comparison. The graphic numbers are therefore the actual numbers assayed during the relevant period.

**Figure 4**
**Duplicate Reject Scatterplots - July 2024 to June 2025.**



## 3.3. Particle Sizing Test – 200# Screen Test

The third test undertaken at the HM Sample Preparation Laboratory as part of the Quality Control monitoring programme is the - 200# Screen Test, or Particle Sizing Test. This is where samples of the pulp sample product from the pulverising operations are taken and weighed and then presented to a 75 micron (200#) steel mesh screen and screened until all the – 75 micron material that can pass the 75 micron screen has passed, and the remaining +75 micron product is collected and weighed, along with the -75 micron product. The weight of the material passing the 75 micron screen is divided by the total weigh of the original sample and the percentage weight passing is calculated and plotted on a chart. This particle sizing test is undertaken on 1 sample in every 20 original samples pulverised, and for the Danmar consignments of 92 original samples, 4 blanks and 4 CRM's for a total of 100 samples, that will vary between four and five 200# Screen tests per consignment.

If more than 95% of the original sample weight passes, then the test is considered a pass, and the sample can proceed for assay. If less than 95% of the sample fails to pass the 75 micron screen, the test is a fail, and the sample will be pulverised for a further period of time until the 95% pass figure is obtained.

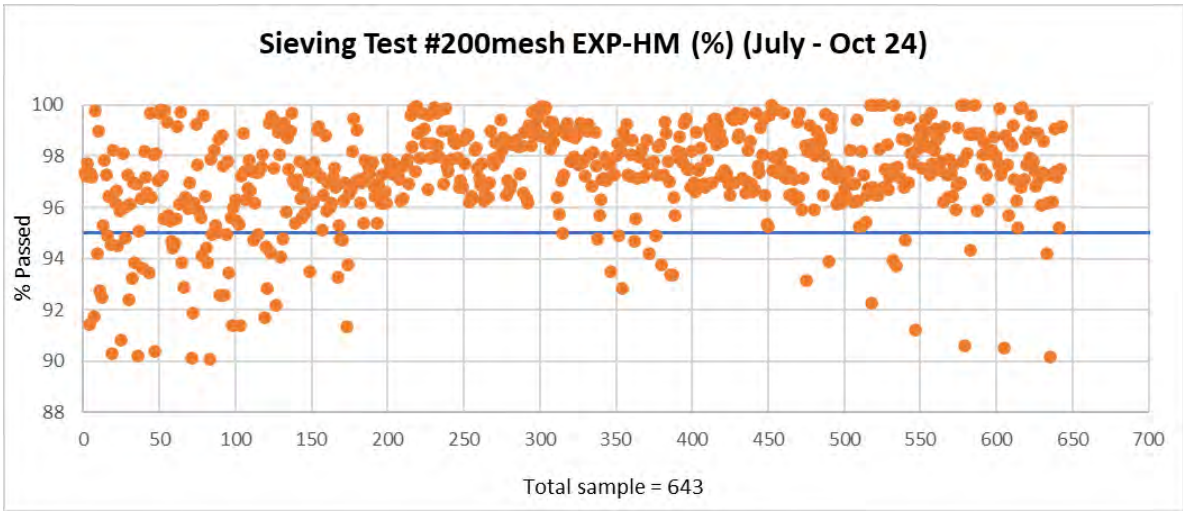
Figure 5 shows three graphs the results of 1,161 200 # Screen Test Results undertaken between July 2024 and June 2025.The three graphs show the results for 643 samples tested between July 2024 and October 2024; the results for 286 samples tested between November2024 and March 2025, and the results of the final 232 samples tested between April and June 2025.

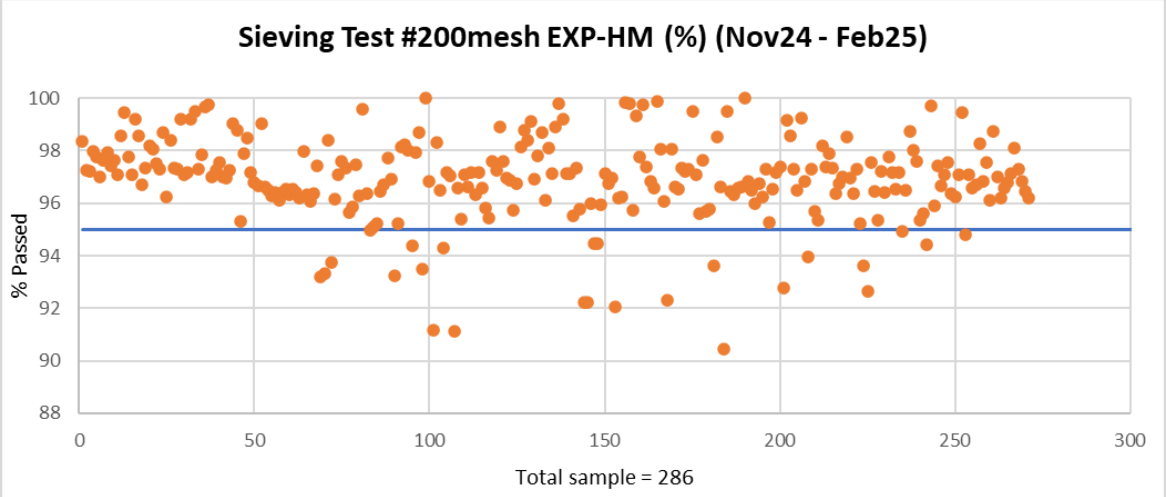
The % passing is shown for values of 88%, 90%, 92%, 94%, 96%, 98% and 100% on the left hand side of the graph, y-axis, while the ranked number showing the sequential increase in the number of the samples, eg 200, 250, 300, 600, 650 and 700 is shown at the bottom of the graphs, x-axis. The individual sample results are shown as orange dots with a blue line representing the minimum 95% pass value which needs to be achieved before the sample can be considered a pass.

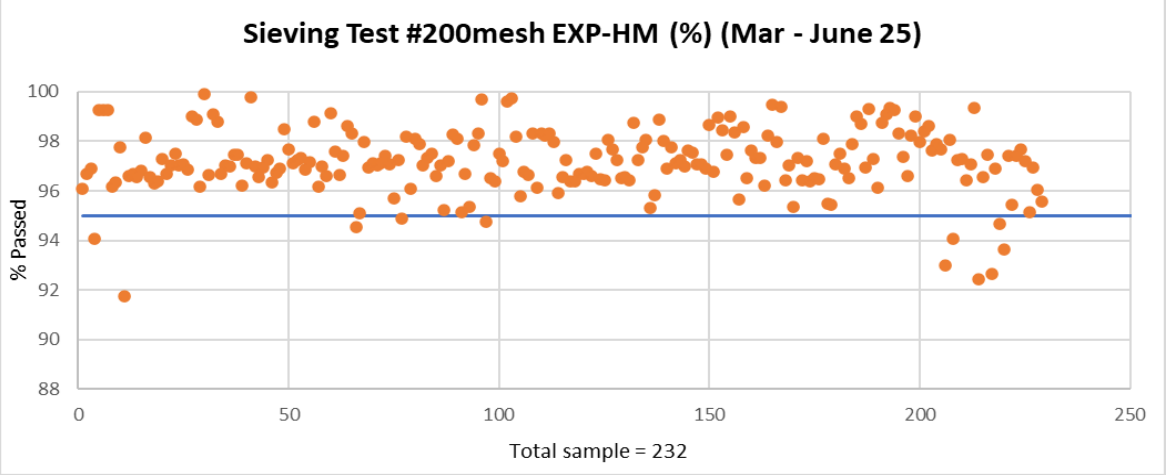
The three charts show the majority of the orange dots plotting between 96% and 99%, with more results falling below the 95% line in July to Oct 24, fewer results below the 95% line in Oct 24 to Feb 25 and the least number of results falling below the 95% line in the period Mar to Jun 25.The improvement in the number of samples passing the 200# screen test is most probably due to a mixture of the sample crew better understanding the nature of the material being pulverised and increasing the pulverising time from 2 to 4 mins to improve the volume of material passing.

These results illustrate the repeatability precision of the pulverising process in reducing the particle size of the samples to be high, and that the sample is considered to be sufficiently homogenised to provide an acceptable assay result when placed in the XRF for assay.

**Figure 5.**
**Graphs showing 200 # Screen Test Results for 1,161 samples pulverized between Jul 2024 and Jun 2025**



## 4. Quality Control at PT Hengjaya Mineralindo Assay Laboratory

Exploration drill samples are first prepared at the PT Hengjaya Mineralindo Sample Preparation Laboratory at the Tangofa Camp, and are submitted to the Sample Assay Lab as approximately 50 gms samples pulps where they are checked against the Sample Jobsheets to ensure all the relevant samples are ready for assay, before being sent to the Weighing Room where a 10 gm sample of pulp is taken and sent to the Pressed Pellet Room where the pulp is placed in a manual 15 ton Hydraulic Press and a pressed pellet is produced from the pulp and an Alteac Tapered Aluminium Cup by this manual pressing. The pressed pellets are prepared and placed into pyrex glass dishes and then taken through to the XRF Room where they are loaded onto the XRF carousels containing a Standard in position number 1 and the 9 remaining pressed pellets are placed into the carousel and they are then assayed using an Epsilon 4 EDS XRF, a process that takes approximately 30 minutes to assay the 10 samples. Once completed, the pressed pellets are removed from the carousel and replaced with a different set of 10 samples and the assaying process then repeated with these further 10 pressed pellet samples.

The Exploration drill sample Jobsheets contain 92 original drill samples and 4 blanks and 4 OREAS Standards, making a total of 100 samples per Jobsheet. The use of three types of standards for testing the accuracy and precision in the Sample Preparation process have already been described, these being the Coarse Blanks, Coarse Rejects (Duplicate Rejects) and 200 # Screen Testing, and the following sections will describe the 4 different types of samples used to test the accuracy and precision in the Sample Assay Section, these being Pulp Duplicates (Duplicate Assays), Certified Reference Materials (CRM's), Replicates and Inter Laboratory Check Samples.

### 4.1. Pulp Duplicates, or Duplicate Assays.

Pulp duplicates, also known as Duplicate Assays, or DA's at the Hengjaya Assay Lab, are splits that are taken from the -75 micron pulp produced in the pulverising bowls, and it is this material which is sent for the preparation of either, pressed pellets or fused beads, the two media used in the XRF assaying of samples. At Hengjaya, explorations samples are prepared for assaying using pressed pellets, while mining samples are prepared for assaying using fused beads.

The pulp duplicates are indicators of the analytical precision, which can be affected by the quality of the pulverisation process, and the this is measured by submitting duplicate samples with different sample numbers for assaying as part of the same Jobsheet.

Scatterplots of pulp duplicates allow a simple graphical representation of the assay results and provide a visual comparison of precision at the pulverising stage in the overall sample size reduction.

**Figure 6**
**Scatterplot showing results of 552 Duplicate Assays, Pulp Duplicates**

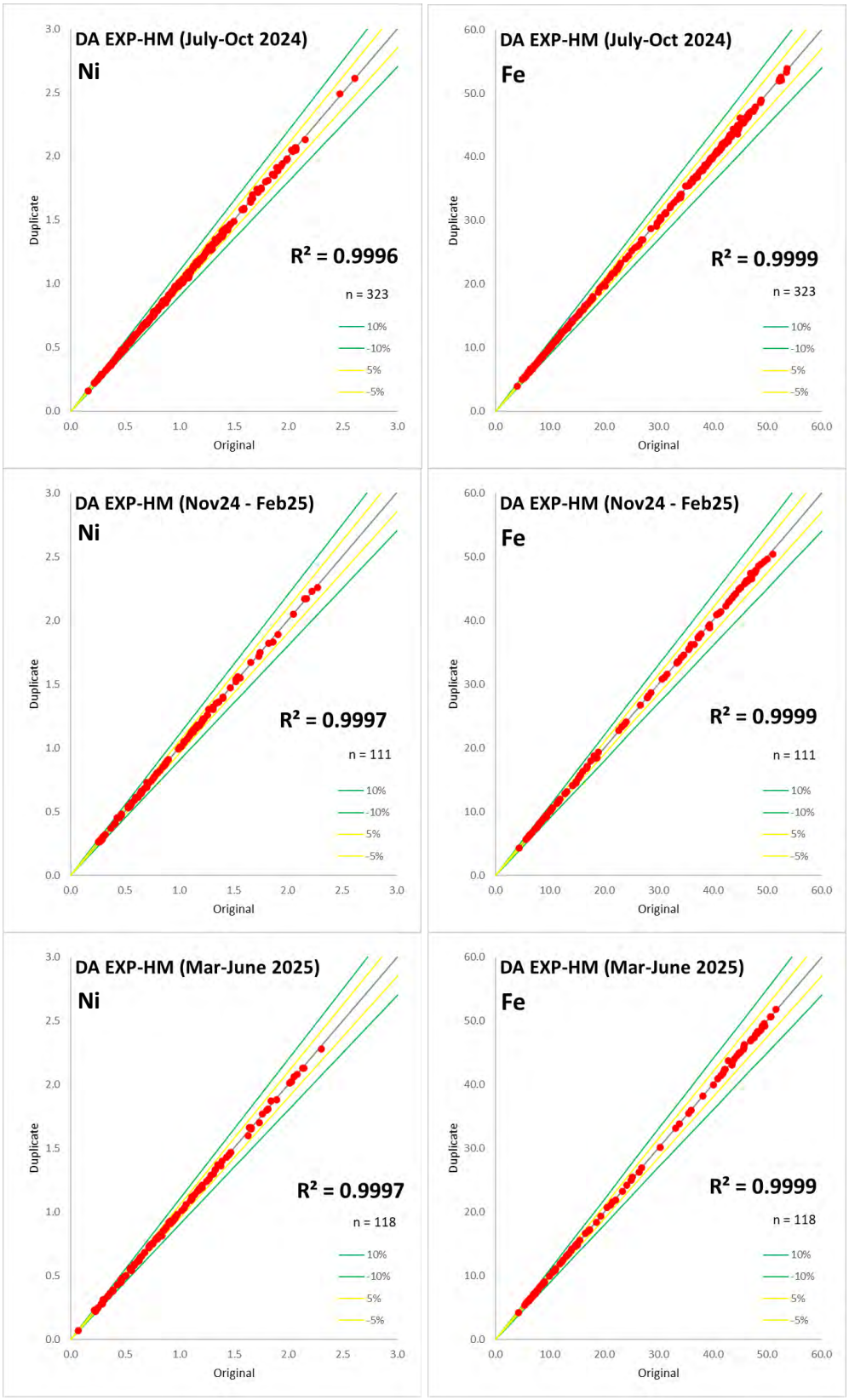


Figure 6 shows scatterplots for the elements Ni and Fe from 323 samples during the period Jul to Oct 2024, 111 samples during the period Nov 2024 to February 2025 and 118 samples from the period Mar to Jun 2025. The scatterplots are similar to those shown in Figures 4 for the Coarse Reject/ Duplicate Reject assays, with the majority of the Ni and Fe falling within the two yellow lines representing a +/- 5% variance from the original and duplicate assay, a high precision, and reflected with correlation coefficients of 0.9995, 0.9998 and 0.9997 for the Ni values respectively.

One comparison of note is that the correlation coefficients for Ni for the periods July – Oct 24, Nov 24- Feb 25 and Mar 25 to June 25 for the Duplicate Pulps are 0.9996, 0.9997 and 0.9997, while the corresponding Ni correlation coefficients for the equivalent Duplicate Rejects are 0.9995, 0.9998 and 0.9997 respectively. This difference is due to the fact that the Duplicate Reject values refer to the samples taken from the crushing and splitting stage while the Duplicate Assay values are taken from after the pulverising stage, and a better value is always expected from the finer pulp material, than from the coarser crushed material. In this case it applies to the first result, does not apply to the second result, or the third result where the values are the same.

The correlation coefficients for the Fe results for the same three periods of Jul to Oct 2024, Nov 2024 – Feb 2025 and Mar to Jun 2025 are all 0.9999, which shows a very high precision, something that was shown in the correlation coefficients for Fe for the DR assays for the same periods, where the same results of 0.9999 were recorded for all three periods.

Roden & Smith (2014) mention how XRF assay procedures have not changed significantly but the use of fused beads instead of pressed powder pellets have resulted in better precision and lower detection limits. They also mention that XRF is an analytical method capable of producing very precise assays over wide concentration ranges and is therefore widely used for assaying nickel laterite ores and iron ores. Bruker also have brochures making similar statements about their spectrometers also offering high accuracy and precision in determining the elemental composition of nickel laterite ores. These statements are supported by the results of our DA assays during the period July 2024 to June 2025.

A point of interest is that Johnson Sebayang of Citrabuana recently told the author that he has performed tests on samples using the Apec 400 Automatic Pressed Pellet Machine to produce pressed pellets using a force of 20 tons to press the pellet and then assay using the Epsilon 4 ED XRF and is very happy with the results, saying that he feels they are almost as good as the results obtained through using fused beads and WDXRF.

HM presently have five XRF Spectrometers at their Tangofa Assay Lab, three Malvern Panalytical Epsilon 4 XRF's, one Bruker S2 Puma XRF and one Bruker S8 Tiger Series 2. These are compact energy dispersive spectrometers that are capable of undertaking elemental analysis and configured with dedicated software specifically for the nickel laterite suite of elements. All our XRF's use a Nickel XRF 12 Element Suite for Ni, Fe, Co, MgO, SiO2, CaO, Al2O3, Cr2O3, MnO, P2O5, SO3 and TiO2 with software applications to differentiate the different Limonite and Saprolite samples.

## 4.2.Certified Reference Materials (CRM's), Check Standards

Certified Reference Materials, CRM's, are samples with certified grades, prepared under specially controlled conditions and having a certified mean value for the contained elements in that standard, along with associated confidence and tolerance limits. They are used in Quality Control to monitor the values of the standard against those of the unknown samples being assayed and allow the accuracy of the assay process to be monitored. CRM's are often referred to as 'standards'.

It is usual for several CRM's to be used in a quality control programme, whose values cover the range of values expected to be encountered in the exploration programme. The Hengjaya Mineralindo Assay Laboratory uses CRMs produced by OREAS (Ore Research & Exploration P/L, from Victoria, Australia, with the OREAS Standards 182, 187 and 192 used, these having Ni values of 0.71, 1.37 and 1.77 respectively, along with Fe values of 20.57, 13.61 and 12.67 respectively.

The Ni value of 0.71 equates to Low Grade Limonite value, a Ni value of 1.37 equates to a Low Grade Saprolite value and a Ni value of 1.77 equates to a Medium Grade Saprolite ore, a Ni value of equal to or more than 1.80 equates to a High Grade Saprolite ore.

In addition, these standards have certified standard deviations and state the 95% Confidence and Tolerance Limits, with corresponding low and high values.

CRMs are generally placed into the sample stream at a frequency of one in 25 exploration samples, for 4 CRM's per 100 sample consignment. Mendez 2011 suggests an insertion rate of 6% for CRM's, and the HM Sample Assay Laboratory has been increasing the numbers of CRM's sent off for Inter Laboratory Check samples to increase the number of 4% used in the Exploration Sample Jobsheet of 92 Original samples, 4 Blank samples and 4 OREAS Standards to arrive at this figure of 6%.

Shewhart Control Charts are used to monitor CRM results, they are line graphs of the analytical results with a grey centre line representing the certified mean, and then green, yellow and red lines representing one sigma (standard deviation), two sigma (standard deviations) and three sigma (standard deviations) respectively. These different sigma lines indicate the process stability.

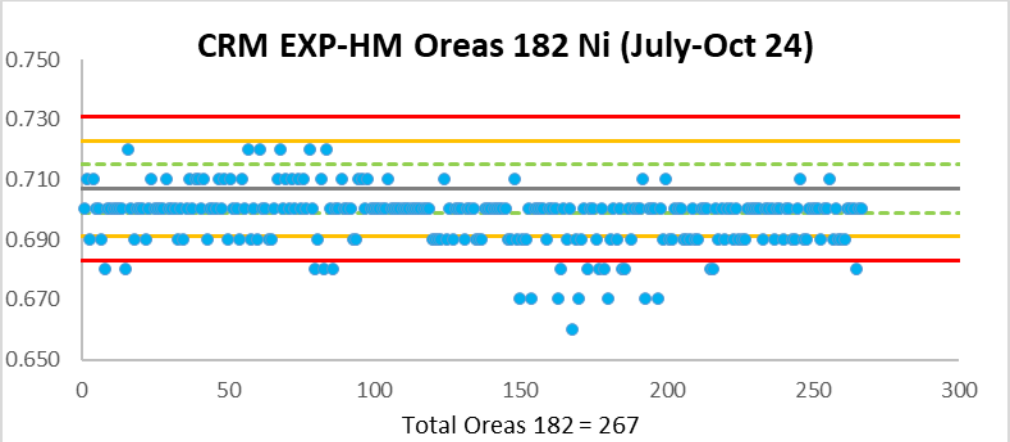
CRM results should fall between +/- 2 standard deviations 95.5% of the time, and between +/- 3 standard deviations 99.7% of the time, and this means that some 1 in 20 results will fall outside +/- 2 standard deviations and 1 in 300 results will fall outside of +/- 300 standard deviations.

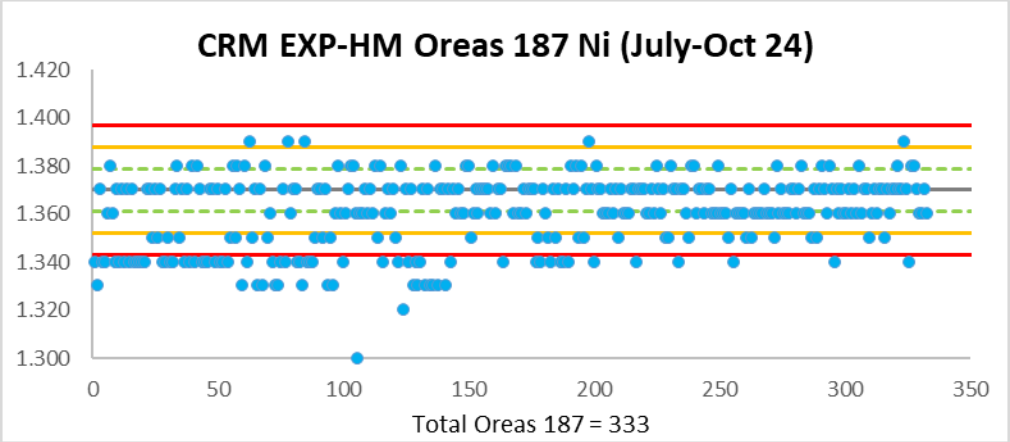
Figures 7, 8 and 9 are Shewart Control Charts for the results of assays using the OREAS standards 182, 187 and 192 over a twelve-month period from July 2024 to Jun 2025, broken down into three separate four month periods, namely Jul to Oct 2024, Nov 24 to Feb 25 and Mar to Jun 2025.

The AusIMM 2011 Field Geologists' Manual describes how all the results plotted on the chart should show a random distribution with no patterns or trends. The assays should be distributed normally and fit a Gaussian 'bell' curve, with approximately 68% of the points within one standard deviation of the value, 95% of the points should be within two standard deviations of the value and 99.7% of the points should lie within three standard deviations of the expected value, these red lines known as the Upper and Lower Control Lines.

Figure 7, showing the Ni results for the July to Oct 2024 period for Standards 182, 187 and 192 show this random distribution to be the case, but whilst the majority of the results plot within the Upper and Lower yellow 2-sigma control lines, a negative bias is shown with a number of results falling outside the – 3 sigma red warning lines.

**Figure 7**
**Ni Result for July to Oct 2024**



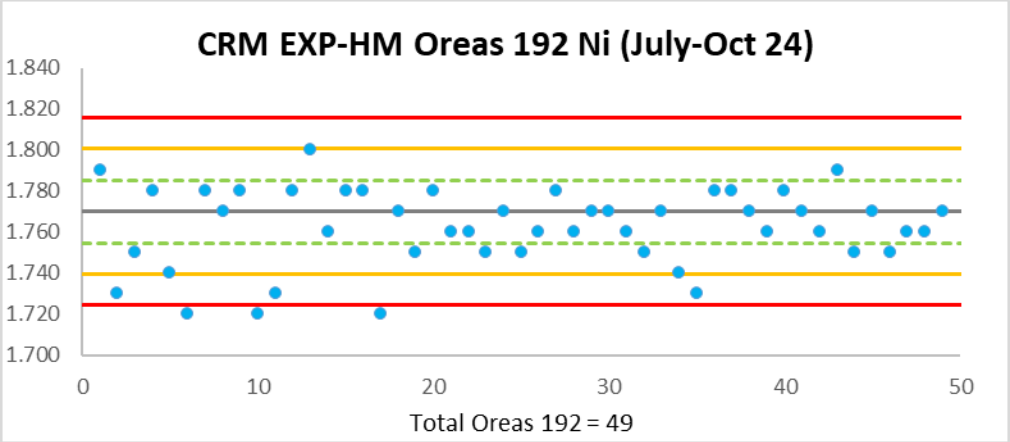
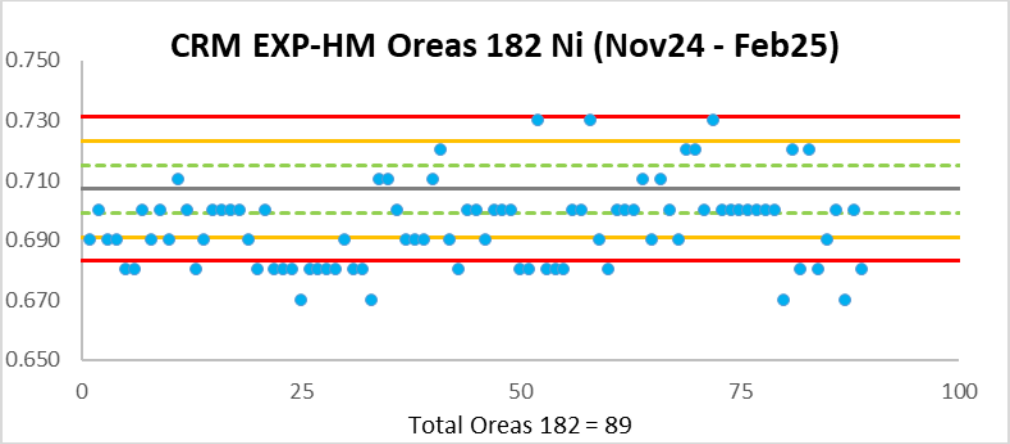
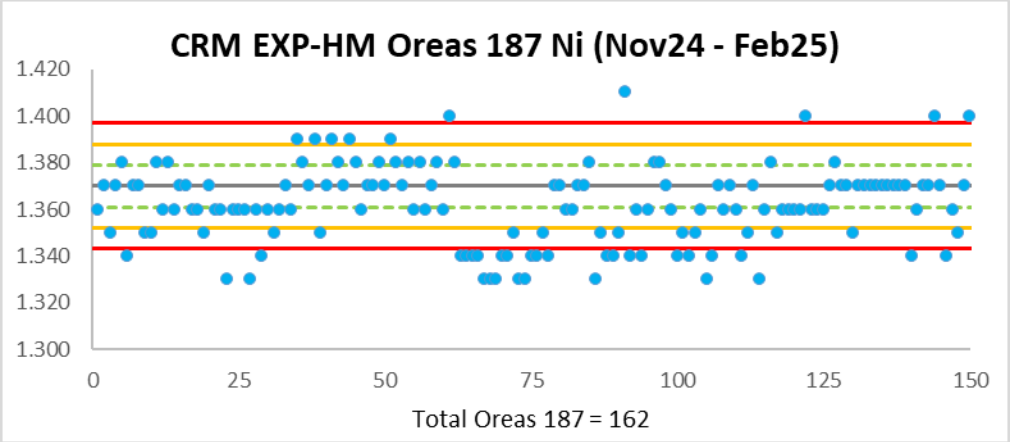



Figure 8, shows a similar pattern for the Ni results for the period Nov 24 to Feb 2025 for standards 182, 187 and 192, with a random distribution visible for all three standards, but a negative bias is shown with more assay results plotting outside the -3 sigma line in standards 182 and 187.

**Figure 8**
**Ni Result for Nov 2024 to Feb 2025**



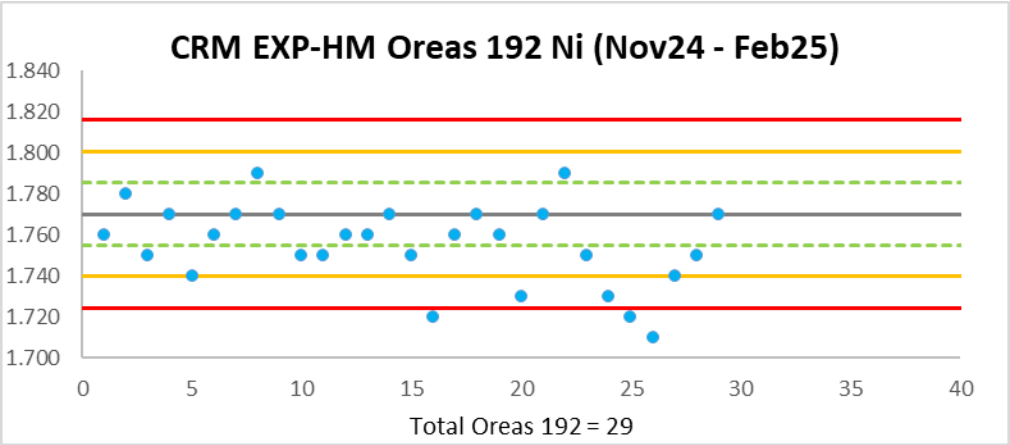
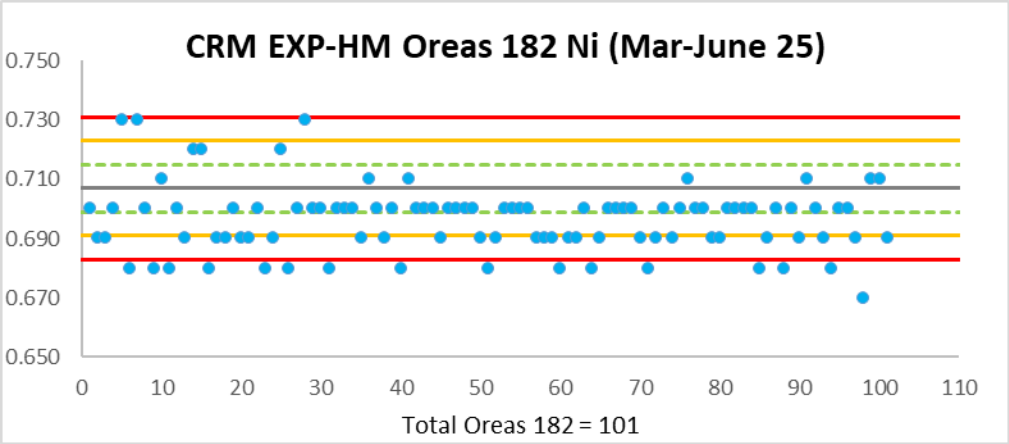
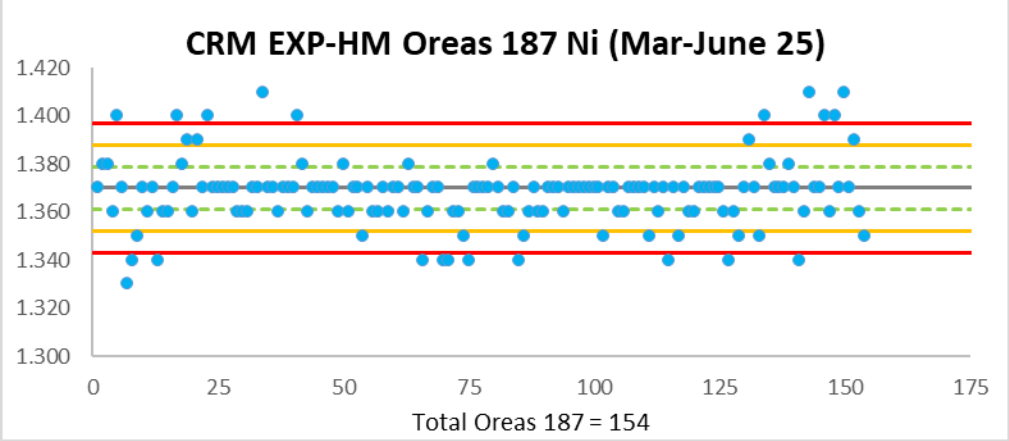
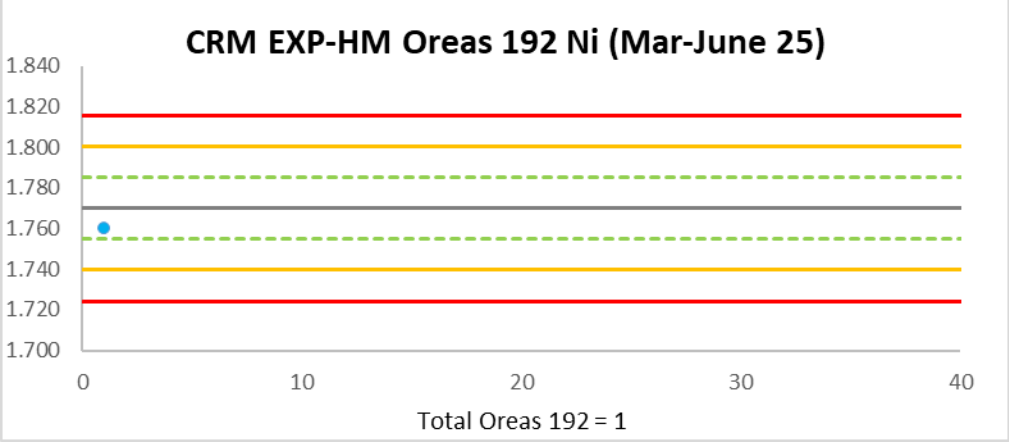



Figure 9, shows the Ni results for the period Mar to Jun 2025, shows a similar pattern as for the previous two periods, that is, a random distribution around the central mean line, but with a negative bias, and more results plotting outside the +3 and -3 sigma lines with standards 182 and 187 than to be expected. With only one results for OREAS standard 192 for this period, no pattern can be discerned.

**Figure 9**
**Ni Result for Mar to Jun 2025**




Once this bias had been identified, a team from PT Citrabuana Jakarta came to site to undertake staff training in validation and verification through the calculation of precision and accuracy using the RSD<2/3 Horwitz formula, and improvements in the quality of the CRM Control Charts will be shown in future reports.

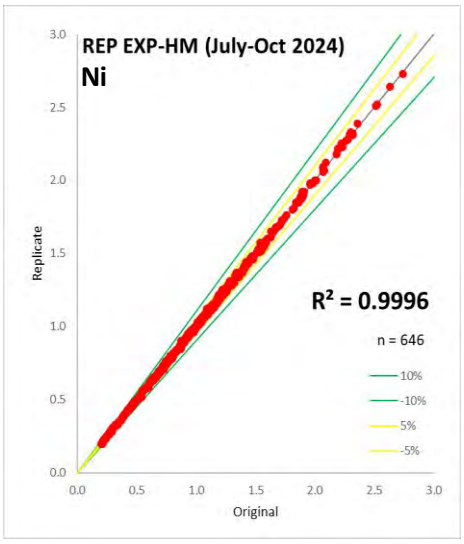
## 4.3.Replicate Assays.

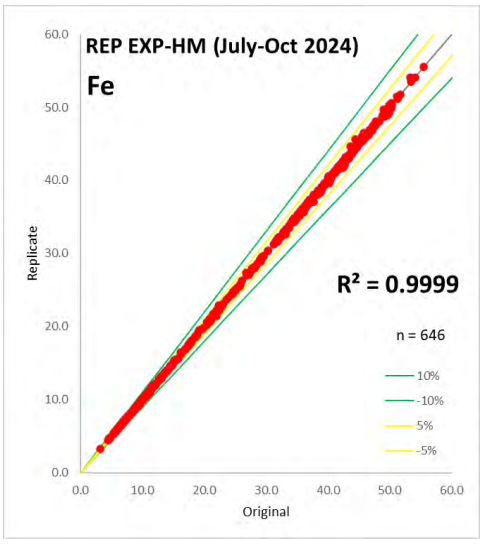
Replicate samples are Assay Laboratory control samples where two samples are taken from one original pulp sample and each of the two samples are given separate numbers and two separate pressed pellets are produced and inserted into the same batch for assay. At the HM Assay Laboratory, they are part of an established standard package of check samples that comprises 2 x DA samples, 2 x DR samples and 4 Replicates per 100 sample Jobsheet.

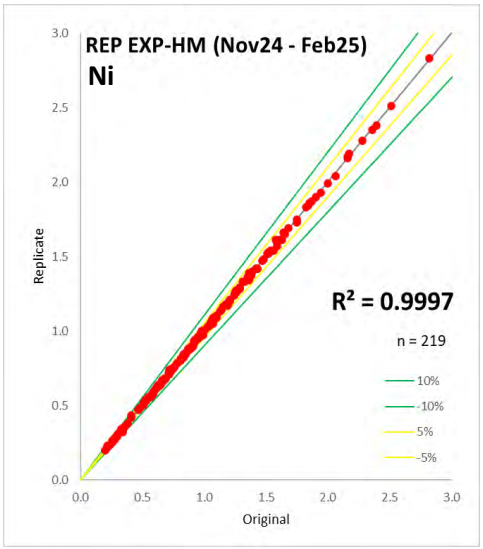
Figure 10 shows 3 x Scatterplots for Replicate assays from 646 samples from the period Jul to Oct 2024, 219 samples from the period Nov 24 to Feb 25 and 236 samples from the period Mar to Jun 2025, with the three scatterplots on the left of the page showing the results for Ni and three scatterplots on the right-hand side of the page showing the results for Fe. These numbers are significantly higher than for the DR samples and DA samples, double in fact, being the same number as for CRM's and Blanks, as shown in Table 1, and as described above, resulting from 4 samples per 100 against 2 samples each for the DR and DA per 100 samples.

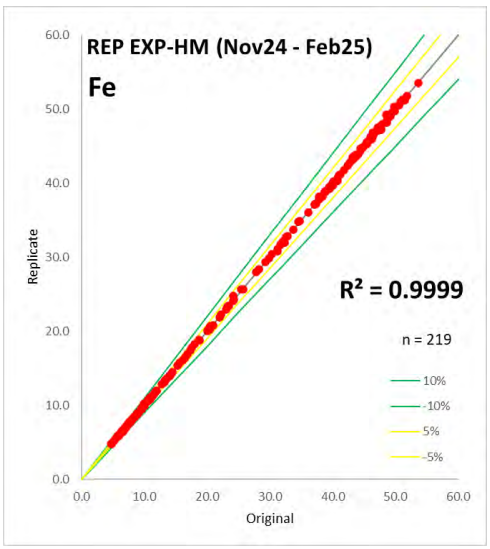
The scatterplots are similar to those shown in Figures 3 and 5 for the Coarse Reject/ Duplicate Reject assays and the Duplicate Assay/Pulp Duplicates, with the majority of the Ni and Fe results falling within the two yellow lines representing a +/- 5% variance from the original and duplicate assay, a high precision, and reflected with correlation coefficients of 0.9996, 0.9997 and 0.9998 for the Ni values respectively, and with the graph running from the bottom left to the top right corner of the graphic, it is again a positive correlation.
The three Fe scatterplots for these three similar periods from Jul 2024 to June 2025 show similar positive correlation coefficients, but the difference is all three plots at 0.9999, 0.9999 and 0.9999, which shows a very high precision over the full twelve-month period.

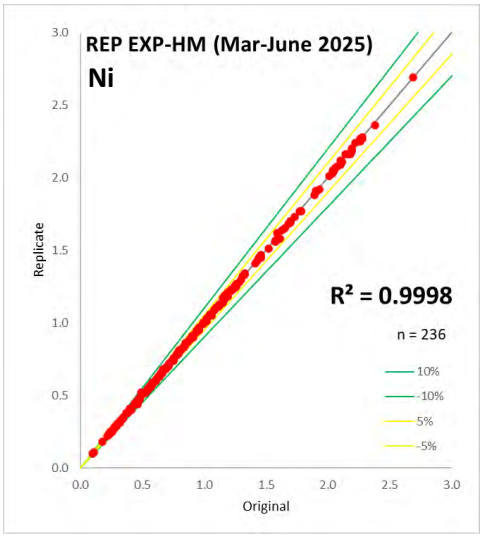
**Figure 10**
**Scatterplot showing results of 1101 Replicate Assays**

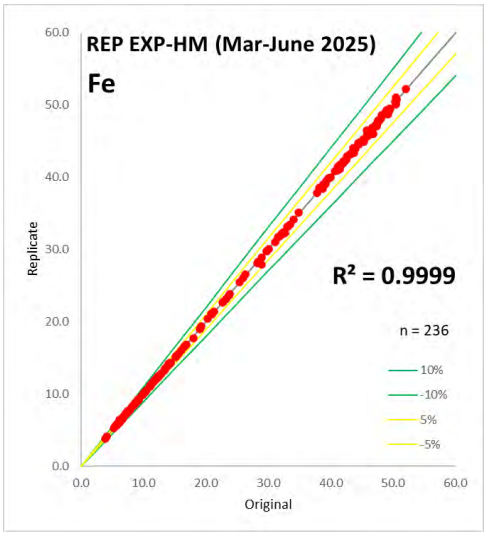


## 4.3.Inter Laboratory Check Samples

Inter laboratory check samples are second splits of the samples taken from the sample streams at the HM Assay Laboratory and are sent off to a certified commercial laboratory for comparative purposes. These samples include the original samples, and various types of sub-sample such as coarse rejects, pulp duplicates, CRM's and replicate samples. These samples are given new sample numbers and sent off to the commercial laboratory on a regular monthly basis. HM have been using the PT Geoservices Mineral Laboratory at Cikarang for this work for the past few years. These Inter Laboratory check samples are used to assess the assay accuracy of the original HM laboratory with the secondary, commercial, Geoservices Laboratory.

Abzalov (2008) remarks how it is good practice to analyze approximately 5% of the pulp duplicates and coarse rejects at a reputable external laboratory because standard samples alone cannot identify biases at different stages of sample preparation within a given laboratory.

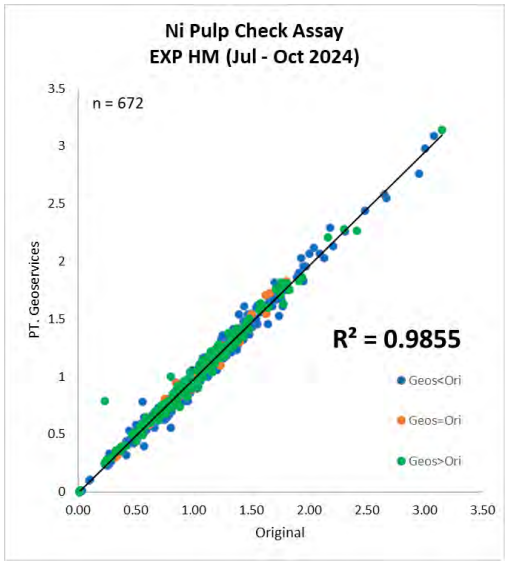
Kaufman and Stoker (2009) remark how the use of an 'umpire' laboratory is still not broadly applied within the industry. The purpose of a check laboratory is to increase the confidence in the accuracy of the primary laboratory (Long, Parker and Françis-Bongarçon, 1997). An example is then given showing results of subsets of samples pulps submitted to a check laboratory for comparison with the results from the primary laboratory.

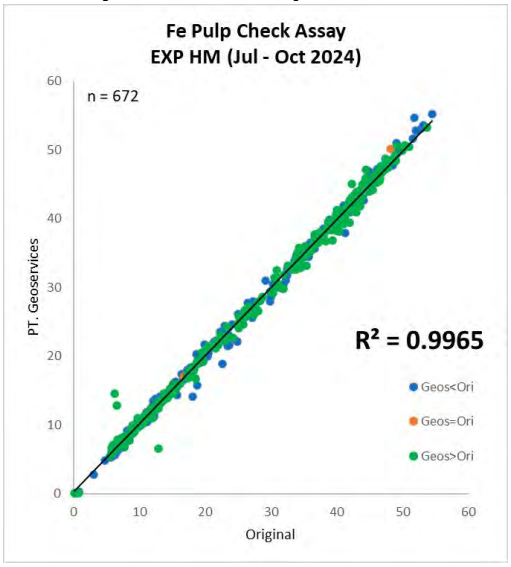
Simon and Gosson (2008) also remark on assessing the accuracy of a laboratory by comparing its results with the results from another laboratory. By submitting a portion of the pulp sample assayed at the original laboratory to a reference laboratory, it is possible to establish the bias between the two laboratories. They state this method should be complimentary to the use of CRM's, the combination of both methods leads to a more representative quantitative appraisal of the accuracy.

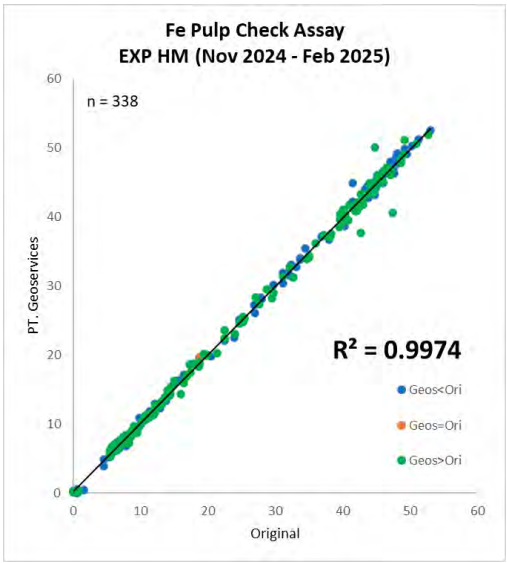
The AusIMM Field Geologists Manual Fifth Edition, (2011) states that five to ten per cent of samples should be re-assayed by a second unrelated laboratory for comparison with the routine laboratory's results.

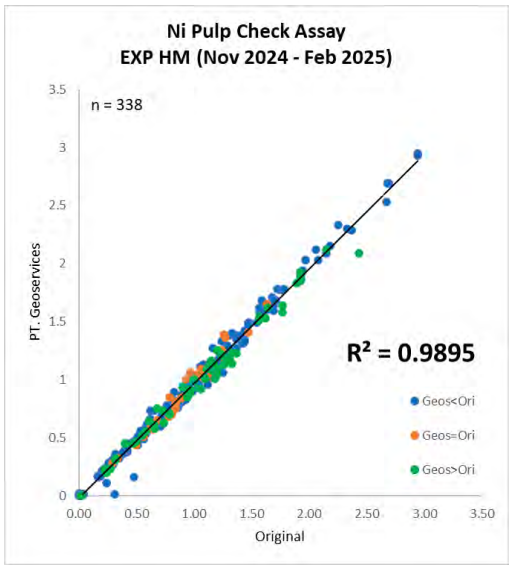
Figure 11 is a scatterplot showing the results of 1,280 Inter Laboratory Check samples submitted during the period July 2024 to June 2025. The first two graphs show the Ni and Fe plots for 672 samples sent off in the period Jul to oct 2024. The second two graphs show the Ni and Fe plots for 338 sample sent off in Nov 24 to Feb 2025. The final two graphs show the Ni and Fe plots for the 270 samples sent off in the period Mar to Jun 2025

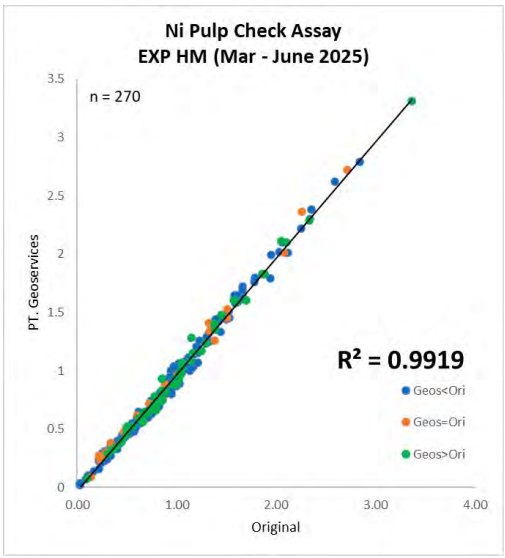
**Figure 11**
**Scatterplot showing Inter Laboratory Check Sample Results**

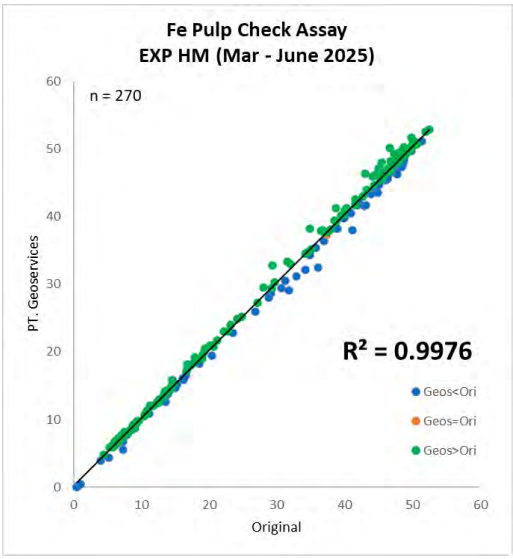


As with previous scatterplots, the differences between the original and the inter laboratory check sample are plotted on a black linear line, sloping from the bottom left to the top right corners of the graphic, indicating a positive correlation. Positive values are plotted as blue points above the line, negative values are plotted in green, below the line, and those results where the original and check laboratory were the same are plotted in brown.

The correlation coefficient for the Ni checks for Jul to Oct 24 is 0.9855. The correlation coefficient for the Ni checks for Nov 24 to Feb 25 is 0.9974, and the correlation coefficient for the Ni checks for the period Feb to Jun 25 is 0.9919, showing the precision between the values from the two laboratories increasing in the period from Jul to Oct 24 to the period Mar to Jun 25.

The correlation coefficients for Fe results for the same periods are 0.9965, 0.9895 and 0.9976 respectively, showing better precision with the Fe results than for the Ni results for the same period, but with all these results being better than 0.9850, they show good precision.

These Inter Lab Check sample results show a lower precision than was the case with the Duplicate Rejects (DR), Pulp Duplicates (DA) and Replicates and the question is why is this so? The differences in precision and accuracy are likely to be due the different sampling procedures at the two different laboratories, coupled with the different equipment used at the two laboratories, and the different personnel operating this equipment.

Firstly, there is a difference in the medium used in the XRF analysis. At HM Pressed Pellets are used while at Geoservices, they are using Fused Beads, which are considered to give better assay results.

Secondly, the HM laboratory uses Malvern Panalytical Epsilon 4 EDXRF's for assaying exploration samples, while Geoservices are using Bruker Tiger S8 WDXRF's that provide better quality elemental results.

Thirdly, at HM where assaying is undertaken using pressed pellets and Epsilon 4 EDXRF's there are no LOI calculations undertaken on the samples, whereas LOI is undertaken at the Geoservices Mineral Laboratory.

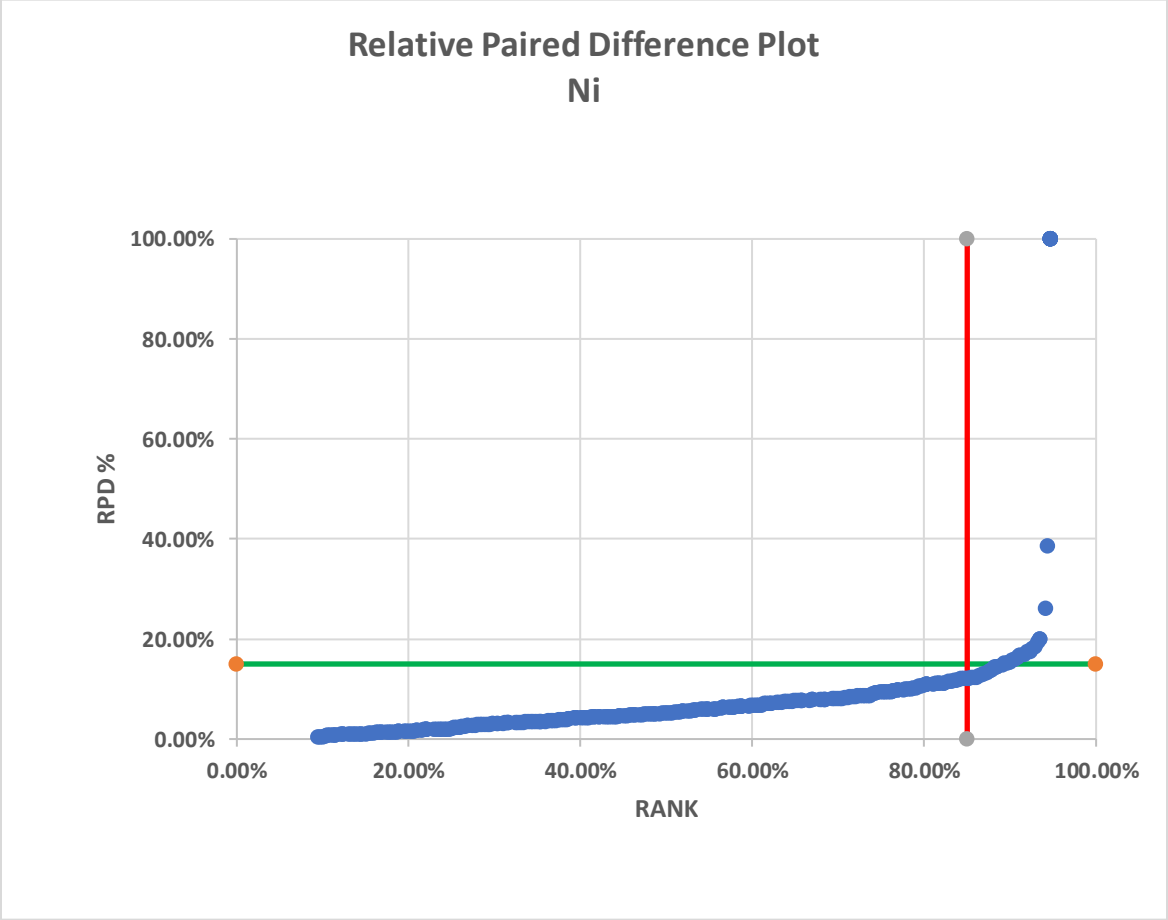
These three differences in equipment and assaying techniques are all likely to play a part in why the precision shown in the scatterplots for the Inter Laboratory Check samples is less than that shown in scatterplots where both original and duplicate samples are assayed using the same techniques and equipment. One way of confirming this is the case is to send Inter Lab Check samples to two different commercial laboratories, and this is a process that has been adopted at the HM laboratory during the second half of 2025, and will be described in future reports.

In their paper "Improving Quality Assurance and Quality Control Practices – Basic Methodology Using Worked Examples" by Kaufman and Stoker, 2009 discuss that their aim is *"…to encourage all geologists to equip themselves with a thorough grounding in QA/QC best practices, and improve the application and understanding of QA/QC at mining operations and throughout the mining industry."*

The case study describes how two sub-sets of pulps were assayed, one by the primary laboratory and the other set going to a check Laboratory. The two sets of results were compared using the relative paired difference (RPD) technique, which measures the absolute difference between a sample and it's check or duplicate. Stoker comments that it is desirable to achieve 80 – 85% of the pairs having less that 15% RPD between the original assay and the check assay.

Figure 12 shows an increasing rank order plot of the RPD of each sample pair sent for Inter Lab Checking in the period Nov 2024 to Feb 2025. It shows that *>85% of the sample pairs (89.1%) have an RPD <15%, (14.7%) which "…indicates reasonable analytical reproducibility between the primary HM laboratory and the Geoservices check Laboratory".*

**Figure 12**
**RPD Plot for Primary HM Lab and Geoservices Check Lab**



## 5. Sample Insertion Rates

Smee et al. (2024) describe the commonly used QC procedures are the insertion of field blanks, CRM's and duplicates, with the submission of check samples to a secondary laboratory at some stage of the programme. They say QC programmes are most effective when there is adequate attention to the details associated with the materials to use, how much to insert and how to interpret the results.

Abzalov (2008) recommends that, in addition to using matrix-matched standards (CRM's), to analyze approximately 5% of the pulp duplicates and coarse rejects at a reputable external laboratory because standard samples alone cannot identify biases introduced at different stages of sample preparation at a given laboratory.

The AusIMM Field Geologists Manual, Fifth Edition (2011) also discusses how a QA/QC programme should incorporate some or all of the following elements and talks of 5-10% field duplicates, 3-5% Coarse Duplicates, 3-5% Pulp Duplicates etc.

In his paper "A discussion on Current Quality Control practices in Mineral Exploration Application and Experience of Quality Control." Mendez (2011) describes going through reports from international QAQC consultants, Exploration and Mining Companies, The Toronto Stock Exchange and other authors and found that a figure of 20%, 1 in 20, of the total number of original numbers assayed should be standard samples such as Coarse and Pulp duplicates, Blanks, CRM's and Inter Laboratory Check samples. He gives a breakdown for the different samples which is shown in Table 2. Also shown alongside the Mendez suggested numbers the author has included the actual details of what numbers of control samples have been used in the HM QC programme for the period Jul 2024 to Jun 2025.

**Table 2**
**Control Sample Insertion Rates - Mendez 2011**

| Sample Type | Sample Sub-type | Mendez Suggested Insertion Rate | | Hengjaya Mineralindo Actual Insertion Rate | |
|---|---|---|---|---|---|
| Duplicates | Twin Samples<br>Coarse Duplicates<br>Pulp Duplicates | 2%<br>2%<br>2% | 6% | 2.0% | 4% |
| CRM's | CRM's | 6% | 6% | 4.2% | 4.2% |
| Blanks | Coarse Blanks<br>Pulp Blanks | 2%<br>2% | 4% | 4.3% | 4.3% |
| Inter Laboratory Check Samples | Inter Laboratory Check Samples | 4% | 4% | 3.9% | 3.9% |
| Replicates | Replicates | - | - | 3.9% | 3.9% |

Comparison between the Mendez proposed number of control samples and the Hengjaya actual number is generally good, with most numbers close to those suggested. The Assay Lab is working to increase CRM numbers from 4.2% - 6% and is using Replicates to increase the number of Pulp Duplicates tested.

## 6. Results and Conclusions

- This report describes the Quality Control programme undertaken at the PT Hengjaya Mineralindo Sample Preparation and Sample Assay Laboratories at their Tangofa Camp in Central Sulawesi for the period July 2024 to June 2025. It describes in particular the processing of the seven various sample sub-types used in the Quality Control programme for the HM Exploration drill samples as follows: Sample Preparation Laboratory, Coarse blanks, Duplicate Rejects/Coarse Rejects, 200# Screen Samples; Sample Assay Laboratory, Pulp Rejects/Pulp Duplicates, Certified Reference Materials/CRM's, Replicates and Inter Laboratory Check samples, sent to the Geoservices Mineral Laboratory at Cikarang, Bekasi.

- Coarse Blanks tested between July 2024 and June 2025 do not indicate ant contamination of the limestone blanks with the Ni results showing a range of values between 0.00 to 0.04%, with the majority showing Ni values of 0.02% and 0.03%.

- Duplicate Reject (Coarse Reject) samples tested between July 2024 and June 2025 show correlation coefficients ($R^2$) of 0.999 for Ni and 0.999 for Fe for the three four month periods, which are very good results, showing the high precision of the crushing and splitting stages using the Boyd Mid Crusher RSD (Rotary Splitting Device) units, and the excellent repeatability over the twelve month period.

- Three graphs showing the results of the 1,161 -200# screen tests show that more than 95% of the sample pass the 75 micron screen and this shows that the pulverizing process is effective in producing a sufficiently homogenized pulp sample, suitable for assaying using pressed pellets for assay in the Epsilon 4 XRF's.

- Scatterplots showing the results of the 552 Duplicate Assay/Pulp Duplicates show correlation coefficients for Ni of 0.9996, 0.9997 and 0.9997 over the three four month periods and 0.9999, 0.9999 and 0.9999 for Fe over the same period. These are excellent results, showing high precision and high repeatability of the pulverizing process during the twelve month period from July 2024 to June 2025.

- The certified reference materials (CRM's) used in our QC are OREAS 182, Ni value 0.71, OREAS 187 with a Ni value of 1.37 and OREAS 192, with a Ni value of 1.77.

- Over the three four month periods OREAS 187 was the most used, with a total of 649 assays, OREAS 182 was used 457 assays and 192 was the third used on only 79 occasions.

- The charts show a random distribution about the mean values in all of the three OREAS charts, but with more values outside the – 3 sigma red control line than expected, and this indicates a negative bias with some of our results.

- Having identified a negative bias in the Ni and Fe assay values from assaying at the Hengjaya Mineralindo Assay Laboratory the company moved to produce a set of 5 In House Standards from a Round Robin set of ISO accredited laboratories for our QA/QC to add to the OREAS Standards used to date. A team from Citrabuana Jakarta came to site for three days of Training in Method Validation, Uncertainty Measurement and Calculation of Precision, Accuracy and Uncertainty using these improved standards, followed by recalibration of our five XRF spectrometers.

The negative bias exhibited in some of the OREAS CRM's is disappointing, but the one thing that can be said for it is that the bias will result in an under estimation of the resource, not an over estimation.

- Scatterplots showing replicate sample splits for 1,101 samples from Jul 24 to Jun 2025 show positive correlation coefficients for Ni of 0.9996, 0.9997 and 0.9998 for the period Jan to Jun 2025, and for Fe, similar correlation coefficients of 0.9999, 0.9999 and 0.9999 which indicates high sub-sampling precision and repeatability in the stages of the production of pressed pellets for sample assay.

- Interlaboratory Check Samples. Scatterplots showing the results from 1,280 samples sent off as Interlaboratory Check samples to the PT Geoservices Laboratory at Cikarang – Bekasi for the three periods July – Oct 2024, Nov 24 – Feb 25 and March – Jun 25 show correlation coefficients for Ni of 0.9855, 0.9974 and 0.9919, and for Fe, of 0.9965, 0.9895 and 0.9976 respectively. This shows high precision and consistency between the results from the PT HM original laboratory and the PT Geoservices Minerals Laboratory over this twelve month period.

  An RPD plot showing the results from the Inter Lab Check samples sent for check assaying for the period Nov 2024 to Feb 2025 compares well with the corresponding scatterplot which showed a Correlation Coefficient ($R^2$) of 0.9974 for Ni, with more than 85% of the sample pairs with an RPD <15%, indicating reasonable analytical reproducibility between the primary and check laboratory.

- With regards to the insertion rate of the sample sub-type standards used in the HM Quality Control programme, the comparison between the number of control samples proposed by Mendez, and the actual number used in the Hengjaya programme is generally good, with the laboratory working to increase the number of CRM's and Pulp Duplicates used during the coming year.

The results from the different sample sub-types tested as part of the HM Quality Control programme for the exploration drill samples submitted between July 2024 and July 2025 show data with precision and accuracy within acceptable tolerances and which is good quality data. As such, this is data which is fit for purpose, data which can be used in calculating the resources in the ore body under review at the Hengjaya Mineralindo Mine.

C.E. Watson
FAusIMM - 312716

**References:**

Abzalov, M, 2008, Quality Control of Assay Data: A Review of Procedures for Measuring and Monitoring Precision and Accuracy, Exploration and Mining Geology, Vol. 17, Nos. 3-4, p 131-144

Abzalov, M, 2009, Sampling Errors and Control of Assay Data Quality in Exploration and Mining Geology

AusIMM, 2011, Field Geologists' Manual, Fifth Edition, Monograph 9.

JIS, August 1996, Method for Sampling and Method of Determination of Moisture Content of Garnierite Nickel Ore, JIS M-8109-1996 H.Kanazawa, Private Translation

Kaufman, A. and Stoker, P., Improving Quality Assurance and Quality Control Practices, Basic Methodology Using Worked Examples, AusIMM New Leaders Conference, Brisbane, April 2009

Mendez, A.S., (2011), A Discussion on Current Quality-Control Practices in mineral Exploration Applications and Experience of Quality Control, Prof. Ognyan Ivanov (Ed.), ISBN:978-953-307-236-4, InTech.

Roden, S. and Smith, T., 2014, Sampling and Analysis Protocols and Their Role in Mineral Exploration and New Resource Development, Monograph 30 – Mineral Resource and Ore Reserve Estimation, the AusIMM Guide to Good Practice, Second Edition, 2014.

Smee, B.W., Bloom, L., Arne, D., Heberlein, D., Practical applications of quality assurance and quality control in mineral exploration, resource estimation and mining programmes: a review of recommended international practices – Geochem2023-046, Vol.24, 2024

Sterk, R., 2015, Quality control on assays: addressing some issues, 2015 AusIMM New Zealand Branch Annual Conference, Dunedin

# APPENDIX 7

# CV COMPETENT PERSONS

# DANIEL MADRE , MSc (GEOLOGY)



## EXPLORATION SPECIALIST

**Summary**

Daniel Madre has been an Australian coal and mineral geologist since 1980, with full time work experience in Indonesia since 1988. He is specialist in exploration and for this reason is familiar with most coal and mineral projects in the country since their earliest stage of development. He has a diverse network of professionals throughout the industry. Daniel has a Master of Science degree in Geology. Daniel Madre is a member of the Australasian Institute of Mining and Metallurgy (no: 100878), Ikatan Ahli Geologi Indonesia (no: 5000) and Masyarakat Geologi, Ekonomi Indonesia (no: B-0718). Daniel is a Competent Person in Indonesia for KCMI Code for Coal Resources.

Daniel runs a successful exploration consultancy and has in-house capabilities that range from geology, geophysics, drilling, geological modelling, mine design and planning. The company has discovered coal in East Kalimantan and Sumatra which has resulted in numerous coal mine developments. The company is formally registered by the Indonesian Department of Minerals and Energy to carry out exploration surveys and report coal and mineral resources.

Since 2000, the company diversified into nickel, gold and mineral sands exploration and resource development. This work resulted in the development of the first nickel mine in Kalimantan. Other nickel projects investigated by the company are located in Sulawesi, Halmahera and Papua. Gold exploration was carried out at Kaur in South Bengkulu and more recently at Lebong Tandai in Bengkulu Utara. Mineral sands projects have been investigated in Bengkulu and Papua.

**Commodities**

Coal, oil shale, nickel laterites, phosphate, gold, manganese and mineral sands

**Countries**

Indonesia, Australia, USA, PNG, Kenya

**Experience**

| | | |
|---|---|---|
| Nov, 2000 - present | PT Danmar Explorindo | Jakarta, Indonesia |
| Managing Director | | |
| 1996–Nov 2000 | Independent Consultant | Jakarta, Indonesia |
| Manager of Geology | | |
| 1988–1996 | PT Petrosea | Jakarta, Indonesia |
| Manager of Geology | | |
| 1982–1988 | Greenvale/Esperance group | Sydney, Australia |
| Exploration Manager | | |
| 1981–1982 | Oil Refining & Exploration PL | Sydney, Australia |
| Field geologist | | |
| 1980 – 1981 | NSW Coastal Engineers | Sydney, Australia |
| Lab attendant | | |

**Education**

| | | |
|---|---|---|
| 1986- 1989 | University of Wollongong | Australia |
| Master of Science (geology) | | |
| 1978- 1980 | University of Sydney | Australia |
| Bachelor of Science (geology and marine science) | | |

Some Articles & Publications written by Daniel Madre

- 1987, The Geology of the Alpha Oil Shale Deposit, Fuel, Vol.66, Butterworths UK
- 1990, Torbanite Deposits of the World, Thesis: University of Wollongong
- 2000, Coal Geology of the Bengkulu Block, Journal Asian Earth Science, Elsevier Advances in Sedimentology Series, Elsevier Special editions
- 2005, Coal Geology of the Bengkulu Block. Proc. SE Asian Coal Geology Conference, Bandung
- 2012, Coal Deposits of Sumatra, Coal Trans Conference Bali
- 2012, Low Rank Coal Deposits of Indonesia, Coal Trans Conference Bali
- 2013, Tectonic Framework of Sumatra & the Distribution of Coal Deposits, Ozmine Conference, Jakarta
- 2014, Coal Potential of Sumatra, Coal Markets Workshop, Singapore
- 2014 Adding Value Through Optimizing Exploration Techniques, 2nd Asian Nickel Conference
- 2014 Coal Potential of Sumatra, World Coal Magazine volume 23
- 2016 The Exploration Potential of Sumatra, Sumatra Miner Conference, Palembang Sumatra
- 2016 Why Things are Improving in the Indonesian Coal Industry, RTC Kalimantan, Conference Balipapan, Indonesia
- 2019 The Coal and Mineral Potential of Sumatra, Sumatra Miner Conference, Palembang Sumatra
- 2022 Underground Mining Potential of Indonesia, Indonesia Miner Conference, Jakarta, Indonesia
- 2023 Gold and copper exploration potential of Indonesia, Indonesia Miner Conference, Jakarta

# Resume


**Name**: Tobias Maya
**Date of Birth**: 26 March 1981
**Marital Status**: Married
**Nationality:** Australian

**Address:** Jl. H. Saidi II No. 16 RT.011 RW.07,
Cipete Utara, Kebayoran Baru,
Jakarta Selatan 12150,

**Mobile:** (+62) 0812 3869379 ;
**Email :** tobiasmaya@yahoo.com.au
tobias.maya@danmar.asia




Since 2004, Tobias has been working full time in the Indonesian coal and minerals exploration industry specializing in exploration geology, regional mineral studies, due diligence work, database validation and resource development. Tobias has a Bachelor of Science degree from the Charles Sturt University in NSW, Australia. He has also held a membership with the AusIMM since 2009.

Tobias has more than 20 years exploration experience throughout the country. This work includes the exploration and development of numerous coal and minerals projects. providing a key role in the optimization of exploration techniques that can be used to minimize costs & maximize project value, increasing confidence in estimation of Mineral Resource volumes to determine what are the controlling factors for project development within Indonesian deposits.

## EDUCATION AND TRAINING

| | |
|---|---|
| 2006-2013 | Completed BSc with major in Spatial Science<br>with 2 minors in information technology and management<br>Charles Sturt University, Wagga Wagga, NSW |
| 2013 | Certificate for successful completion of Valuation and Technical-Economic Assessment of Mining Projects, SRK Consultacy |
| 2009 | Certificate for successful completion of Mining and Minerals optimization course, Whittle Consultacy |
| 1999-2001 | Completed Geographic Information Systems (GIS)Diploma<br>Wollongong TAFE |
| 1998 | Higher School Certificate;<br>Bulli High School |
| 1996 | School Certificate;<br>Bulli High School |
| 1994 | St Johns Ambulance First Aid Certificate |

## MEMBERSHIP OF PROFESSIONAL ORGANIZATIONS

Since 2014 Member of the AusIMM (No.304661)

## EMPLOYMENT & WORK EXPERIENCE

2013 – Present **PT. Geo Search (full-time) part of the Danmar Group**

- President Director.
- Geophysical surveys
- Principle Geological consultant to PT Danmar Explorindo

2004 – 2013 **PT. Danmar Explorindo (full-time)**

- Head GIS/Resource Geologist (SURPAC).
- Management Coal and Mineral Exploration, (Drilling, Survey, Resource Estimates).
- Business development / client relationship manager
- Mine Reconciliations of Ongoing operations (monthly)
- Database validation (JORC)
- Training Personnel in Software (SURPAC, GIS,).
- Drafting JORC reports under Principle Mr Daniel Madre, MSc (AusIMM member - 100878)

**Provided above Consultancy services for following projects:**

2018-present **PT.Hengjaya Mineralindo (HM) -** Morowali, Sulawesi. for **Nickel Industries Limited (ASX : NIL)**
-Laterite Nickel Exploration and database validation
-Resource Geology assessments
-Mine planning and production reconciliations
-UltraGPR survey 265km
-JORC (2012) compliant reports 2020 & 2022

2018-present **PT.Halmahera Sukses Minerals (HSM)** - Halmahera, Maluku.
-Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 150km

2018-Present **PT.Sulawesi Cahaya Mineral (SCM)** – North Konawe, Sulawesi
-Laterite Nickel Exploration and Project support
-UltraGPR survey 2,000km

2020-Present **PT.Iriana Mutiara Mining (IMM) -** Sarmi, Papua for **Nickel Industries Limited (ASX : NIL)**
- Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 185km

2022-Present **PT.Vale Indonesia (PTVI)** – Sorowako, Sulawesi
-Laterite Nickel Exploration and Project support
-UltraGPR survey 300km

2022-Present **PT.Weda Bay Nickel (WBN)** – Halmahera, North Maluku
-Laterite Nickel Exploration and Project support
-UltraGPR survey 500km

2020-Present **PT.Abadi Nikel Nusantara (ANN) -** Routa, Sulawesi for **Nickel Industries Limited (ASX : NIL)**
- Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 485km

2018-Present **PT.Kumamba Mining (KM**) **-** Sarmi, Papua, Indonesia
-Exploration management and database validation
- Geology assessments
- Trial UltraGPR survey 30km
- Trial Ground Magnetometer survey 30km

2019-2021 **PT.Bumi Liputan Teknik (BLT)** - Ketapang, West kalimantan
-Laterite Bauxite Exploration and project Due diligence
-UltraGPR survey 80km

2017-2019 **PT.Sarana Mineralindo Perkasa (SMP) -** Morowali, Sulawesi..
- Laterite Nickel Exploration and database validation
-Resource Geology assessments
-Mine planning and pit optimization
-UltraGPR survey 85km

2017-2018 **PT.Ceria Nugraha Indotama (CNI)** - Kolaka, Sulawesi..
-Laterite Nickel Exploration and database validation
-UltraGPR survey 175km

2017-2018 **PT.Tiga Samudra Perkasa (TPS)** - Malili, Sulawesi
-Laterite Nickel Exploration and database validation
-Resource Geology assessments
-UltraGPR survey 75km

2005-2019 **PT.Ratu Samban Mining (RSM) -** Bengkulu, Sumatra.
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-Mine planning and production reconciliations
-Nedo regional study 2011
-Jogmec regional study 2013
-Bathymetric survey

2009-2018 **PT.Gunung Bara Utama (GBU) -** Kutai Barat, East Kalimantan.
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-Pre-JORC study 2010
-JORC (2004) compliant reports 2011 & 2012

2005-2011 **PT.Itamatra Nusantara (ITM) -** Morowali, Central Sulawesi.
-Laterite Nickel Exploration management and database validation
-Resource Geology assessments
-Bathymetric survey

2004-2010 **PT.Telen Indoclay (TIC) Long Ikis Nickel -** Pasir, East Kalimantan
-Laterite Nickel Exploration management
-database validation
-Resource Geology assessments
-Mine Construction and Production
-Mine planning, Grade control and production reconciliations -
-Bathymetric survey

2010-2016 **PT.Trisula Kencana Sakti (TKS) -** Barito Utara, Central Kalimantan for **Golden Energy Mines (GEMS)**
-Thermal Coal Exploration management and database validation
-Resource Geology assessments
-JORC (2004) compliant reports 2010 & 2012
-JORC (2012) compliant reports 2013

2010-2018 **PT.Moa Maju Kurina Utama (MMKU) -** Bulungan, North Kalimantan
-Lignite Exploration management and database validation
-Resource Geology assessments
-Mine planning
-JORC (2004) compliant reports 2010 & 2011
-JORC (2012) compliant reports 2013

2011-2015 **PT.Delta Samudra (DS) -** Kutai Barat, East Kalimantan
-Lignite Exploration management and database validation
-Resource Geology assessments
-JORC (2004) compliant reports 2013

2012-2018 **PT.Berau Usaha Mandiri (BUM) -** Berau, East Kalimantan
-Lignite database validation
-Resource Geology assessments
-Mine planning

2010-2015 **PT.Inti Putera Kanaan (IPK) -** Musi banyuisn, South Sumatra
-Lignite Exploration management and database validation
-Resource Geology assessments
-Mine planning
-JORC (2004) compliant report 2012

2006-2014 **PT.Mulawarman Putra Abadi Sakti (MPAS) -** East Kalimantan
-PCI Coal Exploration management and database validation
-Resource Geology assessments
-JORC (2012) compliant reports 2014

2013 **Jingella Resources Pty Ltd -** Dingo, Queensland, Australia
-PCI Coal database validation
-Resource Geology assessments

| | |
|---|---|
| 2013 | **Greenvale Mining Pty Ltd - ( Alpha Oil shale )**<br>Alpha, Queensland, Australia<br>-Torbanite / Cannel Coal database validation<br>-Resource Geology assessments |
| 2013 | **PT.Bumi Merapi Energi (BME) -** Lahat, South Sumatra<br>-Thermal Coal database validation<br>-Resource Geology assessments<br>-Mine planning<br>-JORC (2004) compliant report 2012 |
| 2010-2012 | **PT.Komunitas Bangun Bersama (KBB) -** Samarinda, East Kalimantan<br>-Lignite Resource Geology assessment<br>-JORC (2004) compliant reports 2010 & 2012 |
| 2012 | **PT.Delma Mining Corporation (DMC) -** Bulungan, North Kalimantan<br>-Lignite database validation<br>-Resource Geology assessments<br>-JORC (2004) compliant report 2012 |
| 2012 | **PT.Indonesia Pacific Energy (IPE) & PT.Mega Multi Cemerlang (MMC) -** Meulaboh, Aceh Barat & Nagan Raya, Aceh<br>-Lignite database validation<br>-Resource Geology assessments<br>-JORC (2004) compliant report 2012 |
| 2012 | **Draig Resources Pty. Ltd -** Teeg & Nariin Teeg mining license, ovorhangay Province, Central Mongolia<br>-PCI COAL database validation<br>-Resource Geology assessments<br>-JORC (2004) compliant report 2012 |
| 2004-2010 | **PT.Tunas Inti Abdai (TIA) -** Tanah Bumbu, South Kalimantan for **ABM investama (ABM)**<br>-Thermal Coal Exploration management and database validation<br>-Resource Geology assessments<br>-JORC (2004) compliant reports 2010 & 2011 |
| 2010 | **PT.Bukit Utama Sehjatera (BUS) -** Sorong, West Papua<br>-Lignite Exploration management and database validation<br>-Resource Geology assessments |
| 2006-2010 | **PT.Mifa Bersaudara (MIFA) & PT.Bara Energy Leastari (BEL)**<br>- Meulaboh, Aceh Barat & Nagan Raya, Aceh<br>-Lignite Exploration management and database validation<br>-Resource Geology assessments<br>-Mine planning<br>-JORC (2004) compliant report 2010 |

| | |
|---|---|
| 2009 | **PT.Bakti Pertiwi Nusantara (BPN)** –<br>Weda Utara, Central Halmahera, maluku<br>-Laterite Nickel database validation<br>-Resource Geology assessments<br>-JORC (2004) compliant report 2009 |
| 2009 | **Bildan.Pty.Ltd -** Pulau Talud, North sulawesi<br>-Manganese Exploration management |
| 2008 | **PT.Berau Bara Energy (BBE) -** Berau, East Kalimantan<br>-Thermal Coal database validation<br>-Resource Geology assessments<br>-JORC (2004) compliant report 2008 |
| 2007-2008 | **PT.Ratu Samban Mining (RSM) -** Krui, Lampung. Sumatra.<br>-Iron Sand Exploration management |
| 2006-2008 | **PT.Tekno Marina Cipta (TMC) -** Kota Bangun, East Kalimantan<br>-Thermal Coal Exploration management and database validation<br>-Resource Geology assessments |
| 2004-2007 | **CV. Gudang Hitam Prima (GHP/BBM) -** Sanga Sanga Coal Mine, Samarinda, East Kalimantan<br>-Thermal Coal Exploration management and database validation<br>-Resource Geology assessments<br>-Mine planning and production reconciliations |
| 2006 | **PT.Borneo Indobara (BIB) -** Tanah Bumbu, south kalimantan for SINAR MAS MINING<br>- Project Due diligence study Grimulya Block |
| 2004-2006 | **PT. Multi Prima Energy (MPE) -** Loa Raya Coal Mine, Tenggarong, East Kalimantan.<br>-Thermal Coal Exploration management and database validation<br>-Resource Geology assessments<br>-Mine planning and production reconciliations |

## Previous Employment

| | |
|---|---|
| 1999- 2004 | Natural Beauty Floor Sanding (full-time)<br>• Surface preparation; punch & fill, sanding & edging<br>• Applying coating products |
| September 2000 | Hydrographic Sciences Australia (2 weeks work experience)<br>• Re-editing Hydrographic charts<br>• Hydrographic chart compilation<br>• Sounding selection |

## CONFERENCE PAPER PRESENTATIONS

| | |
|---|---|
| November 2023 | **"Nickel Laterites – Adding Value by Optimizing Exploration"**<br>- ANMSEC 69th meeting, Bagiuo City, Philippines |
| September 2023 | **"Nickel Laterites – Adding Value by Optimizing Exploration"**<br>- Mining Philippines, Manilia, Philippines |
| August 2022 | **"Nickel Laterites – Adding Value by Optimizing Exploration"**<br>- Nickel Summit by Indonesia Miner, Jakarta, Indonesia |
| November 2018 | **"Indoneisa, Hi-CV coal supply?"**<br>- 7th annual Coaltrans Emerging Asia Markets, Hanoi, Vietnam |
| May 2018 | **" Developing efficiency in the Indonesian coal supply chain"**<br>- 24th annual Coaltrans Asia, Bali, |
| September 2017 | **" Exploration potential for new Nickel supplies in Indonesia"**<br>- Metal Bulletin: 5th Asian Nickel Conference, Jakarta, |
| July 2016 | **" Which Indonesian coal energy projects will attract Korean investors through 2020?"**<br>- Korea Coaltrans Asia, Seoul, |
| March 2015 | **"The Coal Potential of Sumatra"**<br>- Sumatra Miner 2015 conference |
| September 2014 | **"Adding value through optimizing exploration techniques"**<br>- 2nd Asian Nickel Conference |
| December 2012 | **"Low Rank Coal Deposits of Indonesia"**<br>- IHS Mcloskey Asia Pacific Coal Outlook Conference 2012, Bali |
| June 2012 | **"The Coal Deposits of Sumatra"**<br>- 18th annual Coaltrans Asia, Bali |

## SOFTWARE EXPERIENCE

- SURPAC Mining software – Expert Knowledge of Geodatabase, Surface modelling, Block Modelling, Pit optimisation, Pit design modules.
- WHITTLE Pit optimisation Software – good knowledge of Pit optimisation procedure and analysis of results
- ArcGIS 9.3 GIS Software – Good knowledge of Spatial interpolation techniquies and map design
- MapINFO, Global mapper and Surfer GIS software
- Microsoft 7-11, VISTA, XP and NT operation systems
- Microsoft office 2003, 2007 & 2010 Word, Excel, Access, Powerpoint
- Adobe acrobat 8 Professional
- AutoCAD 2009

## REFERENCES

Daniel Madre (Director)
PT.Danmar Explorindo
SANUR, BALI
Ph. +62 81 23851151
daniel.madre@danmar.asia

Charles Sturt University

*In the name of the Council and by the authority of the same be it known that*

Tobias Geoffrey Maya

*having fulfilled all the requirements and having passed all the examinations prescribed by the By-laws and Rules of the University has this day been admitted to the degree of*

Bachelor of Science

*with all the rights and privileges attached thereto and in witness whereof the Council has authorised the Common Seal of the University to be hereunto affixed.*

*COMMON SEAL AFFIXED ON THIS SIXTEENTH DAY OF DECEMBER TWO THOUSAND AND THIRTEEN*

*W113623961*

Chancellor

Vice-Chancellor and President

Charles Sturt University

Australian Higher Education Graduation Statement

# Academic Transcript

| | |
|---|---|
| STUDENT NAME | Tobias Geoffrey Maya |
| STUDENT NUMBER | 11362396 |
| COURSE NUMBER | 5420SC |
| AWARD TITLE | Bachelor of Science |

| SESSION | CODE | SUBJECT NAME | GRADE | POINTS |
|---|---|---|---|---|
| Credit for work previously completed: | | | | |
| | GEO164 | Earth System Processes | TCR | 8 |
| | ITC114 | Database Management Systems | TCR | 8 |
| | ITC125 | The Information Superhighway | TCR | 8 |
| | ITC161 | Intro to Info Tech | TCR | 8 |
| | SPA105 | Remote Sensing | TCR | 8 |
| | SPA115 | Principles of GIS | TCR | 8 |
| | SPA200 | Geo-Information Management | TCR | 8 |
| Subjects attempted in this course: | | | | |
| 200670 | STA201 | Scientific Statistics | FL | 0 |
| 200740 | | Approved Leave of Absence | | 0 |
| 200770 | SPA211 | GIS Applications | DI | 8 |
| 200840 | SPA512 | Cartography/Data Visualisation | CR | 8 |
| 200870 | SCI101 | What is Science? | CR | 8 |
| 200940 | SPA414 | Current Issues in GIS | PS | 8 |
| 200970 | SPA313 | Adv GIS Apps and Modelling | PS | 8 |
| 201030 | MGT100 | Organisations and Management | PS | 8 |
| 201030 | STA201 | Scientific Statistics | FL | 0 |
| 201060 | ITC211 | Systems Analysis | CR | 8 |
| 201060 | MGT210 | Organisational Behaviour | PS | 8 |
| 201130 | GEO314 | River Hydrol/Geomorph | CR | 8 |
| 201130 | MGT310 | Service Operations Management | CR | 8 |
| 201160 | ITC242 | Intro to Data Communications | PS | 8 |
| 201160 | SPA412 | Integrated GIS/Remote Sensing | PS | 8 |
| 201230 | HRM210 | Human Resource Management | PS | 8 |
| 201230 | MGT220 | eCommerce | PS | 8 |
| 201260 | ACC100 | Accounting 1 | FL | 0 |
| 201260 | MGT340 | International Business Mangt | PS | 8 |
| 201330 | GEO204 | Soils and Landscapes | PS | 8 |
| 201360 | SCI200 | Intro to Spatial Science | CR | 8 |

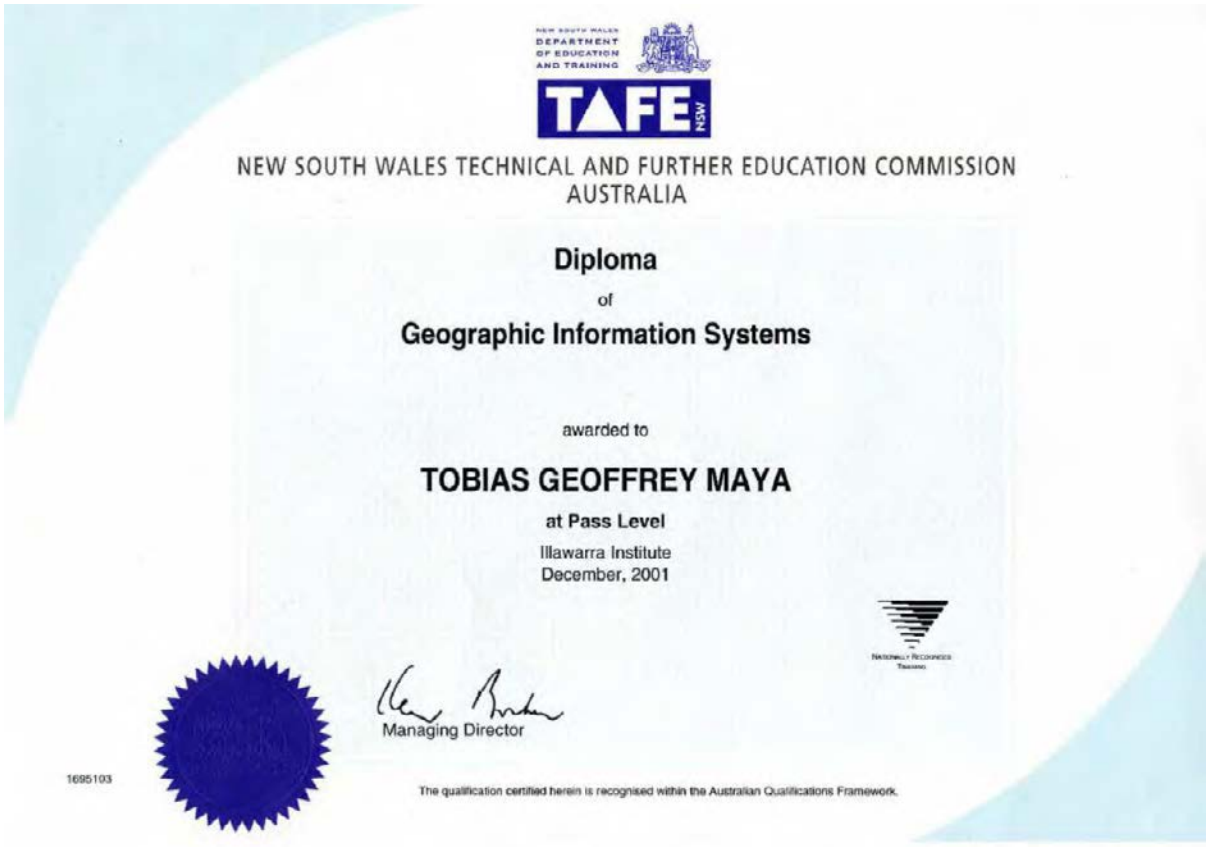
GRADE POINT AVERAGE: 3.80

Key to Grades: http://www.csu.edu.au/ahegs

Tobias Geoffrey Maya, having satisfactorily completed all course requirements, qualified for the award Bachelor of Science, which was conferred on 16 December 2013.

Geoff Honey

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NEW SOUTH WALES TECHNICAL AND FURTHER EDUCATION COMMISSION
AUSTRALIA

# Diploma

of

## Geographic Information Systems

awarded to

## TOBIAS GEOFFREY MAYA

**at Pass Level**

Illawarra Institute
December, 2001

Managing Director

1695103

The qualification certified herein is recognised within the Australian Qualifications Framework.



**ILLAWARRA INSTITUTE**

**Student No.:** 256260727
**Student Name:** TOBIAS GEOFFREY MAYA

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TOBIAS GEOFFREY MAYA
13 HEADLANDS AVE
AUSTINMER NSW 2515

**TRANSCRIPT OF ACADEMIC RECORD** as at 1-MAR-2002

This is to certify that, having completed a course in accordance with Commission requirements, you are eligible to receive the following:

**2947 DIPLOMA OF GEOGRAPHIC INFORMATION SYSTEMS**
**IN THE PASS GRADE**

| YEAR | CODE | MODULE | RESULT |
|---|---|---|---|
| 1999 | 2937D | DRAFTING PRINCIPLES | PASS |
| 1999 | 2937C | COMPUTATIONS 1 | CREDIT |
| 1999 | 2937D | LEVELLING | CREDIT |
| 1999 | 2937E | MAPPING PRINCIPLES | PASS |
| 1999 | 2937F | COMPUTATIONS 2 | CREDIT |
| 1999 | 2937G | ANGLES AND DISTANCES | FAIL |
| 1999 | 2937H | INTRODUCTION TO G I S | CREDIT |
| 1999 | 2937K | PHOTOGRAMMETRY 1 | PASS |
| 1999 | 2937L | PHOTOGRAMMETRY 2 | PASS |
| 1999 | 2937M | ETHICS | PASS |
| 1999 | 2947A | G I S APPLICATIONS - RASTER 1 | DISTINCTION |
| 1999 | 2947B | DATABASE | PASS |
| 1999 | 2947C | MAP PROJECTIONS | PASS |
| 1999 | 2947D | CADASTRAL SYSTEMS 1 | PASS |
| 1999 | 2947E | ELECTRONIC PUBLISHING | PASS |
| 1999 | 2947F | G I S APPLICATIONS - VECTOR 1 | PASS |
| 1999 | 2947H | PRINCIPLES OF PHYSICAL GEOGRAPHY | CREDIT |
| 1999 | 2947J | G I S PROJECT 1 | PASS |
| 1999 | 2947S | G I S PROJECT 2 | CREDIT |
| 1999 | 2991H | COMPUTER AIDED DRAFTING 1 | PASS |
| 1999 | 2991P | OCCUPATIONAL HEALTH AND SAFETY | CREDIT |
| 1999 | 2991R | COMPUTER AIDED DRAFTING 2 | CREDIT |
| 1999 | 7365D | KEYBOARDING - TECHNIQUES AND OPERATIONS | PASS (UNGRADED) |
| 1999 | 8979P | PRESENTING REPORTS | PASS (UNGRADED) |

END OF TRANSCRIPT

Page 2 of 3



**ILLAWARRA INSTITUTE**

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**2947 DIPLOMA OF GEOGRAPHIC INFORMATION SYSTEMS**
**IN THE PASS GRADE**

| YEAR | CODE | MODULE | RESULT |
|---|---|---|---|
| 2001 | 2937G | ANGLES AND DISTANCES | CREDIT |
| 2001 | 2947N | MAP DESIGN & PRODUCTION | PASS |
| 2001 | 2947R | DESKTOP MAPPING 2 | CREDIT |
| 2001 | 2991AJ | PROJECT MANAGEMENT | PASS |
| 2000 | 1755DA | QUALITY CONCEPTS | DISTINCTION |
| 2000 | 2937G | ANGLES AND DISTANCES | WITHDRAWN NO PENALTY |
| 2000 | 2937N | S I S MANAGEMENT AND SUPERVISION | PASS |
| 2000 | 2947AA | G I S SYSTEMS MANAGEMENT | PASS |
| 2000 | 2947AB | G I S PROJECT 3 | PASS |
| 2000 | 2947AD | REMOTE SENSING 2 | CREDIT |
| 2000 | 2947K | REMOTE SENSING 1 | PASS |
| 2000 | 2947L | DESKTOP MAPPING 1 | CREDIT |
| 2000 | 2947M | G I S APPLICATIONS - VECTOR 2 | CREDIT |
| 2000 | 2947N | MAP DESIGN & PRODUCTION | FAIL |
| 2000 | 2947P | DATA STANDARDS | DISTINCTION |
| 2000 | 2947Q | G I S APPLICATIONS - RASTER 2 | PASS |
| 2000 | 2947R | DESKTOP MAPPING 2 | FAIL |
| 2000 | 2947T | G I S APPLICATIONS MANAGEMENT | CREDIT |
| 2000 | 2947V | LAND & ENVIRONMENT MANAGEMENT | PASS |
| 2000 | 2947W | G P S/G I S LINKS | PASS |
| 2000 | 2947X | SPATIAL & ASPATIAL DATABASES | PASS |
| 2000 | 2947Y | ENVIRONMENTAL MAPPING | CREDIT |
| 2000 | 2991AJ | PROJECT MANAGEMENT | FAIL |
| 2000 | 3607A | C PROGRAMMING CONCEPTS 1 | PASS |
| 2000 | 3617D | INTRODUCTION TO THE INTERNET | PASS (UNGRADED) |
| 2000 | 3617E | WRITING FOR THE WORLD WIDE WEB | PASS (UNGRADED) |
| 2000 | 8979H | NEGOTIATION SKILLS | PASS (UNGRADED) |
| 1999 | 2937A | COMPUTING CONCEPTS | CREDIT |

Page 1 of 3

# HIGHER SCHOOL CERTIFICATE

BOARD OF STUDIES
NEW SOUTH WALES

*This is to certify that*

*Tobias Geoffrey Maya*

*who attended*

*Bulli High School*

*has met the requirements for the award of a Higher School Certificate.*

OSTIA RECENS QUAM PURA NITES

8278067

*Dated at Sydney on 5th January 1999*

*President*

*This certificate is issued by the Board of Studies without alteration or erasure.*



AusIMM
THE MINERALS INSTITUTE

THIS IS TO CERTIFY THAT

*Tobias Maya*

WAS ELECTED TO THE GRADE OF

*Member (MAusIMM)*

OF THE AUSTRALASIAN INSTITUTE OF
MINING & METALLURGY ON

*31 March 2014*

FOUNDED 1892

PRESIDENT

CHIEF EXECUTIVE OFFICER

MEMBER NO: 304661

# CV – Charles Edward Watson

Date of Birth : 9th October 1951
Nationality : New Zealand
Address : 11 Cassidy Avenue, Lincoln
7608, Canterbury, New Zealand
Education : B.Sc (Hons) Geology, University of London (1971-1974)
Australasian Institution of Mining & Metallurgy, Fellow (2012)

Professional Experience :

*July 2022 – present: Senior Technical Adviser, PT Hengjaya Mineralindo, Sulawesi, Indonesia*

Coordinated design, construction, equipping and commissioning of purpose built Sample Preparation and Sample Assay Laboratory at PT Hengjaya Mineralindo Tangofa site. Monitored and introduced new equipment into both sections of laboratory to improve the sample flowheets and the efficiency and performance in these sections, eg better quality ovens and pulverisers, Boyd Mid Crusher RSD units, WDXRF and Fused Bead machines. Increase the focus on quality control at all stages of the sample process flowsheet through better managing the collection and processing of sample standard subtypes to improve accuracy and precision of the results. Strengthen the knowledge base of the laboratory team through raising educational qualifications and competency of incoming personnel and ongoing training and development. Upgraded Inter Laboratory Check sampling programme to include two commercial mineral laboratories for comparative purposes and achieve best practice.

Assisted independent consultant and JORC Competent Person in providing QA/QC Reports on the Sample Preparation and Assay Laboratory for inclusion as an Appendix to the main reports submitted in 2022 and 2025.

*July 2019 – Mar 2020: Technical Adviser, PT Hengjaya Mineralindo, Sulawesi, Indonesia*

Undertook a Technical Audit of the Sample Processing and Assay Laboratories at the PTHM mine site at Tangofa, Sulawesi, Indonesia. Prime objective the optimization of production and Quality Control during the ramp up in lateritic nickel ore production from 70,000 wmt to 200,000 wmt per month. Addressed sampling flow and assay capacity & capability; current restrictions eg sample turnaround time, shift hours and manpower; staff skillsets required for current and expanded operations; equipment selection and utilisation; liaison with Drilling Contractor Danmar on JORC compliance, assay results and storage; amendment of SOP's where required; implemented improved monthly reporting of data for management. Included as a Qualified Person for the compilation of QA/QC section of independent JORC Compliant Nickel Resource Estimate, 30th June 2020, for submission to the ASX.

*Jan 2013 – Dec 2017: Managing Director, Mineral Services Ltd. Lincoln, New Zealand*

Established, commissioned and managed Mineral Processing Laboratory at Kiunga, in the Western Province, Papua New Guinea, processing drill samples collected from a high quality magnetite source. Trained local staff in skills required and monitored programme to meet the throughput from the drill programme. Working in a very challenging environment, programme was completed on time and selected sample cons sent off for assay.

Established and operated Mineral Processing Facility at Greymouth providing heavy mineral separation, recovery and identification services to the West Coast alluvial gold mining sector and overseas clients. Undertook mineralogical examination and reporting on heavy mineral samples containing diamonds, gold and tin from various projects in West Africa.

Commissioned and operated Gold Room at Greymouth for smelting of alluvial gold and the production of gold dore bars for Southern Gold Buyers; undertook fire assay of samples from gold dore bars to determine gold fineness prior to despatch of bars to Perth Mint for refining.

*Apr 2010 – Dec 2012 : Geologist, Gold & Green Resources, Hokitika, New Zealand*

Compiled Gold Exploration and Mining Permit applications for clients; compiled and submitted Resource Consent and Access Agreement applications for clients; mineralogical investigation of concentrates from West Coast gold mining operations; researched West Coast and Central Otago alluvial gold mining operations.

*Jan 2009 – Mar 2010 : Technical Services Manager, Woodlark Mining Limited, PNG*

Established, commissioned and managed Prep Lab at Woodlark Mining gold project; recovered gold grains from island wide pan con survey and classified based on morphology and surface textures of alluvial gold grains.

Responsible for maintaining company relations with Provincial Government & the Mineral Resources Authority in Port Moresby.

*Mar 2005 – Dec 2009 : Alotau Manager, Woodlark Mining Limited, Papua New Guinea*

Established base for exploration operations on Woodlark Island supporting two drill gold sampling programme; Managed Logistics for field operations, including initial construction of Bomagai Camp, while establishing and managing gold Preparation Laboratory in Alotau.

*Dec 2001 – Oct 2004 : Operations Manager, PT Galuh Cempaka, Indonesia*

Managed operations at Galuh Cempaka Diamond Project following purchase from Ashton Mining / MMC JV; Designed drill sampling programme to increase diamond reserves; produced updated Feasibility Study prior to commencing Dry Mining operations.

*2000 – May 2011 : Director, Tristate Resources, Mildura, Victoria, Australia*

Established and commissioned Heavy Mineral Laboratory at Mildura to process samples produced from major Mineral Sand companies' drilling and bulk sampling activities in the Murray Basin.

*Jan 1993 – Dec 1999 : Technical Advisor, PT Indo Mineratama, Indonesia*

Provided technical and logistical support to IndoMin Resources and Ocean Resources projects; Compilation of technical data for IndoMin Resources IPO on Vancouver Stock Exchange; Undertook Technical Audit of Aokam Thai No. 3 Dredge prior to mobilisation to Ocean Resources Offshore Diamond Project; Commissioned Navstar DGPS system and instructed local staff in its use at the Offshore Diamond Project; Monitored drill programme Undertook detailed Scoping Study on Tin Tailings Project on Indonesian Tin Islands.

*Oct 1989 – Dec 1992 : Operations Manager, Shell-Billiton Heavy Mineral Project, Indonesia*

Managed field programmes from first reconnaissance through to follow-up drilling at Kumamba and other Mineral Sand projects; prepared semi-annual work programmes and budgets and submitted Monthly and Quarterly Reports to Government and Joint Venture partners; Established and managed fully equipped Heavy Mineral Laboratory at Pangkal Pinang for processing of samples from Heavy Mineral Sands project, gold, diamond and tin projects with particular reference to gold grain morphologies and surface textures as part of provenance studies.

*Mar 1989 – Sep 1989 : Geologist, BP Minerals, Indonesia*

Managed exploration programme and upgraded sample processing lab at gold / zircon project in Central Kalimantan, Indonesia.

*Sep 1987 – Mar 1989 : Project Manager, Acorn Diamonds Indonesia*

Managed advanced exploration programme at alluvial diamond project in South Kalimantan; included bulk sampling with open pits and sheet pile caissons, plant operation, diamond and gold recovery and recording; supervised drilling programme utilising five drills; prepared budgets and work programmes for Government and management; active in preparation of Feasibility Study by Alluvial Dredges; undertook investor presentations in Australia & Europe.

*Jan 1983 – Mar 1987 : Senior Geologist, De Beers, Kimberley, South Africa*

Managed De Beers Kimberley Heavy Mineral Laboratory and co-ordinated operations at four other regional laboratories; Liaised with Exploration Managers over new techniques for improving operational efficiency and with Research Geologists to ensure new developments in mineral chemistry and surface texture analysis circulated into all laboratories.

*Dec 1974 – Dec 1982 : Geologist/Staff Geologist/Senior Geologist, De Beers South Africa, Congo, Botswana*

Supervised and managed hard rock and alluvial diamond exploration programmes using loam sampling, stream sampling, geochemical and geophysical surveys, Churn drilling and RC Drill programmes.

# APPENDIX 8

# DRILL HOLE DATA SUMMARY

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| TFD37 | 418829.748 | 9673464.317 | 496.692 | 23 | -90 | 10 | 12 |
| TFD38 | 418826.457 | 9673436.342 | 504.386 | 32 | -90 | 8 | 21 |
| TFD39 | 418825.655 | 9673411.595 | 509.044 | 8 | -90 | 3 | 2 |
| TFD50 | 418846.602 | 9673512.704 | 479.413 | 35 | -90 | 8 | 27 |
| TFD51 | 418855.159 | 9673486.584 | 491.397 | 21 | -90 | 9 | 9 |
| TFD52 | 418851.809 | 9673459.688 | 499.696 | 27 | -90 | 17 | 7 |
| TFD53 | 418852.712 | 9673437.313 | 506.142 | 21 | -90 | 15 | 2 |
| TFD54 | 418856.315 | 9673411.419 | 511.188 | 22 | -90 | 14 | 2 |
| TFD55 | 418852.838 | 9673386.686 | 511.500 | 36 | -90 | 22 | 14 |
| TFD65 | 418876.148 | 9673535.068 | 467.218 | 14 | -90 | 6 | 5 |
| TFD66 | 418870.759 | 9673509.246 | 481.121 | 7 | -90 | 3 | 1 |
| TFD67 | 418871.858 | 9673483.936 | 493.144 | 23 | -90 | 2 | 17 |
| TFD68 | 418879.208 | 9673463.403 | 501.605 | 12 | -90 | 6 | 2 |
| TFD69 | 418877.298 | 9673434.807 | 509.501 | 34 | -90 | 25 | 9 |
| TFD70 | 418878.620 | 9673413.830 | 511.500 | 21 | -90 | 15 | 3 |
| TFD71 | 418874.606 | 9673383.366 | 511.500 | 18 | -90 | 12 | 2 |
| TFL140 | 419303.652 | 9673711.813 | 357.204 | 24 | -90 | 7 | 9 |
| TFL144 | 419298.570 | 9673512.098 | 394.915 | 43 | -90 | 11 | 13 |
| TFL146 | 419301.096 | 9673411.676 | 387.699 | 21 | -90 | 7 | 7 |
| TFL148 | 419303.730 | 9673309.230 | 362.853 | 27 | -90 | 6 | 9 |
| TFL150 | 419303.340 | 9673209.600 | 368.082 | 33 | -90 | 5 | 8.67 |
| TFL170 | 419402.195 | 9673511.947 | 376.962 | 22 | -90 | 2 | 8 |
| TFL172 | 419403.239 | 9673408.702 | 366.252 | 5 | -90 | 1 | 1 |
| TFL176 | 419403.010 | 9673209.820 | 384.762 | 39 | -90 | 3 | 7.35 |
| TFL187 | 419505.508 | 9673612.643 | 323.812 | 17 | -90 | 11 | 2 |
| TFL199 | 419504.753 | 9673511.477 | 353.067 | 11 | -90 | 1 | 6 |
| TFL34 | 419002.796 | 9673510.044 | 462.621 | 19 | -90 | 8 | 3 |
| TFL345 | 420101.780 | 9673510.040 | 233.700 | 21.5 | -90 | 5 | 0 |
| TFL350 | 420101.090 | 9673238.200 | 248.043 | 32 | -90 | 9 | 0 |
| TFL36 | 419001.908 | 9673411.600 | 477.526 | 18 | -90 | 7 | 6 |
| TFL372 | 420203.060 | 9673509.460 | 212.250 | 7 | -90 | 0 | 1 |
| TFL377 | 420102.270 | 9673908.990 | 238.616 | 23 | -90 | 3 | 5 |
| TFL38 | 419003.590 | 9673309.930 | 469.882 | 12 | -90 | 0 | 0 |
| TFL40 | 419003.050 | 9673208.910 | 457.929 | 15 | -90 | 1 | 0 |
| TFL469 | 419404.260 | 9673809.412 | 310.571 | 35 | -90 | 19 | 16 |
| TFL58 | 419110.146 | 9673910.048 | 347.102 | 32 | -90 | 24 | 4.32 |
| TFL60 | 419109.553 | 9673847.182 | 345.118 | 59 | -90 | 6 | 23.42 |
| TFL66 | 419102.799 | 9673508.200 | 438.090 | 31 | -90 | 20 | 4 |
| TFL68 | 419103.110 | 9673411.388 | 452.471 | 16 | -90 | 8 | 2 |
| TFL72 | 419102.809 | 9673209.607 | 430.406 | 13 | -90 | 1 | 5 |
| TFL94 | 419197.198 | 9673967.266 | 324.389 | 49 | -90 | 17 | 22 |
| TFL96 | 419207.274 | 9673867.976 | 342.207 | 57 | -90 | 17 | 12 |
| TFL98 | 419202.146 | 9673711.831 | 371.563 | 39 | -90 | 16 | 10 |
| TFT1277 | 419078.304 | 9673885.721 | 353.819 | 60 | -90 | 18 | 34 |
| TFT1278 | 419079.381 | 9673862.276 | 355.910 | 54 | -90 | 25 | 4 |
| TFT1284 | 419102.063 | 9673938.378 | 347.631 | 49 | -90 | 14 | 22 |
| TFT1285RD | 419102.165 | 9673889.156 | 345.626 | 31 | -90 | 22 | 2 |
| TFT1286 | 419101.909 | 9673865.420 | 348.801 | 39 | -90 | 12 | 5 |
| TFT1288 | 419103.427 | 9673789.089 | 363.719 | 45 | -90 | 26 | 4 |
| TFT1292 | 419126.535 | 9673961.301 | 342.262 | 43 | -90 | 19 | 13 |
| TFT1293 | 419128.255 | 9673936.024 | 341.806 | 46 | -90 | 20 | 17 |
| TFT1294RD | 419125.497 | 9673913.467 | 343.175 | 43 | -90 | 26 | 10 |
| TFT1295 | 419127.510 | 9673887.893 | 334.579 | 27 | -90 | 20 | 4 |
| TFT1296 | 419126.864 | 9673862.163 | 337.502 | 33 | -90 | 7 | 9 |
| TFT1299RD | 419128.762 | 9673783.461 | 357.636 | 39.5 | -90 | 7 | 8 |
| TFT1300 | 419127.147 | 9673760.849 | 362.097 | 36.4 | -90 | 5 | 8 |
| TFT1301 | 419127.892 | 9673736.402 | 369.300 | 43 | -90 | 7 | 12 |
| TFT1305 | 419151.849 | 9673962.539 | 337.617 | 38 | -90 | 14 | 22 |
| TFT1306 | 419153.263 | 9673937.090 | 335.153 | 28 | -90 | 16 | 9 |
| TFT1307 | 419153.095 | 9673911.077 | 331.904 | 42 | -90 | 28 | 11 |
| TFT1308 | 419152.212 | 9673888.364 | 331.500 | 34 | -90 | 7 | 21 |
| TFT1311 | 419154.433 | 9673811.786 | 355.593 | 58 | -90 | 9 | 8 |
| TFT1313 | 419152.525 | 9673763.237 | 365.550 | 60 | -90 | 23 | 11 |
| TFT1314 | 419153.155 | 9673736.842 | 370.806 | 41 | -90 | 20 | 2 |
| TFT1315 | 419154.650 | 9673711.712 | 375.961 | 27 | -90 | 19 | 4 |
| TFT1316 | 419152.183 | 9673686.588 | 382.000 | 45 | -90 | 7 | 14 |
| TFT1317 | 419156.782 | 9673664.059 | 389.290 | 30 | -90 | 8 | 12 |
| TFT1318 | 419178.921 | 9673987.547 | 332.290 | 46 | -90 | 26 | 20 |
| TFT1319 | 419176.308 | 9673960.003 | 329.895 | 46 | -90 | 16 | 19 |
| TFT1320 | 419176.490 | 9673937.207 | 326.400 | 26 | -90 | 15 | 8 |
| TFT1321 | 419177.557 | 9673913.435 | 327.143 | 35 | -90 | 19 | 13 |
| TFT1325 | 419173.880 | 9673814.382 | 356.085 | 60 | -90 | 16 | 25 |
| TFT1326 | 419176.763 | 9673789.719 | 360.198 | 46 | -90 | 16 | 10 |
| TFT1327 | 419177.573 | 9673764.336 | 364.545 | 43 | -90 | 23 | 16 |
| TFT1328 | 419177.183 | 9673740.684 | 368.705 | 26 | -90 | 18 | 5 |
| TFT1329 | 419179.369 | 9673715.178 | 372.847 | 35 | -90 | 26 | 5 |
| TFT1332 | 419201.750 | 9673987.273 | 326.377 | 48 | -90 | 19 | 11 |
| TFT1333 | 419200.889 | 9673962.743 | 322.265 | 45 | -90 | 23 | 13 |
| TFT1334 | 419202.245 | 9673936.408 | 327.493 | 26 | -90 | 15 | 7 |
| TFT1335 | 419204.060 | 9673887.619 | 337.446 | 41 | -90 | 15 | 12 |
| TFT1340 | 419203.704 | 9673739.159 | 366.652 | 54 | -90 | 13 | 17 |
| TFT1341 | 419205.654 | 9673688.990 | 376.287 | 24 | -90 | 11 | 10 |
| TFT1342 | 419202.492 | 9673666.160 | 381.422 | 34 | -90 | 19 | 8 |
| TFT1343 | 419227.416 | 9673961.777 | 320.845 | 33 | -90 | 13 | 9 |
| TFT1344 | 419227.796 | 9673936.097 | 327.848 | 44 | -90 | 12 | 12 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6619 | 416921.581 | 9672667.435 | 415.690 | 36 | -90 | 29.34 | 5 |
| DEX-CZ6621 | 417975.859 | 9672649.926 | 417.354 | 18 | -90 | 11 | 6 |
| DEX-CZ6622 | 417922.599 | 9672646.436 | 403.503 | 18 | -90 | 5 | 10 |
| DEX-CZ6623 | 417574.720 | 9672651.357 | 384.641 | 26 | -90 | 13 | 11 |
| DEX-CZ6624 | 417521.677 | 9672647.749 | 394.735 | 14 | -90 | 4 | 7 |
| DEX-CZ6625 | 416975.940 | 9672649.120 | 400.368 | 19 | -90 | 13 | 4 |
| DEX-CZ6626 | 416923.517 | 9672648.335 | 419.047 | 23 | -90 | 15.25 | 6.49 |
| DEX-CZ6628 | 417996.282 | 9672622.674 | 422.996 | 8 | -90 | 1 | 1 |
| DEX-CZ6629 | 417974.626 | 9672624.895 | 419.098 | 21 | -90 | 8 | 7 |
| DEX-CZ6630 | 417951.213 | 9672622.082 | 413.132 | 16 | -90 | 5 | 9 |
| DEX-CZ6631 | 417923.525 | 9672626.182 | 405.618 | 12 | -90 | 9 | 0 |
| DEX-CZ6632 | 417904.042 | 9672628.283 | 399.790 | 15 | -90 | 7 | 6 |
| DEX-CZ6633 | 417878.573 | 9672627.095 | 392.292 | 30 | -90 | 15.51 | 11 |
| DEX-CZ6634 | 417823.926 | 9672622.183 | 397.907 | 14 | -90 | 12 | 0.24 |
| DEX-CZ6635 | 417800.446 | 9672623.944 | 399.210 | 15 | -90 | 10.55 | 2.45 |
| DEX-CZ6636 | 417773.178 | 9672624.734 | 397.204 | 14 | -90 | 6 | 5 |
| DEX-CZ6637 | 417751.200 | 9672623.744 | 394.239 | 32 | -90 | 11 | 12 |
| DEX-CZ6638 | 417726.290 | 9672623.936 | 395.799 | 29 | -90 | 8 | 14 |
| DEX-CZ6639 | 417625.906 | 9672623.509 | 393.493 | 17 | -90 | 9.27 | 5.16 |
| DEX-CZ6640 | 417601.620 | 9672625.410 | 391.645 | 30 | -90 | 24.42 | 4 |
| DEX-CZ6641 | 417573.178 | 9672624.793 | 386.813 | 34 | -90 | 18 | 13 |
| DEX-CZ6642 | 417551.779 | 9672626.026 | 389.680 | 43 | -90 | 17 | 26 |
| DEX-CZ6643 | 417525.925 | 9672625.565 | 396.783 | 31 | -90 | 17 | 11 |
| DEX-CZ6644 | 417425.067 | 9672625.787 | 412.354 | 23 | -90 | 8 | 6 |
| DEX-CZ6645 | 417402.238 | 9672626.597 | 412.707 | 24 | -90 | 11 | 11 |
| DEX-CZ6646 | 417374.689 | 9672622.512 | 412.938 | 35 | -90 | 10 | 8 |
| DEX-CZ6647 | 417352.981 | 9672623.824 | 414.763 | 33 | -90 | 12 | 14 |
| DEX-CZ6648 | 417325.637 | 9672626.454 | 415.241 | 30 | -90 | 13 | 6 |
| DEX-CZ6649 | 417304.436 | 9672626.673 | 416.654 | 30 | -90 | 8 | 9 |
| DEX-CZ6650 | 417272.903 | 9672624.625 | 416.000 | 12 | -90 | 4 | 4 |
| DEX-CZ6651 | 416969.392 | 9672629.679 | 405.616 | 19 | -90 | 6 | 10 |
| DEX-CZ6652 | 416951.077 | 9672629.912 | 408.355 | 16 | -90 | 11 | 5 |
| DEX-CZ6653 | 416925.783 | 9672618.670 | 414.890 | 18 | -90 | 5 | 10 |
| DEX-CZ6655 | 417974.414 | 9672599.812 | 416.945 | 18 | -90 | 4 | 10 |
| DEX-CZ6656 | 417923.491 | 9672602.872 | 406.123 | 27 | -90 | 6 | 13 |
| DEX-CZ6657 | 417877.469 | 9672602.354 | 392.452 | 12 | -90 | 7 | 2 |
| DEX-CZ6658 | 417826.498 | 9672600.352 | 401.704 | 19 | -90 | 16 | 0 |
| DEX-CZ6659 | 417776.631 | 9672597.185 | 401.675 | 18 | -90 | 13 | 3 |
| DEX-CZ6660 | 417726.266 | 9672600.845 | 400.618 | 18 | -90 | 13 | 5 |
| DEX-CZ6661 | 417626.531 | 9672598.067 | 396.874 | 17 | -90 | 14 | 1 |
| DEX-CZ6662 | 417572.542 | 9672597.440 | 389.742 | 29 | -90 | 25 | 2 |
| DEX-CZ6663 | 417424.549 | 9672599.885 | 415.271 | 29 | -90 | 7 | 11 |
| DEX-CZ6664 | 417375.477 | 9672599.811 | 416.819 | 29 | -90 | 15 | 13 |
| DEX-CZ6665 | 417325.697 | 9672600.735 | 417.912 | 43 | -90 | 12 | 21.53 |
| DEX-CZ6666 | 417274.370 | 9672598.914 | 415.721 | 14 | -90 | 3 | 9 |
| DEX-CZ6668 | 418003.805 | 9672571.408 | 406.996 | 33 | -90 | 1 | 31 |
| DEX-CZ6669 | 417973.794 | 9672578.673 | 414.357 | 8 | -90 | 4 | 2 |
| DEX-CZ6670 | 417951.628 | 9672576.240 | 410.240 | 14 | -90 | 5 | 5 |
| DEX-CZ6671 | 417920.374 | 9672573.476 | 402.819 | 15 | -90 | 8 | 4 |
| DEX-CZ6672 | 417903.525 | 9672576.465 | 398.561 | 20 | -90 | 9 | 5 |
| DEX-CZ6673 | 417872.526 | 9672576.135 | 396.534 | 21 | -90 | 17.28 | 2 |
| DEX-CZ6674 | 417849.477 | 9672575.219 | 402.010 | 23 | -90 | 20 | 1 |
| DEX-CZ6675 | 417827.090 | 9672576.232 | 405.473 | 14 | -90 | 5 | 3 |
| DEX-CZ6676 | 417797.949 | 9672575.974 | 407.168 | 23 | -90 | 19 | 2 |
| DEX-CZ6677 | 417772.286 | 9672571.534 | 405.608 | 22 | -90 | 14.18 | 7 |
| DEX-CZ6678 | 417750.145 | 9672576.163 | 405.116 | 16 | -90 | 13 | 1 |
| DEX-CZ6679 | 417723.721 | 9672573.319 | 406.055 | 30 | -90 | 12 | 15 |
| DEX-CZ6680 | 417622.552 | 9672573.099 | 398.459 | 25 | -90 | 21 | 2 |
| DEX-CZ6681 | 417600.085 | 9672577.453 | 392.674 | 26 | -90 | 7 | 17 |
| DEX-CZ6682 | 417577.275 | 9672574.358 | 391.801 | 29 | -90 | 12 | 14 |
| DEX-CZ6683 | 417550.264 | 9672575.511 | 394.690 | 18 | -90 | 11 | 5 |
| DEX-CZ6684 | 417525.559 | 9672575.322 | 400.431 | 28 | -90 | 13 | 11 |
| DEX-CZ6685 | 417421.283 | 9672573.132 | 416.000 | 8 | -90 | 3 | 3.26 |
| DEX-CZ6686 | 417400.145 | 9672576.527 | 419.086 | 17 | -90 | 8 | 7 |
| DEX-CZ6687 | 417376.621 | 9672578.279 | 419.554 | 45 | -90 | 15 | 23 |
| DEX-CZ6688 | 417350.617 | 9672579.192 | 419.371 | 32 | -90 | 10 | 19 |
| DEX-CZ6689 | 417325.791 | 9672574.122 | 419.776 | 37 | -90 | 25 | 9 |
| DEX-CZ6690 | 417300.303 | 9672577.308 | 418.121 | 21 | -90 | 4 | 11 |
| DEX-CZ6691 | 417276.013 | 9672575.683 | 415.282 | 13 | -90 | 7 | 4 |
| DEX-CZ6693 | 417975.300 | 9672558.287 | 408.384 | 24 | -90 | 7 | 15 |
| DEX-CZ6694 | 417923.189 | 9672551.098 | 400.729 | 35 | -90 | 17 | 13 |
| DEX-CZ6695 | 417876.070 | 9672553.124 | 398.720 | 17 | -90 | 10 | 4 |
| DEX-CZ6696 | 417828.764 | 9672554.939 | 407.355 | 20 | -90 | 10.31 | 8 |
| DEX-CZ6697 | 417773.926 | 9672549.425 | 409.855 | 24 | -90 | 17.77 | 5.23 |
| DEX-CZ6698 | 417726.246 | 9672547.160 | 410.838 | 41 | -90 | 12 | 18 |
| DEX-CZ6699 | 417627.055 | 9672550.382 | 400.461 | 20 | -90 | 11 | 7 |
| DEX-CZ6700 | 417576.236 | 9672550.174 | 396.114 | 16 | -90 | 6 | 8 |
| DEX-CZ6701 | 417520.149 | 9672547.727 | 400.549 | 31 | -90 | 20.53 | 8.69 |
| DEX-CZ6702 | 417325.522 | 9672551.279 | 420.757 | 30 | -90 | 16 | 12 |
| DEX-CZ6703 | 417276.621 | 9672553.249 | 413.682 | 25 | -90 | 16 | 3 |
| DEX-CZ6705 | 417996.832 | 9672528.268 | 400.181 | 25 | -90 | 10.6 | 12.4 |
| DEX-CZ6706 | 417974.286 | 9672527.678 | 400.812 | 16 | -90 | 14 | 1 |
| DEX-CZ6707 | 417955.496 | 9672526.758 | 399.664 | 19 | -90 | 12 | 7 |
| DEX-CZ6708 | 417931.187 | 9672524.443 | 396.752 | 22 | -90 | 20.2 | 0 |
| DEX-CZ6709 | 417899.768 | 9672525.285 | 397.000 | 18 | -90 | 15 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| TFT1345 | 419227.936 | 9673913.669 | 332.509 | 29 | -90 | 20 | 2 |
| TFT1346 | 419225.769 | 9673885.476 | 337.861 | 42 | -90 | 20 | 7 |
| TFT1347 | 419227.596 | 9673862.998 | 342.291 | 43 | -90 | 14 | 11 |
| TFT1349 | 419225.315 | 9673816.785 | 352.118 | 21 | -90 | 5 | 9 |
| TFT1350RD | 419225.076 | 9673791.854 | 356.966 | 46 | -90 | 12 | 7 |
| TFT1351 | 419227.902 | 9673766.895 | 360.979 | 34 | -90 | 15 | 7 |
| TFT1352 | 419229.935 | 9673739.845 | 364.767 | 60 | -90 | 20 | 12 |
| TFT1354 | 419230.044 | 9673690.291 | 373.031 | 30 | -90 | 19 | 7 |
| TFT1355 | 419232.662 | 9673666.460 | 377.662 | 19 | -90 | 15 | 1 |
| TFT1356 | 419257.897 | 9673961.573 | 320.922 | 32 | -90 | 15 | 4 |
| TFT1357 | 419250.868 | 9673937.272 | 325.603 | 30 | -90 | 6 | 2 |
| TFT1358 | 419252.121 | 9673912.338 | 331.579 | 30 | -90 | 9 | 10 |
| TFT1359 | 419253.051 | 9673887.377 | 336.173 | 31 | -90 | 21 | 5 |
| TFT1360 | 419251.472 | 9673863.353 | 340.675 | 43 | -90 | 9 | 17 |
| TFT1361 | 419263.840 | 9673852.925 | 341.468 | 34 | -90 | 12 | 5 |
| TFT1362 | 419250.073 | 9673817.621 | 351.531 | 42 | -90 | 15 | 4 |
| TFT1363 | 419265.833 | 9673787.441 | 353.914 | 30 | -90 | 9 | 3 |
| TFT1365 | 419253.466 | 9673742.492 | 362.952 | 34 | -90 | 15 | 0 |
| TFT1366 | 419253.554 | 9673716.462 | 365.889 | 52 | -90 | 14 | 18 |
| TFT1367 | 419253.514 | 9673691.584 | 368.561 | 39 | -90 | 20 | 4 |
| TFT1368 | 419283.091 | 9673964.001 | 320.575 | 45 | -90 | 15 | 0 |
| TFT1370 | 419279.450 | 9673911.182 | 324.905 | 28 | -90 | 10 | 9 |
| TFT1371 | 419273.691 | 9673886.979 | 333.394 | 25 | -90 | 6 | 1 |
| TFT1372RD | 419282.571 | 9673860.864 | 336.028 | 28 | -90 | 2 | 0 |
| TFT1373 | 419283.790 | 9673843.433 | 338.375 | 22 | -90 | 6 | 4 |
| TFT1374 | 419277.408 | 9673808.764 | 346.979 | 23 | -90 | 2 | 9 |
| TFT1375 | 419290.049 | 9673782.399 | 350.897 | 22 | -90 | 0 | 4 |
| TFT1376 | 419289.287 | 9673755.737 | 355.652 | 14 | -90 | 6 | 3 |
| TFT1377 | 419283.594 | 9673730.674 | 360.838 | 14 | -90 | 7 | 1 |
| TFT1378 | 419278.566 | 9673706.726 | 362.856 | 33 | -90 | 14 | 8 |
| TFT1380 | 419306.690 | 9673937.475 | 319.986 | 35 | -90 | 17 | 5 |
| TFT1381 | 419303.442 | 9673888.747 | 323.537 | 21 | -90 | 7 | 4 |
| TFT1382 | 419302.984 | 9673860.941 | 331.341 | 35 | -90 | 7 | 9 |
| TFT1383RD | 419305.074 | 9673834.725 | 334.963 | 19 | -90 | 8 | 0 |
| TFT1384 | 419312.613 | 9673777.596 | 343.930 | 42 | -90 | 5 | 15 |
| TFT1385 | 419311.198 | 9673752.031 | 349.666 | 54 | -90 | 10 | 15 |
| TFT1386 | 419305.490 | 9673730.322 | 355.156 | 26 | -90 | 9 | 6 |
| TFT1388 | 419329.781 | 9673941.422 | 316.926 | 32 | -90 | 14 | 17 |
| TFT1389 | 419331.673 | 9673914.346 | 317.678 | 28 | -90 | 13 | 9 |
| TFT1390 | 419329.109 | 9673887.268 | 319.527 | 27 | -90 | 6 | 15 |
| TFT1391 | 419335.679 | 9673862.779 | 319.045 | 21 | -90 | 9 | 10 |
| TFT1392 | 419331.451 | 9673839.921 | 327.985 | 34 | -90 | 13 | 13 |
| TFT1393RD | 419346.401 | 9673796.179 | 331.876 | 41 | -90 | 13 | 3 |
| TFT1395 | 419333.174 | 9673743.778 | 344.554 | 45 | -90 | 10 | 7 |
| TFT1399 | 419358.090 | 9673911.539 | 312.872 | 28 | -90 | 17 | 4 |
| TFT1400 | 419355.530 | 9673886.307 | 312.726 | 32 | -90 | 15 | 10 |
| TFT1401 | 419356.950 | 9673863.915 | 315.320 | 35 | -90 | 13 | 10 |
| TFT1402 | 419356.107 | 9673836.714 | 322.374 | 26 | -90 | 13 | 5 |
| TFT1403 | 419353.033 | 9673810.987 | 327.360 | 24 | -90 | 13 | 8 |
| TFT1405 | 419352.652 | 9673693.189 | 341.687 | 15 | -90 | 8 | 4 |
| TFT1407 | 419379.795 | 9673839.056 | 315.455 | 27 | -90 | 18 | 0 |
| TFT1408 | 419395.408 | 9673788.194 | 318.117 | 29 | -90 | 19 | 4 |
| TFT1561 | 419252.970 | 9673558.457 | 415.462 | 10 | -90 | 2 | 1 |
| TFT1563 | 419301.310 | 9673559.170 | 398.336 | 19 | -90 | 4 | 11 |
| TFT1565 | 419354.680 | 9673560.780 | 386.384 | 22 | -90 | 4 | 5 |
| TFT1567 | 419404.898 | 9673561.841 | 369.666 | 22 | -90 | 4 | 9 |
| TFT1568 | 419199.850 | 9673461.058 | 415.597 | 22 | -90 | 5 | 10 |
| TFT1569 | 419453.015 | 9673562.784 | 351.318 | 18 | -90 | 8 | 3 |
| TFT1571 | 419503.136 | 9673559.682 | 340.587 | 21 | -90 | 8 | 1 |
| TFT1572 | 419201.264 | 9673561.098 | 422.822 | 30 | -90 | 5 | 9 |
| TFT1574 | 419152.176 | 9673560.521 | 423.724 | 47 | -90 | 11 | 14 |
| TFT1576 | 419103.322 | 9673562.013 | 430.130 | 39 | -90 | 16 | 3 |
| TFT1577 | 419100.542 | 9673462.274 | 446.655 | 26 | -90 | 13 | 6 |
| TFT1578 | 419051.935 | 9673560.120 | 441.651 | 23 | -90 | 17 | 2 |
| TFT1580 | 419000.737 | 9673561.513 | 447.464 | 24 | -90 | 16 | 1 |
| TFT1584 | 418899.044 | 9673560.646 | 454.682 | 19 | -90 | 11 | 3 |
| TFT1613 | 419254.601 | 9673509.985 | 405.728 | 26 | -90 | 16 | 5 |
| TFT1614 | 419253.542 | 9673457.317 | 402.574 | 25 | -90 | 1 | 18 |
| TFT1617 | 419353.017 | 9673510.999 | 388.029 | 36 | -90 | 7 | 1 |
| TFT1621 | 419450.526 | 9673513.013 | 362.899 | 32 | -90 | 8 | 9 |
| TFT1627 | 419152.359 | 9673511.254 | 430.247 | 41 | -90 | 7 | 2 |
| TFT1628 | 419151.724 | 9673463.353 | 430.463 | 25 | -90 | 8 | 11 |
| TFT1629 | 419152.851 | 9673409.536 | 433.840 | 15 | -90 | 4 | 4 |
| TFT1631 | 419049.191 | 9673511.915 | 450.351 | 13 | -90 | 7 | 0 |
| TFT1632 | 419055.417 | 9673461.134 | 464.961 | 15 | -90 | 8 | 1 |
| TFT1633 | 419053.695 | 9673416.616 | 469.368 | 15 | -90 | 1 | 11 |
| TFT1635 | 418952.918 | 9673510.689 | 470.696 | 15 | -90 | 8 | 2 |
| TFT1642 | 419304.016 | 9673460.054 | 387.694 | 22 | -90 | 8 | 14 |
| TFT1644 | 419353.069 | 9673463.037 | 377.156 | 20 | -90 | 6 | 11 |
| TFT1646 | 419403.750 | 9673461.347 | 369.996 | 28 | -90 | 6 | 9 |
| TFT1647 | 419357.265 | 9673409.812 | 374.590 | 14 | -90 | 2 | 0 |
| TFT1648 | 419456.159 | 9673458.980 | 357.002 | 13 | -90 | 4 | 3 |
| TFT1650 | 419505.290 | 9673458.079 | 343.412 | 11 | -90 | 3 | 0 |
| TFT1681 | 419001.233 | 9673464.072 | 479.585 | 22 | -90 | 2 | 9 |
| TFT1691 | 418954.066 | 9673459.727 | 495.825 | 4 | -90 | 0 | 0 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6710 | 417874.798 | 9672528.106 | 401.046 | 20 | -90 | 14 | 4 |
| DEX-CZ6711 | 417851.846 | 9672524.487 | 405.461 | 25 | -90 | 13 | 10 |
| DEX-CZ6712 | 417826.125 | 9672523.915 | 409.458 | 21 | -90 | 8 | 11 |
| DEX-CZ6713 | 417798.109 | 9672523.986 | 411.853 | 18 | -90 | 12 | 4 |
| DEX-CZ6714 | 417774.049 | 9672523.674 | 413.412 | 22 | -90 | 17.56 | 2.64 |
| DEX-CZ6715 | 417748.147 | 9672525.494 | 414.001 | 27 | -90 | 17.27 | 10 |
| DEX-CZ6716 | 417722.872 | 9672523.521 | 413.891 | 23 | -90 | 16.24 | 3 |
| DEX-CZ6717 | 417625.593 | 9672526.914 | 401.122 | 13 | -90 | 11 | 0.21 |
| DEX-CZ6718 | 417598.074 | 9672526.647 | 397.459 | 28 | -90 | 10 | 15.42 |
| DEX-CZ6719 | 417574.204 | 9672527.414 | 402.741 | 24 | -90 | 14 | 10 |
| DEX-CZ6720 | 417551.616 | 9672524.548 | 405.715 | 26 | -90 | 10 | 10 |
| DEX-CZ6721 | 417526.036 | 9672529.660 | 402.895 | 23 | -90 | 7 | 14.27 |
| DEX-CZ6722 | 417322.909 | 9672524.318 | 423.588 | 20 | -90 | 11 | 6 |
| DEX-CZ6723 | 417308.050 | 9672520.817 | 421.676 | 22 | -90 | 19 | 0 |
| DEX-CZ6724 | 417275.471 | 9672525.208 | 412.533 | 20 | -90 | 16 | 1.6 |
| DEX-CZ6726 | 417970.145 | 9672500.812 | 391.411 | 26 | -90 | 20.25 | 3 |
| DEX-CZ6727 | 417926.168 | 9672503.242 | 395.277 | 30 | -90 | 27.59 | 0 |
| DEX-CZ6728 | 417871.517 | 9672495.881 | 400.733 | 31 | -90 | 23.67 | 5 |
| DEX-CZ6729 | 417825.024 | 9672503.130 | 409.027 | 27 | -90 | 24.66 | 0 |
| DEX-CZ6730 | 417772.306 | 9672503.616 | 414.483 | 28 | -90 | 11 | 14 |
| DEX-CZ6731 | 417723.382 | 9672496.780 | 416.770 | 18 | -90 | 8 | 6 |
| DEX-CZ6732 | 418025.733 | 9672476.850 | 385.116 | 8 | -90 | 5 | 1 |
| DEX-CZ6733 | 418001.754 | 9672478.257 | 386.060 | 10 | -90 | 7.29 | 0.71 |
| DEX-CZ6734 | 417970.306 | 9672474.574 | 387.742 | 25 | -90 | 21.8 | 2.59 |
| DEX-CZ6735 | 417776.395 | 9672476.711 | 415.345 | 18 | -90 | 10 | 7 |
| DEX-CZ6736 | 417748.555 | 9672474.759 | 417.960 | 22 | -90 | 9 | 12 |
| DEX-CZ6737 | 417720.585 | 9672473.131 | 418.000 | 26 | -90 | 8 | 11 |
| DEX-CZ6738 | 417698.455 | 9672471.573 | 417.487 | 30 | -90 | 6.62 | 11.38 |
| DEX-CZ6739 | 417673.094 | 9672472.003 | 414.424 | 32 | -90 | 21 | 4 |
| DEX-CZ6740 | 417776.607 | 9672446.426 | 415.867 | 15 | -90 | 12 | 1 |
| DEX-CZ6741 | 417722.099 | 9672449.112 | 417.716 | 20 | -90 | 13.29 | 4 |
| DEX-CZ6742 | 417675.348 | 9672446.319 | 415.011 | 29 | -90 | 17.27 | 9 |
| DEX-CZ6743 | 417925.791 | 9672427.151 | 403.588 | 23 | -90 | 16.29 | 5 |
| DEX-CZ6744 | 417901.835 | 9672429.089 | 404.899 | 26 | -90 | 12.33 | 11 |
| DEX-CZ6745 | 417877.847 | 9672425.657 | 408.352 | 34 | -90 | 15.57 | 10.43 |
| DEX-CZ6746 | 417773.912 | 9672425.437 | 417.432 | 25 | -90 | 15 | 8 |
| DEX-CZ6747 | 417746.527 | 9672424.434 | 418.728 | 23 | -90 | 16.36 | 4.64 |
| DEX-CZ6748 | 417725.865 | 9672425.369 | 418.401 | 34 | -90 | 13 | 19 |
| DEX-CZ6749 | 417701.290 | 9672426.445 | 416.845 | 30 | -90 | 15 | 5 |
| DEX-CZ6750 | 417677.623 | 9672423.292 | 415.251 | 23 | -90 | 10 | 9 |
| DEX-CZ6751 | 417924.608 | 9672398.083 | 408.102 | 28 | -90 | 14 | 8 |
| DEX-CZ6752 | 417873.780 | 9672398.892 | 413.433 | 31 | -90 | 11 | 11 |
| DEX-CZ6753 | 417772.280 | 9672398.789 | 418.570 | 29 | -90 | 22 | 5 |
| DEX-CZ6754 | 417725.007 | 9672404.725 | 420.086 | 32 | -90 | 19.33 | 5 |
| DEX-CZ6755 | 417927.713 | 9672375.540 | 411.795 | 20 | -90 | 10 | 3 |
| DEX-CZ6756 | 417898.727 | 9672374.542 | 415.456 | 28 | -90 | 15 | 10 |
| DEX-CZ6757 | 417876.349 | 9672377.172 | 417.120 | 32 | -90 | 19 | 7 |
| DEX-CZ6758 | 417851.961 | 9672377.942 | 420.007 | 33 | -90 | 14 | 16 |
| DEX-CZ6759 | 417824.712 | 9672376.816 | 421.199 | 22 | -90 | 12 | 9 |
| DEX-CZ6760 | 417801.450 | 9672374.688 | 421.213 | 25 | -90 | 16 | 7 |
| DEX-CZ6761 | 417776.175 | 9672373.732 | 421.688 | 29 | -90 | 22 | 5.75 |
| DEX-CZ6762 | 417750.172 | 9672375.870 | 421.859 | 32 | -90 | 17.2 | 12 |
| DEX-CZ6763 | 417722.534 | 9672375.071 | 422.513 | 35 | -90 | 20.34 | 11 |
| DEX-CZ6764 | 417924.228 | 9672350.150 | 417.810 | 22 | -90 | 15 | 2 |
| DEX-CZ6765 | 417876.566 | 9672347.711 | 421.745 | 28 | -90 | 19 | 5 |
| DEX-CZ6766 | 417823.883 | 9672349.015 | 423.392 | 11 | -90 | 5 | 4 |
| DEX-CZ6767 | 417922.510 | 9672323.379 | 423.364 | 16 | -90 | 5 | 8 |
| DEX-CZ6768 | 417899.119 | 9672323.926 | 423.571 | 10 | -90 | 6 | 2 |
| DEX-CZ6769 | 417872.686 | 9672323.011 | 424.861 | 15 | -90 | 6 | 7 |
| DEX-CZ6770 | 417850.461 | 9672325.194 | 425.440 | 29 | -90 | 5 | 8 |
| DEX-CZ6771 | 417827.635 | 9672330.226 | 425.126 | 13 | -90 | 5 | 5 |
| DEX-CZ6772 | 417802.396 | 9672324.788 | 426.344 | 34 | -90 | 15 | 17 |
| DEX-CZ6773 | 417776.295 | 9672327.211 | 425.853 | 25 | -90 | 17 | 5.6 |
| DEX-CZ6774 | 417748.992 | 9672322.871 | 426.260 | 21 | -90 | 15 | 4 |
| DEX-CZ6775 | 417725.689 | 9672323.802 | 426.148 | 33 | -90 | 13 | 19 |
| DEX-CZ6776 | 417823.368 | 9672301.386 | 428.420 | 25 | -90 | 22.24 | 1 |
| DEX-CZ6777 | 417774.653 | 9672300.606 | 428.451 | 30 | -90 | 13 | 8 |
| DEX-CZ6778 | 417724.347 | 9672302.137 | 426.263 | 28 | -90 | 14.25 | 10 |
| DEX-CZ6779 | 417826.395 | 9672273.070 | 428.070 | 34 | -90 | 14.23 | 15 |
| DEX-CZ6780 | 417802.216 | 9672275.758 | 428.975 | 19 | -90 | 9 | 7 |
| DEX-CZ6781 | 417772.837 | 9672275.308 | 427.805 | 24 | -90 | 8 | 7 |
| DEX-CZ6782 | 417749.500 | 9672276.264 | 425.739 | 24 | -90 | 13.24 | 10 |
| DEX-CZ6783 | 417724.083 | 9672274.693 | 423.889 | 24 | -90 | 8 | 14 |
| DEX-CZ6784 | 417774.137 | 9672247.052 | 420.724 | 20 | -90 | 6 | 12 |
| DEX-CZ6785 | 417727.091 | 9672251.732 | 417.166 | 17 | -90 | 10 | 4 |
| DEX-CZ6786 | 417773.238 | 9672229.165 | 415.283 | 34 | -90 | 2.5 | 13.5 |
| DEX-CZ6787 | 417750.152 | 9672232.816 | 411.692 | 13 | -90 | 3 | 3 |
| DEX-CZ6788 | 417723.721 | 9672233.236 | 408.775 | 19 | -90 | 5 | 8 |
| DEX-CZ6789 | 418229.982 | 9673800.564 | 366.131 | 31 | -90 | 17.38 | 12.29 |
| DEX-CZ6790 | 418280.272 | 9673800.663 | 367.950 | 40 | -90 | 20.51 | 16 |
| DEX-CZ6791 | 418231.030 | 9673826.938 | 364.093 | 18 | -90 | 14.08 | 3 |
| DEX-CZ6792 | 418254.556 | 9673824.675 | 365.729 | 41 | -90 | 13 | 21 |
| DEX-CZ6793 | 418280.807 | 9673825.785 | 367.151 | 35 | -90 | 29.39 | 5 |
| DEX-CZ6794 | 418305.136 | 9673824.399 | 368.353 | 41 | -90 | 27.27 | 12 |
| DEX-CZ6795 | 418329.641 | 9673826.314 | 368.394 | 31 | -90 | 14.33 | 3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| TFT1693 | 418952.160 | 9673410.533 | 499.414 | 20 | -90 | 1 | 8 |
| TFT1701 | 418903.511 | 9673457.595 | 504.354 | 24 | -90 | 6 | 2 |
| TFT1712 | 418903.133 | 9673535.127 | 464.843 | 27 | -90 | 7 | 17 |
| TFT1713 | 418905.325 | 9673487.449 | 491.396 | 13 | -90 | 1 | 3 |
| TFT1714 | 418902.095 | 9673432.372 | 509.849 | 20 | -90 | 12 | 6 |
| TFT1715 | 418901.043 | 9673384.320 | 510.356 | 29 | -90 | 13 | 12 |
| TFT1719 | 418927.597 | 9673586.976 | 446.041 | 23 | -90 | 13 | 3 |
| TFT1720 | 418928.855 | 9673561.992 | 453.779 | 21 | -90 | 17 | 1 |
| TFT1721 | 418929.124 | 9673538.687 | 461.763 | 20 | -90 | 12 | 5 |
| TFT1722 | 418929.139 | 9673515.743 | 470.744 | 17 | -90 | 6 | 6 |
| TFT1723 | 418929.211 | 9673483.820 | 490.946 | 6 | -90 | 0 | 6 |
| TFT1724 | 418928.101 | 9673460.033 | 502.320 | 16 | -90 | 1 | 10 |
| TFT1725 | 418929.524 | 9673431.256 | 506.785 | 19 | -90 | 4 | 11 |
| TFT1726 | 418929.375 | 9673410.732 | 506.074 | 19 | -90 | 2 | 14 |
| TFT1727 | 418928.222 | 9673383.847 | 503.934 | 22 | -90 | 9 | 11 |
| TFT1730 | 418953.526 | 9673585.403 | 445.137 | 21 | -90 | 15 | 3 |
| TFT1731 | 418953.413 | 9673538.894 | 458.389 | 18 | -90 | 12 | 5 |
| TFT1732 | 418958.779 | 9673490.796 | 480.950 | 21 | -90 | 0 | 18 |
| TFT1733 | 418950.584 | 9673432.477 | 502.279 | 12 | -90 | 2 | 7 |
| TFT1734 | 418949.447 | 9673383.072 | 497.072 | 20 | -90 | 5 | 9 |
| TFT1740 | 418979.675 | 9673584.192 | 443.143 | 28 | -90 | 15 | 9 |
| TFT1741 | 418978.101 | 9673559.770 | 450.236 | 31 | -90 | 16 | 11 |
| TFT1742 | 418979.256 | 9673534.605 | 458.393 | 21 | -90 | 15 | 0 |
| TFT1743 | 418979.073 | 9673511.266 | 466.794 | 26 | -90 | 9 | 9 |
| TFT1744 | 418982.742 | 9673482.046 | 478.688 | 14 | -90 | 0 | 7 |
| TFT1745 | 418979.749 | 9673461.252 | 487.940 | 8 | -90 | 0 | 4 |
| TFT1746 | 418979.897 | 9673436.338 | 490.432 | 12 | -90 | 0 | 5 |
| TFT1747 | 418978.934 | 9673413.747 | 489.526 | 15 | -90 | 0 | 1 |
| TFT1748 | 418976.419 | 9673382.208 | 485.797 | 22 | -90 | 1 | 11 |
| TFT1751 | 419003.347 | 9673584.071 | 441.629 | 38 | -90 | 5 | 15 |
| TFT1752 | 419001.605 | 9673532.583 | 455.370 | 22 | -90 | 15 | 4 |
| TFT1753 | 419004.133 | 9673481.560 | 473.757 | 16 | -90 | 6 | 5 |
| TFT1754 | 419001.925 | 9673438.026 | 480.494 | 24 | -90 | 4 | 7 |
| TFT1755 | 419002.934 | 9673385.959 | 475.196 | 29 | -90 | 4 | 22 |
| TFT1761 | 419029.578 | 9673585.394 | 439.483 | 22 | -90 | 8 | 9 |
| TFT1762 | 419028.064 | 9673563.109 | 444.529 | 35.78 | -90 | 15 | 5 |
| TFT1763 | 419027.999 | 9673537.440 | 450.075 | 21 | -90 | 17 | 1 |
| TFT1764 | 419033.292 | 9673513.424 | 454.817 | 14 | -90 | 5 | 6 |
| TFT1765 | 419030.310 | 9673488.763 | 464.501 | 18 | -90 | 4 | 9 |
| TFT1766 | 419026.223 | 9673461.527 | 471.996 | 25 | -90 | 11 | 9 |
| TFT1767 | 419028.737 | 9673438.760 | 473.753 | 16 | -90 | 7 | 5 |
| TFT1768 | 419028.208 | 9673411.030 | 471.471 | 26 | -90 | 4 | 10 |
| TFT1769 | 419026.651 | 9673388.755 | 468.256 | 30 | -90 | 2 | 21 |
| TFT1771 | 419053.761 | 9673586.948 | 435.065 | 15 | -90 | 2 | 5 |
| TFT1772 | 419053.271 | 9673536.471 | 445.066 | 24 | -90 | 11 | 9 |
| TFT1773 | 419052.056 | 9673438.945 | 468.721 | 24.39 | -90 | 8 | 5 |
| TFT1774 | 419054.301 | 9673488.050 | 455.016 | 15 | -90 | 6 | 6 |
| TFT1775 | 419052.316 | 9673388.941 | 462.089 | 15 | -90 | 1 | 10 |
| TFT1776 | 419081.163 | 9673463.208 | 452.362 | 20 | -90 | 7 | 4 |
| TFT1779 | 419427.360 | 9673510.585 | 369.121 | 32 | -90 | 4 | 6 |
| TFT1780 | 419077.332 | 9673559.492 | 435.853 | 30 | -90 | 20 | 4 |
| TFT1781 | 419078.636 | 9673534.927 | 439.122 | 40 | -90 | 16 | 3 |
| TFT1782 | 419072.939 | 9673516.206 | 444.086 | 27 | -90 | 13 | 8 |
| TFT1784 | 419078.003 | 9673435.565 | 460.714 | 24 | -90 | 1 | 8 |
| TFT1785 | 419077.652 | 9673411.745 | 462.274 | 10 | -90 | 1 | 6 |
| TFT1786 | 419078.539 | 9673386.210 | 455.983 | 30 | -90 | 7 | 17 |
| TFT1788 | 419101.088 | 9673587.865 | 423.963 | 41 | -90 | 6 | 11 |
| TFT1789 | 419104.028 | 9673536.335 | 435.179 | 33 | -90 | 18 | 6 |
| TFT1790 | 419104.346 | 9673483.180 | 441.839 | 34 | -90 | 16 | 4 |
| TFT1791 | 419103.542 | 9673433.470 | 452.159 | 23 | -90 | 12 | 3 |
| TFT1792 | 419103.333 | 9673386.993 | 448.603 | 23 | -90 | 4 | 7 |
| TFT1793 | 419125.957 | 9673463.316 | 439.088 | 28 | -90 | 17 | 3 |
| TFT1796 | 419127.201 | 9673587.186 | 419.120 | 28 | -90 | 10 | 2 |
| TFT1797 | 419131.596 | 9673558.241 | 426.709 | 29 | -90 | 16 | 3 |
| TFT1798 | 419127.896 | 9673536.321 | 431.452 | 26 | -90 | 13 | 13 |
| TFT1799 | 419129.189 | 9673511.566 | 433.405 | 47 | -90 | 16 | 11 |
| TFT1800 | 419126.252 | 9673486.291 | 436.508 | 19 | -90 | 5 | 7 |
| TFT1801 | 419123.506 | 9673441.458 | 443.516 | 14 | -90 | 0 | 0 |
| TFT1802 | 419128.848 | 9673413.204 | 442.278 | 34 | -90 | 5 | 14 |
| TFT1803 | 419128.116 | 9673382.230 | 438.833 | 11 | -90 | 3 | 5 |
| TFT1805RD | 419156.127 | 9673586.263 | 417.481 | 36 | -90 | 14 | 13 |
| TFT1806 | 419178.236 | 9673537.137 | 427.410 | 35 | -90 | 9 | 8 |
| TFT1807 | 419152.074 | 9673486.307 | 429.883 | 30 | -90 | 7 | 10 |
| TFT1808 | 419154.765 | 9673437.305 | 432.324 | 16 | -90 | 0 | 4 |
| TFT1809 | 419152.480 | 9673385.980 | 430.846 | 10 | -90 | 5 | 1 |
| TFT1810 | 419176.721 | 9673464.668 | 422.052 | 33 | -90 | 4 | 7 |
| TFT1811 | 419178.832 | 9673634.391 | 396.398 | 17 | -90 | 4 | 0 |
| TFT1812 | 419177.287 | 9673613.198 | 406.262 | 21 | -90 | 9 | 1 |
| TFT1813 | 419178.844 | 9673587.905 | 415.953 | 23 | -90 | 8 | 9 |
| TFT1814 | 419181.808 | 9673565.420 | 421.978 | 29 | -90 | 18 | 9 |
| TFT1816 | 419179.997 | 9673511.851 | 426.957 | 22 | -90 | 3 | 14 |
| TFT1817 | 419180.122 | 9673485.936 | 423.930 | 45 | -90 | 1 | 12 |
| TFT1818 | 419177.321 | 9673433.036 | 421.477 | 18 | -90 | 10 | 2 |
| TFT1819 | 419178.875 | 9673411.715 | 421.473 | 18 | -90 | 6 | 0 |
| TFT1820 | 419177.070 | 9673386.960 | 422.183 | 15 | -90 | 1 | 9 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6796 | 418353.567 | 9673827.006 | 368.573 | 20 | -90 | 16.27 | 2 |
| DEX-CZ6797 | 418232.583 | 9673849.173 | 364.475 | 26 | -90 | 20.39 | 6 |
| DEX-CZ6798 | 418280.018 | 9673849.448 | 366.000 | 30 | -90 | 11.3 | 17 |
| DEX-CZ6799 | 418329.459 | 9673849.982 | 367.000 | 31 | -90 | 16.38 | 13 |
| DEX-CZ6800 | 418385.219 | 9673849.758 | 369.704 | 23 | -90 | 17.18 | 4 |
| DEX-CZ6801 | 418430.553 | 9673851.455 | 372.685 | 22 | -90 | 17.44 | 3 |
| DEX-CZ6802 | 418480.145 | 9673852.265 | 372.895 | 17 | -90 | 11.05 | 1 |
| DEX-CZ6803 | 418529.964 | 9673851.844 | 371.502 | 36 | -90 | 33.2 | 1.62 |
| DEX-CZ6804 | 418579.361 | 9673852.297 | 371.716 | 28 | -90 | 25.76 | 5 |
| DEX-CZ6805 | 418629.001 | 9673853.646 | 372.601 | 37 | -90 | 13 | 24.23 |
| DEX-CZ6806 | 418681.844 | 9673852.242 | 375.140 | 34 | -90 | 31.17 | 3.25 |
| DEX-CZ6807 | 418232.455 | 9673873.424 | 363.245 | 29 | -90 | 15.63 | 10 |
| DEX-CZ6808 | 418257.648 | 9673873.388 | 364.759 | 28 | -90 | 21.91 | 5 |
| DEX-CZ6809 | 418280.636 | 9673871.120 | 364.758 | 21 | -90 | 6 | 13 |
| DEX-CZ6810 | 418304.826 | 9673875.918 | 365.556 | 22 | -90 | 11.81 | 6.4 |
| DEX-CZ6811 | 418331.398 | 9673876.353 | 367.505 | 22 | -90 | 19.97 | 1 |
| DEX-CZ6812 | 418355.526 | 9673875.248 | 368.560 | 41 | -90 | 28.09 | 6 |
| DEX-CZ6813 | 418379.541 | 9673875.071 | 370.273 | 27 | -90 | 15.22 | 4 |
| DEX-CZ6814 | 418406.718 | 9673875.003 | 372.226 | 24 | -90 | 6.4 | 10.64 |
| DEX-CZ6815 | 418428.832 | 9673877.922 | 373.770 | 17 | -90 | 3.56 | 10.44 |
| DEX-CZ6816 | 418453.806 | 9673877.780 | 374.000 | 18 | -90 | 12.15 | 5 |
| DEX-CZ6817 | 418481.500 | 9673876.974 | 372.438 | 22 | -90 | 11.03 | 11.51 |
| DEX-CZ6818 | 418507.131 | 9673875.430 | 370.109 | 38 | -90 | 32.47 | 9.32 |
| DEX-CZ6819 | 418529.767 | 9673874.803 | 368.837 | 42 | -90 | 28.56 | 12 |
| DEX-CZ6820 | 418553.904 | 9673872.049 | 369.254 | 31 | -90 | 25.63 | 5 |
| DEX-CZ6821 | 418584.166 | 9673874.296 | 369.633 | 32 | -90 | 28.17 | 6.18 |
| DEX-CZ6822 | 418603.522 | 9673876.119 | 369.438 | 43 | -90 | 30.66 | 10.47 |
| DEX-CZ6823 | 418636.867 | 9673874.367 | 370.414 | 39 | -90 | 26.94 | 12 |
| DEX-CZ6824 | 418655.722 | 9673875.962 | 370.837 | 27 | -90 | 13 | 5 |
| DEX-CZ6825 | 418679.605 | 9673874.195 | 372.055 | 25 | -90 | 16 | 7.65 |
| DEX-CZ6826 | 418704.295 | 9673874.141 | 372.209 | 29 | -90 | 24.49 | 3 |
| DEX-CZ6827 | 418731.015 | 9673876.792 | 371.417 | 30 | -90 | 20 | 8 |
| DEX-CZ6828 | 418230.778 | 9673901.620 | 361.017 | 26 | -90 | 20.85 | 5 |
| DEX-CZ6829 | 418280.953 | 9673902.057 | 364.379 | 30 | -90 | 15.51 | 13 |
| DEX-CZ6830 | 418329.716 | 9673899.961 | 366.879 | 27 | -90 | 13.1 | 12.5 |
| DEX-CZ6831 | 418380.100 | 9673901.472 | 370.781 | 37 | -90 | 15.51 | 17 |
| DEX-CZ6832 | 418431.734 | 9673900.588 | 373.434 | 16 | -90 | 6 | 6 |
| DEX-CZ6833 | 418478.568 | 9673902.542 | 370.878 | 36 | -90 | 25.04 | 9.3 |
| DEX-CZ6834 | 418529.468 | 9673898.169 | 367.234 | 26 | -90 | 13 | 10 |
| DEX-CZ6835 | 418577.457 | 9673895.424 | 368.243 | 40 | -90 | 16.6 | 20.03 |
| DEX-CZ6836 | 418629.883 | 9673902.591 | 368.122 | 29 | -90 | 24.53 | 4.72 |
| DEX-CZ6837 | 418680.442 | 9673899.228 | 369.683 | 25 | -90 | 13 | 10.5 |
| DEX-CZ6838 | 418730.090 | 9673898.644 | 368.211 | 28 | -90 | 17 | 11 |
| DEX-CZ6839 | 418227.842 | 9673929.737 | 364.000 | 38 | -90 | 27.84 | 10.71 |
| DEX-CZ6840 | 418254.076 | 9673927.306 | 364.011 | 29 | -90 | 24.01 | 6.22 |
| DEX-CZ6841 | 418283.233 | 9673924.523 | 365.149 | 57 | -90 | 27.37 | 30.66 |
| DEX-CZ6842 | 418305.458 | 9673925.908 | 365.969 | 45 | -90 | 15.01 | 28.35 |
| DEX-CZ6843 | 418329.283 | 9673926.538 | 366.745 | 29 | -90 | 22.3 | 4 |
| DEX-CZ6844 | 418354.174 | 9673926.013 | 368.689 | 46 | -90 | 28.7 | 16 |
| DEX-CZ6845 | 418380.841 | 9673924.127 | 370.359 | 22 | -90 | 14.64 | 6 |
| DEX-CZ6846 | 418404.747 | 9673924.180 | 371.471 | 27 | -90 | 24.76 | 3 |
| DEX-CZ6847 | 418426.786 | 9673925.273 | 371.256 | 18 | -90 | 11 | 5.25 |
| DEX-CZ6848 | 418455.057 | 9673927.667 | 369.779 | 17 | -90 | 7.27 | 8 |
| DEX-CZ6849 | 418480.535 | 9673924.752 | 368.643 | 38 | -90 | 29.81 | 5 |
| DEX-CZ6850 | 418505.462 | 9673922.041 | 366.178 | 30 | -90 | 28.62 | 1 |
| DEX-CZ6851 | 418530.561 | 9673927.402 | 367.089 | 31 | -90 | 12.37 | 6 |
| DEX-CZ6852 | 418555.228 | 9673925.599 | 368.000 | 49 | -90 | 33 | 15 |
| DEX-CZ6853 | 418576.464 | 9673923.687 | 367.936 | 24 | -90 | 21.25 | 5 |
| DEX-CZ6854 | 418604.985 | 9673923.444 | 365.000 | 23 | -90 | 13 | 8 |
| DEX-CZ6855 | 418629.267 | 9673923.123 | 365.942 | 38 | -90 | 15 | 22 |
| DEX-CZ6856 | 418654.906 | 9673925.891 | 368.059 | 50 | -90 | 54.54 | 4 |
| DEX-CZ6857 | 418680.599 | 9673928.084 | 369.000 | 26 | -90 | 11 | 10 |
| DEX-CZ6858 | 418705.728 | 9673922.539 | 368.998 | 29 | -90 | 22.9 | 3 |
| DEX-CZ6859 | 418729.468 | 9673925.934 | 367.670 | 44 | -90 | 17 | 26.68 |
| DEX-CZ6860 | 418231.165 | 9673953.127 | 364.860 | 31 | -90 | 27.69 | 4 |
| DEX-CZ6861 | 418279.177 | 9673951.465 | 365.581 | 39 | -90 | 18.4 | 11 |
| DEX-CZ6862 | 418327.683 | 9673950.530 | 367.967 | 21 | -90 | 16.18 | 4 |
| DEX-CZ6863 | 418380.184 | 9673950.741 | 368.202 | 20 | -90 | 17.67 | 0.55 |
| DEX-CZ6864 | 418429.160 | 9673949.600 | 368.492 | 21 | -90 | 14.55 | 5 |
| DEX-CZ6865 | 418478.822 | 9673949.978 | 365.497 | 26 | -90 | 24.13 | 4 |
| DEX-CZ6866 | 418529.541 | 9673947.796 | 365.617 | 38 | -90 | 29.65 | 9.52 |
| DEX-CZ6867 | 418581.745 | 9673947.906 | 365.559 | 24 | -90 | 20.46 | 4 |
| DEX-CZ6868 | 418629.855 | 9673950.710 | 363.187 | 26 | -90 | 19 | 5 |
| DEX-CZ6869 | 418682.401 | 9673948.900 | 367.453 | 17 | -90 | 10 | 5 |
| DEX-CZ6870 | 418730.887 | 9673948.337 | 366.203 | 31 | -90 | 18 | 12.64 |
| DEX-CZ6871 | 418256.156 | 9673970.636 | 365.000 | 28 | -90 | 18.65 | 0.55 |
| DEX-CZ6872 | 418280.684 | 9673975.983 | 366.594 | 29 | -90 | 12.37 | 15.31 |
| DEX-CZ6873 | 418308.768 | 9673970.636 | 368.193 | 38 | -90 | 23.97 | 16 |
| DEX-CZ6874 | 418329.753 | 9673974.870 | 369.391 | 18 | -90 | 6 | 10 |
| DEX-CZ6875 | 418354.423 | 9673975.191 | 369.412 | 34 | -90 | 17.91 | 17 |
| DEX-CZ6876 | 418453.774 | 9673978.528 | 362.686 | 23 | -90 | 16.31 | 4 |
| DEX-CZ6877 | 418479.860 | 9673975.647 | 361.633 | 24 | -90 | 17 | 3 |
| DEX-CZ6878 | 418513.285 | 9673975.858 | 355.676 | 26 | -90 | 11 | 15 |
| DEX-CZ6879 | 418555.732 | 9673978.032 | 361.207 | 22 | -90 | 9 | 7 |
| DEX-CZ6880 | 418580.359 | 9673975.380 | 361.654 | 25 | -90 | 20.78 | 4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| TFT1821 | 419201.367 | 9673634.907 | 394.103 | 29 | -90 | 6 | 14 |
| TFT1822 | 419201.928 | 9673586.512 | 416.090 | 20 | -90 | 8 | 9 |
| TFT1823 | 419202.509 | 9673536.875 | 425.097 | 18 | -90 | 4 | 5 |
| TFT1824 | 419202.063 | 9673482.901 | 418.442 | 17 | -90 | 4 | 4 |
| TFT1825 | 419203.646 | 9673435.218 | 413.660 | 20 | -90 | 6 | 11 |
| TFT1826 | 419203.299 | 9673386.214 | 411.968 | 29 | -90 | 3 | 13 |
| TFT1827 | 419225.328 | 9673461.477 | 410.778 | 40 | -90 | 3 | 4 |
| TFT1828 | 419226.626 | 9673636.438 | 390.806 | 24 | -90 | 6 | 1 |
| TFT1829 | 419228.935 | 9673610.105 | 404.110 | 11 | -90 | 3 | 2 |
| TFT1830 | 419227.972 | 9673584.237 | 416.535 | 7 | -90 | 2 | 1 |
| TFT1831 | 419229.329 | 9673563.121 | 420.104 | 12 | -90 | 3 | 0 |
| TFT1832 | 419225.792 | 9673530.917 | 418.520 | 15 | -90 | 1 | 6 |
| TFT1833 | 419229.764 | 9673510.916 | 413.830 | 12 | -90 | 0 | 7 |
| TFT1834 | 419223.840 | 9673484.527 | 413.019 | 19 | -90 | 2 | 14 |
| TFT1835 | 419230.987 | 9673438.101 | 406.424 | 24 | -90 | 9 | 12 |
| TFT1836 | 419226.688 | 9673411.237 | 406.289 | 21 | -90 | 3 | 2 |
| TFT1837 | 419227.006 | 9673385.311 | 403.876 | 18 | -90 | 5 | 7 |
| TFT1838 | 419255.536 | 9673535.131 | 410.371 | 15 | -90 | 4 | 8 |
| TFT1839 | 419254.106 | 9673489.018 | 403.532 | 23 | -90 | 2 | 11 |
| TFT1840 | 419255.251 | 9673436.694 | 400.587 | 18 | -90 | 4 | 10 |
| TFT1841 | 419255.799 | 9673383.813 | 395.789 | 23 | -90 | 5 | 16 |
| TFT1842 | 419277.681 | 9673458.289 | 395.607 | 31 | -90 | 14 | 16 |
| TFT1843 | 419277.479 | 9673535.130 | 403.868 | 22 | -90 | 5 | 11 |
| TFT1844 | 419278.035 | 9673508.904 | 398.992 | 27 | -90 | 18 | 5 |
| TFT1845 | 419276.146 | 9673486.178 | 398.035 | 35 | -90 | 7 | 28 |
| TFT1846 | 419277.534 | 9673436.437 | 394.678 | 21 | -90 | 8 | 6 |
| TFT1847 | 419278.471 | 9673410.280 | 393.995 | 32 | -90 | 7 | 8 |
| TFT1848 | 419277.367 | 9673383.190 | 394.820 | 33 | -90 | 8 | 7 |
| TFT1849 | 419300.703 | 9673534.550 | 398.772 | 32 | -90 | 21 | 5 |
| TFT1850 | 419301.055 | 9673490.214 | 390.474 | 29 | -90 | 7 | 12 |
| TFT1851 | 419306.443 | 9673434.761 | 388.118 | 18 | -90 | 7 | 5 |
| TFT1852 | 419299.033 | 9673383.963 | 389.465 | 27 | -90 | 2 | 1 |
| TFT1853 | 419327.239 | 9673560.533 | 392.719 | 20 | -90 | 2 | 8 |
| TFT1854 | 419331.313 | 9673537.865 | 394.077 | 13 | -90 | 3 | 7 |
| TFT1855 | 419326.501 | 9673510.028 | 391.416 | 35 | -90 | 10 | 7 |
| TFT1856 | 419329.704 | 9673488.428 | 385.762 | 19 | -90 | 3 | 8 |
| TFT1857 | 419328.084 | 9673463.113 | 380.437 | 14 | -90 | 5 | 6 |
| TFT1858 | 419329.568 | 9673437.935 | 382.977 | 18 | -90 | 5 | 8 |
| TFT1859 | 419328.141 | 9673409.271 | 380.482 | 25 | -90 | 13 | 1 |
| TFT1860 | 419327.848 | 9673386.922 | 384.540 | 18 | -90 | 3 | 8 |
| TFT1861 | 419350.887 | 9673537.231 | 391.265 | 30 | -90 | 4 | 22 |
| TFT1862 | 419350.837 | 9673484.706 | 383.476 | 26 | -90 | 9 | 6 |
| TFT1863 | 419348.181 | 9673434.744 | 375.098 | 27 | -90 | 7 | 8 |
| TFT1864 | 419352.748 | 9673386.147 | 379.011 | 15 | -90 | 1 | 11 |
| TFT1865 | 419378.978 | 9673561.601 | 379.217 | 18 | -90 | 4 | 3 |
| TFT1867 | 419380.085 | 9673511.833 | 383.161 | 17 | -90 | 1 | 6 |
| TFT1868 | 419380.071 | 9673484.935 | 379.345 | 33 | -90 | 5 | 17 |
| TFT1869 | 419377.169 | 9673458.599 | 374.605 | 17 | -90 | 9 | 5 |
| TFT1870 | 419376.051 | 9673430.604 | 363.646 | 22 | -90 | 4 | 10 |
| TFT1871 | 419380.958 | 9673411.436 | 368.993 | 15 | -90 | 7 | 4 |
| TFT1873 | 419399.644 | 9673545.365 | 375.539 | 34 | -90 | 7 | 25 |
| TFT1874 | 419404.301 | 9673485.317 | 374.604 | 35 | -90 | 6 | 20 |
| TFT1875 | 419401.862 | 9673435.307 | 358.109 | 12 | -90 | 4 | 0 |
| TFT1877 | 419454.880 | 9673434.617 | 342.253 | 21 | -90 | 3 | 11 |
| TFT1878 | 419430.152 | 9673536.097 | 366.433 | 32 | -90 | 7 | 14 |
| TFT1880 | 419429.518 | 9673486.479 | 368.885 | 27 | -90 | 9 | 12 |
| TFT1881 | 419430.200 | 9673463.072 | 364.474 | 21 | -90 | 8 | 9 |
| TFT1882 | 419429.408 | 9673437.204 | 351.997 | 15 | -90 | 3 | 8 |
| TFT1885 | 419455.763 | 9673532.932 | 359.003 | 30 | -90 | 14 | 8 |
| TFT1886 | 419454.506 | 9673484.877 | 364.052 | 35 | -90 | 11 | 14 |
| TFT1889 | 419479.021 | 9673559.726 | 345.407 | 20 | -90 | 10 | 5 |
| TFT1890 | 419476.176 | 9673539.058 | 351.237 | 28 | -90 | 8 | 14 |
| TFT1891 | 419474.223 | 9673510.218 | 357.575 | 25 | -90 | 12 | 10 |
| TFT1893 | 419478.011 | 9673461.751 | 353.049 | 14 | -90 | 2 | 5 |
| TFT1896 | 419503.004 | 9673535.977 | 345.620 | 19 | -90 | 8 | 7 |
| TFT1897 | 419501.805 | 9673485.603 | 354.977 | 34 | -90 | 7 | 14 |
| TFT1899 | 419527.838 | 9673534.545 | 340.644 | 12 | -90 | 4 | 2 |
| TFT1900 | 419527.592 | 9673512.474 | 345.997 | 9 | -90 | 2 | 3 |
| TFT1901 | 419522.166 | 9673487.433 | 348.711 | 28 | -90 | 3 | 21 |
| TFT1902 | 419527.532 | 9673458.438 | 339.237 | 12 | -90 | 2 | 2 |
| TFT1916 | 419250.509 | 9673636.614 | 387.419 | 17 | -90 | 4 | 10 |
| TFT1921RD | 419249.814 | 9673609.095 | 400.671 | 16 | -90 | 2 | 4 |
| TFT1922 | 419280.540 | 9673613.332 | 389.104 | 9 | -90 | 1 | 4 |
| TFT1925 | 419249.764 | 9673583.628 | 412.265 | 6 | -90 | 1 | 1 |
| TFT1926 | 419280.865 | 9673590.857 | 398.402 | 12 | -90 | 1 | 5 |
| TFT1927 | 419303.032 | 9673586.596 | 391.064 | 15 | -90 | 9 | 4 |
| TFT1928 | 419325.316 | 9673589.394 | 383.583 | 18 | -90 | 5 | 9 |
| TFT1929 | 419353.193 | 9673580.939 | 379.365 | 24 | -90 | 1 | 15 |
| TFT959 | 419827.972 | 9673635.025 | 276.955 | 20 | -90 | 5 | 7 |
| TFT960 | 419827.000 | 9673610.029 | 272.574 | 9 | -90 | 0 | 0 |
| TFT966 | 419852.989 | 9673635.029 | 279.984 | 31 | -90 | 2 | 12.36 |
| TL10 | 421802.990 | 9673359.991 | 69.489 | 12 | -90 | 0 | 7 |
| TL12 | 421602.978 | 9673461.031 | 100.500 | 22.4 | -90 | 0 | 0 |
| TL17 | 421406.039 | 9673462.012 | 133.869 | 38 | -90 | 16 | 6 |
| TL18 | 421350.990 | 9673421.990 | 149.545 | 19.6 | -90 | 1 | 2 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6881 | 418603.978 | 9673974.529 | 358.879 | 27 | -90 | 17 | 8.3 |
| DEX-CZ6882 | 418633.892 | 9673972.179 | 360.976 | 23 | -90 | 14 | 8 |
| DEX-CZ6883 | 418656.551 | 9673972.989 | 364.083 | 31 | -90 | 28.87 | 0 |
| DEX-CZ6884 | 418279.436 | 9674000.239 | 366.190 | 24 | -90 | 11.32 | 12 |
| DEX-CZ6885 | 418329.687 | 9673999.935 | 369.000 | 17 | -90 | 8.28 | 7 |
| DEX-CZ6886 | 418482.364 | 9674001.046 | 359.065 | 24 | -90 | 22.27 | 1 |
| DEX-CZ6887 | 418528.626 | 9673997.096 | 354.643 | 25 | -90 | 12 | 8 |
| DEX-CZ6888 | 418576.797 | 9674001.512 | 358.256 | 34 | -90 | 22 | 11 |
| DEX-CZ6889 | 418629.327 | 9674001.250 | 357.976 | 20 | -90 | 15 | 3 |
| DEX-CZ6890 | 418255.239 | 9674023.975 | 361.798 | 17 | -90 | 11 | 2.23 |
| DEX-CZ6891 | 418279.891 | 9674026.045 | 364.854 | 20 | -90 | 6 | 5.11 |
| DEX-CZ6892 | 418305.114 | 9674025.322 | 367.617 | 12 | -90 | 4 | 6 |
| DEX-CZ6893 | 418327.168 | 9674027.211 | 366.470 | 19 | -90 | 15.43 | 2 |
| DEX-CZ6894 | 418354.066 | 9674026.202 | 365.098 | 24 | -90 | 15.47 | 1.53 |
| DEX-CZ6895 | 418379.987 | 9674023.729 | 363.393 | 30 | -90 | 14 | 14 |
| DEX-CZ6896 | 418404.385 | 9674021.916 | 361.981 | 50 | -90 | 9 | 35.37 |
| DEX-CZ6897 | 418438.007 | 9674026.458 | 359.000 | 28 | -90 | 25.61 | 1 |
| DEX-CZ6898 | 418455.467 | 9674025.606 | 359.622 | 29 | -90 | 20.28 | 7 |
| DEX-CZ6899 | 418479.789 | 9674025.130 | 359.164 | 29 | -90 | 16 | 11 |
| DEX-CZ6900 | 418503.527 | 9674026.366 | 357.144 | 34 | -90 | 23.6 | 14 |
| DEX-CZ6901 | 418530.722 | 9674028.014 | 352.120 | 36 | -90 | 15.56 | 19 |
| DEX-CZ6902 | 418552.229 | 9674021.272 | 351.842 | 13 | -90 | 9 | 4 |
| DEX-CZ6903 | 418580.109 | 9674027.065 | 352.573 | 15 | -90 | 7 | 6 |
| DEX-CZ6904 | 418611.873 | 9674026.433 | 346.506 | 5 | -90 | 1 | 2 |
| DEX-CZ6905 | 418633.598 | 9674026.077 | 354.910 | 34 | -90 | 32.21 | 2 |
| DEX-CZ6906 | 418656.854 | 9674023.504 | 358.758 | 27 | -90 | 21.3 | 5 |
| DEX-CZ6907 | 418280.007 | 9674050.370 | 363.034 | 26 | -90 | 23.26 | 0.63 |
| DEX-CZ6908 | 418329.797 | 9674051.191 | 362.620 | 48 | -90 | 31.65 | 9 |
| DEX-CZ6909 | 418376.275 | 9674048.618 | 362.393 | 37 | -90 | 22 | 13 |
| DEX-CZ6910 | 418428.437 | 9674049.568 | 359.401 | 25 | -90 | 19 | 4 |
| DEX-CZ6911 | 418478.053 | 9674048.016 | 359.000 | 37 | -90 | 12 | 21 |
| DEX-CZ6912 | 418529.608 | 9674050.068 | 352.421 | 39 | -90 | 15 | 19 |
| DEX-CZ6913 | 418582.463 | 9674049.790 | 346.555 | 14 | -90 | 7 | 7 |
| DEX-CZ6914 | 418633.372 | 9674043.612 | 350.179 | 20 | -90 | 17 | 1 |
| DEX-CZ6915 | 418679.808 | 9674046.667 | 357.145 | 26 | -90 | 11 | 15.23 |
| DEX-CZ6916 | 418728.373 | 9674050.634 | 359.316 | 16 | -90 | 10 | 5 |
| DEX-CZ6917 | 418880.552 | 9674056.287 | 348.559 | 30 | -90 | 26.24 | 2 |
| DEX-CZ6918 | 418930.395 | 9674053.604 | 347.078 | 34 | -90 | 16 | 13 |
| DEX-CZ6919 | 418980.216 | 9674048.850 | 347.029 | 28 | -90 | 12 | 15 |
| DEX-CZ6920 | 419030.593 | 9674049.867 | 348.668 | 21 | -90 | 13.61 | 6 |
| DEX-CZ6921 | 418255.194 | 9674075.066 | 357.387 | 26 | -90 | 23.03 | 3 |
| DEX-CZ6922 | 418280.085 | 9674075.857 | 359.694 | 25 | -90 | 18.04 | 5 |
| DEX-CZ6923 | 418307.625 | 9674072.631 | 361.301 | 24 | -90 | 14 | 1 |
| DEX-CZ6924 | 418330.904 | 9674075.776 | 359.696 | 22 | -90 | 17 | 3 |
| DEX-CZ6925 | 418355.770 | 9674077.201 | 360.021 | 26 | -90 | 25.35 | 2 |
| DEX-CZ6926 | 418378.389 | 9674073.050 | 360.524 | 28 | -90 | 18.36 | 7 |
| DEX-CZ6927 | 418405.385 | 9674074.809 | 359.941 | 37 | -90 | 18 | 15 |
| DEX-CZ6928 | 418429.166 | 9674075.547 | 359.261 | 25 | -90 | 11.35 | 13.65 |
| DEX-CZ6929 | 418454.634 | 9674076.864 | 359.269 | 43 | -90 | 19 | 20.37 |
| DEX-CZ693 | 416006.059 | 9673121.314 | 369.600 | 20 | -90 | 7.12 | 4.8 |
| DEX-CZ6931 | 418580.767 | 9674075.338 | 336.081 | 5 | -90 | 2 | 1 |
| DEX-CZ6932 | 418604.463 | 9674074.671 | 339.000 | 26 | -90 | 22 | 2 |
| DEX-CZ6933 | 418627.352 | 9674078.272 | 349.950 | 28 | -90 | 10 | 17 |
| DEX-CZ6934 | 418657.224 | 9674076.116 | 355.095 | 46 | -90 | 39.47 | 6 |
| DEX-CZ6935 | 418678.962 | 9674076.984 | 357.470 | 26 | -90 | 19 | 7 |
| DEX-CZ6936 | 418704.858 | 9674075.610 | 357.079 | 17 | -90 | 14 | 1.35 |
| DEX-CZ6939 | 418857.546 | 9674074.958 | 349.364 | 24 | -90 | 12 | 10 |
| DEX-CZ6940 | 418878.898 | 9674075.180 | 351.383 | 24 | -90 | 9 | 11 |
| DEX-CZ6941 | 418906.129 | 9674075.074 | 349.836 | 27 | -90 | 22.64 | 3.26 |
| DEX-CZ6942 | 418930.347 | 9674073.113 | 346.578 | 38 | -90 | 27.92 | 11.35 |
| DEX-CZ6943 | 418954.600 | 9674072.982 | 344.962 | 28 | -90 | 26.45 | 0 |
| DEX-CZ6944 | 418981.140 | 9674073.844 | 345.135 | 26 | -90 | 18.32 | 6 |
| DEX-CZ6945 | 419004.963 | 9674074.747 | 346.829 | 22 | -90 | 18.27 | 2 |
| DEX-CZ6946 | 419030.903 | 9674075.808 | 348.000 | 28 | -90 | 20.57 | 8.29 |
| DEX-CZ6947 | 419056.044 | 9674073.277 | 348.000 | 34 | -90 | 24 | 8 |
| DEX-CZ6948 | 418278.246 | 9674101.968 | 355.332 | 32 | -90 | 23.02 | 8 |
| DEX-CZ6949 | 418328.731 | 9674098.960 | 356.549 | 18 | -90 | 15 | 1 |
| DEX-CZ6950 | 418380.755 | 9674098.752 | 359.027 | 52 | -90 | 49.22 | 4 |
| DEX-CZ6951 | 418429.741 | 9674101.942 | 360.000 | 55 | -90 | 22 | 32.71 |
| DEX-CZ6953 | 418633.236 | 9674101.817 | 356.026 | 22 | -90 | 12 | 8 |
| DEX-CZ6954 | 418679.933 | 9674100.238 | 356.875 | 22 | -90 | 10 | 5 |
| DEX-CZ6956 | 418879.008 | 9674099.017 | 352.000 | 21 | -90 | 12 | 8 |
| DEX-CZ6957 | 418929.355 | 9674100.184 | 344.982 | 46 | -90 | 26.8 | 20.59 |
| DEX-CZ6958 | 418980.185 | 9674096.010 | 345.742 | 25 | -90 | 21 | 2 |
| DEX-CZ6959 | 419028.685 | 9674099.230 | 348.000 | 42 | -90 | 31.96 | 9 |
| DEX-CZ6960 | 419080.677 | 9674098.415 | 348.000 | 28 | -90 | 26.3 | 0 |
| DEX-CZ6961 | 418253.057 | 9674126.311 | 349.032 | 42 | -90 | 20.56 | 10.28 |
| DEX-CZ6962 | 418280.055 | 9674125.245 | 352.071 | 20 | -90 | 10 | 7 |
| DEX-CZ6963 | 418306.333 | 9674125.522 | 354.071 | 23 | -90 | 15 | 6 |
| DEX-CZ6964 | 418337.924 | 9674124.944 | 355.550 | 34 | -90 | 22.54 | 8.4 |
| DEX-CZ6965 | 418354.122 | 9674125.476 | 354.774 | 47 | -90 | 20.68 | 26.92 |
| DEX-CZ6966 | 418381.452 | 9674124.995 | 355.058 | 34 | -90 | 19 | 14.03 |
| DEX-CZ6967 | 418405.562 | 9674125.949 | 356.421 | 45 | -90 | 31.25 | 13 |
| DEX-CZ6968 | 418430.038 | 9674123.015 | 359.033 | 47 | -90 | 25.4 | 21 |
| DEX-CZ6969 | 418456.537 | 9674123.186 | 357.555 | 16 | -90 | 6 | 4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| TL3 | 421652.970 | 9673460.070 | 99.704 | 15 | -90 | 2 | 0 |
| TL5 | 421652.978 | 9673409.972 | 98.413 | 14 | -90 | 5 | 6 |
| TL7 | 421754.951 | 9673402.975 | 86.992 | 20 | -90 | 0 | 2 |
| TL9 | 421753.020 | 9673360.030 | 86.974 | 33 | -90 | 1 | 4 |
| BB190052 | 414566.126 | 9675613.948 | 459.016 | 17 | -90 | 2 | 9.8 |
| BB190031 | 413806.779 | 9676286.985 | 471.429 | 8 | -90 | 3.3 | 4.95 |
| BB190043 | 414307.525 | 9675656.739 | 474.962 | 7 | -90 | 3.7 | 0.3 |
| BB190059 | 414551.525 | 9675550.629 | 467.769 | 9 | -90 | 6 | 0 |
| BB190039 | 414196.322 | 9675456.747 | 464.889 | 10 | -90 | 4.5 | 4.3 |
| BB190105 | 414159.687 | 9676063.319 | 515.982 | 19 | -90 | 14.21 | 4.54 |
| DX00022 | 415301.082 | 9675796.984 | 458.151 | 20 | -90 | 10.18 | 7.85 |
| DX00099 | 415202.349 | 9676299.342 | 459.105 | 8 | -90 | 0 | 3 |
| DX00068 | 415500.035 | 9676096.548 | 441.911 | 13 | -90 | 5.87 | 4.42 |
| DX00114 | 414599.568 | 9675551.913 | 453.388 | 12 | -90 | 4.15 | 4.56 |
| DEX-BB2026 | 413696.099 | 9675747.291 | 431.532 | 17 | -90 | 1 | 12 |
| DX00147 | 414691.211 | 9675746.488 | 489.740 | 19 | -90 | 14.34 | 5.5 |
| DEX-BB2043 | 413549.808 | 9675550.003 | 387.260 | 19 | -90 | 8 | 7 |
| DX00183 | 414545.582 | 9675302.532 | 446.162 | 17 | -90 | 4.13 | 6.14 |
| BB190048 | 414346.625 | 9675603.683 | 475.243 | 12 | -90 | 1.6 | 7.4 |
| BB190071 | 414438.156 | 9675449.335 | 481.475 | 8 | -90 | 3.5 | 0 |
| DEX-BB091 | 414002.595 | 9675257.691 | 412.846 | 13 | -90 | 2 | 9.38 |
| DX00024 | 415502.887 | 9675807.473 | 432.798 | 23 | -90 | 11.89 | 2.64 |
| DX00113 | 414587.432 | 9675457.420 | 455.570 | 14 | -90 | 1 | 3 |
| DEX-BB2047 | 413597.614 | 9675498.341 | 392.263 | 9 | -90 | 2 | 4 |
| DX00159 | 414741.838 | 9675557.533 | 446.134 | 11 | -90 | 8.82 | 0 |
| BB190055 | 414351.841 | 9675550.768 | 486.006 | 8 | -90 | 2 | 1.9 |
| DX00130 | 414662.044 | 9675897.469 | 494.423 | 14 | -90 | 10.95 | 2 |
| DEX-MIA053 | 413003.213 | 9675926.621 | 365.657 | 7 | -90 | 0 | 0 |
| DX00002 | 414602.092 | 9675505.213 | 465.142 | 8 | -90 | 2 | 1 |
| BB190056 | 414389.219 | 9675549.968 | 479.541 | 9 | -90 | 1 | 0.95 |
| NCZ21-10003 | 415396.645 | 9675395.435 | 432.646 | 13 | -90 | 8.91 | 2.31 |
| BB190012 | 414051.979 | 9676064.487 | 515.640 | 20 | -90 | 14.67 | 6.47 |
| DEX-BB2046 | 413564.907 | 9675507.489 | 390.874 | 10 | -90 | 5 | 2 |
| BB190106 | 414150.261 | 9675956.339 | 510.333 | 23 | -90 | 14.21 | 9.09 |
| BB190073 | 414554.053 | 9675456.912 | 465.936 | 14 | -90 | 2 | 6.85 |
| DEX-BB2025 | 413654.497 | 9675733.264 | 423.903 | 14 | -90 | 1 | 1 |
| DEX-MIA003 | 413406.970 | 9676130.015 | 342.011 | 25 | -90 | 7.22 | 19.9 |
| DX00066 | 415302.761 | 9676101.459 | 459.788 | 19 | -90 | 6.38 | 8 |
| BB190064 | 414451.306 | 9675499.649 | 481.955 | 23 | -90 | 5.08 | 9.85 |
| DX00014 | 414604.310 | 9676387.119 | 493.290 | 11 | -90 | 3.3 | 3.2 |
| DEX-MIA089 | 413201.942 | 9675829.222 | 361.953 | 7 | -90 | 4 | 0 |
| BB190042R | 414251.087 | 9675656.901 | 487.509 | 13 | -90 | 10.8 | 3.1 |
| BB190083 | 413904.449 | 9675977.848 | 492.789 | 15 | -90 | 10.07 | 6.48 |
| DX00047 | 415500.919 | 9675701.289 | 440.262 | 8 | -90 | 2 | 0 |
| BB190050 | 414453.069 | 9675596.039 | 461.965 | 23 | -90 | 3.2 | 1 |
| BB190058 | 414493.774 | 9675552.046 | 470.892 | 32 | -90 | 15.62 | 17.38 |
| BB190092 | 414127.399 | 9675811.638 | 522.886 | 11 | -90 | 8.21 | 2.2 |
| BB190021 | 413951.965 | 9676116.009 | 512.344 | 30 | -90 | 18.95 | 1.25 |
| DEX-MIA131 | 413308.279 | 9675647.577 | 364.943 | 9 | -90 | 0 | 0 |
| DX00019 | 415002.918 | 9675797.225 | 471.231 | 31 | -90 | 14.02 | 24.88 |
| DX00080 | 414795.693 | 9675496.711 | 443.529 | 12 | -90 | 5.42 | 0 |
| DEX-MIA092 | 413305.177 | 9675765.322 | 377.439 | 8 | -90 | 2 | 2 |
| BB190057 | 414440.753 | 9675549.439 | 475.756 | 17 | -90 | 5 | 4 |
| DX00010 | 414616.971 | 9676008.122 | 493.413 | 9 | -90 | 5.6 | 2 |
| DEX-MIA006 | 413117.047 | 9676088.382 | 390.037 | 8 | -90 | 2 | 2 |
| DX00093 | 415191.128 | 9676201.946 | 468.308 | 18 | -90 | 3 | 12.31 |
| DX00102 | 414895.184 | 9676391.156 | 479.259 | 8 | -90 | 1 | 3.54 |
| BB190049 | 414401.623 | 9675601.363 | 465.336 | 11 | -90 | 3 | 3 |
| DX00054 | 415101.803 | 9676003.302 | 457.054 | 9 | -90 | 3.87 | 3.26 |
| BB190038 | 414190.764 | 9675403.849 | 460.379 | 9 | -90 | 4.2 | 0 |
| BB190062 | 414354.328 | 9675499.809 | 491.626 | 12 | -90 | 2.53 | 5.85 |
| BB190060 | 414244.017 | 9675500.023 | 467.989 | 8 | -90 | 6.8 | 0 |
| BB190063 | 414399.327 | 9675497.317 | 488.129 | 19 | -90 | 7.63 | 6.16 |
| BB190065 | 414487.033 | 9675500.854 | 478.034 | 12 | -90 | 5.85 | 2.6 |
| DX00139 | 414640.789 | 9675758.981 | 495.943 | 22 | -90 | 13.69 | 7.65 |
| DX00039 | 414694.341 | 9675702.384 | 484.488 | 18 | -90 | 3 | 2.8 |
| DX00033 | 415207.183 | 9675899.965 | 468.330 | 17 | -90 | 9.32 | 8.65 |
| DX00079 | 414699.945 | 9675494.555 | 447.377 | 5 | -90 | 3 | 0 |
| DX00120 | 414596.432 | 9675943.567 | 497.422 | 24 | -90 | 5 | 12 |
| DEX-BB064 | 414502.626 | 9675359.277 | 455.500 | 18 | -90 | 6.68 | 3.97 |
| DX00069 | 414692.637 | 9675606.189 | 459.438 | 21 | -90 | 20.37 | 2 |
| DX00088 | 414707.959 | 9676209.354 | 507.426 | 22 | -90 | 8.56 | 11.35 |
| DX00040 | 414776.395 | 9675703.612 | 465.179 | 23 | -90 | 4.28 | 1 |
| DX00076 | 415399.065 | 9675600.122 | 449.164 | 20 | -90 | 13.14 | 1.51 |
| DX00084 | 415196.240 | 9675500.880 | 436.177 | 24 | -90 | 16.66 | 10.36 |
| DX00151 | 414734.954 | 9675698.010 | 473.695 | 22 | -90 | 11.86 | 4 |
| BB190046 | 414248.463 | 9675606.006 | 494.059 | 9 | -90 | 7.01 | 0 |
| BB190051 | 414499.194 | 9675601.985 | 459.047 | 10 | -90 | 4.1 | 0 |
| DX00021 | 415200.731 | 9675796.793 | 473.776 | 11 | -90 | 5.89 | 2.24 |
| DX00090 | 414893.956 | 9676204.338 | 492.350 | 17 | -90 | 5.92 | 12.86 |
| NCZ21-10008 | 415295.115 | 9675299.152 | 449.671 | 29 | -90 | 20.95 | 8.11 |
| DEX-MIA004 | 413319.021 | 9676129.124 | 337.203 | 17 | -90 | 15.86 | 1 |
| DX00045 | 415298.932 | 9675697.457 | 462.862 | 28 | -90 | 17.32 | 4.58 |
| DX00134 | 414642.539 | 9675455.649 | 451.112 | 8 | -90 | 2 | 3.13 |
| DEX-BB092 | 414097.674 | 9675259.152 | 419.662 | 15 | -90 | 1 | 12.11 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6970 | 418579.826 | 9674124.689 | 344.390 | 23 | -90 | 12 | 11 |
| DEX-CZ6971 | 418610.398 | 9674124.132 | 353.519 | 13 | -90 | 6 | 3 |
| DEX-CZ6972 | 418633.147 | 9674122.280 | 358.968 | 32 | -90 | 24 | 8 |
| DEX-CZ6973 | 418657.749 | 9674126.834 | 358.090 | 17 | -90 | 10 | 2 |
| DEX-CZ6974 | 418677.553 | 9674127.123 | 354.820 | 22 | -90 | 8 | 12 |
| DEX-CZ6976 | 418726.911 | 9674121.691 | 330.448 | 14 | -90 | 4 | 8 |
| DEX-CZ6977 | 418755.867 | 9674131.401 | 333.249 | 12 | -90 | 3 | 9 |
| DEX-CZ6978 | 418856.309 | 9674132.712 | 348.783 | 24 | -90 | 11 | 13 |
| DEX-CZ6979 | 418884.851 | 9674121.142 | 350.595 | 19 | -90 | 11 | 7 |
| DEX-CZ6980 | 418902.177 | 9674123.943 | 348.432 | 17 | -90 | 13 | 2 |
| DEX-CZ6981 | 418931.228 | 9674126.764 | 345.437 | 28 | -90 | 21.27 | 7.35 |
| DEX-CZ6982 | 418954.229 | 9674128.084 | 346.723 | 38 | -90 | 25.53 | 14 |
| DEX-CZ6983 | 418978.327 | 9674126.612 | 348.807 | 23 | -90 | 12 | 11 |
| DEX-CZ6984 | 419004.709 | 9674124.669 | 350.457 | 26 | -90 | 7 | 14 |
| DEX-CZ6985 | 419029.595 | 9674124.420 | 350.265 | 17 | -90 | 12 | 2 |
| DEX-CZ6986 | 419056.843 | 9674126.607 | 348.729 | 23 | -90 | 13 | 8 |
| DEX-CZ6987 | 419079.688 | 9674123.832 | 348.000 | 35 | -90 | 24.38 | 11 |
| DEX-CZ6988 | 418280.822 | 9674150.612 | 348.160 | 19 | -90 | 10 | 6 |
| DEX-CZ6989 | 418328.999 | 9674148.049 | 350.436 | 32 | -90 | 28.61 | 3 |
| DEX-CZ699 | 416803.563 | 9673649.399 | 346.037 | 14 | -90 | 4 | 4.36 |
| DEX-CZ6990 | 418379.902 | 9674151.089 | 354.750 | 55 | -90 | 39.52 | 16 |
| DEX-CZ6991 | 418429.864 | 9674151.800 | 356.504 | 21 | -90 | 9 | 6 |
| DEX-CZ6992 | 418582.830 | 9674152.683 | 350.270 | 24 | -90 | 14 | 10 |
| DEX-CZ6993 | 418632.594 | 9674151.160 | 359.990 | 32 | -90 | 9 | 6 |
| DEX-CZ6994 | 418677.422 | 9674150.282 | 351.320 | 19 | -90 | 11.32 | 6.68 |
| DEX-CZ6995 | 418728.171 | 9674147.587 | 326.160 | 5 | -90 | 2 | 0 |
| DEX-CZ6996 | 418878.955 | 9674149.674 | 347.727 | 22 | -90 | 19 | 2 |
| DEX-CZ6997 | 418931.667 | 9674151.718 | 347.622 | 31 | -90 | 20.85 | 11.26 |
| DEX-CZ6998 | 418980.477 | 9674148.798 | 351.661 | 37 | -90 | 26 | 10 |
| DEX-CZ6999 | 419031.881 | 9674148.471 | 351.619 | 19 | -90 | 10 | 7 |
| DEX-CZ700 | 416848.529 | 9673648.537 | 353.616 | 15 | -90 | 8.83 | 5.9 |
| DEX-CZ7000 | 419081.547 | 9674149.530 | 346.842 | 25 | -90 | 23.91 | 1 |
| DEX-CZ7001 | 418330.995 | 9674176.233 | 347.702 | 9 | -90 | 6 | 1 |
| DEX-CZ7002 | 418356.441 | 9674175.869 | 351.527 | 29 | -90 | 22.86 | 4 |
| DEX-CZ7003 | 418379.805 | 9674177.150 | 353.776 | 44 | -90 | 27.33 | 11 |
| DEX-CZ7004 | 418405.621 | 9674176.490 | 355.000 | 41 | -90 | 7 | 28.26 |
| DEX-CZ7005 | 418428.237 | 9674174.128 | 354.913 | 30 | -90 | 10 | 17 |
| DEX-CZ7006 | 418451.627 | 9674176.186 | 351.952 | 18 | -90 | 4 | 8 |
| DEX-CZ7007 | 418905.033 | 9674175.100 | 349.805 | 38 | -90 | 37.38 | 2 |
| DEX-CZ7008 | 418929.422 | 9674175.500 | 350.440 | 41 | -90 | 19.28 | 20 |
| DEX-CZ7009 | 418955.611 | 9674173.139 | 351.221 | 28 | -90 | 20.35 | 6 |
| DEX-CZ701 | 416894.674 | 9673649.954 | 349.351 | 29 | -90 | 15.02 | 15.23 |
| DEX-CZ7010 | 418980.234 | 9674173.215 | 352.494 | 28 | -90 | 23.39 | 6 |
| DEX-CZ7011 | 419003.383 | 9674174.299 | 352.000 | 32 | -90 | 20.22 | 12 |
| DEX-CZ7012 | 418329.879 | 9674198.356 | 346.250 | 32 | -90 | 22 | 10 |
| DEX-CZ7013 | 418380.961 | 9674201.561 | 352.924 | 28 | -90 | 17 | 8 |
| DEX-CZ7014 | 418431.840 | 9674201.010 | 352.376 | 14 | -90 | 4 | 7 |
| DEX-CZ7015 | 418331.040 | 9674223.338 | 344.856 | 41 | -90 | 20 | 14 |
| DEX-CZ7016 | 418356.197 | 9674227.024 | 348.399 | 27 | -90 | 19 | 6 |
| DEX-CZ7017 | 418380.579 | 9674226.284 | 352.024 | 21 | -90 | 14 | 4 |
| DEX-CZ7018 | 418405.239 | 9674221.791 | 353.894 | 9 | -90 | 7 | 0 |
| DEX-CZ7019 | 418426.698 | 9674225.398 | 351.868 | 19 | -90 | 5 | 12 |
| DEX-CZ702 | 416949.895 | 9673645.670 | 344.189 | 25 | -90 | 16.88 | 11.36 |
| DEX-CZ7020 | 418455.103 | 9674230.657 | 345.633 | 24 | -90 | 22.25 | 0 |
| DEX-CZ7021 | 418326.978 | 9674244.781 | 344.179 | 20 | -90 | 11 | 7 |
| DEX-CZ7022 | 418381.399 | 9674250.162 | 350.765 | 19 | -90 | 11 | 5 |
| DEX-CZ7023 | 418429.883 | 9674250.602 | 348.163 | 12 | -90 | 8 | 3 |
| DEX-CZ7024 | 418330.409 | 9674272.886 | 343.918 | 34 | -90 | 30 | 2 |
| DEX-CZ7025 | 418356.568 | 9674273.671 | 347.776 | 14 | -90 | 5 | 7 |
| DEX-CZ7026 | 418384.754 | 9674276.067 | 349.124 | 17 | -90 | 6 | 9 |
| DEX-CZ7027 | 418408.400 | 9674281.168 | 346.637 | 18 | -90 | 8 | 10 |
| DEX-CZ7028 | 418434.109 | 9674276.045 | 343.173 | 17 | -90 | 14.24 | 1 |
| DEX-CZ7029 | 418458.674 | 9674275.017 | 340.014 | 24 | -90 | 21 | 1 |
| DEX-CZ7030 | 418332.095 | 9674300.190 | 343.358 | 28 | -90 | 11 | 15 |
| DEX-CZ7031 | 418376.882 | 9674301.339 | 347.234 | 10 | -90 | 4 | 4 |
| DEX-CZ7032 | 418425.696 | 9674298.511 | 340.909 | 26 | -90 | 21.96 | 5.25 |
| DEX-CZ7033 | 418330.412 | 9674328.153 | 340.318 | 23 | -90 | 18.25 | 3 |
| DEX-CZ7034 | 418357.885 | 9674323.779 | 343.600 | 9 | -90 | 6 | 1 |
| DEX-CZ7035 | 418373.030 | 9674327.536 | 342.000 | 12 | -90 | 6 | 4 |
| DEX-CZ7036 | 418400.077 | 9674326.286 | 339.371 | 16 | -90 | 12 | 2 |
| DEX-CZ7037 | 418429.451 | 9674323.213 | 335.550 | 21 | -90 | 17.25 | 2 |
| DEX-CZ7038 | 418449.966 | 9674322.551 | 333.080 | 22 | -90 | 18 | 2 |
| DEX-CZ7039 | 418323.769 | 9674349.436 | 336.917 | 22 | -90 | 11 | 11 |
| DEX-CZ7040 | 418380.197 | 9674347.886 | 336.890 | 22 | -90 | 14 | 7 |
| DEX-CZ7041 | 418419.570 | 9674348.482 | 328.987 | 21 | -90 | 11 | 10 |
| DEX-CZ7042 | 417179.343 | 9673624.224 | 346.119 | 30 | -90 | 29.79 | 1 |
| DEX-CZ7043 | 417204.088 | 9673623.757 | 344.000 | 43 | -90 | 40.33 | 4 |
| DEX-CZ7044 | 417227.714 | 9673624.285 | 344.018 | 47 | -90 | 34.29 | 9 |
| DEX-CZ7045 | 417254.911 | 9673624.994 | 344.542 | 35 | -90 | 31.26 | 1 |
| DEX-CZ7046 | 417279.845 | 9673623.181 | 345.738 | 39 | -90 | 34.82 | 2 |
| DEX-CZ7047 | 417306.007 | 9673625.134 | 346.621 | 26 | -90 | 22 | 2 |
| DEX-CZ7048 | 417330.756 | 9673625.515 | 347.075 | 35 | -90 | 33 | 0 |
| DEX-CZ7050 | 417454.827 | 9673627.884 | 350.472 | 35 | -90 | 31.71 | 1 |
| DEX-CZ7051 | 417481.043 | 9673626.580 | 352.031 | 27 | -90 | 20 | 2 |
| DEX-CZ7052 | 417504.982 | 9673625.235 | 352.238 | 23 | -90 | 16.4 | 4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DX00089 | 414794.682 | 9676187.965 | 506.696 | 21 | -90 | 0 | 8.3 |
| DX00121 | 414605.505 | 9676040.753 | 492.787 | 27 | -90 | 15.46 | 7.71 |
| DX00189 | 414562.937 | 9675900.042 | 502.598 | 26 | -90 | 18.04 | 3.4 |
| DEX-BB065 | 413452.938 | 9675810.478 | 387.815 | 11 | -90 | 4.2 | 1.1 |
| DX00031 | 414993.645 | 9675904.725 | 469.885 | 21 | -90 | 2 | 17 |
| DX00160 | 414745.123 | 9675662.069 | 462.600 | 22 | -90 | 7 | 7 |
| DX00184 | 414555.285 | 9675354.000 | 445.443 | 6 | -90 | 2 | 2.45 |
| DX00009 | 414602.613 | 9675897.790 | 499.938 | 24 | -90 | 14.42 | 2.26 |
| DX00056 | 415296.752 | 9676003.417 | 468.301 | 11 | -90 | 2 | 7.6 |
| DEX-BB108 | 414455.170 | 9675213.617 | 421.563 | 12 | -90 | 0 | 7.2 |
| BB190030 | 413812.892 | 9676260.378 | 484.406 | 8 | -90 | 3.4 | 3.95 |
| BB190034 | 413844.965 | 9676258.491 | 490.524 | 8 | -90 | 3.85 | 2.3 |
| DEX-BB068 | 413442.262 | 9675712.582 | 387.662 | 13 | -90 | 2 | 8.27 |
| DX00032 | 415098.197 | 9675906.173 | 460.957 | 22 | -90 | 5.92 | 8.55 |
| DEX-BB094 | 414148.330 | 9675508.153 | 481.242 | 34 | -90 | 9 | 25.2 |
| DX00124 | 414646.998 | 9675501.831 | 454.460 | 9 | -90 | 2 | 4 |
| BB190078 | 414499.885 | 9675405.545 | 462.888 | 23 | -90 | 7.94 | 11.75 |
| BB190099 | 414104.681 | 9676158.196 | 523.206 | 18 | -90 | 9.98 | 8.49 |
| DX00011 | 414604.519 | 9676099.899 | 489.760 | 21 | -90 | 10.52 | 6.34 |
| DX00119 | 414601.612 | 9675861.214 | 502.481 | 23 | -90 | 6.39 | 8 |
| NCZ21-10001 | 415189.218 | 9675409.301 | 439.107 | 33 | -90 | 15.23 | 17.99 |
| BB190008 | 413856.708 | 9676008.572 | 485.436 | 21 | -90 | 9.03 | 3 |
| BB190036 | 413904.645 | 9676256.332 | 494.766 | 17 | -90 | 7.91 | 7.71 |
| DEX-BB070 | 413504.849 | 9675659.400 | 388.694 | 24 | -90 | 3.14 | 13.89 |
| DX00003 | 414601.035 | 9675404.282 | 452.524 | 14 | -90 | 8.17 | 5.7 |
| DX00042 | 414998.264 | 9675694.165 | 461.853 | 15 | -90 | 6.32 | 1 |
| DX00023 | 415396.186 | 9675796.145 | 448.418 | 8 | -90 | 4.65 | 1.11 |
| DX00148 | 414697.930 | 9675859.584 | 494.082 | 16 | -90 | 14.61 | 4 |
| DX00185 | 414543.868 | 9675698.538 | 495.922 | 36 | -90 | 16.07 | 14.49 |
| BB190082 | 413850.183 | 9675955.421 | 489.100 | 29 | -90 | 9.98 | 11.22 |
| DEX-BB078 | 413645.250 | 9675506.284 | 389.897 | 25 | -90 | 25.85 | 1.35 |
| DEX-MIA091 | 413395.698 | 9675841.227 | 376.990 | 7 | -90 | 5 | 2 |
| DX00028 | 414713.367 | 9675895.700 | 482.122 | 18 | -90 | 4.2 | 7.7 |
| DX00100 | 414712.299 | 9676409.114 | 502.396 | 17 | -90 | 4.38 | 11.37 |
| DX00063 | 414989.485 | 9676090.368 | 484.541 | 15 | -90 | 6.5 | 10.05 |
| DX00098 | 415104.844 | 9676296.802 | 484.824 | 17 | -90 | 2 | 8.08 |
| DX00141 | 414646.667 | 9675948.418 | 489.337 | 29 | -90 | 13.67 | 18.16 |
| DX00188 | 414547.695 | 9675848.361 | 504.775 | 18 | -90 | 10.73 | 5.3 |
| DX00077 | 415495.235 | 9675605.474 | 427.501 | 19 | -90 | 9.82 | 7.22 |
| DX00092 | 415091.474 | 9676203.786 | 484.590 | 16 | -90 | 2 | 13.51 |
| BB190047 | 414300.750 | 9675608.904 | 489.057 | 10 | -90 | 3 | 3.82 |
| DX00125 | 414642.812 | 9675399.908 | 442.726 | 17 | -90 | 8.79 | 4 |
| DX00152 | 414749.848 | 9675610.824 | 452.779 | 18 | -90 | 8.59 | 7.9 |
| BB190104 | 414101.645 | 9675960.895 | 508.238 | 25 | -90 | 14.53 | 4.2 |
| DX00059 | 415600.656 | 9675995.095 | 441.425 | 17 | -90 | 4.04 | 11.42 |
| DX00062 | 414896.600 | 9676091.360 | 494.280 | 24 | -90 | 8.03 | 15.31 |
| DX00112 | 414602.245 | 9675360.056 | 445.103 | 19 | -90 | 13.52 | 0 |
| BB190014 | 414050.254 | 9676307.035 | 526.972 | 23 | -90 | 15.29 | 7.75 |
| DX00058 | 415501.394 | 9675999.484 | 453.566 | 23 | -90 | 7.1 | 14.76 |
| DX00129 | 414645.537 | 9675808.480 | 494.449 | 37 | -90 | 32.96 | 8.15 |
| BB190024 | 413897.104 | 9676162.614 | 499.523 | 23 | -90 | 8.76 | 12.35 |
| DX00094 | 414699.618 | 9676305.579 | 507.695 | 20 | -90 | 4.82 | 16.88 |
| NCZ21-10002 | 415312.731 | 9675387.940 | 440.034 | 33 | -90 | 26.47 | 9.86 |
| DEX-BB011 | 413917.156 | 9675713.001 | 485.065 | 17 | -90 | 3.47 | 10.32 |
| DEX-MIA137 | 413106.184 | 9675536.671 | 334.765 | 5 | -90 | 0 | 0 |
| DX00015 | 414604.878 | 9676453.853 | 493.709 | 11 | -90 | 2 | 9.15 |
| DX00053 | 414992.029 | 9676006.923 | 482.212 | 12 | -90 | 6.07 | 3.31 |
| DX00067 | 415393.800 | 9676099.322 | 449.107 | 9 | -90 | 5.16 | 1 |
| BB190072 | 414497.297 | 9675447.814 | 472.322 | 17 | -90 | 2 | 10.9 |
| DEX-BB090 | 413898.385 | 9675260.956 | 394.106 | 11 | -90 | 3 | 4 |
| DEX-BB2045 | 413750.860 | 9675549.053 | 409.977 | 19 | -90 | 5 | 11 |
| DEX-BB2050 | 413753.400 | 9675452.722 | 396.423 | 16 | -90 | 5 | 7 |
| DX00052 | 414900.539 | 9676001.210 | 496.688 | 19 | -90 | 4.48 | 14.1 |
| BB190019 | 414004.198 | 9676260.357 | 524.014 | 15 | -90 | 9.38 | 6.2 |
| DX00007 | 414595.958 | 9675709.522 | 490.195 | 25 | -90 | 18.41 | 10.36 |
| DX00035 | 415397.579 | 9675901.228 | 449.664 | 17 | -90 | 12.58 | 5.83 |
| DEX-BB004 | 413747.746 | 9675955.645 | 490.839 | 14 | -90 | 1 | 11.37 |
| DX00030 | 414893.625 | 9675905.470 | 481.295 | 21 | -90 | 13.19 | 9.22 |
| DX00057 | 415399.783 | 9676003.314 | 445.941 | 16 | -90 | 11.68 | 3.29 |
| DX00095 | 414801.031 | 9676306.935 | 499.384 | 22 | -90 | 4.56 | 15.84 |
| DEX-BB007 | 414105.003 | 9676061.800 | 519.130 | 24 | -90 | 18.24 | 6.33 |
| DEX-BB2040 | 413510.613 | 9675610.194 | 382.182 | 10 | -90 | 2 | 3 |
| DEX-MIA041 | 412999.481 | 9676039.304 | 343.796 | 7 | -90 | 2 | 2 |
| DX00083 | 415097.620 | 9675498.684 | 433.040 | 15 | -90 | 10.49 | 5.63 |
| DX00140 | 414650.228 | 9675840.786 | 496.931 | 20 | -90 | 10.48 | 8.39 |
| BB190017 | 414002.923 | 9676061.031 | 511.026 | 19 | -90 | 10.66 | 5.65 |
| DEX-MIA087 | 413003.908 | 9675820.630 | 382.055 | 8 | -90 | 0 | 0 |
| DEX-MIA093 | 413203.947 | 9675730.623 | 383.272 | 19 | -90 | 3.8 | 8.74 |
| DX00020 | 415104.681 | 9675798.237 | 469.765 | 29 | -90 | 12.19 | 16.07 |
| DX00051 | 414790.786 | 9675998.734 | 498.192 | 28 | -90 | 9.13 | 22.26 |
| BB190061 | 414303.071 | 9675503.935 | 472.434 | 13 | -90 | 2 | 7.3 |
| DX00046 | 415399.765 | 9675701.758 | 449.026 | 23 | -90 | 14.64 | 11.22 |
| DX00075 | 415292.751 | 9675603.143 | 447.256 | 22 | -90 | 14.22 | 10.02 |
| DX00085 | 415301.047 | 9675502.150 | 433.469 | 18 | -90 | 12.09 | 7.7 |
| DEX-BB072 | 413703.451 | 9675671.810 | 409.020 | 20 | -90 | 3.22 | 14.41 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7053 | 417528.800 | 9673625.929 | 351.392 | 42 | -90 | 24.98 | 15 |
| DEX-CZ7054 | 417555.840 | 9673625.563 | 350.000 | 32 | -90 | 13 | 16 |
| DEX-CZ7055 | 417604.971 | 9673623.689 | 351.797 | 50 | -90 | 33.26 | 4 |
| DEX-CZ7056 | 417630.649 | 9673624.320 | 352.180 | 29 | -90 | 19 | 8 |
| DEX-CZ7057 | 417656.354 | 9673626.704 | 353.599 | 20 | -90 | 17.99 | 1.3 |
| DEX-CZ7058 | 417680.152 | 9673626.793 | 355.250 | 25 | -90 | 20.57 | 4 |
| DEX-CZ7059 | 417704.612 | 9673624.514 | 357.166 | 21 | -90 | 17.77 | 2.35 |
| DEX-CZ7060 | 417729.922 | 9673624.615 | 358.992 | 37 | -90 | 15 | 20.87 |
| DEX-CZ7061 | 417754.966 | 9673629.627 | 360.592 | 20 | -90 | 13.8 | 5 |
| DEX-CZ7063 | 417777.962 | 9673650.963 | 362.099 | 28 | -90 | 19.64 | 8 |
| DEX-CZ7064 | 417729.189 | 9673650.483 | 357.345 | 20 | -90 | 15.25 | 3 |
| DEX-CZ7065 | 417679.183 | 9673649.950 | 354.700 | 29 | -90 | 20 | 6 |
| DEX-CZ7066 | 417630.017 | 9673649.637 | 352.375 | 28 | -90 | 27.23 | 0 |
| DEX-CZ7067 | 417528.744 | 9673650.646 | 355.404 | 26 | -90 | 21.24 | 2 |
| DEX-CZ7068 | 417481.577 | 9673649.531 | 356.616 | 25 | -90 | 14.25 | 6 |
| DEX-CZ7069 | 417330.892 | 9673648.770 | 349.000 | 37 | -90 | 33.48 | 2 |
| DEX-CZ7070 | 417278.355 | 9673649.032 | 346.452 | 48 | -90 | 34.94 | 9 |
| DEX-CZ7071 | 417230.161 | 9673649.564 | 344.478 | 33 | -90 | 28.21 | 3 |
| DEX-CZ7072 | 417780.030 | 9673674.108 | 361.988 | 20 | -90 | 14.78 | 2.26 |
| DEX-CZ7073 | 417754.922 | 9673675.378 | 359.758 | 20 | -90 | 18.15 | 1 |
| DEX-CZ7074 | 417730.552 | 9673673.712 | 358.450 | 25 | -90 | 20.65 | 3 |
| DEX-CZ7075 | 417702.139 | 9673673.196 | 357.046 | 30 | -90 | 28 | 0 |
| DEX-CZ7076 | 417679.094 | 9673674.859 | 356.710 | 27 | -90 | 22.8 | 4 |
| DEX-CZ7078 | 417628.953 | 9673675.051 | 353.810 | 20 | -90 | 15.29 | 4 |
| DEX-CZ7079 | 417555.095 | 9673673.363 | 352.823 | 22 | -90 | 17 | 3 |
| DEX-CZ7080 | 417529.015 | 9673675.737 | 356.192 | 22 | -90 | 13.18 | 5 |
| DEX-CZ7081 | 417503.614 | 9673674.559 | 358.000 | 44 | -90 | 26.15 | 16 |
| DEX-CZ7082 | 417480.758 | 9673675.641 | 358.000 | 45 | -90 | 33.89 | 9 |
| DEX-CZ7083 | 417454.545 | 9673674.075 | 356.670 | 26 | -90 | 18.27 | 5 |
| DEX-CZ7084 | 417353.417 | 9673673.562 | 350.000 | 31 | -90 | 19 | 3.23 |
| DEX-CZ7085 | 417331.530 | 9673673.880 | 348.397 | 39 | -90 | 33.44 | 4 |
| DEX-CZ7086 | 417303.406 | 9673677.629 | 347.000 | 38 | -90 | 26.61 | 7.35 |
| DEX-CZ7087 | 417280.734 | 9673675.720 | 347.000 | 39 | -90 | 31.61 | 6 |
| DEX-CZ7088 | 417259.933 | 9673674.268 | 347.000 | 32 | -90 | 21.33 | 5 |
| DEX-CZ7090 | 417773.231 | 9673706.465 | 363.609 | 29 | -90 | 19.3 | 6 |
| DEX-CZ7091 | 417729.381 | 9673699.712 | 361.698 | 25 | -90 | 14.3 | 8.65 |
| DEX-CZ7092 | 417680.943 | 9673700.849 | 360.115 | 41 | -90 | 23.13 | 17 |
| DEX-CZ7093 | 417628.703 | 9673699.591 | 356.489 | 29 | -90 | 13 | 17.01 |
| DEX-CZ7094 | 417584.716 | 9673696.536 | 355.000 | 53 | -90 | 19 | 33.54 |
| DEX-CZ7095 | 417529.782 | 9673700.713 | 355.449 | 33 | -90 | 20 | 11 |
| DEX-CZ7096 | 417478.999 | 9673700.288 | 358.000 | 42 | -90 | 27.29 | 11 |
| DEX-CZ7097 | 417329.530 | 9673701.461 | 347.164 | 41 | -90 | 36.32 | 4 |
| DEX-CZ7098 | 417280.836 | 9673700.818 | 348.000 | 44 | -90 | 28.25 | 14.36 |
| DEX-CZ7101 | 417779.279 | 9673722.789 | 366.166 | 24 | -90 | 15 | 1 |
| DEX-CZ7102 | 417754.299 | 9673724.305 | 366.342 | 24 | -90 | 10 | 12.3 |
| DEX-CZ7103 | 417729.283 | 9673723.140 | 365.720 | 17 | -90 | 11 | 4.63 |
| DEX-CZ7104 | 417707.042 | 9673723.344 | 364.313 | 23 | -90 | 11 | 10.26 |
| DEX-CZ7105 | 417680.175 | 9673725.867 | 363.776 | 19 | -90 | 15 | 3 |
| DEX-CZ7106 | 417654.454 | 9673724.851 | 362.616 | 24 | -90 | 23.39 | 0 |
| DEX-CZ7107 | 417628.972 | 9673726.445 | 360.271 | 26 | -90 | 20 | 6 |
| DEX-CZ7108 | 417604.620 | 9673724.609 | 357.579 | 23 | -90 | 21.07 | 1 |
| DEX-CZ7109 | 417580.015 | 9673724.947 | 358.104 | 37 | -90 | 25.72 | 9 |
| DEX-CZ7110 | 417551.847 | 9673727.631 | 358.236 | 31 | -90 | 21.57 | 5 |
| DEX-CZ7111 | 417529.798 | 9673723.128 | 357.808 | 21 | -90 | 14 | 4 |
| DEX-CZ7112 | 417505.913 | 9673724.132 | 358.769 | 20 | -90 | 13 | 6 |
| DEX-CZ7113 | 417479.703 | 9673722.985 | 359.030 | 18 | -90 | 13 | 3 |
| DEX-CZ7114 | 417355.746 | 9673725.086 | 349.000 | 40 | -90 | 38.4 | 2 |
| DEX-CZ7115 | 417333.128 | 9673726.598 | 348.854 | 44 | -90 | 24.62 | 17.38 |
| DEX-CZ7116 | 417306.909 | 9673724.287 | 348.319 | 28 | -90 | 15 | 7.26 |
| DEX-CZ7117 | 417779.095 | 9673748.925 | 371.036 | 20 | -90 | 17.35 | 0 |
| DEX-CZ7118 | 417729.188 | 9673750.651 | 372.066 | 15 | -90 | 4 | 9 |
| DEX-CZ7119 | 417678.395 | 9673749.284 | 367.567 | 21 | -90 | 11 | 8.55 |
| DEX-CZ7120 | 417625.191 | 9673747.047 | 361.889 | 26 | -90 | 25.7 | 0.55 |
| DEX-CZ7121 | 417577.760 | 9673749.617 | 360.772 | 30 | -90 | 22.14 | 7 |
| DEX-CZ7122 | 417529.899 | 9673750.350 | 362.862 | 33 | -90 | 15 | 13 |
| DEX-CZ7123 | 417480.097 | 9673748.801 | 362.885 | 14 | -90 | 9 | 2 |
| DEX-CZ7124 | 417430.483 | 9673751.074 | 355.941 | 23 | -90 | 13 | 6 |
| DEX-CZ7125 | 417378.717 | 9673752.628 | 349.529 | 27 | -90 | 20.27 | 3 |
| DEX-CZ7126 | 417329.838 | 9673741.094 | 348.612 | 39 | -90 | 29.27 | 9 |
| DEX-CZ7127 | 417754.345 | 9673773.066 | 375.816 | 18 | -90 | 6 | 8 |
| DEX-CZ7128 | 417730.405 | 9673775.435 | 377.146 | 13 | -90 | 4 | 5 |
| DEX-CZ7129 | 417708.625 | 9673778.258 | 375.562 | 24 | -90 | 22.58 | 0 |
| DEX-CZ7130 | 417679.352 | 9673773.703 | 370.846 | 30 | -90 | 22.32 | 6 |
| DEX-CZ7131 | 417660.175 | 9673774.212 | 368.601 | 29 | -90 | 22.69 | 6.79 |
| DEX-CZ7132 | 417627.540 | 9673776.660 | 365.113 | 33 | -90 | 23.06 | 8 |
| DEX-CZ7133 | 417605.283 | 9673772.624 | 362.243 | 35 | -90 | 23 | 9.22 |
| DEX-CZ7134 | 417576.515 | 9673776.966 | 363.528 | 44 | -90 | 15 | 6 |
| DEX-CZ7135 | 417552.489 | 9673771.262 | 365.318 | 26 | -90 | 14.36 | 10 |
| DEX-CZ7136 | 417529.182 | 9673775.521 | 367.455 | 14 | -90 | 8 | 2 |
| DEX-CZ7137 | 417503.290 | 9673776.415 | 368.745 | 16 | -90 | 6 | 8 |
| DEX-CZ7138 | 417479.771 | 9673778.382 | 366.787 | 13 | -90 | 6 | 5 |
| DEX-CZ7139 | 417456.082 | 9673769.353 | 361.199 | 14 | -90 | 3 | 4 |
| DEX-CZ7140 | 417429.378 | 9673775.195 | 355.230 | 23 | -90 | 16.47 | 5 |
| DEX-CZ7141 | 417403.874 | 9673776.576 | 350.629 | 25 | -90 | 16.22 | 5 |
| DEX-CZ7142 | 417377.574 | 9673776.451 | 348.475 | 26 | -90 | 22.03 | 4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DX00146 | 414698.559 | 9675651.044 | 469.134 | 25 | -90 | 12.3 | 8.44 |
| BB190026 | 413850.297 | 9676108.106 | 491.254 | 17 | -90 | 10.37 | 7.12 |
| BB190041 | 414196.666 | 9675555.929 | 487.860 | 11 | -90 | 5.61 | 4.57 |
| DEX-MIA130 | 413198.740 | 9675628.412 | 381.425 | 6 | -90 | 0 | 0 |
| DX00013 | 414603.160 | 9676290.836 | 499.229 | 18 | -90 | 3 | 10.3 |
| DX00074 | 415198.401 | 9675605.257 | 450.227 | 20 | -90 | 16.73 | 5.13 |
| DX00101 | 414806.790 | 9676398.483 | 502.695 | 11 | -90 | 2 | 7.31 |
| DX00118 | 414593.110 | 9675758.031 | 499.582 | 17 | -90 | 14.76 | 1.35 |
| BB190070 | 414392.361 | 9675452.615 | 489.713 | 11 | -90 | 3.73 | 6.88 |
| DEX-BB016 | 414101.896 | 9676266.208 | 527.953 | 18 | -90 | 12.07 | 8.9 |
| DEX-BB025 | 413283.171 | 9675701.626 | 377.853 | 23 | -90 | 9.43 | 9.91 |
| DEX-BB083 | 413950.559 | 9675414.302 | 428.694 | 9 | -90 | 2 | 1 |
| DX00070 | 414786.154 | 9675610.566 | 446.584 | 13 | -90 | 1 | 9 |
| BB190079 | 414547.350 | 9675406.580 | 459.032 | 15 | -90 | 3 | 7.95 |
| DEX-BB2009 | 415041.633 | 9675254.872 | 422.537 | 23 | -90 | 15 | 6 |
| DX00091 | 414950.686 | 9676185.996 | 485.913 | 22 | -90 | 6.55 | 13.21 |
| DEX-BB1808 | 414659.233 | 9676447.096 | 488.925 | 11 | -90 | 3 | 3 |
| DEX-BB1815 | 414753.897 | 9676455.348 | 487.467 | 12 | -90 | 1 | 2 |
| DEX-BB1817 | 414659.841 | 9676413.617 | 498.417 | 17 | -90 | 1 | 5 |
| DEX-BB1822 | 414762.053 | 9676403.964 | 499.304 | 14 | -90 | 1 | 4.65 |
| DEX-BB1831 | 414598.094 | 9676244.643 | 496.732 | 18 | -90 | 3 | 12 |
| DEX-BB1834 | 414649.373 | 9676211.246 | 505.843 | 25 | -90 | 18.69 | 7 |
| DEX-BB1836 | 414630.823 | 9676153.804 | 500.208 | 14 | -90 | 4 | 7.5 |
| DEX-BB1837 | 414628.746 | 9676132.577 | 496.483 | 11 | -90 | 3 | 6 |
| DEX-BB1838 | 414645.693 | 9676352.614 | 499.828 | 20 | -90 | 4 | 2 |
| DEX-BB1840 | 414664.565 | 9676303.350 | 506.487 | 17 | -90 | 5.22 | 10 |
| DEX-BB1842 | 414656.325 | 9676253.764 | 507.682 | 31 | -90 | 8.52 | 13 |
| DEX-BB1845 | 414660.015 | 9676152.537 | 504.313 | 21 | -90 | 5 | 14 |
| DEX-BB1846 | 414655.673 | 9676123.310 | 499.393 | 15 | -90 | 7 | 6 |
| DEX-BB1848 | 414818.549 | 9676464.162 | 483.090 | 15 | -90 | 0 | 0 |
| DEX-BB1849 | 414851.888 | 9676431.449 | 488.824 | 10 | -90 | 1 | 1.54 |
| DEX-BB1851 | 414709.915 | 9676358.704 | 505.096 | 19 | -90 | 4.38 | 13 |
| DEX-BB1853 | 414768.856 | 9676341.191 | 505.000 | 20 | -90 | 7.49 | 5 |
| DEX-BB1855 | 414848.720 | 9676385.654 | 497.412 | 10 | -90 | 2 | 4 |
| DEX-BB1856 | 414804.523 | 9676343.081 | 500.498 | 18 | -90 | 6 | 9 |
| DEX-BB1861 | 414850.091 | 9676352.939 | 496.297 | 12 | -90 | 3 | 6 |
| DEX-BB1868 | 414765.248 | 9676251.186 | 506.963 | 24 | -90 | 8.04 | 15 |
| DEX-BB1869 | 414587.194 | 9676340.623 | 494.561 | 15 | -90 | 4 | 4 |
| DEX-BB1873 | 414708.582 | 9676252.997 | 509.000 | 17 | -90 | 6.32 | 8 |
| DEX-BB1876 | 414757.625 | 9676298.497 | 505.637 | 29 | -90 | 21.2 | 5 |
| DEX-BB1878 | 414701.287 | 9676170.147 | 507.000 | 12 | -90 | 5.44 | 5 |
| DEX-BB1879 | 414608.257 | 9676176.516 | 497.206 | 15 | -90 | 8.23 | 5 |
| DEX-BB1880 | 414644.582 | 9676094.398 | 493.496 | 23 | -90 | 2 | 19 |
| DEX-BB1881 | 414691.675 | 9676155.693 | 506.238 | 26 | -90 | 9.63 | 15 |
| DEX-BB1882 | 415104.044 | 9676249.373 | 483.740 | 19 | -90 | 9.8 | 6 |
| DEX-BB1883 | 415054.591 | 9676251.569 | 488.000 | 26 | -90 | 7.58 | 12 |
| DEX-BB1884 | 415154.002 | 9676250.534 | 474.540 | 23 | -90 | 2 | 15 |
| DEX-BB1885 | 415005.037 | 9676252.624 | 485.376 | 22 | -90 | 2 | 10 |
| DEX-BB1886 | 414955.436 | 9676242.743 | 482.119 | 17 | -90 | 5 | 8 |
| DEX-BB1887 | 415055.024 | 9676300.828 | 486.034 | 13 | -90 | 2 | 5 |
| DEX-BB1888 | 415004.274 | 9676201.676 | 486.000 | 18 | -90 | 7.53 | 8 |
| DEX-BB1889 | 415007.076 | 9676147.248 | 483.261 | 26 | -90 | 5 | 19 |
| DEX-BB1890 | 414952.810 | 9676146.097 | 490.397 | 18 | -90 | 6 | 8 |
| DEX-BB1891 | 414952.445 | 9676093.590 | 491.312 | 17 | -90 | 7 | 8 |
| DEX-BB1892 | 415054.411 | 9676146.010 | 478.538 | 18 | -90 | 4 | 9.43 |
| DEX-BB1893 | 415104.143 | 9676146.068 | 476.401 | 26 | -90 | 6.47 | 11 |
| DEX-BB1894 | 415153.410 | 9676100.079 | 458.718 | 10 | -90 | 2 | 4.37 |
| DEX-BB1895 | 414895.007 | 9676049.722 | 497.962 | 27 | -90 | 14.99 | 8 |
| DEX-BB1896 | 414953.356 | 9676011.957 | 487.201 | 14 | -90 | 9.28 | 2 |
| DEX-BB1897 | 414951.843 | 9675908.709 | 475.146 | 26 | -90 | 9.5 | 13.5 |
| DEX-BB1898 | 415154.573 | 9676009.679 | 451.694 | 17 | -90 | 7 | 1 |
| DEX-BB1899 | 415249.273 | 9676006.242 | 470.242 | 13 | -90 | 2 | 8.33 |
| DEX-BB1900 | 415038.025 | 9675909.334 | 464.364 | 13 | -90 | 7.3 | 4 |
| DEX-BB1901 | 415148.267 | 9675906.873 | 467.498 | 15 | -90 | 8.49 | 3 |
| DEX-BB1902 | 415106.146 | 9675857.509 | 464.346 | 21 | -90 | 11.68 | 3 |
| DEX-BB1903 | 415158.303 | 9675861.557 | 472.475 | 10 | -90 | 6.43 | 1 |
| DEX-BB1904 | 415210.677 | 9675861.013 | 470.839 | 22 | -90 | 10 | 5 |
| DEX-BB1905 | 414949.712 | 9675806.613 | 479.281 | 23 | -90 | 10 | 11 |
| DEX-BB1906 | 414945.285 | 9675706.682 | 464.124 | 5 | -90 | 2 | 0 |
| DEX-BB1907 | 414948.070 | 9675598.345 | 441.537 | 21 | -90 | 11.48 | 8 |
| DEX-BB1908 | 414900.500 | 9675654.342 | 449.706 | 20 | -90 | 6 | 12 |
| DEX-BB1909 | 415003.801 | 9675661.314 | 452.059 | 17 | -90 | 6.84 | 8.35 |
| DEX-BB1910 | 414950.159 | 9675656.048 | 449.519 | 11 | -90 | 7 | 2 |
| DEX-BB1911 | 414896.950 | 9675556.819 | 436.417 | 13 | -90 | 8.4 | 3.32 |
| DEX-BB1913 | 415155.246 | 9675752.417 | 477.000 | 20 | -90 | 10.46 | 7.5 |
| DEX-BB1914 | 415156.714 | 9675705.305 | 471.477 | 17 | -90 | 9.95 | 5.54 |
| DEX-BB1916 | 415305.372 | 9675754.073 | 461.527 | 20 | -90 | 14.92 | 1 |
| DEX-BB1917 | 415396.948 | 9675748.524 | 445.146 | 17 | -90 | 7.51 | 2 |
| DEX-BB1919 | 415343.569 | 9675701.780 | 455.610 | 24 | -90 | 10.28 | 9 |
| DEX-BB1920 | 415456.240 | 9675703.823 | 448.071 | 11 | -90 | 8.46 | 0 |
| DEX-BB1921 | 415460.310 | 9675653.230 | 440.134 | 9 | -90 | 2 | 3 |
| DEX-BB1922 | 415499.912 | 9675651.317 | 435.303 | 13 | -90 | 6.46 | 3.37 |
| DEX-BB1923 | 415462.197 | 9675602.478 | 435.811 | 13 | -90 | 8.84 | 3 |
| DEX-BB1924 | 415250.604 | 9675609.711 | 452.970 | 21 | -90 | 15.66 | 5.53 |
| DEX-BB1925 | 415347.531 | 9675601.759 | 453.941 | 20 | -90 | 16.82 | 2.6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7144 | 417729.282 | 9673797.712 | 376.709 | 22 | -90 | 6 | 14 |
| DEX-CZ7145 | 417679.354 | 9673802.680 | 373.497 | 17 | -90 | 12 | 0 |
| DEX-CZ7146 | 417628.102 | 9673796.250 | 368.179 | 26 | -90 | 17.34 | 6.92 |
| DEX-CZ7147 | 417580.501 | 9673800.211 | 366.551 | 46 | -90 | 17.35 | 28.45 |
| DEX-CZ7148 | 417434.039 | 9673799.498 | 356.009 | 18 | -90 | 15.27 | 1 |
| DEX-CZ7149 | 417383.936 | 9673795.693 | 347.065 | 39 | -90 | 13.25 | 17 |
| DEX-CZ7150 | 417754.283 | 9673824.192 | 371.610 | 8 | -90 | 5 | 0 |
| DEX-CZ7151 | 417731.644 | 9673822.149 | 372.481 | 11 | -90 | 6 | 4 |
| DEX-CZ7152 | 417703.373 | 9673823.528 | 373.752 | 29 | -90 | 25.61 | 3 |
| DEX-CZ7153 | 417677.648 | 9673827.912 | 373.700 | 30 | -90 | 27.11 | 3 |
| DEX-CZ7154 | 417653.402 | 9673826.618 | 374.007 | 37 | -90 | 32.37 | 3 |
| DEX-CZ7155 | 417629.723 | 9673828.672 | 373.184 | 29 | -90 | 21.22 | 7.37 |
| DEX-CZ7156 | 417602.016 | 9673824.911 | 368.750 | 29 | -90 | 22.39 | 5 |
| DEX-CZ7157 | 417582.385 | 9673824.822 | 368.342 | 33 | -90 | 11 | 16 |
| DEX-CZ7158 | 417554.692 | 9673827.653 | 371.000 | 30 | -90 | 8 | 14 |
| DEX-CZ7160 | 417431.230 | 9673826.384 | 352.923 | 28 | -90 | 12.28 | 14 |
| DEX-CZ7162 | 417832.267 | 9673849.857 | 349.839 | 34 | -90 | 30 | 2 |
| DEX-CZ7163 | 417779.600 | 9673849.389 | 360.804 | 16 | -90 | 5 | 6 |
| DEX-CZ7164 | 417726.755 | 9673851.743 | 365.661 | 22 | -90 | 11 | 6 |
| DEX-CZ7165 | 417678.969 | 9673845.859 | 372.572 | 18 | -90 | 11 | 4 |
| DEX-CZ7166 | 417631.284 | 9673848.664 | 375.000 | 20 | -90 | 13 | 4.56 |
| DEX-CZ7168 | 417528.918 | 9673847.829 | 370.154 | 13 | -90 | 7.5 | 3.5 |
| DEX-CZ7169 | 417479.663 | 9673845.722 | 362.619 | 22 | -90 | 4 | 16 |
| DEX-CZ7171 | 417855.040 | 9673872.230 | 345.394 | 60 | -90 | 57.35 | 3 |
| DEX-CZ7172 | 417830.071 | 9673872.557 | 347.528 | 60 | -90 | 44.35 | 16 |
| DEX-CZ7173 | 417804.984 | 9673877.745 | 349.924 | 32 | -90 | 23.63 | 6.7 |
| DEX-CZ7174 | 417780.751 | 9673875.078 | 354.056 | 27 | -90 | 17 | 8 |
| DEX-CZ7175 | 417756.226 | 9673875.817 | 357.779 | 23 | -90 | 14.22 | 2 |
| DEX-CZ7176 | 417729.579 | 9673875.486 | 360.689 | 26 | -90 | 19 | 5.24 |
| DEX-CZ7177 | 417705.409 | 9673876.975 | 363.841 | 24 | -90 | 18.4 | 4 |
| DEX-CZ7178 | 417679.547 | 9673877.420 | 366.659 | 28 | -90 | 18.68 | 8.38 |
| DEX-CZ7179 | 417655.178 | 9673876.868 | 371.769 | 23 | -90 | 18.76 | 3 |
| DEX-CZ7180 | 417631.621 | 9673874.781 | 374.000 | 26 | -90 | 16 | 8.66 |
| DEX-CZ7184 | 417529.348 | 9673875.086 | 369.949 | 29 | -90 | 21.96 | 0 |
| DEX-CZ7185 | 417505.964 | 9673876.734 | 365.426 | 48 | -90 | 20 | 27 |
| DEX-CZ7186 | 417480.777 | 9673870.273 | 358.622 | 17 | -90 | 2 | 12 |
| DEX-CZ7189 | 417831.184 | 9673895.023 | 343.804 | 43 | -90 | 37.56 | 4 |
| DEX-CZ7190 | 417780.455 | 9673898.410 | 349.238 | 33 | -90 | 21.45 | 9 |
| DEX-CZ7191 | 417530.606 | 9673902.291 | 369.026 | 20 | -90 | 10 | 8 |
| DEX-CZ7192 | 417482.674 | 9673895.388 | 356.460 | 16 | -90 | 9.22 | 4 |
| DEX-CZ7193 | 417853.462 | 9673926.991 | 344.996 | 34 | -90 | 30.3 | 4 |
| DEX-CZ7194 | 417832.528 | 9673925.485 | 344.861 | 33 | -90 | 30.56 | 1 |
| DEX-CZ7195 | 417804.003 | 9673919.580 | 338.232 | 29 | -90 | 22 | 5 |
| DEX-CZ7196 | 417778.278 | 9673924.928 | 343.428 | 18 | -90 | 12.28 | 1.32 |
| DEX-CZ7197 | 417752.663 | 9673926.087 | 353.872 | 22 | -90 | 17.32 | 1.6 |
| DEX-CZ7198 | 417729.268 | 9673926.309 | 359.087 | 28.38 | -90 | 20 | 5 |
| DEX-CZ7199 | 417706.502 | 9673925.027 | 362.835 | 18 | -90 | 12 | 4 |
| DEX-CZ7200 | 417676.360 | 9673924.889 | 367.833 | 21 | -90 | 10 | 6.4 |
| DEX-CZ7201 | 417652.072 | 9673922.938 | 371.638 | 27 | -90 | 15.23 | 9.29 |
| DEX-CZ7202 | 417632.102 | 9673920.738 | 372.176 | 15 | -90 | 4 | 1 |
| DEX-CZ7206 | 417530.465 | 9673926.200 | 366.817 | 25 | -90 | 6 | 15 |
| DEX-CZ7207 | 417507.439 | 9673928.309 | 361.738 | 12 | -90 | 7 | 3 |
| DEX-CZ7208 | 417484.539 | 9673916.902 | 355.266 | 21 | -90 | 10 | 5 |
| DEX-CZ7210 | 417833.645 | 9673947.681 | 341.467 | 20 | -90 | 18 | 0 |
| DEX-CZ7211 | 417778.088 | 9673951.082 | 349.888 | 21 | -90 | 5 | 7.6 |
| DEX-CZ7212 | 417727.197 | 9673950.265 | 362.311 | 30 | -90 | 17.4 | 5.87 |
| DEX-CZ7213 | 417679.742 | 9673950.319 | 372.191 | 12 | -90 | 4 | 4 |
| DEX-CZ7214 | 417630.415 | 9673937.134 | 372.342 | 26 | -90 | 16.76 | 6 |
| DEX-CZ7216 | 418179.686 | 9673975.791 | 364.000 | 29 | -90 | 23.86 | 5 |
| DEX-CZ7217 | 418158.039 | 9673975.181 | 364.000 | 35 | -90 | 14.07 | 21 |
| DEX-CZ7218 | 418130.202 | 9673975.845 | 363.737 | 18 | -90 | 14 | 1 |
| DEX-CZ7219 | 418103.971 | 9673974.523 | 364.609 | 32 | -90 | 16.32 | 14 |
| DEX-CZ7220 | 418080.646 | 9673975.519 | 364.294 | 25 | -90 | 15.33 | 8 |
| DEX-CZ7221 | 418055.676 | 9673975.543 | 363.330 | 24 | -90 | 19.25 | 3 |
| DEX-CZ7222 | 418029.537 | 9673968.491 | 365.366 | 7 | -90 | 4 | 0 |
| DEX-CZ7224 | 417980.160 | 9673979.713 | 369.225 | 16 | -90 | 9 | 6 |
| DEX-CZ7225 | 417958.623 | 9673974.728 | 363.455 | 23 | -90 | 12 | 8 |
| DEX-CZ7227 | 417829.102 | 9673980.807 | 332.293 | 5 | -90 | 3 | 2 |
| DEX-CZ7229 | 417777.695 | 9673968.531 | 354.523 | 18 | -90 | 10.14 | 5.32 |
| DEX-CZ7230 | 417755.262 | 9673975.039 | 361.228 | 19 | -90 | 10 | 6.46 |
| DEX-CZ7231 | 417729.128 | 9673976.871 | 364.102 | 12 | -90 | 9 | 0 |
| DEX-CZ7232 | 417701.491 | 9673976.589 | 371.222 | 30 | -90 | 14 | 14.69 |
| DEX-CZ7233 | 417679.556 | 9673978.991 | 377.019 | 6 | -90 | 2 | 2 |
| DEX-CZ7234 | 417654.288 | 9673972.725 | 377.908 | 19 | -90 | 10 | 6 |
| DEX-CZ7235 | 417627.216 | 9673972.027 | 371.983 | 28 | -90 | 15 | 10 |
| DEX-CZ7236 | 417612.013 | 9673975.158 | 369.344 | 33 | -90 | 10 | 6 |
| DEX-CZ7237 | 417579.823 | 9673978.067 | 363.979 | 27 | -90 | 10 | 12 |
| DEX-CZ7239 | 418181.183 | 9673998.095 | 362.101 | 28 | -90 | 26.18 | 6.44 |
| DEX-CZ7240 | 418128.601 | 9674001.175 | 365.673 | 26 | -90 | 12 | 14 |
| DEX-CZ7241 | 418079.658 | 9673997.488 | 368.959 | 26 | -90 | 21.22 | 3 |
| DEX-CZ7243 | 417979.890 | 9673998.506 | 370.654 | 14 | -90 | 11 | 3 |
| DEX-CZ7245 | 417776.662 | 9674005.069 | 359.211 | 10 | -90 | 6 | 1 |
| DEX-CZ7246 | 417725.912 | 9674006.586 | 371.617 | 21 | -90 | 14.35 | 0.48 |
| DEX-CZ7247 | 417679.391 | 9673995.147 | 378.447 | 8 | -90 | 3 | 2.42 |
| DEX-CZ7248 | 417635.982 | 9673999.982 | 375.745 | 11 | -90 | 3 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB1928 | 415252.647 | 9675550.603 | 440.972 | 30 | -90 | 16.04 | 8 |
| DEX-BB1929 | 415298.511 | 9675550.500 | 436.742 | 17 | -90 | 14.92 | 5 |
| DEX-BB1930 | 415362.306 | 9675495.503 | 426.200 | 19 | -90 | 14 | 3 |
| DEX-BB1931 | 415354.938 | 9675558.217 | 440.418 | 29 | -90 | 26.12 | 3.47 |
| DEX-BB1932 | 415408.269 | 9675551.142 | 437.472 | 16 | -90 | 14.71 | 2 |
| DEX-BB1933 | 415463.970 | 9675498.672 | 420.456 | 10 | -90 | 6.55 | 2 |
| DEX-BB1934 | 415196.012 | 9675447.376 | 434.553 | 18 | -90 | 13.4 | 1.6 |
| DEX-BB1935 | 415251.056 | 9675446.891 | 436.207 | 19 | -90 | 11 | 4 |
| DEX-BB1936 | 415309.407 | 9675448.936 | 436.586 | 28 | -90 | 15.01 | 9 |
| DEX-BB1938 | 415139.652 | 9675497.060 | 434.522 | 19 | -90 | 14.8 | 3 |
| DEX-BB1940 | 414904.498 | 9675754.045 | 482.066 | 23 | -90 | 17.16 | 5.33 |
| DEX-BB1941 | 415254.069 | 9675701.096 | 469.451 | 18 | -90 | 8 | 6 |
| DEX-BB1942 | 414954.807 | 9675756.855 | 476.511 | 21 | -90 | 14.44 | 3 |
| DEX-BB1943 | 415105.476 | 9675658.377 | 456.572 | 18 | -90 | 9 | 6 |
| DEX-BB1944 | 415156.297 | 9675593.939 | 447.219 | 31 | -90 | 24.13 | 7 |
| DEX-BB1945 | 415155.716 | 9675652.023 | 457.921 | 27 | -90 | 15.36 | 10.66 |
| DEX-BB1946 | 415207.945 | 9675655.545 | 460.427 | 25 | -90 | 27.54 | 3 |
| DEX-BB1947 | 415256.323 | 9675653.186 | 461.519 | 29 | -90 | 10 | 15 |
| DEX-BB1948 | 415301.857 | 9675658.628 | 458.805 | 27 | -90 | 14.4 | 13.31 |
| DEX-BB1949 | 415348.051 | 9675658.602 | 455.478 | 26 | -90 | 12.65 | 9 |
| DEX-BB1950 | 415463.722 | 9675552.515 | 426.343 | 11 | -90 | 7 | 1.43 |
| DEX-BB1951 | 415147.560 | 9676199.428 | 478.118 | 20 | -90 | 4.25 | 10.11 |
| DEX-BB1952 | 415156.606 | 9676146.913 | 469.755 | 12 | -90 | 1 | 6 |
| DEX-BB1953 | 414896.855 | 9676140.371 | 491.372 | 24 | -90 | 7 | 16 |
| DEX-BB1954 | 415100.730 | 9675546.736 | 437.690 | 21 | -90 | 9.69 | 1 |
| DEX-BB1955 | 415056.459 | 9675547.484 | 437.507 | 26 | -90 | 14.7 | 3 |
| DEX-BB1956 | 414951.286 | 9675556.908 | 436.416 | 25 | -90 | 19.37 | 1 |
| DEX-BB1957 | 415002.318 | 9675761.292 | 471.632 | 21 | -90 | 12.72 | 7.36 |
| DEX-BB1958 | 414903.389 | 9675859.950 | 479.427 | 21 | -90 | 13.39 | 0 |
| DEX-BB1959 | 414948.837 | 9675857.023 | 473.294 | 18 | -90 | 12.63 | 3 |
| DEX-BB1960 | 415106.828 | 9675750.850 | 474.364 | 27 | -90 | 9.56 | 13 |
| DEX-BB1961 | 415253.335 | 9675954.534 | 466.023 | 26 | -90 | 2 | 18 |
| DEX-BB1962 | 415302.589 | 9675954.549 | 458.533 | 14 | -90 | 6.42 | 4 |
| DEX-BB1963 | 415053.877 | 9676095.231 | 468.751 | 22 | -90 | 11.97 | 6.45 |
| DEX-BB1964 | 415037.747 | 9676004.001 | 476.330 | 14 | -90 | 3 | 8 |
| DEX-BB1965 | 414995.550 | 9675859.872 | 469.746 | 15 | -90 | 9.98 | 4.11 |
| DEX-BB1966 | 415042.499 | 9675860.129 | 468.783 | 23 | -90 | 7.87 | 7 |
| DEX-BB1967 | 415045.925 | 9675802.195 | 468.122 | 17 | -90 | 11.23 | 3 |
| DEX-BB1968 | 415045.543 | 9675755.513 | 468.758 | 26 | -90 | 11 | 4.5 |
| DEX-BB1969 | 415047.827 | 9675707.080 | 460.627 | 15 | -90 | 9.79 | 4 |
| DEX-BB1970 | 415049.737 | 9675657.188 | 451.349 | 13 | -90 | 9 | 1 |
| DEX-BB1971 | 415049.754 | 9675598.993 | 442.532 | 19 | -90 | 10 | 6 |
| DEX-BB1973 | 415277.686 | 9675858.423 | 457.478 | 10 | -90 | 4 | 3 |
| DEX-BB1974 | 415452.409 | 9675751.917 | 448.321 | 13 | -90 | 4.22 | 1.45 |
| DEX-BB1976 | 414946.629 | 9676045.045 | 491.853 | 15 | -90 | 3 | 9 |
| DEX-BB1977 | 414995.587 | 9676046.405 | 480.626 | 14 | -90 | 3 | 8 |
| DEX-BB1978 | 415047.290 | 9676042.740 | 471.295 | 13 | -90 | 2.55 | 6.45 |
| DEX-BB1979 | 415098.110 | 9676045.208 | 457.722 | 13 | -90 | 5 | 6 |
| DEX-BB1980 | 415147.293 | 9676042.075 | 450.605 | 16 | -90 | 4 | 9 |
| DEX-BB1981 | 415197.463 | 9676048.389 | 454.348 | 20 | -90 | 9.74 | 7 |
| DEX-BB1982 | 415246.055 | 9676046.083 | 466.595 | 20 | -90 | 2 | 6 |
| DEX-BB1983 | 415298.019 | 9676042.213 | 466.223 | 16 | -90 | 3 | 5.58 |
| DEX-BB1984 | 415337.291 | 9676011.980 | 459.269 | 12 | -90 | 4.49 | 3 |
| DEX-BB1985 | 414901.272 | 9675955.772 | 490.518 | 10 | -90 | 3 | 5 |
| DEX-BB1986 | 414950.717 | 9675956.161 | 483.018 | 18 | -90 | 6 | 10.16 |
| DEX-BB1987 | 415004.161 | 9675957.991 | 472.386 | 21 | -90 | 6 | 10 |
| DEX-BB1988 | 415051.166 | 9675950.800 | 466.518 | 11 | -90 | 5.26 | 4 |
| DEX-BB1989 | 415098.376 | 9675951.527 | 459.698 | 13 | -90 | 0 | 5 |
| DEX-BB1990 | 415150.715 | 9675950.467 | 460.107 | 29 | -90 | 4 | 19 |
| DEX-BB1991 | 415203.361 | 9675756.185 | 476.363 | 15 | -90 | 11.14 | 1 |
| DEX-BB1992 | 415187.505 | 9675357.713 | 444.043 | 9 | -90 | 5 | 2 |
| DEX-BB1993 | 415243.413 | 9675304.636 | 451.390 | 22 | -90 | 19.16 | 2 |
| DEX-BB1994 | 415142.267 | 9675307.264 | 438.204 | 25 | -90 | 16 | 7 |
| DEX-BB1995 | 415250.729 | 9675409.410 | 439.915 | 36 | -90 | 17.43 | 16.73 |
| DEX-BB1996 | 415247.206 | 9675360.970 | 445.834 | 19 | -90 | 17.31 | 1 |
| DEX-BB1997 | 415311.724 | 9675343.177 | 445.215 | 31 | -90 | 16.53 | 14.5 |
| DEX-BB1998 | 415357.587 | 9675386.658 | 436.825 | 29 | -90 | 16.04 | 11 |
| DEX-BB2000 | 415358.272 | 9675298.135 | 446.801 | 26 | -90 | 15.68 | 10 |
| DEX-BB2001 | 415052.512 | 9676199.357 | 486.822 | 23 | -90 | 9.79 | 11 |
| DEX-BB2002 | 415359.855 | 9675442.380 | 432.509 | 20 | -90 | 13 | 4 |
| DEX-BB2003 | 415143.130 | 9675444.890 | 432.777 | 20 | -90 | 11.95 | 6 |
| DEX-BB2004 | 415143.587 | 9675407.199 | 439.000 | 20 | -90 | 14.32 | 5.33 |
| DEX-BB2005 | 415143.859 | 9675355.441 | 440.193 | 25 | -90 | 8.67 | 14.93 |
| DEX-BB2006 | 415091.170 | 9675358.658 | 434.453 | 17 | -90 | 8 | 5 |
| DEX-BB2007 | 415049.380 | 9675355.775 | 429.122 | 21 | -90 | 11 | 5 |
| DEX-BB2008 | 415039.845 | 9675304.992 | 423.720 | 29 | -90 | 18 | 8 |
| DEX-BB2010 | 415093.479 | 9675251.267 | 431.153 | 21 | -90 | 8 | 11 |
| DEX-BB2011 | 415144.012 | 9675252.871 | 443.813 | 18 | -90 | 6 | 10 |
| DEX-BB2012 | 415194.179 | 9675247.551 | 451.048 | 23 | -90 | 8 | 13 |
| DEX-BB2013 | 415245.327 | 9675253.107 | 453.119 | 19 | -90 | 12 | 4 |
| DEX-BB2014 | 415312.664 | 9675254.252 | 446.599 | 21 | -90 | 17 | 2 |
| DEX-BB2015 | 415049.057 | 9675499.365 | 431.118 | 8 | -90 | 3 | 0 |
| DEX-BB2016 | 415095.259 | 9675448.459 | 430.939 | 18 | -90 | 9.2 | 4 |
| DEX-BB2017 | 415049.385 | 9675448.397 | 430.507 | 16 | -90 | 6 | 5.24 |
| DEX-BB2018 | 415047.968 | 9675405.264 | 431.919 | 18 | -90 | 9 | 7 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7249 | 417579.582 | 9674001.671 | 365.484 | 26 | -90 | 15.22 | 5 |
| DEX-CZ7250 | 418180.192 | 9674018.059 | 359.116 | 21 | -90 | 16.78 | 3 |
| DEX-CZ7251 | 418158.845 | 9674020.383 | 362.273 | 38 | -90 | 27.35 | 12.84 |
| DEX-CZ7252 | 418131.083 | 9674026.790 | 365.509 | 18 | -90 | 14.28 | 1 |
| DEX-CZ7253 | 418109.572 | 9674025.670 | 369.205 | 27 | -90 | 13.25 | 13 |
| DEX-CZ7254 | 418080.063 | 9674023.096 | 372.183 | 23 | -90 | 10.3 | 7 |
| DEX-CZ7256 | 418031.787 | 9674026.628 | 378.529 | 6 | -90 | 3 | 3 |
| DEX-CZ7257 | 418005.366 | 9674027.347 | 377.730 | 7 | -90 | 4 | 3 |
| DEX-CZ7258 | 417981.070 | 9674027.856 | 371.548 | 22 | -90 | 6 | 13.56 |
| DEX-CZ7259 | 417955.983 | 9674026.270 | 366.639 | 11 | -90 | 5.4 | 3.6 |
| DEX-CZ7260 | 417862.395 | 9674024.355 | 349.911 | 8 | -90 | 4.55 | 1.45 |
| DEX-CZ7261 | 417828.105 | 9674029.889 | 331.462 | 12 | -90 | 3 | 7 |
| DEX-CZ7263 | 417776.771 | 9674025.231 | 356.551 | 14 | -90 | 7.38 | 5 |
| DEX-CZ7264 | 417753.189 | 9674025.011 | 367.567 | 10 | -90 | 5 | 2 |
| DEX-CZ7265 | 417734.949 | 9674022.436 | 373.318 | 9 | -90 | 2 | 0 |
| DEX-CZ7266 | 417707.463 | 9674021.647 | 373.265 | 12 | -90 | 8 | 1 |
| DEX-CZ7267 | 417676.239 | 9674021.804 | 373.954 | 20 | -90 | 6 | 10 |
| DEX-CZ7268 | 417653.177 | 9674023.092 | 373.924 | 7 | -90 | 3 | 2 |
| DEX-CZ7269 | 417625.419 | 9674017.994 | 373.394 | 8 | -90 | 2.35 | 2.65 |
| DEX-CZ7270 | 417606.722 | 9674023.540 | 370.614 | 18 | -90 | 3 | 7 |
| DEX-CZ7271 | 417580.725 | 9674030.681 | 366.153 | 14 | -90 | 5 | 5 |
| DEX-CZ7273 | 418178.604 | 9674049.164 | 357.456 | 39 | -90 | 16.7 | 23.02 |
| DEX-CZ7274 | 418129.051 | 9674049.058 | 363.267 | 21 | -90 | 17.26 | 4 |
| DEX-CZ7275 | 418081.919 | 9674048.230 | 371.068 | 27 | -90 | 24.36 | 6 |
| DEX-CZ7276 | 418027.863 | 9674057.347 | 379.000 | 6 | -90 | 3 | 1 |
| DEX-CZ7277 | 417980.841 | 9674051.437 | 370.874 | 18 | -90 | 5.37 | 9.63 |
| DEX-CZ7282 | 417630.454 | 9674039.876 | 368.593 | 17 | -90 | 6 | 5.73 |
| DEX-CZ7283 | 417580.614 | 9674053.026 | 364.813 | 8 | -90 | 2 | 4 |
| DEX-CZ7284 | 418231.432 | 9674076.123 | 354.304 | 28 | -90 | 23.24 | 4.4 |
| DEX-CZ7285 | 418209.441 | 9674074.937 | 353.714 | 32 | -90 | 26.83 | 2 |
| DEX-CZ7286 | 418178.812 | 9674074.323 | 354.000 | 28 | -90 | 15.08 | 12.31 |
| DEX-CZ7287 | 418156.874 | 9674072.479 | 357.425 | 20 | -90 | 14.09 | 5 |
| DEX-CZ7288 | 418132.549 | 9674074.903 | 358.927 | 19 | -90 | 13.99 | 4 |
| DEX-CZ7289 | 418102.585 | 9674072.331 | 363.176 | 16 | -90 | 11 | 3.23 |
| DEX-CZ7290 | 418079.032 | 9674074.503 | 366.783 | 24 | -90 | 16.26 | 6 |
| DEX-CZ7291 | 418053.740 | 9674072.006 | 372.944 | 4 | -90 | 1 | 0 |
| DEX-CZ7292 | 418026.157 | 9674075.860 | 375.409 | 10 | -90 | 4 | 2 |
| DEX-CZ7293 | 418002.850 | 9674075.857 | 372.005 | 14 | -90 | 10.28 | 1.4 |
| DEX-CZ7294 | 417977.799 | 9674075.428 | 366.280 | 19 | -90 | 11.33 | 7.29 |
| DEX-CZ7295 | 417955.963 | 9674078.011 | 362.099 | 32 | -90 | 12.91 | 17.47 |
| DEX-CZ7296 | 418229.770 | 9674101.139 | 349.238 | 19 | -90 | 13.24 | 4 |
| DEX-CZ7297 | 418180.445 | 9674100.074 | 352.001 | 39 | -90 | 13.38 | 23.34 |
| DEX-CZ7298 | 418127.715 | 9674096.441 | 354.887 | 20 | -90 | 18.26 | 1.39 |
| DEX-CZ7299 | 418079.200 | 9674098.126 | 360.153 | 21 | -90 | 9.2 | 10 |
| DEX-CZ7300 | 418029.422 | 9674101.362 | 366.875 | 11 | -90 | 2 | 5 |
| DEX-CZ7301 | 417975.863 | 9674097.263 | 362.153 | 28 | -90 | 10.6 | 17.7 |
| DEX-CZ7302 | 417929.744 | 9674100.237 | 354.185 | 23 | -90 | 18 | 4 |
| DEX-CZ7303 | 418229.705 | 9674125.532 | 346.107 | 49 | -90 | 7 | 38.61 |
| DEX-CZ7304 | 418207.139 | 9674125.775 | 346.097 | 36 | -90 | 22.14 | 15 |
| DEX-CZ7305 | 418180.872 | 9674124.589 | 349.576 | 29 | -90 | 10 | 17 |
| DEX-CZ7306 | 418154.814 | 9674126.909 | 350.177 | 26 | -90 | 16.32 | 5 |
| DEX-CZ7307 | 418131.035 | 9674125.335 | 350.788 | 32 | -90 | 26.84 | 5 |
| DEX-CZ7311 | 418028.102 | 9674124.755 | 360.569 | 34 | -90 | 34.58 | 0.55 |
| DEX-CZ7312 | 418003.870 | 9674123.495 | 360.696 | 12 | -90 | 9.35 | 1 |
| DEX-CZ7313 | 417979.916 | 9674125.048 | 356.819 | 37 | -90 | 25.63 | 8.45 |
| DEX-CZ7314 | 417952.803 | 9674125.497 | 352.370 | 21 | -90 | 17.8 | 2 |
| DEX-CZ7315 | 417932.508 | 9674121.759 | 348.532 | 28 | -90 | 23.33 | 4.45 |
| DEX-CZ7316 | 418229.784 | 9674149.865 | 342.500 | 19 | -90 | 9.26 | 4 |
| DEX-CZ7317 | 418180.631 | 9674149.756 | 345.617 | 35 | -90 | 23.32 | 7 |
| DEX-CZ7318 | 418129.894 | 9674149.980 | 350.764 | 29 | -90 | 17.32 | 7 |
| DEX-CZ7319 | 418081.337 | 9674151.782 | 352.389 | 24 | -90 | 19.9 | 2.6 |
| DEX-CZ7320 | 418026.158 | 9674147.471 | 355.979 | 23 | -90 | 14.07 | 7.15 |
| DEX-CZ7321 | 417982.484 | 9674148.586 | 352.345 | 34 | -90 | 23.85 | 10.43 |
| DEX-CZ7323 | 418155.229 | 9674174.385 | 348.792 | 21 | -90 | 15.7 | 1 |
| DEX-CZ7324 | 418130.786 | 9674174.687 | 351.000 | 26 | -90 | 21.97 | 2 |
| DEX-CZ7325 | 418105.314 | 9674174.881 | 351.674 | 33 | -90 | 27.18 | 4 |
| DEX-CZ7326 | 418079.633 | 9674174.696 | 350.375 | 23 | -90 | 17.63 | 5 |
| DEX-CZ7327 | 418055.306 | 9674174.556 | 351.126 | 20 | -90 | 15.35 | 3 |
| DEX-CZ7328 | 418130.344 | 9674200.164 | 349.838 | 30 | -90 | 14.3 | 16 |
| DEX-CZ7329 | 418078.305 | 9674200.757 | 347.861 | 8 | -90 | 5.3 | 1.22 |
| DEX-CZ7330 | 418155.619 | 9674224.800 | 348.476 | 20 | -90 | 8 | 7 |
| DEX-CZ7331 | 418130.495 | 9674224.305 | 347.854 | 28 | -90 | 14.34 | 14 |
| DEX-CZ7332 | 418104.757 | 9674222.800 | 347.795 | 35 | -90 | 20 | 14 |
| DEX-CZ7333 | 418081.358 | 9674220.958 | 345.255 | 19 | -90 | 10 | 6.3 |
| DEX-CZ7334 | 418057.098 | 9674215.339 | 345.355 | 13 | -90 | 5 | 6 |
| DEX-CZ7335 | 418129.691 | 9673774.353 | 356.470 | 40 | -90 | 26.94 | 15 |
| DEX-CZ7336 | 418154.667 | 9673776.403 | 359.071 | 23 | -90 | 8 | 15 |
| DEX-CZ7337 | 418180.325 | 9673775.882 | 363.425 | 27 | -90 | 9 | 17 |
| DEX-CZ7338 | 418203.513 | 9673776.935 | 366.580 | 35 | -90 | 12 | 21 |
| DEX-CZ7339 | 418229.559 | 9673775.124 | 368.745 | 24 | -90 | 16.64 | 6 |
| DEX-CZ7340 | 418254.495 | 9673775.268 | 368.621 | 28 | -90 | 19.18 | 7 |
| DEX-CZ7341 | 418274.608 | 9673776.133 | 368.497 | 17 | -90 | 11.04 | 2 |
| DEX-CZ7342 | 418129.463 | 9673799.606 | 355.323 | 34 | -90 | 16 | 8.4 |
| DEX-CZ7343 | 418181.932 | 9673799.871 | 363.005 | 41 | -90 | 8 | 32 |
| DEX-CZ7344 | 418132.069 | 9673822.883 | 354.840 | 30 | -90 | 12.62 | 9.92 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB2019 | 415441.253 | 9675347.162 | 432.831 | 20 | -90 | 10 | 7 |
| DEX-BB2020 | 413502.256 | 9675797.384 | 396.182 | 22 | -90 | 11 | 1 |
| DEX-BB2021 | 413549.941 | 9675796.550 | 402.646 | 16 | -90 | 3 | 5 |
| DEX-BB2022 | 413449.033 | 9675751.376 | 386.000 | 29 | -90 | 9 | 6 |
| DEX-BB2023 | 413545.803 | 9675750.590 | 392.603 | 17 | -90 | 10.44 | 4 |
| DEX-BB2029 | 413500.182 | 9675701.168 | 383.059 | 29 | -90 | 7.77 | 17 |
| DEX-BB2030 | 413549.983 | 9675696.141 | 391.832 | 19 | -90 | 8 | 9 |
| DEX-BB2031 | 413606.965 | 9675706.291 | 406.535 | 23 | -90 | 1 | 7 |
| DEX-BB2033 | 413710.198 | 9675686.752 | 413.165 | 20 | -90 | 3 | 10 |
| DEX-BB2034 | 413740.644 | 9675702.958 | 424.166 | 17 | -90 | 1 | 7 |
| DEX-BB2036 | 413550.010 | 9675652.264 | 387.533 | 20 | -90 | 11.82 | 5 |
| DEX-BB2037 | 413650.207 | 9675649.573 | 397.237 | 16 | -90 | 6 | 7 |
| DEX-BB2038 | 413747.907 | 9675652.613 | 411.564 | 18 | -90 | 1 | 12 |
| DEX-BB2041 | 413598.217 | 9675599.867 | 385.164 | 26 | -90 | 11 | 10 |
| DEX-BB2042 | 413697.590 | 9675597.953 | 392.620 | 15 | -90 | 1 | 10 |
| DEX-BB2044 | 413652.254 | 9675548.425 | 391.323 | 15 | -90 | 10 | 0 |
| DEX-BB2049 | 413650.431 | 9675450.229 | 385.394 | 12 | -90 | 5 | 4 |
| DEX-BB2051 | 413799.853 | 9675448.256 | 403.838 | 5 | -90 | 1 | 0 |
| DEX-BB2053 | 413700.334 | 9675402.899 | 385.521 | 13 | -90 | 5.27 | 2 |
| DEX-BB2054 | 413800.017 | 9675399.536 | 389.094 | 29 | -90 | 13.31 | 14.68 |
| DEX-BB2056 | 413750.573 | 9675351.043 | 382.694 | 18 | -90 | 12.4 | 1 |
| DEX-BB4332 | 413892.817 | 9674876.843 | 381.000 | 22 | -90 | 16.23 | 5.25 |
| DEX-BB4333 | 413811.298 | 9675082.624 | 380.000 | 15 | -90 | 5 | 4 |
| DEX-BB4334 | 413747.828 | 9675250.721 | 379.060 | 17 | -90 | 10.51 | 3 |
| DEX-BB4340 | 414216.859 | 9675121.515 | 388.000 | 13 | -90 | 8 | 2 |
| DEX-BB4385 | 415156.290 | 9675526.096 | 438.029 | 22 | -90 | 15.51 | 2.4 |
| DEX-BB4386 | 415176.316 | 9675525.041 | 438.643 | 21 | -90 | 16.99 | 2 |
| DEX-BB4395 | 415182.675 | 9675498.485 | 436.115 | 21 | -90 | 10.43 | 10.35 |
| DEX-BB4396 | 415234.604 | 9675496.593 | 436.264 | 19 | -90 | 11 | 5 |
| DEX-BB4399 | 415278.171 | 9675475.205 | 435.661 | 17 | -90 | 13.62 | 0 |
| DEX-BB4400 | 415302.676 | 9675479.469 | 433.955 | 17 | -90 | 10 | 1 |
| DEX-BB4404 | 415323.673 | 9675452.185 | 436.384 | 26 | -90 | 16 | 5 |
| DEX-BB4405 | 414977.196 | 9675550.793 | 437.373 | 25 | -90 | 19.71 | 2 |
| DEX-BB4406 | 414950.667 | 9675545.787 | 434.565 | 28 | -90 | 15.43 | 9 |
| DEX-BB4407 | 414928.653 | 9675548.185 | 434.823 | 23 | -90 | 12.72 | 3.75 |
| DEX-BB4408 | 414880.800 | 9675546.424 | 436.376 | 8 | -90 | 3.6 | 0 |
| DEX-BB4410 | 414951.179 | 9675571.883 | 439.000 | 16 | -90 | 8.35 | 5.56 |
| DEX-BB4411 | 414927.086 | 9675573.702 | 437.534 | 12 | -90 | 8 | 1 |
| DEX-BB4412 | 414904.793 | 9675572.024 | 437.299 | 24 | -90 | 7 | 13.2 |
| DEX-BB4413 | 414872.909 | 9675572.722 | 438.901 | 13 | -90 | 6 | 0.46 |
| DEX-BB4414 | 414855.475 | 9675580.011 | 440.693 | 9 | -90 | 5 | 0 |
| DEX-BB4415 | 414976.945 | 9675595.605 | 441.592 | 19 | -90 | 12.52 | 4.7 |
| DEX-BB4416 | 414933.066 | 9675595.966 | 440.249 | 20 | -90 | 10.17 | 6 |
| DEX-BB4417 | 414881.832 | 9675599.026 | 441.458 | 21 | -90 | 9.91 | 9 |
| DEX-BB4418 | 415130.050 | 9675478.910 | 433.000 | 18 | -90 | 9 | 8.6 |
| DEX-BB4419 | 415152.423 | 9675477.912 | 433.227 | 15 | -90 | 9.4 | 3.16 |
| DEX-BB4420 | 415183.075 | 9675472.761 | 433.947 | 18 | -90 | 10 | 5.16 |
| DEX-BB4421 | 415199.908 | 9675478.313 | 435.188 | 18 | -90 | 14.7 | 1 |
| DEX-BB4422 | 415226.772 | 9675474.521 | 436.000 | 18 | -90 | 13.19 | 2 |
| DEX-BB4423 | 415255.429 | 9675477.266 | 436.000 | 20 | -90 | 13 | 4 |
| DEX-BB4424 | 415126.085 | 9675452.100 | 431.000 | 15 | -90 | 9.75 | 4 |
| DEX-BB4425 | 415175.070 | 9675453.709 | 433.000 | 19 | -90 | 14.65 | 3 |
| DEX-BB4426 | 415227.820 | 9675449.587 | 435.435 | 19 | -90 | 12 | 2 |
| DEX-BB4427 | 415280.429 | 9675449.025 | 436.596 | 26 | -90 | 17.01 | 4 |
| DEX-BB4428 | 415128.420 | 9675423.387 | 435.806 | 14 | -90 | 9.4 | 3 |
| DEX-BB4429 | 415127.016 | 9675396.837 | 439.289 | 27 | -90 | 12 | 12.38 |
| DEX-BB4430 | 415128.864 | 9675374.947 | 439.521 | 20 | -90 | 14.39 | 5.32 |
| DEX-BB4431 | 415131.777 | 9675351.787 | 438.603 | 27 | -90 | 14.31 | 11 |
| DEX-BB4432 | 415129.797 | 9675325.134 | 434.688 | 37 | -90 | 11 | 22.5 |
| DEX-BB4434 | 415122.684 | 9675267.494 | 437.857 | 16 | -90 | 4 | 6.9 |
| DEX-BB4435 | 415132.249 | 9675250.182 | 440.159 | 19 | -90 | 4 | 9.83 |
| DEX-BB4437 | 415100.818 | 9675424.782 | 434.827 | 19 | -90 | 11.94 | 5 |
| DEX-BB4438 | 415075.506 | 9675423.963 | 433.870 | 18 | -90 | 14.5 | 1 |
| DEX-BB4439 | 415052.056 | 9675421.851 | 432.068 | 13 | -90 | 8.43 | 2 |
| DEX-BB4440 | 415028.924 | 9675427.444 | 429.485 | 17 | -90 | 7.5 | 6 |
| DEX-BB4441 | 415029.383 | 9675401.256 | 425.733 | 14 | -90 | 4.24 | 7.56 |
| DEX-BB4442 | 415027.530 | 9675382.226 | 424.888 | 13 | -90 | 5 | 5 |
| DEX-BB4443 | 415032.021 | 9675354.536 | 427.144 | 39 | -90 | 13.51 | 18.57 |
| DEX-BB4444 | 415030.146 | 9675330.383 | 424.000 | 29 | -90 | 19.19 | 10.34 |
| DEX-BB4445 | 415030.656 | 9675299.099 | 423.025 | 24 | -90 | 16 | 5 |
| DEX-BB4446 | 415029.455 | 9675277.471 | 422.542 | 26 | -90 | 15 | 11 |
| DEX-BB4447 | 415030.725 | 9675251.734 | 421.911 | 26 | -90 | 17 | 7 |
| DEX-BB4448 | 415056.430 | 9675377.301 | 431.731 | 20 | -90 | 8 | 6.3 |
| DEX-BB4449 | 415056.105 | 9675328.856 | 426.219 | 20 | -90 | 15.2 | 2 |
| DEX-BB4450 | 415054.966 | 9675302.421 | 424.933 | 32 | -90 | 12.6 | 16.37 |
| DEX-BB4451 | 415054.689 | 9675276.272 | 424.709 | 22 | -90 | 12.22 | 5 |
| DEX-BB4452 | 415056.930 | 9675249.681 | 423.903 | 16 | -90 | 12 | 1.53 |
| DEX-BB4453 | 415059.014 | 9675226.347 | 423.166 | 19 | -90 | 10 | 6 |
| DEX-BB4454 | 415076.666 | 9675402.361 | 435.428 | 12 | -90 | 7.5 | 3.24 |
| DEX-BB4455 | 415079.033 | 9675374.281 | 434.243 | 18 | -90 | 5 | 9.36 |
| DEX-BB4456 | 415076.535 | 9675330.164 | 429.165 | 23 | -90 | 11.39 | 6.33 |
| DEX-BB4457 | 415083.718 | 9675304.154 | 428.482 | 29 | -90 | 14.83 | 10 |
| DEX-BB4458 | 415080.082 | 9675276.896 | 428.910 | 25 | -90 | 12 | 9 |
| DEX-BB4459 | 415075.907 | 9675248.929 | 427.517 | 26 | -90 | 12 | 10 |
| DEX-BB4460 | 415075.467 | 9675227.101 | 426.086 | 21 | -90 | 15 | 3.5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7345 | 418154.216 | 9673826.210 | 357.715 | 33 | -90 | 15.42 | 16.5 |
| DEX-CZ7346 | 418180.104 | 9673825.452 | 359.651 | 25 | -90 | 15 | 3 |
| DEX-CZ7347 | 418207.019 | 9673826.675 | 361.955 | 37 | -90 | 17.43 | 13 |
| DEX-CZ7348 | 418128.474 | 9673849.768 | 353.844 | 35 | -90 | 28.48 | 5.39 |
| DEX-CZ7349 | 418179.522 | 9673849.844 | 359.672 | 21 | -90 | 15 | 1 |
| DEX-CZ7350 | 418132.856 | 9673872.248 | 353.885 | 34 | -90 | 27.68 | 7.28 |
| DEX-CZ7351 | 418154.441 | 9673873.207 | 354.986 | 37 | -90 | 23.66 | 15.61 |
| DEX-CZ7352 | 418180.571 | 9673877.135 | 357.995 | 24 | -90 | 14.99 | 9 |
| DEX-CZ7353 | 418205.213 | 9673872.295 | 362.000 | 26 | -90 | 17.56 | 9 |
| DEX-CZ7354 | 418132.396 | 9673901.038 | 355.488 | 34 | -90 | 27.58 | 7 |
| DEX-CZ7355 | 418179.389 | 9673902.940 | 358.140 | 23 | -90 | 16.83 | 6.5 |
| DEX-CZ7356 | 418129.004 | 9673918.898 | 356.544 | 27 | -90 | 17.75 | 9 |
| DEX-CZ7357 | 418156.217 | 9673925.194 | 360.723 | 47 | -90 | 38.53 | 11.4 |
| DEX-CZ7358 | 418181.223 | 9673926.782 | 362.427 | 38 | -90 | 38.42 | 2.33 |
| DEX-CZ7359 | 418203.146 | 9673921.298 | 360.874 | 23 | -90 | 20.56 | 4 |
| DEX-CZ7360 | 418755.986 | 9673926.493 | 366.369 | 44 | -90 | 16 | 26 |
| DEX-CZ7361 | 418779.692 | 9673925.088 | 363.887 | 31 | -90 | 24 | 5 |
| DEX-CZ7362 | 418805.108 | 9673924.911 | 360.397 | 21 | -90 | 20.42 | 0 |
| DEX-CZ7363 | 418829.696 | 9673925.828 | 356.608 | 27 | -90 | 8 | 18 |
| DEX-CZ7364 | 418853.841 | 9673923.563 | 354.527 | 32 | -90 | 29.33 | 5 |
| DEX-CZ7365 | 418880.665 | 9673924.774 | 352.577 | 42 | -90 | 24.51 | 10.91 |
| DEX-CZ7366 | 418182.569 | 9673950.434 | 364.000 | 36 | -90 | 27.15 | 10.2 |
| DEX-CZ7367 | 418779.677 | 9673947.994 | 363.073 | 22 | -90 | 19.5 | 1 |
| DEX-CZ7368 | 418832.364 | 9673951.944 | 354.174 | 32 | -90 | 23.56 | 8 |
| DEX-CZ7369 | 418880.704 | 9673949.491 | 349.794 | 25 | -90 | 23.19 | 2 |
| DEX-CZ7370 | 418205.868 | 9673981.218 | 364.126 | 37 | -90 | 16.68 | 21.47 |
| DEX-CZ7371 | 418233.190 | 9673977.367 | 364.806 | 29 | -90 | 16.09 | 9 |
| DEX-CZ7372 | 418683.612 | 9673975.292 | 363.594 | 19 | -90 | 15.26 | 2 |
| DEX-CZ7373 | 418701.820 | 9673971.336 | 364.077 | 19 | -90 | 13.34 | 4 |
| DEX-CZ7374 | 418727.522 | 9673976.845 | 363.644 | 27 | -90 | 14 | 5 |
| DEX-CZ7375 | 418755.143 | 9673974.901 | 364.000 | 25 | -90 | 17 | 5.8 |
| DEX-CZ7376 | 418781.118 | 9673976.864 | 362.552 | 26 | -90 | 22.06 | 7 |
| DEX-CZ7377 | 418804.242 | 9673974.479 | 358.373 | 24 | -90 | 18.92 | 6.23 |
| DEX-CZ7378 | 418828.165 | 9673974.020 | 352.932 | 29 | -90 | 16 | 11 |
| DEX-CZ7379 | 418852.320 | 9673974.206 | 349.417 | 39 | -90 | 18 | 4 |
| DEX-CZ7380 | 418878.502 | 9673973.486 | 347.234 | 23 | -90 | 16.26 | 4 |
| DEX-CZ7381 | 418681.041 | 9674024.828 | 359.359 | 14 | -90 | 10 | 2.52 |
| DEX-CZ7382 | 418706.209 | 9674026.352 | 360.749 | 27 | -90 | 22 | 5 |
| DEX-CZ7383 | 418728.284 | 9674026.026 | 361.947 | 33 | -90 | 27 | 6 |
| DEX-CZ7384 | 418753.465 | 9674024.249 | 361.658 | 23 | -90 | 18 | 4 |
| DEX-CZ7385 | 418783.201 | 9674026.875 | 355.606 | 10 | -90 | 6 | 2 |
| DEX-CZ7386 | 418880.025 | 9674021.840 | 339.061 | 38 | -90 | 34.72 | 5 |
| DEX-CZ7387 | 418901.324 | 9674026.909 | 341.486 | 34 | -90 | 25.28 | 5 |
| DEX-CZ7388 | 418931.133 | 9674023.317 | 347.219 | 37 | -90 | 23.07 | 16 |
| DEX-CZ7389 | 418954.355 | 9674022.875 | 348.000 | 26 | -90 | 19.95 | 6 |
| DEX-CZ7390 | 418980.714 | 9674023.969 | 348.860 | 26 | -90 | 16.32 | 8 |
| DEX-CZ7391 | 419005.139 | 9674025.763 | 349.093 | 19 | -90 | 14 | 3 |
| DEX-CZ7392 | 419032.726 | 9674026.820 | 349.467 | 30 | -90 | 8 | 19 |
| DEX-CZ7393 | 418776.933 | 9674045.459 | 352.029 | 17 | -90 | 8 | 7 |
| DEX-CZ7394 | 418480.432 | 9674072.151 | 358.269 | 48 | -90 | 17 | 21 |
| DEX-CZ7395 | 418501.384 | 9674078.857 | 353.571 | 11 | -90 | 5 | 5 |
| DEX-CZ7396 | 418529.268 | 9674074.065 | 348.027 | 16 | -90 | 5 | 9 |
| DEX-CZ7399 | 418478.967 | 9674124.251 | 353.214 | 13 | -90 | 4 | 7 |
| DEX-CZ7401 | 418535.741 | 9674128.210 | 328.443 | 6 | -90 | 3 | 1 |
| DEX-CZ7402 | 418556.728 | 9674123.483 | 334.515 | 18 | -90 | 6 | 11 |
| DEX-CZ7403 | 418480.365 | 9674149.108 | 347.243 | 15 | -90 | 8 | 4 |
| DEX-CZ7404 | 418531.339 | 9674149.514 | 326.000 | 14 | -90 | 9 | 3 |
| DEX-CZ7405 | 418470.177 | 9674173.267 | 348.027 | 9 | -90 | 5 | 2 |
| DEX-CZ7406 | 418510.409 | 9674173.726 | 327.671 | 17 | -90 | 7 | 8 |
| DEX-CZ7408 | 418632.605 | 9674174.432 | 360.094 | 10 | -90 | 3 | 5 |
| DEX-CZ7409 | 418653.265 | 9674175.388 | 357.869 | 9 | -90 | 5 | 4 |
| DEX-CZ7410 | 418674.791 | 9674177.207 | 350.157 | 21 | -90 | 12.31 | 7.35 |
| DEX-CZ7411 | 419031.827 | 9674174.875 | 350.916 | 28 | -90 | 16 | 10 |
| DEX-CZ7412 | 419050.573 | 9674174.230 | 348.455 | 23 | -90 | 9 | 13 |
| DEX-CZ7413 | 419077.618 | 9674177.114 | 343.323 | 27 | -90 | 20 | 5 |
| DEX-CZ7414 | 419100.587 | 9674176.702 | 339.645 | 33 | -90 | 12 | 11 |
| DEX-CZ7415 | 419128.323 | 9674176.820 | 338.024 | 18 | -90 | 9 | 4 |
| DEX-CZ7416 | 418928.756 | 9674200.442 | 354.543 | 31 | -90 | 29.08 | 1 |
| DEX-CZ7417 | 418979.545 | 9674196.719 | 353.970 | 33 | -90 | 21 | 12 |
| DEX-CZ7418 | 419030.402 | 9674203.801 | 348.029 | 30 | -90 | 22.72 | 8 |
| DEX-CZ7419 | 419078.050 | 9674207.552 | 336.955 | 32 | -90 | 20 | 12 |
| DEX-CZ7420 | 419124.803 | 9674201.004 | 330.996 | 34 | -90 | 10 | 24 |
| DEX-CZ7421 | 418931.168 | 9674224.816 | 357.000 | 28 | -90 | 16.35 | 10 |
| DEX-CZ7422 | 418956.477 | 9674225.856 | 355.852 | 19 | -90 | 13.37 | 5 |
| DEX-CZ7423 | 418977.629 | 9674227.289 | 354.734 | 6 | -90 | 4 | 0 |
| DEX-CZ7424 | 419076.144 | 9674227.032 | 334.229 | 32 | -90 | 24.29 | 6 |
| DEX-CZ7428 | 418929.210 | 9674250.387 | 355.322 | 11 | -90 | 8 | 1 |
| DEX-CZ7430 | 418928.993 | 9674271.576 | 349.170 | 18 | -90 | 11 | 7 |
| DEX-CZ7436 | 418179.547 | 9674329.506 | 336.547 | 19 | -90 | 15 | 2 |
| DEX-CZ7437 | 418198.172 | 9674322.765 | 334.098 | 32 | -90 | 15.25 | 14.24 |
| DEX-CZ7438 | 418220.760 | 9674320.963 | 328.070 | 16 | -90 | 10 | 3 |
| DEX-CZ7439 | 418242.601 | 9674320.411 | 319.314 | 10 | -90 | 5 | 2 |
| DEX-CZ7440 | 418284.161 | 9674324.770 | 335.301 | 45 | -90 | 28.76 | 16 |
| DEX-CZ7441 | 418306.320 | 9674326.967 | 338.081 | 30 | -90 | 16.52 | 14 |
| DEX-CZ7444 | 418236.543 | 9674349.637 | 315.000 | 8 | -90 | 1 | 5 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4461 | 415079.514 | 9675352.088 | 432.650 | 16 | -90 | 8.37 | 6.77 |
| DEX-BB4462 | 415104.172 | 9675403.649 | 437.370 | 16 | -90 | 9 | 1 |
| DEX-BB4463 | 415102.877 | 9675373.172 | 436.763 | 14 | -90 | 7.4 | 3.3 |
| DEX-BB4464 | 415102.345 | 9675355.601 | 435.768 | 13 | -90 | 8 | 4.88 |
| DEX-BB4465 | 415109.838 | 9675323.481 | 432.072 | 31 | -90 | 27.19 | 5 |
| DEX-BB4466 | 415105.865 | 9675297.109 | 432.675 | 20 | -90 | 11.64 | 5 |
| DEX-BB4467 | 415108.073 | 9675279.029 | 434.296 | 22 | -90 | 11.26 | 5 |
| DEX-BB4468 | 415105.849 | 9675227.713 | 432.167 | 22 | -90 | 15 | 3 |
| DEX-BB4469 | 415153.770 | 9675423.812 | 436.404 | 26 | -90 | 11.82 | 7.78 |
| DEX-BB4470 | 415178.370 | 9675422.144 | 437.258 | 20 | -90 | 12.35 | 4 |
| DEX-BB4471 | 415203.015 | 9675417.444 | 438.316 | 34 | -90 | 11.44 | 20.84 |
| DEX-BB4472 | 415229.336 | 9675426.729 | 437.580 | 34 | -90 | 24.01 | 7 |
| DEX-BB4473 | 415252.061 | 9675427.676 | 437.819 | 29 | -90 | 11 | 13 |
| DEX-BB4474 | 415278.038 | 9675426.894 | 437.795 | 20 | -90 | 15 | 0 |
| DEX-BB4475 | 415303.432 | 9675422.140 | 437.894 | 28 | -90 | 24.52 | 2 |
| DEX-BB4476 | 415328.478 | 9675423.795 | 436.476 | 26 | -90 | 17.6 | 5 |
| DEX-BB4477 | 415349.294 | 9675430.446 | 434.411 | 27 | -90 | 17 | 1 |
| DEX-BB4478 | 415373.943 | 9675424.378 | 429.923 | 16 | -90 | 10 | 2 |
| DEX-BB4479 | 415154.307 | 9675402.954 | 439.936 | 19 | -90 | 10.44 | 3.88 |
| DEX-BB4480 | 415180.098 | 9675404.839 | 439.873 | 34 | -90 | 15.59 | 8.76 |
| DEX-BB4481 | 415201.976 | 9675399.452 | 441.213 | 27 | -90 | 20.32 | 3.76 |
| DEX-BB4482 | 415230.729 | 9675400.357 | 441.173 | 18 | -90 | 12.26 | 3 |
| DEX-BB4483 | 415279.633 | 9675401.090 | 439.997 | 18 | -90 | 12 | 4 |
| DEX-BB4484 | 415308.095 | 9675401.059 | 439.497 | 24 | -90 | 16 | 4 |
| DEX-BB4485 | 415336.183 | 9675397.437 | 437.273 | 36 | -90 | 25 | 8.8 |
| DEX-BB4486 | 415352.171 | 9675397.327 | 435.771 | 35 | -90 | 12.35 | 19.06 |
| DEX-BB4487 | 415378.894 | 9675404.065 | 432.875 | 16 | -90 | 7 | 3 |
| DEX-BB4488 | 415151.849 | 9675376.220 | 441.178 | 17 | -90 | 9.5 | 6.71 |
| DEX-BB4489 | 415181.222 | 9675378.723 | 442.617 | 18 | -90 | 9.4 | 2 |
| DEX-BB4490 | 415206.136 | 9675372.557 | 444.210 | 19 | -90 | 9.76 | 6.85 |
| DEX-BB4491 | 415231.706 | 9675376.390 | 444.165 | 24 | -90 | 12 | 6 |
| DEX-BB4492 | 415257.688 | 9675371.470 | 444.183 | 23 | -90 | 16.36 | 3 |
| DEX-BB4493 | 415280.331 | 9675373.138 | 442.964 | 22 | -90 | 15.2 | 4 |
| DEX-BB4494 | 415304.904 | 9675373.266 | 442.184 | 22 | -90 | 18 | 2 |
| DEX-BB4495 | 415332.252 | 9675373.832 | 440.013 | 20 | -90 | 15 | 3 |
| DEX-BB4497 | 415379.335 | 9675375.165 | 438.000 | 15 | -90 | 9 | 2 |
| DEX-BB4498 | 415206.806 | 9675347.835 | 445.949 | 24 | -90 | 6 | 8 |
| DEX-BB4499 | 415230.161 | 9675353.445 | 446.470 | 20 | -90 | 11 | 5 |
| DEX-BB4500 | 415253.422 | 9675355.519 | 446.422 | 23 | -90 | 13.33 | 6.27 |
| DEX-BB4501 | 415281.250 | 9675352.404 | 445.702 | 16 | -90 | 11 | 2 |
| DEX-BB4502 | 415309.657 | 9675346.426 | 445.001 | 27 | -90 | 16.58 | 8 |
| DEX-BB4503 | 415324.378 | 9675347.671 | 444.180 | 23 | -90 | 16.37 | 4 |
| DEX-BB4504 | 415361.825 | 9675347.759 | 443.647 | 25 | -90 | 13 | 8 |
| DEX-BB4505 | 415381.771 | 9675351.247 | 441.504 | 31 | -90 | 5 | 17.65 |
| DEX-BB4506 | 415404.130 | 9675351.951 | 438.674 | 23 | -90 | 7 | 7 |
| DEX-BB4507 | 415187.395 | 9675327.172 | 445.781 | 21 | -90 | 10 | 6 |
| DEX-BB4508 | 415203.225 | 9675328.763 | 447.752 | 26 | -90 | 19.46 | 4 |
| DEX-BB4509 | 415232.406 | 9675328.023 | 449.739 | 32 | -90 | 17.26 | 8 |
| DEX-BB4510 | 415253.798 | 9675331.225 | 449.135 | 32 | -90 | 27.34 | 1 |
| DEX-BB4511 | 415281.319 | 9675325.582 | 448.499 | 27 | -90 | 18.28 | 4 |
| DEX-BB4512 | 415305.575 | 9675329.402 | 446.929 | 22 | -90 | 13.65 | 5.74 |
| DEX-BB4513 | 415329.457 | 9675323.519 | 447.161 | 28 | -90 | 19.04 | 6 |
| DEX-BB4514 | 415356.170 | 9675329.436 | 446.104 | 32 | -90 | 16.29 | 13 |
| DEX-BB4515 | 415376.434 | 9675329.114 | 444.697 | 24 | -90 | 13 | 8.7 |
| DEX-BB4516 | 415407.283 | 9675325.368 | 440.163 | 21 | -90 | 8 | 0 |
| DEX-BB4517 | 415158.500 | 9675297.587 | 443.128 | 23 | -90 | 15.36 | 6 |
| DEX-BB4518 | 415179.127 | 9675300.933 | 446.112 | 20 | -90 | 16.61 | 1 |
| DEX-BB4519 | 415229.784 | 9675305.242 | 451.483 | 24 | -90 | 15.43 | 7 |
| DEX-BB4520 | 415287.663 | 9675308.249 | 449.585 | 30 | -90 | 16.63 | 5 |
| DEX-BB4521 | 415303.406 | 9675311.908 | 448.588 | 30 | -90 | 17.57 | 9.85 |
| DEX-BB4522 | 415331.750 | 9675301.474 | 448.000 | 35 | -90 | 30 | 3 |
| DEX-BB4524 | 415378.061 | 9675313.154 | 444.714 | 20 | -90 | 12 | 3 |
| DEX-BB4525 | 415181.199 | 9675274.925 | 450.394 | 35 | -90 | 12.28 | 21.16 |
| DEX-BB4526 | 415209.555 | 9675279.536 | 453.018 | 30 | -90 | 25.26 | 4.5 |
| DEX-BB4527 | 415225.280 | 9675275.219 | 453.615 | 25 | -90 | 18 | 5 |
| DEX-BB4528 | 415252.564 | 9675276.083 | 452.959 | 24 | -90 | 13 | 9 |
| DEX-BB4529 | 415281.428 | 9675276.532 | 451.175 | 32 | -90 | 26 | 2 |
| DEX-BB4530 | 415306.160 | 9675272.994 | 449.163 | 32 | -90 | 15 | 14 |
| DEX-BB4531 | 415330.361 | 9675276.285 | 447.394 | 22 | -90 | 18 | 2 |
| DEX-BB4532 | 415350.505 | 9675278.755 | 445.973 | 22 | -90 | 13 | 6 |
| DEX-BB4533 | 415161.253 | 9675250.570 | 446.804 | 23 | -90 | 10 | 8.73 |
| DEX-BB4534 | 415180.708 | 9675249.428 | 449.807 | 27 | -90 | 14 | 6 |
| DEX-BB4535 | 415211.112 | 9675257.512 | 453.652 | 35 | -90 | 12.21 | 20.82 |
| DEX-BB4536 | 415231.140 | 9675245.704 | 453.690 | 27 | -90 | 10 | 13 |
| DEX-BB4537 | 415280.832 | 9675254.626 | 448.636 | 24 | -90 | 10 | 11 |
| DEX-BB4538 | 415329.047 | 9675261.051 | 445.676 | 32 | -90 | 25 | 5 |
| DEX-BB4539 | 415133.415 | 9675227.217 | 437.783 | 20 | -90 | 6 | 8.72 |
| DEX-BB4540 | 415155.688 | 9675226.602 | 443.216 | 23 | -90 | 10 | 9 |
| DEX-BB4541 | 415179.504 | 9675228.270 | 447.161 | 23 | -90 | 13 | 8 |
| DEX-BB4542 | 415203.874 | 9675226.493 | 449.156 | 20 | -90 | 4 | 13 |
| DEX-BB4543 | 415227.089 | 9675225.193 | 450.932 | 12 | -90 | 3 | 5 |
| DEX-BB4544 | 415252.304 | 9675228.381 | 449.701 | 31 | -90 | 21 | 7 |
| DEX-BB4545 | 415278.006 | 9675221.391 | 444.118 | 30 | -90 | 15 | 9 |
| DEX-BB4546 | 415311.066 | 9675228.516 | 441.577 | 40 | -90 | 30 | 7 |
| DEX-BB4585 | 415008.583 | 9675329.954 | 421.695 | 32 | -90 | 17.25 | 14.07 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7445 | 418279.323 | 9674353.924 | 333.549 | 24 | -90 | 14.29 | 8 |
| DEX-CZ7447 | 418159.222 | 9674378.037 | 324.580 | 13 | -90 | 5 | 7 |
| DEX-CZ7448 | 418178.020 | 9674369.154 | 329.511 | 17 | -90 | 9 | 6 |
| DEX-CZ7449 | 418212.696 | 9674372.454 | 312.582 | 11 | -90 | 7 | 3 |
| DEX-CZ7451 | 418261.090 | 9674376.519 | 329.484 | 44 | -90 | 15.28 | 27 |
| DEX-CZ7452 | 418279.274 | 9674377.702 | 331.731 | 17 | -90 | 9 | 6 |
| DEX-CZ7453 | 418305.986 | 9674373.845 | 333.663 | 24 | -90 | 13 | 8 |
| DEX-CZ7454 | 418327.568 | 9674373.899 | 333.250 | 21 | -90 | 11 | 10 |
| DEX-CZ7455 | 418351.938 | 9674378.138 | 331.905 | 34 | -90 | 12.26 | 22 |
| DEX-CZ7456 | 418381.921 | 9674368.181 | 331.725 | 22 | -90 | 16.23 | 5 |
| DEX-CZ7457 | 418399.884 | 9674367.889 | 329.158 | 14 | -90 | 10 | 4 |
| DEX-CZ7458 | 418427.800 | 9674369.360 | 319.059 | 8 | -90 | 4 | 2 |
| DEX-CZ7463 | 418328.319 | 9674395.017 | 329.648 | 23 | -90 | 9 | 14 |
| DEX-CZ7466 | 418135.972 | 9674425.425 | 312.394 | 18 | -90 | 8 | 8 |
| DEX-CZ7468 | 418174.392 | 9674418.964 | 319.227 | 20 | -90 | 16.26 | 2 |
| DEX-CZ7469 | 418209.059 | 9674418.536 | 306.228 | 15 | -90 | 2 | 10 |
| DEX-CZ7470 | 418238.226 | 9674420.539 | 309.252 | 17 | -90 | 4 | 6 |
| DEX-CZ7472 | 418283.200 | 9674426.359 | 324.910 | 27 | -90 | 22.09 | 4 |
| DEX-CZ7473 | 418302.964 | 9674422.233 | 326.077 | 26 | -90 | 19.51 | 5 |
| DEX-CZ7477 | 418123.076 | 9674450.142 | 305.457 | 12 | -90 | 8 | 2 |
| DEX-CZ7480 | 418278.401 | 9674445.301 | 320.641 | 25 | -90 | 21.55 | 2 |
| DEX-CZ7494 | 418033.524 | 9673800.969 | 350.627 | 43 | -90 | 40.72 | 4 |
| DEX-CZ7495 | 418084.201 | 9673800.939 | 352.508 | 29 | -90 | 27.08 | 1 |
| DEX-CZ7496 | 418033.078 | 9673826.371 | 349.231 | 42 | -90 | 40.41 | 2 |
| DEX-CZ7497 | 418054.261 | 9673828.011 | 350.021 | 34 | -90 | 33.16 | 3 |
| DEX-CZ7498 | 418080.331 | 9673823.540 | 351.270 | 32 | -90 | 26.33 | 8 |
| DEX-CZ7499 | 418107.281 | 9673825.284 | 352.671 | 25 | -90 | 20.29 | 3.28 |
| DEX-CZ7500 | 418031.613 | 9673919.789 | 353.335 | 29 | -90 | 13.29 | 15 |
| DEX-CZ7501 | 418050.519 | 9673926.384 | 354.791 | 13 | -90 | 10 | 1 |
| DEX-CZ7502 | 418079.067 | 9673922.030 | 354.445 | 25 | -90 | 16.27 | 8 |
| DEX-CZ7503 | 418101.259 | 9673928.771 | 355.878 | 25 | -90 | 22.28 | 2 |
| DEX-CZ7504 | 418026.045 | 9673947.845 | 361.029 | 13 | -90 | 5.76 | 3.24 |
| DEX-CZ7505 | 418079.761 | 9673947.046 | 359.244 | 24 | -90 | 16.27 | 6 |
| DEX-CZ7506 | 418127.292 | 9673949.469 | 360.476 | 31 | -90 | 27.43 | 3 |
| DEX-CZ7507 | 418380.634 | 9673972.697 | 367.114 | 26 | -90 | 15.81 | 4.55 |
| DEX-CZ7508 | 418378.970 | 9673999.183 | 364.888 | 36 | -90 | 11.62 | 15.97 |
| DEX-CZ7509 | 418685.595 | 9674000.851 | 361.608 | 18 | -90 | 11 | 5 |
| DEX-CZ7510 | 418781.133 | 9674090.846 | 333.876 | 15 | -90 | 5 | 10 |
| DEX-CZ7511 | 418783.062 | 9674124.703 | 341.148 | 17 | -90 | 5 | 10 |
| DEX-CZ7512 | 418782.234 | 9674149.257 | 338.472 | 17 | -90 | 6 | 6 |
| DEX-CZ7513 | 418558.974 | 9674172.848 | 343.666 | 22 | -90 | 8 | 12 |
| DEX-CZ7514 | 418580.368 | 9674174.500 | 351.660 | 25 | -90 | 18.59 | 7 |
| DEX-CZ7515 | 418733.590 | 9674173.378 | 320.373 | 18 | -90 | 6 | 11 |
| DEX-CZ7516 | 418764.061 | 9674170.498 | 328.946 | 22 | -90 | 4 | 17 |
| DEX-CZ7517 | 418779.167 | 9674167.466 | 335.050 | 17 | -90 | 7 | 6 |
| DEX-CZ7518 | 418483.510 | 9674204.786 | 338.526 | 9 | -90 | 5 | 2 |
| DEX-CZ7520 | 418576.314 | 9674199.202 | 348.923 | 23 | -90 | 10.27 | 13 |
| DEX-CZ7521 | 418479.609 | 9674223.620 | 339.627 | 39 | -90 | 16.49 | 20.76 |
| DEX-CZ7524 | 418579.703 | 9674221.931 | 346.772 | 21 | -90 | 11.25 | 9 |
| DEX-CZ7525 | 418604.661 | 9674221.296 | 353.529 | 19 | -90 | 9 | 7 |
| DEX-CZ7526 | 418630.023 | 9674226.486 | 356.595 | 14 | -90 | 5 | 8 |
| DEX-CZ7527 | 418653.644 | 9674220.204 | 355.416 | 6 | -90 | 1 | 4 |
| DEX-CZ7528 | 418681.808 | 9674222.705 | 346.991 | 24 | -90 | 9 | 12 |
| DEX-CZ7529 | 418702.030 | 9674220.224 | 341.236 | 20 | -90 | 16 | 2 |
| DEX-CZ7530 | 418733.421 | 9674230.065 | 325.163 | 22 | -90 | 12 | 8 |
| DEX-CZ7531 | 419028.753 | 9674222.472 | 345.824 | 11 | -90 | 6 | 3 |
| DEX-CZ7532 | 419052.308 | 9674225.130 | 339.739 | 22 | -90 | 16 | 5 |
| DEX-CZ7534 | 418588.619 | 9674252.440 | 344.207 | 12 | -90 | 3 | 8 |
| DEX-CZ7535 | 418622.573 | 9674251.020 | 350.778 | 5 | -90 | 2 | 0 |
| DEX-CZ7540 | 418603.140 | 9674272.618 | 345.594 | 8 | -90 | 1 | 7 |
| DEX-CZ7670 | 416747.267 | 9673122.454 | 407.627 | 15 | -90 | 6 | 5 |
| DEX-CZ7671 | 416725.505 | 9673126.873 | 411.646 | 19 | -90 | 14 | 3 |
| DEX-CZ7672 | 416723.990 | 9673105.236 | 405.247 | 9 | -90 | 3 | 4 |
| DEX-CZ7673 | 416752.553 | 9673075.419 | 382.573 | 8 | -90 | 2 | 4 |
| DEX-CZ7674 | 416726.417 | 9673083.948 | 394.964 | 10 | -90 | 3 | 5 |
| DEX-CZ7675 | 416699.190 | 9673079.515 | 396.538 | 11 | -90 | 4 | 5 |
| DEX-CZ7676 | 416673.560 | 9673077.312 | 393.130 | 15 | -90 | 11.3 | 2 |
| DEX-CZ7677 | 416827.574 | 9673054.127 | 368.705 | 10 | -90 | 5 | 3 |
| DEX-CZ7678 | 416779.090 | 9673055.119 | 370.494 | 10 | -90 | 5 | 3 |
| DEX-CZ7679 | 416719.026 | 9673050.420 | 381.429 | 16 | -90 | 6 | 8 |
| DEX-CZ7680 | 416681.193 | 9673047.613 | 380.249 | 20 | -90 | 11 | 6 |
| DEX-CZ7681 | 416755.775 | 9673032.564 | 365.611 | 9 | -90 | 6 | 1 |
| DEX-CZ7682 | 416729.372 | 9673027.387 | 370.518 | 13 | -90 | 3 | 1 |
| DEX-CZ7683 | 416699.403 | 9673026.850 | 374.519 | 16 | -90 | 8 | 3.21 |
| DEX-CZ7684 | 416682.611 | 9673028.396 | 372.735 | 16 | -90 | 10.3 | 5 |
| DEX-CZ7685 | 417101.574 | 9672400.386 | 430.809 | 32 | -90 | 16 | 11 |
| DEX-CZ7686 | 417008.335 | 9672401.461 | 426.620 | 40 | -90 | 6 | 21.66 |
| DEX-CZ7687 | 417201.445 | 9672304.681 | 429.642 | 41 | -90 | 12.28 | 27 |
| DEX-CZ7688 | 417102.237 | 9672297.104 | 442.614 | 25 | -90 | 18.23 | 3 |
| DEX-CZ7689 | 417002.332 | 9672298.873 | 438.930 | 20 | -90 | 12 | 4 |
| DEX-CZ7690 | 416904.185 | 9672297.241 | 422.477 | 27 | -90 | 8 | 13.73 |
| DEX-CZ7691 | 416799.312 | 9672303.573 | 406.637 | 33 | -90 | 17 | 7 |
| DEX-CZ7692 | 416698.281 | 9672300.406 | 387.596 | 25 | -90 | 14 | 9 |
| DEX-CZ7695 | 417199.730 | 9672192.266 | 435.525 | 53 | -90 | 19 | 29 |
| DEX-CZ7696 | 417100.125 | 9672198.023 | 441.455 | 27 | -90 | 23 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5186 | 415127.431 | 9675523.719 | 436.949 | 17 | -90 | 11 | 3.88 |
| DEX-BB5187 | 415190.998 | 9675513.519 | 437.409 | 20 | -90 | 12 | 7 |
| DEX-BB5195 | 415119.818 | 9675498.798 | 433.816 | 20 | -90 | 14.26 | 5 |
| DEX-BB5196 | 415246.806 | 9675497.288 | 436.000 | 17 | -90 | 12.26 | 1.6 |
| DEX-BB5197 | 415268.449 | 9675493.043 | 435.936 | 18 | -90 | 12.32 | 3 |
| DEX-BB5202 | 415321.996 | 9675469.793 | 435.537 | 19 | -90 | 13.21 | 3 |
| DEX-BB5207 | 415350.717 | 9675449.870 | 433.615 | 18 | -90 | 10 | 4 |
| DEX-BB5208 | 415370.454 | 9675443.270 | 429.481 | 25 | -90 | 11 | 8 |
| DEX-BB5229 | 414871.844 | 9675623.824 | 445.849 | 17 | -90 | 8 | 6.24 |
| DEX-BB5230 | 414897.903 | 9675624.385 | 444.811 | 20 | -90 | 9.26 | 8 |
| DEX-BB5231 | 414922.552 | 9675623.939 | 443.783 | 23 | -90 | 8 | 11.58 |
| DEX-BB5232 | 414947.592 | 9675626.026 | 444.554 | 19 | -90 | 9 | 8.3 |
| DEX-BB5233 | 414971.911 | 9675626.380 | 444.959 | 25 | -90 | 11 | 11.79 |
| DEX-BB5234 | 414991.421 | 9675623.477 | 444.498 | 22 | -90 | 12.3 | 8 |
| DEX-BB5239 | 414996.529 | 9675648.364 | 448.961 | 21 | -90 | 14.31 | 4 |
| DEX-BB5251 | 414574.306 | 9675672.006 | 486.059 | 25 | -90 | 13.67 | 9 |
| DEX-BB5252 | 414568.294 | 9675696.506 | 493.018 | 24 | -90 | 21.79 | 3 |
| DEX-BB5253 | 414531.239 | 9675699.258 | 496.679 | 19 | -90 | 14.53 | 2 |
| DEX-BB5256 | 414521.623 | 9675680.387 | 493.619 | 17 | -90 | 14.49 | 1.26 |
| DEX-BB5257 | 414551.386 | 9675669.473 | 488.733 | 18 | -90 | 11 | 4.33 |
| DEX-BB5260 | 414594.880 | 9675679.894 | 484.955 | 27 | -90 | 15.27 | 9.53 |
| DEX-BB5261 | 414623.782 | 9675676.513 | 476.841 | 32 | -90 | 10 | 19.12 |
| DEX-BB5262 | 414647.429 | 9675681.642 | 479.830 | 23 | -90 | 5 | 14 |
| DEX-BB5263 | 414668.293 | 9675681.789 | 479.751 | 13 | -90 | 6 | 3.89 |
| DEX-BB5264 | 414694.429 | 9675665.829 | 473.107 | 28 | -90 | 11 | 14.86 |
| DEX-BB5265 | 414746.992 | 9675674.766 | 463.675 | 10 | -90 | 3 | 3 |
| DEX-BB5266 | 414595.948 | 9675647.076 | 477.490 | 27 | -90 | 10 | 13.83 |
| DEX-BB5267 | 414622.354 | 9675655.190 | 472.536 | 24 | -90 | 12 | 8.76 |
| DEX-BB5268 | 414648.110 | 9675652.806 | 472.845 | 28 | -90 | 17.91 | 10.14 |
| DEX-BB5269 | 414668.121 | 9675651.145 | 470.709 | 29 | -90 | 10 | 14.86 |
| DEX-BB5270 | 414723.599 | 9675651.075 | 464.477 | 23 | -90 | 8.72 | 10.86 |
| DEX-BB5271 | 414748.130 | 9675650.029 | 459.581 | 12 | -90 | 7 | 3 |
| DEX-BB5272 | 414595.665 | 9675627.388 | 469.219 | 20 | -90 | 8 | 10.18 |
| DEX-BB5273 | 414619.424 | 9675623.631 | 466.961 | 23 | -90 | 10 | 10.36 |
| DEX-BB5274 | 414647.777 | 9675628.577 | 466.841 | 26 | -90 | 13.67 | 10.84 |
| DEX-BB5275 | 414666.996 | 9675625.725 | 466.330 | 24 | -90 | 13 | 9.59 |
| DEX-BB5276 | 414697.128 | 9675627.300 | 463.768 | 22 | -90 | 13.85 | 5.4 |
| DEX-BB5277 | 414721.864 | 9675626.979 | 460.213 | 21 | -90 | 10 | 8 |
| DEX-BB5278 | 414747.024 | 9675625.138 | 455.543 | 14 | -90 | 9 | 1 |
| DEX-BB5279 | 414595.798 | 9675607.299 | 460.368 | 22 | -90 | 6 | 11.16 |
| DEX-BB5280 | 414627.582 | 9675606.554 | 460.369 | 11 | -90 | 6.64 | 2.01 |
| DEX-BB5281 | 414645.385 | 9675599.554 | 457.422 | 14 | -90 | 10 | 0 |
| DEX-BB5282 | 414670.091 | 9675603.808 | 461.611 | 23 | -90 | 21.88 | 0 |
| DEX-BB5283 | 414693.915 | 9675603.990 | 459.371 | 21 | -90 | 16.84 | 1 |
| DEX-BB5284 | 414724.049 | 9675600.506 | 455.037 | 23 | -90 | 16.9 | 3.36 |
| DEX-BB5285 | 414756.736 | 9675599.425 | 450.102 | 27 | -90 | 9 | 14 |
| DEX-BB5287 | 414625.535 | 9675576.301 | 452.444 | 13 | -90 | 6 | 4 |
| DEX-BB5333 | 413774.713 | 9675426.633 | 391.023 | 12 | -90 | 6 | 4 |
| DEX-BB5334 | 413797.547 | 9675429.051 | 394.845 | 5 | -90 | 2 | 0 |
| DEX-BB5338 | 413817.398 | 9675402.891 | 391.869 | 15 | -90 | 8 | 5.3 |
| DEX-BB5341 | 413816.186 | 9675378.173 | 389.417 | 18 | -90 | 8 | 8.28 |
| DEX-BB5342 | 413818.956 | 9675427.313 | 396.155 | 9 | -90 | 4 | 2.4 |
| DEX-BB5366 | 413973.925 | 9675282.176 | 407.246 | 16 | -90 | 5 | 7.89 |
| DEX-BB5367 | 413997.454 | 9675279.247 | 408.590 | 9 | -90 | 6 | 1 |
| DEX-BB5374 | 413999.935 | 9675308.985 | 410.836 | 12 | -90 | 7 | 2 |
| DEX-BB5375 | 414020.536 | 9675301.621 | 412.099 | 16 | -90 | 11.21 | 3 |
| DEX-BB5383 | 414598.331 | 9675699.979 | 487.871 | 27 | -90 | 9.32 | 15.73 |
| DEX-BB5384 | 414620.085 | 9675704.591 | 487.142 | 16 | -90 | 9 | 4.8 |
| DEX-BB5386 | 414670.597 | 9675698.740 | 485.564 | 11 | -90 | 3 | 5.88 |
| DEX-BB5387 | 414722.254 | 9675703.897 | 479.160 | 17 | -90 | 10 | 3.7 |
| DEX-BB5388 | 414746.292 | 9675701.612 | 470.356 | 12 | -90 | 3 | 5.92 |
| DEX-BB5409 | 413822.781 | 9675354.463 | 388.644 | 22 | -90 | 11 | 6 |
| DEX-BB5410 | 413838.489 | 9675355.172 | 389.000 | 14 | -90 | 9.32 | 2 |
| DEX-BB5417 | 413846.157 | 9675320.672 | 385.454 | 9 | -90 | 6 | 1 |
| DEX-BB5418 | 413878.572 | 9675322.982 | 389.276 | 8 | -90 | 5 | 1 |
| DEX-BB5424 | 413847.902 | 9675300.598 | 386.032 | 16 | -90 | 7 | 6 |
| DEX-BB5425 | 413871.468 | 9675304.632 | 388.402 | 10 | -90 | 5 | 2.45 |
| DEX-BB5427 | 413844.896 | 9675283.365 | 384.857 | 10 | -90 | 1 | 6.89 |
| DEX-BB5428 | 413723.573 | 9675502.798 | 401.316 | 14 | -90 | 7.6 | 3.85 |
| DEX-BB5429 | 413723.953 | 9675478.645 | 397.488 | 20 | -90 | 9 | 9 |
| DEX-BB5430 | 413746.875 | 9675478.277 | 401.241 | 12 | -90 | 3 | 4.82 |
| DEX-BB5431 | 413747.388 | 9675494.802 | 403.910 | 10 | -90 | 3 | 5 |
| DEX-BB5432 | 413972.058 | 9675350.394 | 414.577 | 8 | -90 | 3 | 1 |
| DEX-BB5433 | 413994.743 | 9675352.494 | 416.442 | 12 | -90 | 8 | 1.87 |
| DEX-BB5434 | 414014.669 | 9675341.762 | 416.386 | 16 | -90 | 12 | 1.81 |
| DEX-BB5437 | 413995.783 | 9675374.855 | 420.119 | 14 | -90 | 7 | 4.85 |
| DEX-BB5440 | 413968.005 | 9675379.497 | 418.372 | 10 | -90 | 7 | 1 |
| DEX-BB5441 | 413971.897 | 9675327.252 | 410.977 | 8 | -90 | 5 | 1 |
| DEX-BB5442 | 413996.864 | 9675323.733 | 413.115 | 12 | -90 | 8 | 2 |
| DEX-BB5443 | 414017.296 | 9675325.369 | 414.654 | 12 | -90 | 8 | 1 |
| DEX-BB5444 | 414715.549 | 9675684.718 | 474.389 | 9 | -90 | 2 | 2 |
| DEX-BB5445 | 414771.040 | 9675673.771 | 458.004 | 14 | -90 | 5 | 6 |
| DEX-BB5446 | 414797.779 | 9675672.794 | 454.489 | 16 | -90 | 8 | 4.29 |
| DEX-BB5447 | 414825.393 | 9675679.640 | 454.255 | 15 | -90 | 4 | 6 |
| DEX-BB5448 | 414645.052 | 9675576.341 | 451.675 | 10 | -90 | 5 | 1 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7697 | 416999.653 | 9672194.499 | 437.924 | 26 | -90 | 22 | 2 |
| DEX-CZ7698 | 416904.792 | 9672197.048 | 421.746 | 32 | -90 | 4 | 24 |
| DEX-CZ7699 | 416804.411 | 9672191.980 | 402.527 | 20 | -90 | 17 | 1 |
| DEX-CZ7700 | 416695.124 | 9672208.199 | 394.000 | 23 | -90 | 19 | 1.54 |
| DEX-CZ7705 | 417190.329 | 9672099.733 | 439.555 | 19 | -90 | 8 | 8 |
| DEX-CZ7706 | 417094.622 | 9672093.304 | 437.830 | 29 | -90 | 22 | 5 |
| DEX-CZ7707 | 417001.782 | 9672099.544 | 429.591 | 38 | -90 | 20 | 13 |
| DEX-CZ7708 | 416892.091 | 9672111.831 | 422.552 | 33 | -90 | 12 | 19 |
| DEX-CZ7709 | 416802.439 | 9672100.100 | 418.748 | 31 | -90 | 22 | 5 |
| DEX-CZ7710 | 416696.738 | 9672095.831 | 422.871 | 11 | -90 | 7 | 2 |
| DEX-CZ7711 | 416600.520 | 9672100.917 | 416.988 | 29 | -90 | 23 | 2 |
| DEX-CZ7716 | 416894.096 | 9671983.910 | 395.821 | 18 | -90 | 8 | 6 |
| DEX-CZ7717 | 416798.053 | 9671991.992 | 399.271 | 13 | -90 | 9 | 2 |
| DEX-CZ7725 | 416350.706 | 9673243.085 | 351.104 | 38 | -90 | 34.24 | 2 |
| DEX-CZ7726 | 416442.800 | 9673244.040 | 356.055 | 43 | -90 | 26.6 | 17 |
| DEX-CZ7727 | 416548.370 | 9673236.388 | 369.787 | 24 | -90 | 20.85 | 1 |
| DEX-CZ7728 | 416654.282 | 9673236.738 | 386.690 | 18 | -90 | 14.88 | 2 |
| DEX-CZ7729 | 416748.020 | 9673247.654 | 400.681 | 27 | -90 | 21.46 | 5 |
| DEX-CZ7730 | 416847.333 | 9673254.566 | 394.558 | 23 | -90 | 17 | 4.3 |
| DEX-CZ7731 | 416342.125 | 9673280.956 | 358.577 | 44 | -90 | 33.1 | 14 |
| DEX-CZ7732 | 416436.579 | 9673338.699 | 365.601 | 16 | -90 | 13 | 0 |
| DEX-CZ7733 | 416541.934 | 9673348.128 | 374.478 | 19 | -90 | 16.28 | 1 |
| DEX-CZ7734 | 416648.100 | 9673346.250 | 381.199 | 41 | -90 | 38.76 | 3 |
| DEX-CZ7735 | 416752.822 | 9673342.432 | 378.483 | 33 | -90 | 31.41 | 2.38 |
| DEX-CZ7737 | 416643.922 | 9673441.888 | 374.740 | 27 | -90 | 24 | 0 |
| DEX-CZ7738 | 416741.033 | 9673446.493 | 373.159 | 20 | -90 | 16.29 | 3 |
| DEX-CZ7739 | 416647.476 | 9673545.080 | 367.002 | 22 | -90 | 16.88 | 4.27 |
| DEX-CZ7740 | 416738.558 | 9673541.782 | 358.371 | 7 | -90 | 4 | 1 |
| DEX-CZ7742 | 416647.208 | 9673617.335 | 351.177 | 12 | -90 | 6 | 6 |
| DEX-CZ7745 | 417450.889 | 9673353.806 | 413.088 | 42 | -90 | 31.9 | 9.03 |
| DEX-CZ7746 | 417345.473 | 9673353.655 | 406.497 | 36 | -90 | 28.27 | 7.2 |
| DEX-CZ7747 | 417245.786 | 9673349.423 | 397.785 | 24 | -90 | 7.5 | 15.5 |
| DEX-CZ7748 | 417151.470 | 9673356.036 | 390.100 | 17 | -90 | 5 | 10 |
| DEX-CZ7749 | 417449.840 | 9673253.464 | 403.742 | 11 | -90 | 3 | 6 |
| DEX-CZ7750 | 417347.422 | 9673247.516 | 399.122 | 33 | -90 | 25.37 | 7 |
| DEX-CZ7751 | 417259.478 | 9673247.622 | 388.023 | 25 | -90 | 22.02 | 1 |
| DEX-CZ7752 | 417154.864 | 9673238.653 | 376.232 | 24 | -90 | 18.78 | 4 |
| DEX-CZ7753 | 417444.806 | 9673446.712 | 386.307 | 39 | -90 | 20.11 | 18 |
| DEX-CZ7754 | 417349.697 | 9673447.791 | 380.985 | 24 | -90 | 18.55 | 4 |
| DEX-CZ7755 | 417247.896 | 9673446.539 | 369.000 | 35 | -90 | 10 | 6 |
| DEX-CZ7756 | 417382.756 | 9673627.270 | 347.226 | 20 | -90 | 15.26 | 3 |
| DEX-CZ7757 | 417580.374 | 9673625.994 | 350.450 | 28 | -90 | 22 | 3 |
| DEX-CZ7758 | 417576.291 | 9673652.690 | 350.738 | 48 | -90 | 17.33 | 26 |
| DEX-CZ7759 | 417384.051 | 9673646.925 | 350.000 | 25 | -90 | 19.19 | 4 |
| DEX-CZ7760 | 417609.440 | 9673675.559 | 352.855 | 29 | -90 | 19.33 | 6 |
| DEX-CZ7761 | 417577.675 | 9673674.613 | 352.791 | 56 | -90 | 21 | 27 |
| DEX-CZ7762 | 417383.684 | 9673674.771 | 351.343 | 34 | -90 | 28.16 | 6 |
| DEX-CZ7763 | 417378.533 | 9673727.421 | 349.790 | 26 | -90 | 20.5 | 4 |
| DEX-CZ7764 | 417828.268 | 9673753.535 | 369.612 | 12 | -90 | 5 | 5 |
| DEX-CZ7765 | 417830.016 | 9673774.827 | 369.330 | 9 | -90 | 2 | 2 |
| DEX-CZ7766 | 417808.016 | 9673774.081 | 373.340 | 12 | -90 | 8 | 1 |
| DEX-CZ7767 | 417779.996 | 9673769.274 | 375.000 | 15 | -90 | 10 | 3 |
| DEX-CZ7768 | 417777.362 | 9673795.677 | 373.514 | 13 | -90 | 3 | 10 |
| DEX-CZ7769 | 417526.464 | 9673797.788 | 370.926 | 21 | -90 | 11 | 8 |
| DEX-CZ7770 | 417880.723 | 9673827.127 | 348.441 | 28 | -90 | 24 | 1 |
| DEX-CZ7771 | 417855.821 | 9673830.716 | 349.793 | 31 | -90 | 24 | 5 |
| DEX-CZ7772 | 417827.600 | 9673824.835 | 354.945 | 18 | -90 | 3 | 12 |
| DEX-CZ7773 | 417775.403 | 9673831.017 | 366.147 | 9 | -90 | 3 | 4 |
| DEX-CZ7774 | 417529.694 | 9673827.073 | 371.598 | 29 | -90 | 14 | 13 |
| DEX-CZ7775 | 417504.394 | 9673826.028 | 370.632 | 18 | -90 | 5 | 10 |
| DEX-CZ7776 | 417476.310 | 9673826.639 | 365.898 | 8 | -90 | 3 | 3 |
| DEX-CZ7777 | 417874.512 | 9673852.801 | 345.960 | 60 | -90 | 60 | 0 |
| DEX-CZ7778 | 417885.190 | 9673876.803 | 345.505 | 42 | -90 | 42.38 | 0 |
| DEX-CZ7779 | 417881.453 | 9673899.618 | 345.056 | 48 | -90 | 46.7 | 0 |
| DEX-CZ7780 | 417877.156 | 9673920.383 | 344.350 | 40 | -90 | 29.58 | 9 |
| DEX-CZ7781 | 417928.559 | 9673979.553 | 359.634 | 9 | -90 | 6 | 0 |
| DEX-CZ7782 | 417928.390 | 9674002.069 | 362.783 | 24 | -90 | 10 | 13 |
| DEX-CZ7783 | 418232.324 | 9674019.714 | 362.274 | 27 | -90 | 15.65 | 7 |
| DEX-CZ7784 | 418205.866 | 9674027.655 | 359.686 | 23 | -90 | 12.28 | 9 |
| DEX-CZ7785 | 417931.681 | 9674027.466 | 363.367 | 10 | -90 | 6 | 3 |
| DEX-CZ7786 | 418229.984 | 9674044.356 | 358.941 | 19 | -90 | 11 | 6 |
| DEX-CZ7787 | 417930.369 | 9674076.147 | 358.430 | 14 | -90 | 11 | 2 |
| DEX-CZ7788 | 417910.444 | 9674072.493 | 356.028 | 28 | -90 | 22.36 | 4.5 |
| DEX-CZ7789 | 417883.414 | 9674074.003 | 341.941 | 20 | -90 | 2 | 19 |
| DEX-CZ7790 | 417826.511 | 9674077.467 | 329.945 | 11 | -90 | 7.77 | 0 |
| DEX-CZ7791 | 417800.625 | 9674071.692 | 335.749 | 16 | -90 | 11 | 2.78 |
| DEX-CZ7792 | 417776.725 | 9674076.457 | 348.754 | 7 | -90 | 4 | 0 |
| DEX-CZ7793 | 417752.903 | 9674074.302 | 363.575 | 23 | -90 | 16.33 | 5 |
| DEX-CZ7794 | 417728.594 | 9674074.760 | 367.620 | 15 | -90 | 11 | 2 |
| DEX-CZ7795 | 417628.025 | 9674072.963 | 360.215 | 31 | -90 | 21.83 | 3 |
| DEX-CZ7796 | 417605.586 | 9674065.379 | 364.485 | 7 | -90 | 4 | 1 |
| DEX-CZ7797 | 417579.337 | 9674071.419 | 361.988 | 9 | -90 | 3 | 4 |
| DEX-CZ7799 | 417826.113 | 9674099.792 | 332.924 | 7 | -90 | 4 | 0 |
| DEX-CZ7800 | 417773.185 | 9674101.779 | 357.342 | 19 | -90 | 16.3 | 1 |
| DEX-CZ7801 | 417725.622 | 9674101.041 | 365.107 | 32 | -90 | 12.86 | 18.29 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5449 | 414671.288 | 9675583.593 | 456.106 | 19 | -90 | 10.23 | 3.19 |
| DEX-BB5450 | 414700.129 | 9675575.041 | 455.791 | 13 | -90 | 8 | 0 |
| DEX-BB5451 | 414721.534 | 9675572.728 | 452.124 | 20 | -90 | 12.27 | 2 |
| DEX-BB5452 | 414748.909 | 9675576.348 | 448.329 | 19 | -90 | 12.28 | 3 |
| DEX-BB5453 | 414671.046 | 9675555.102 | 447.498 | 8 | -90 | 4 | 1 |
| DEX-BB5454 | 414698.087 | 9675551.623 | 450.457 | 11 | -90 | 6 | 1.69 |
| DEX-BB5455 | 414722.661 | 9675546.997 | 447.748 | 13 | -90 | 7 | 2 |
| DEX-BB5456 | 414750.993 | 9675550.502 | 444.262 | 18 | -90 | 9 | 2.4 |
| DEX-BB5457 | 414875.223 | 9675823.211 | 484.299 | 17 | -90 | 13.26 | 0 |
| DEX-BB5458 | 414899.065 | 9675825.706 | 480.970 | 26 | -90 | 13 | 10.73 |
| DEX-BB5459 | 414922.620 | 9675824.728 | 479.474 | 21 | -90 | 12 | 7 |
| DEX-BB5460 | 414949.331 | 9675827.793 | 477.932 | 25 | -90 | 17.29 | 6 |
| DEX-BB5461 | 414966.693 | 9675819.709 | 476.345 | 15 | -90 | 8 | 4 |
| DEX-BB5465 | 415091.378 | 9675826.684 | 465.943 | 22 | -90 | 14.27 | 5 |
| DEX-BB5466 | 415123.256 | 9675826.188 | 468.323 | 16 | -90 | 7 | 5 |
| DEX-BB5467 | 415148.329 | 9675825.229 | 471.946 | 17 | -90 | 7 | 5.24 |
| DEX-BB5468 | 414869.975 | 9675801.809 | 483.489 | 24 | -90 | 19 | 2 |
| DEX-BB5469 | 414920.348 | 9675798.917 | 482.000 | 13 | -90 | 10.21 | 0 |
| DEX-BB5470 | 414968.920 | 9675798.628 | 476.135 | 27 | -90 | 21.62 | 4 |
| DEX-BB5473 | 415120.256 | 9675802.499 | 469.777 | 29 | -90 | 13.31 | 8.53 |
| DEX-BB5474 | 415146.054 | 9675797.647 | 473.127 | 13 | -90 | 8 | 2 |
| DEX-BB5475 | 414874.560 | 9675774.204 | 482.284 | 29 | -90 | 15.23 | 2 |
| DEX-BB5476 | 414896.286 | 9675773.556 | 482.436 | 21 | -90 | 12 | 6 |
| DEX-BB5477 | 414922.207 | 9675774.136 | 480.527 | 11 | -90 | 8 | 0 |
| DEX-BB5478 | 414948.908 | 9675778.502 | 478.005 | 24 | -90 | 11.36 | 10.32 |
| DEX-BB5479 | 414972.540 | 9675774.796 | 475.155 | 21 | -90 | 14.27 | 5 |
| DEX-BB5480 | 414992.787 | 9675773.899 | 473.159 | 24 | -90 | 13.24 | 5 |
| DEX-BB5484 | 415097.255 | 9675774.856 | 472.704 | 21 | -90 | 11.22 | 5 |
| DEX-BB5485 | 415119.397 | 9675774.524 | 473.684 | 20 | -90 | 11.32 | 5 |
| DEX-BB5486 | 415147.410 | 9675774.949 | 475.214 | 27 | -90 | 20.25 | 3 |
| DEX-BB5487 | 415172.044 | 9675775.415 | 476.273 | 29 | -90 | 14 | 7 |
| DEX-BB5488 | 414873.868 | 9675752.045 | 482.179 | 23 | -90 | 17.27 | 3 |
| DEX-BB5489 | 414922.951 | 9675750.385 | 480.372 | 22 | -90 | 14.19 | 4.9 |
| DEX-BB5490 | 414969.997 | 9675751.010 | 474.738 | 17 | -90 | 4 | 11 |
| DEX-BB5492 | 415072.505 | 9675748.608 | 469.401 | 18 | -90 | 7 | 7 |
| DEX-BB5493 | 415118.133 | 9675748.078 | 475.142 | 20 | -90 | 11 | 6 |
| DEX-BB5494 | 415175.573 | 9675753.115 | 477.000 | 21 | -90 | 11 | 7 |
| DEX-BB5495 | 415221.985 | 9675754.551 | 475.065 | 18 | -90 | 13 | 1 |
| DEX-BB5496 | 415247.367 | 9675750.552 | 471.728 | 15 | -90 | 11 | 1 |
| DEX-BB5497 | 415276.854 | 9675751.454 | 467.285 | 16 | -90 | 12 | 2 |
| DEX-BB5498 | 414875.367 | 9675732.369 | 477.554 | 21 | -90 | 13.28 | 6 |
| DEX-BB5499 | 414895.432 | 9675733.235 | 480.568 | 23 | -90 | 16.28 | 5 |
| DEX-BB5500 | 414922.556 | 9675727.138 | 476.479 | 23 | -90 | 3 | 18.25 |
| DEX-BB5501 | 414950.305 | 9675728.842 | 473.104 | 22 | -90 | 5 | 14.25 |
| DEX-BB5502 | 414968.546 | 9675723.201 | 472.731 | 18 | -90 | 6 | 7 |
| DEX-BB5503 | 414993.211 | 9675725.062 | 470.427 | 19 | -90 | 12.19 | 1 |
| DEX-BB5505 | 415051.111 | 9675730.470 | 465.423 | 34 | -90 | 12 | 12.75 |
| DEX-BB5506 | 415073.445 | 9675731.512 | 467.916 | 32 | -90 | 17 | 1 |
| DEX-BB5514 | 415273.454 | 9675727.999 | 468.952 | 17 | -90 | 14.24 | 0.36 |
| DEX-BB5515 | 414772.865 | 9675650.900 | 454.140 | 11 | -90 | 6 | 3 |
| DEX-BB5516 | 414796.702 | 9675648.554 | 451.404 | 14 | -90 | 9 | 1 |
| DEX-BB5517 | 414823.965 | 9675652.223 | 448.670 | 14 | -90 | 6 | 4.89 |
| DEX-BB5518 | 414850.518 | 9675654.199 | 452.061 | 17 | -90 | 7 | 7 |
| DEX-BB5519 | 414873.000 | 9675648.060 | 450.414 | 12 | -90 | 8 | 2 |
| DEX-BB5520 | 414921.586 | 9675649.498 | 447.466 | 18 | -90 | 8 | 6 |
| DEX-BB5521 | 414973.712 | 9675649.040 | 448.786 | 27 | -90 | 10.32 | 14.49 |
| DEX-BB5528 | 414993.336 | 9675669.477 | 453.925 | 13 | -90 | 5 | 5 |
| DEX-BB5529 | 414972.919 | 9675678.276 | 456.629 | 11 | -90 | 3.55 | 3.45 |
| DEX-BB5530 | 414946.870 | 9675679.332 | 454.874 | 16 | -90 | 2.25 | 8.75 |
| DEX-BB5531 | 415019.587 | 9675669.539 | 453.652 | 12 | -90 | 0 | 0 |
| DEX-BB5534 | 415017.078 | 9675697.830 | 461.415 | 12 | -90 | 7 | 2 |
| DEX-BB5537 | 415094.756 | 9675523.019 | 434.911 | 18 | -90 | 12.55 | 3 |
| DEX-BB5538 | 415073.185 | 9675522.068 | 434.312 | 19 | -90 | 6 | 6.2 |
| DEX-BB5539 | 415048.645 | 9675523.655 | 437.194 | 21 | -90 | 12 | 4 |
| DEX-BB5540 | 415071.101 | 9675503.235 | 432.836 | 16 | -90 | 8 | 2 |
| DEX-BB5617 | 415698.463 | 9675434.313 | 404.253 | 16 | -90 | 10.2 | 1 |
| BB190013 | 414052.648 | 9676262.442 | 529.049 | 15 | -90 | 13.15 | 3.65 |
| DEX-BB043 | 413947.440 | 9675915.834 | 499.560 | 12 | -90 | 7.04 | 1 |
| DEX-BB103 | 414255.258 | 9675313.944 | 431.050 | 13 | -90 | 1 | 5 |
| DX00086 | 415406.273 | 9675503.408 | 425.606 | 19 | -90 | 13.78 | 7.21 |
| DX00144 | 414697.090 | 9675451.245 | 452.187 | 6 | -90 | 5.39 | 0 |
| DX00145 | 414706.716 | 9675556.768 | 452.017 | 10 | -90 | 6 | 2.5 |
| DEX-BB013 | 413749.824 | 9675917.147 | 485.473 | 12 | -90 | 2.36 | 6.29 |
| DX00064 | 415103.643 | 9676100.220 | 463.747 | 9 | -90 | 3.09 | 5.62 |
| DX00153 | 414752.475 | 9675495.074 | 444.586 | 7 | -90 | 4.57 | 0 |
| DEX-BB067 | 413497.317 | 9675765.393 | 389.799 | 21 | -90 | 9.23 | 12.85 |
| DEX-MIA042 | 413103.951 | 9676020.109 | 376.609 | 7 | -90 | 0.7 | 3 |
| DX00034 | 415295.685 | 9675901.219 | 454.830 | 24 | -90 | 7.83 | 11.06 |
| DX00187 | 414547.976 | 9675801.286 | 502.659 | 18 | -90 | 16.84 | 1.5 |
| BB190018 | 414003.536 | 9676160.875 | 520.587 | 21 | -90 | 15.04 | 3.4 |
| DEX-BB1926 | 415197.409 | 9675549.902 | 441.947 | 27 | -90 | 19.62 | 6.35 |
| DX00158 | 414750.140 | 9675453.100 | 453.052 | 5 | -90 | 1.95 | 0 |
| DEX-BB002 | 413904.451 | 9675873.115 | 489.573 | 35 | -90 | 5.21 | 21.77 |
| DEX-BB066 | 413395.293 | 9675757.206 | 385.860 | 6 | -90 | 2 | 2 |
| DEX-BB086 | 413998.487 | 9675362.187 | 418.233 | 13 | -90 | 7.25 | 3.84 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7802 | 417632.705 | 9674100.836 | 358.359 | 26 | -90 | 15 | 9.27 |
| DEX-CZ7803 | 417575.958 | 9674095.782 | 359.516 | 19 | -90 | 10.31 | 7 |
| DEX-CZ7806 | 417826.280 | 9674125.348 | 338.354 | 30 | -90 | 29.4 | 0 |
| DEX-CZ7807 | 417792.400 | 9674131.558 | 350.440 | 38 | -90 | 28.35 | 12 |
| DEX-CZ7808 | 417777.821 | 9674120.791 | 354.941 | 21 | -90 | 18.24 | 2 |
| DEX-CZ7809 | 417757.001 | 9674122.858 | 358.010 | 26 | -90 | 22.88 | 2 |
| DEX-CZ7810 | 417727.532 | 9674119.691 | 362.765 | 28 | -90 | 18.58 | 10.65 |
| DEX-CZ7811 | 417706.751 | 9674118.049 | 363.819 | 24 | -90 | 17.49 | 5 |
| DEX-CZ7812 | 417681.572 | 9674123.074 | 360.234 | 9 | -90 | 3 | 4 |
| DEX-CZ7813 | 417635.372 | 9674113.804 | 357.436 | 26 | -90 | 23.5 | 1 |
| DEX-CZ7814 | 417608.677 | 9674119.021 | 350.148 | 16 | -90 | 6.24 | 8.33 |
| DEX-CZ7815 | 417575.304 | 9674118.866 | 356.803 | 24 | -90 | 16.68 | 4 |
| DEX-CZ7819 | 417683.562 | 9674146.669 | 354.188 | 7 | -90 | 3 | 1 |
| DEX-CZ7820 | 418230.802 | 9674172.571 | 337.516 | 18 | -90 | 11 | 5 |
| DEX-CZ7821 | 418203.245 | 9674175.347 | 341.342 | 23 | -90 | 16.3 | 4 |
| DEX-CZ7822 | 418177.633 | 9674180.665 | 347.099 | 15 | -90 | 11 | 4 |
| DEX-CZ7829 | 418205.346 | 9674223.202 | 347.309 | 15 | -90 | 9 | 4 |
| DEX-CZ7830 | 418179.301 | 9674224.080 | 349.000 | 22 | -90 | 7 | 14 |
| DEX-CZ7832 | 418130.223 | 9674248.364 | 344.492 | 22 | -90 | 13 | 9.1 |
| DEX-CZ7833 | 418177.598 | 9674240.065 | 348.392 | 9 | -90 | 6 | 1 |
| DEX-CZ7837 | 418140.362 | 9674268.102 | 342.838 | 10 | -90 | 7 | 1 |
| DEX-CZ7838 | 418183.205 | 9674276.978 | 344.148 | 29 | -90 | 21.71 | 7 |
| DEX-CZ7839 | 418203.404 | 9674272.416 | 342.972 | 10 | -90 | 7 | 1 |
| DEX-CZ7841 | 416727.930 | 9672894.573 | 382.785 | 19 | -90 | 14 | 2 |
| DEX-CZ7842 | 416676.409 | 9672908.112 | 380.237 | 31 | -90 | 10 | 17 |
| DEX-CZ7843 | 416613.886 | 9672898.877 | 372.164 | 13 | -90 | 4 | 7 |
| DEX-CZ7844 | 416577.477 | 9672896.021 | 378.535 | 19 | -90 | 12.31 | 5 |
| DEX-CZ7845 | 416524.967 | 9672902.315 | 366.069 | 23 | -90 | 5 | 13 |
| DEX-CZ7846 | 416475.464 | 9672886.459 | 353.694 | 14 | -90 | 4.4 | 6.6 |
| DEX-CZ7847 | 416427.476 | 9672893.273 | 362.743 | 12 | -90 | 5 | 4 |
| DEX-CZ7848 | 416380.376 | 9672886.664 | 358.361 | 12 | -90 | 4 | 6 |
| DEX-CZ7849 | 416316.881 | 9672893.428 | 356.927 | 6 | -90 | 2 | 1 |
| DEX-CZ7850 | 416298.234 | 9672891.430 | 359.653 | 11 | -90 | 5 | 2.7 |
| DEX-CZ7851 | 416075.588 | 9672889.411 | 318.089 | 13 | -90 | 5 | 5.45 |
| DEX-CZ7852 | 416025.293 | 9672900.136 | 312.109 | 20 | -90 | 13 | 4.5 |
| DEX-CZ7853 | 415973.739 | 9672894.492 | 311.647 | 6 | -90 | 3 | 0 |
| DEX-CZ7854 | 415928.353 | 9672892.973 | 304.396 | 25 | -90 | 8 | 17.76 |
| DEX-CZ7855 | 415960.415 | 9672919.298 | 307.011 | 12 | -90 | 7 | 2 |
| DEX-CZ7856 | 415981.055 | 9672912.569 | 309.207 | 11 | -90 | 8 | 1 |
| DEX-CZ7857 | 416003.249 | 9672926.157 | 308.000 | 5 | -90 | 2 | 0 |
| DEX-CZ7858 | 416033.321 | 9672923.638 | 309.191 | 5 | -90 | 2 | 0 |
| DEX-CZ7859 | 416058.331 | 9672924.303 | 310.952 | 11 | -90 | 4 | 5 |
| DEX-CZ7860 | 416081.930 | 9672919.215 | 312.000 | 11 | -90 | 6 | 2.4 |
| DEX-CZ7861 | 416300.775 | 9672931.513 | 335.000 | 6 | -90 | 3 | 0 |
| DEX-CZ7862 | 416334.043 | 9672925.264 | 339.246 | 11 | -90 | 5 | 3 |
| DEX-CZ7863 | 416350.902 | 9672922.055 | 341.000 | 15 | -90 | 7 | 5 |
| DEX-CZ7864 | 416383.899 | 9672912.352 | 344.294 | 9 | -90 | 6 | 0 |
| DEX-CZ7865 | 416448.824 | 9672928.476 | 346.000 | 20 | -90 | 15 | 2 |
| DEX-CZ7866 | 416473.942 | 9672923.714 | 346.000 | 10 | -90 | 7 | 3 |
| DEX-CZ7867 | 416498.969 | 9672922.276 | 347.429 | 8 | -90 | 3.6 | 3.4 |
| DEX-CZ7868 | 416519.035 | 9672927.382 | 353.324 | 22 | -90 | 3 | 15 |
| DEX-CZ7869 | 416574.365 | 9672921.502 | 368.219 | 15 | -90 | 6 | 5 |
| DEX-CZ7870 | 416612.840 | 9672925.814 | 359.000 | 16 | -90 | 5 | 2.98 |
| DEX-CZ7871 | 416629.452 | 9672928.858 | 366.492 | 16 | -90 | 5 | 8 |
| DEX-CZ7872 | 416655.085 | 9672925.508 | 374.027 | 20 | -90 | 12 | 6 |
| DEX-CZ7873 | 416678.226 | 9672923.619 | 378.420 | 14 | -90 | 11 | 1 |
| DEX-CZ7874 | 416700.134 | 9672925.107 | 377.850 | 18 | -90 | 7 | 9 |
| DEX-CZ7875 | 416721.807 | 9672924.923 | 374.817 | 19 | -90 | 8 | 9 |
| DEX-CZ7876 | 416750.099 | 9672927.261 | 368.400 | 24 | -90 | 19.83 | 3 |
| DEX-CZ7877 | 416778.520 | 9672925.936 | 366.000 | 13 | -90 | 9 | 2 |
| DEX-CZ7878 | 415777.750 | 9673000.115 | 333.915 | 6 | -90 | 3 | 1 |
| DEX-CZ7879 | 415780.567 | 9673027.817 | 331.697 | 6 | -90 | 2 | 1 |
| DEX-CZ7880 | 415781.636 | 9673054.041 | 316.957 | 4 | -90 | 1.6 | 0 |
| DEX-CZ7881 | 415781.165 | 9673073.653 | 307.150 | 7 | -90 | 4 | 1 |
| DEX-CZ7882 | 415979.335 | 9673199.478 | 335.222 | 15 | -90 | 7 | 8 |
| DEX-CZ7883 | 416026.238 | 9673195.124 | 346.858 | 15 | -90 | 3 | 10 |
| DEX-CZ7884 | 416078.172 | 9673202.813 | 347.341 | 35 | -90 | 6 | 29 |
| DEX-CZ7885 | 416100.835 | 9673200.531 | 348.054 | 32 | -90 | 10 | 14 |
| DEX-CZ7886 | 416126.296 | 9673202.507 | 348.146 | 17 | -90 | 12.3 | 5 |
| DEX-CZ7887 | 416172.866 | 9673202.806 | 350.295 | 19 | -90 | 15.22 | 3 |
| DEX-CZ7889 | 416350.439 | 9673036.663 | 393.632 | 12 | -90 | 6 | 4 |
| DEX-CZ7890 | 416355.781 | 9673067.978 | 391.640 | 18 | -90 | 13.86 | 3 |
| DEX-CZ7891 | 416326.239 | 9673078.497 | 381.993 | 12 | -90 | 8 | 2 |
| DEX-CZ7892 | 416326.326 | 9673025.756 | 386.282 | 16 | -90 | 4.44 | 9.56 |
| DEX-CZ7895 | 415883.405 | 9672945.188 | 312.786 | 16 | -90 | 4 | 9 |
| DEX-CZ7897 | 416479.500 | 9672951.048 | 356.890 | 23 | -90 | 8 | 13 |
| DEX-CZ7898 | 416527.667 | 9672947.103 | 350.000 | 17 | -90 | 8 | 5 |
| DEX-CZ7899 | 416568.739 | 9672955.979 | 352.000 | 14 | -90 | 5 | 7 |
| DEX-CZ7900 | 416623.611 | 9672945.661 | 364.328 | 14 | -90 | 7 | 5 |
| DEX-CZ7901 | 416674.990 | 9672946.695 | 372.967 | 19 | -90 | 9 | 8 |
| DEX-CZ7902 | 416202.246 | 9673166.171 | 346.000 | 25 | -90 | 20.25 | 2.67 |
| DEX-CZ7903 | 416178.096 | 9673169.119 | 346.000 | 43 | -90 | 38 | 4 |
| DEX-CZ7904 | 416150.234 | 9673166.816 | 347.000 | 29 | -90 | 20 | 8 |
| DEX-CZ7905 | 416125.230 | 9673175.537 | 346.607 | 26 | -90 | 19 | 4 |
| DEX-CZ7906 | 416100.832 | 9673181.492 | 349.386 | 9 | -90 | 4 | 3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB2032 | 413654.472 | 9675707.616 | 419.522 | 20 | -90 | 2 | 9 |
| DX00061 | 414796.327 | 9676096.905 | 502.937 | 25 | -90 | 8.2 | 16.31 |
| DX00103 | 414707.541 | 9676453.993 | 497.836 | 11 | -90 | 3 | 4.35 |
| BB190033 | 413845.982 | 9676215.526 | 492.393 | 22 | -90 | 9.96 | 14.51 |
| DEX-MIA044 | 413312.967 | 9676019.984 | 341.260 | 22 | -90 | 11.7 | 5.84 |
| DX00071 | 414897.502 | 9675598.976 | 440.932 | 24 | -90 | 10.02 | 14.32 |
| DEX-BB077 | 413697.929 | 9675555.654 | 397.006 | 9 | -90 | 6.36 | 2.54 |
| DX00165 | 414798.350 | 9675545.809 | 439.982 | 14 | -90 | 4.99 | 4 |
| BB190069 | 414346.902 | 9675452.078 | 481.974 | 14 | -90 | 8.28 | 5.8 |
| BB190080 | 413805.695 | 9675955.482 | 493.200 | 26 | -90 | 8.49 | 19.44 |
| DX00172 | 414850.725 | 9675551.254 | 438.162 | 9 | -90 | 3 | 0 |
| BB190023 | 413905.082 | 9676067.806 | 499.793 | 15 | -90 | 6.72 | 9.09 |
| BB190075 | 414346.153 | 9675400.907 | 467.018 | 8 | -90 | 0 | 4 |
| DEX-BB080 | 413700.797 | 9675468.129 | 393.521 | 21 | -90 | 16.53 | 7 |
| DX00072 | 415002.927 | 9675601.069 | 442.784 | 20 | -90 | 14.24 | 8.43 |
| BB190040 | 414202.623 | 9675503.579 | 474.682 | 20 | -90 | 6.35 | 10 |
| DEX-MIA051 | 413221.267 | 9675938.950 | 348.072 | 8 | -90 | 4.59 | 0 |
| DEX-BB2055 | 413707.542 | 9675362.714 | 380.617 | 17 | -90 | 13.43 | 2 |
| DX00044 | 415202.036 | 9675697.281 | 469.587 | 21 | -90 | 12.19 | 6.4 |
| BB190053 | 414245.210 | 9675556.968 | 477.783 | 9 | -90 | 0 | 0 |
| DEX-MIA094 | 413104.506 | 9675716.355 | 376.684 | 7 | -90 | 0 | 0 |
| BB190029 | 413803.798 | 9676201.718 | 486.711 | 8 | -90 | 3.74 | 3.49 |
| DEX-BB024 | 413606.653 | 9675467.222 | 387.307 | 17 | -90 | 4.71 | 9.88 |
| BB190028 | 413799.888 | 9676155.689 | 494.770 | 17 | -90 | 12.01 | 7.84 |
| DEX-BB073 | 413559.485 | 9675608.663 | 380.609 | 16 | -90 | 14.44 | 1 |
| DX00050 | 414694.491 | 9675995.257 | 494.836 | 15 | -90 | 4.15 | 8.08 |
| DEX-BB008 | 413563.060 | 9675517.648 | 391.450 | 10 | -90 | 2 | 6.67 |
| DEX-BB104 | 414350.499 | 9675314.150 | 432.844 | 4 | -90 | 0 | 1 |
| DEX-BB2048 | 413699.314 | 9675500.543 | 397.121 | 19 | -90 | 9 | 5 |
| DEX-BB098 | 414145.111 | 9675405.378 | 465.255 | 22 | -90 | 2.22 | 7.97 |
| NCZ21-10007 | 415195.461 | 9675302.671 | 448.931 | 21 | -90 | 16.47 | 6.04 |
| BB190101 | 414149.062 | 9676253.008 | 521.816 | 17 | -90 | 11.31 | 3.3 |
| BB190032 | 413847.979 | 9676157.396 | 494.869 | 26 | -90 | 20.46 | 5.39 |
| DEX-BB012 | 413871.736 | 9675749.204 | 478.109 | 16 | -90 | 4.87 | 9.19 |
| BB190007 | 413960.689 | 9676019.530 | 502.319 | 26 | -90 | 8.12 | 15 |
| DEX-MIA045 | 413407.022 | 9676028.254 | 343.140 | 4 | -90 | 1 | 0 |
| DEX-BB084 | 413804.416 | 9675360.589 | 388.001 | 27 | -90 | 10.77 | 12.38 |
| BB190022 | 413940.881 | 9676163.870 | 512.496 | 31 | -90 | 14.86 | 19.93 |
| DEX-BB022 | 414051.089 | 9676111.978 | 521.833 | 20 | -90 | 15.55 | 7.32 |
| DX00073 | 415103.317 | 9675597.166 | 443.804 | 26 | -90 | 17.68 | 6.76 |
| DEX-BB101 | 414306.378 | 9675364.418 | 452.685 | 11 | -90 | 7.2 | 1 |
| DEX-MIA043 | 413214.798 | 9676030.323 | 359.545 | 5 | -90 | 2 | 1 |
| DX00186 | 414547.433 | 9675754.766 | 500.651 | 22 | -90 | 17.06 | 1 |
| DX00104 | 414698.523 | 9675405.432 | 438.977 | 8 | -90 | 5.37 | 0 |
| DX00017 | 414783.530 | 9675783.233 | 484.717 | 21 | -90 | 15.62 | 3.85 |
| DEX-MIA007 | 413009.006 | 9676111.650 | 342.436 | 5 | -90 | 1 | 1 |
| DX00065 | 415190.045 | 9676110.373 | 454.944 | 7 | -90 | 1 | 1 |
| DEX-BB089 | 414041.749 | 9675308.194 | 414.734 | 21 | -90 | 8.47 | 3 |
| BB190076 | 414397.668 | 9675400.377 | 466.694 | 10 | -90 | 3.28 | 3 |
| DEX-BB081 | 413743.404 | 9675413.231 | 387.425 | 26 | -90 | 15.21 | 9.72 |
| DEX-BB076 | 413592.439 | 9675558.094 | 383.343 | 25 | -90 | 13.94 | 7.19 |
| BB190025 | 413855.970 | 9676063.101 | 490.231 | 19 | -90 | 13.77 | 6.47 |
| DEX-BB107 | 414404.192 | 9675262.431 | 419.830 | 8 | -90 | 2 | 3.65 |
| DX00060 | 414697.632 | 9676099.348 | 504.313 | 17 | -90 | 7.1 | 8.55 |
| BB190005 | 414046.094 | 9676003.047 | 510.592 | 41 | -90 | 11 | 29.21 |
| DX00055 | 415205.112 | 9676003.649 | 460.563 | 18 | -90 | 5.54 | 2 |
| BB190027 | 413808.120 | 9676070.582 | 486.075 | 13 | -90 | 5.36 | 1.1 |
| DEX-MIA088 | 413101.514 | 9675808.040 | 365.387 | 4 | -90 | 0 | 0 |
| DEX-MIA095 | 412985.280 | 9675729.870 | 367.374 | 5 | -90 | 0 | 0 |
| DX00016 | 414698.411 | 9675812.084 | 491.470 | 30 | -90 | 22.21 | 7.9 |
| DX00166 | 414787.710 | 9675644.283 | 451.894 | 24 | -90 | 6.45 | 1 |
| BB190054 | 414302.716 | 9675550.793 | 481.139 | 8 | -90 | 1 | 0 |
| BB190037 | 413953.424 | 9676255.651 | 509.929 | 9 | -90 | 2.6 | 5.65 |
| BB190068 | 414301.878 | 9675458.490 | 471.418 | 16 | -90 | 5 | 9.88 |
| DEX-BB106 | 414310.913 | 9675273.666 | 422.740 | 12 | -90 | 2.97 | 4.63 |
| DX00096 | 414902.725 | 9676298.968 | 487.444 | 14 | -90 | 3.07 | 5.19 |
| BB190074 | 414256.284 | 9675401.310 | 447.898 | 7 | -90 | 3.28 | 0 |
| BB190081 | 413836.991 | 9675912.326 | 492.490 | 20 | -90 | 7 | 13 |
| DEX-BB010 | 413903.544 | 9675769.867 | 481.922 | 9 | -90 | 3.75 | 3.14 |
| DEX-BB021 | 414056.785 | 9676157.408 | 524.407 | 26 | -90 | 14.68 | 11.88 |
| DEX-BB041 | 414004.734 | 9675957.743 | 500.042 | 15 | -90 | 10.55 | 4.3 |
| DEX-MIA090 | 413306.501 | 9675826.420 | 365.340 | 7 | -90 | 3 | 1 |
| BB190077 | 414448.565 | 9675412.133 | 466.865 | 7 | -90 | 1 | 3 |
| DEX-MIA128 | 413001.045 | 9675624.402 | 362.852 | 9 | -90 | 0 | 0 |
| DX00041 | 414901.800 | 9675705.355 | 468.434 | 12 | -90 | 2 | 5 |
| DX00116 | 414606.294 | 9675610.215 | 461.776 | 15 | -90 | 8.22 | 5.5 |
| DX00131 | 414660.193 | 9676002.774 | 487.433 | 36 | -90 | 6.73 | 26.3 |
| DEX-BB093 | 414139.527 | 9675216.695 | 400.525 | 9 | -90 | 1 | 4 |
| DX00117 | 414604.248 | 9675657.623 | 479.890 | 20 | -90 | 11.85 | 9.08 |
| BB190102 | 414154.694 | 9676208.218 | 518.268 | 19 | -90 | 10.49 | 9.03 |
| DX00029 | 414788.074 | 9675893.733 | 493.229 | 35 | -90 | 15.25 | 14.05 |
| BB190066 | 414552.539 | 9675503.810 | 469.481 | 18 | -90 | 8 | 7 |
| DEX-BB071 | 413604.915 | 9675661.433 | 394.749 | 14 | -90 | 4.7 | 6.35 |
| DEX-BB026 | 413469.782 | 9675877.182 | 403.441 | 9 | -90 | 0 | 0 |
| DX00128 | 414652.294 | 9675707.592 | 489.196 | 16 | -90 | 10.61 | 5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7907 | 416075.880 | 9673178.531 | 353.231 | 15 | -90 | 12.25 | 1 |
| DEX-CZ7908 | 416050.280 | 9673173.366 | 355.861 | 16 | -90 | 4 | 12 |
| DEX-CZ7909 | 416029.776 | 9673174.372 | 355.606 | 15 | -90 | 5 | 5 |
| DEX-CZ7910 | 416002.792 | 9673171.400 | 352.613 | 14 | -90 | 3 | 10 |
| DEX-CZ7911 | 415978.818 | 9673172.485 | 349.481 | 14 | -90 | 4 | 8 |
| DEX-CZ7912 | 415953.318 | 9673173.992 | 342.954 | 5 | -90 | 2 | 0 |
| DEX-CZ7915 | 415873.987 | 9673180.332 | 305.407 | 8 | -90 | 5 | 0 |
| DEX-CZ7916 | 416179.679 | 9673226.484 | 359.023 | 13 | -90 | 4 | 7 |
| DEX-CZ7917 | 416151.072 | 9673219.734 | 353.955 | 19 | -90 | 16 | 1 |
| DEX-CZ7918 | 416127.737 | 9673224.430 | 352.857 | 16 | -90 | 9.6 | 5.4 |
| DEX-CZ7919 | 416103.173 | 9673223.355 | 348.167 | 28 | -90 | 6 | 22 |
| DEX-CZ7920 | 416078.899 | 9673219.285 | 342.957 | 11 | -90 | 4 | 6 |
| DEX-CZ7921 | 416055.101 | 9673212.734 | 340.496 | 19 | -90 | 4 | 12 |
| DEX-CZ7922 | 416033.393 | 9673209.684 | 340.634 | 11 | -90 | 3 | 6 |
| DEX-CZ7923 | 416004.175 | 9673208.753 | 336.919 | 20 | -90 | 4 | 10 |
| DEX-CZ7924 | 415972.624 | 9673211.847 | 328.929 | 23 | -90 | 8 | 11 |
| DEX-CZ7925 | 415952.238 | 9673218.517 | 324.936 | 9 | -90 | 5 | 4 |
| DEX-CZ7926 | 415930.935 | 9673218.777 | 322.571 | 9 | -90 | 5 | 2 |
| DEX-CZ7927 | 416183.327 | 9673148.161 | 346.642 | 35 | -90 | 28 | 7 |
| DEX-CZ7928 | 416129.744 | 9673146.616 | 348.691 | 44 | -90 | 35.63 | 7 |
| DEX-CZ7929 | 416076.302 | 9673150.785 | 357.804 | 14 | -90 | 12.15 | 0 |
| DEX-CZ7930 | 416026.064 | 9673155.175 | 361.660 | 20 | -90 | 2.4 | 8.6 |
| DEX-CZ7932 | 415930.268 | 9673155.165 | 341.016 | 6 | -90 | 3 | 1 |
| DEX-CZ7933 | 415876.459 | 9673148.500 | 321.825 | 15 | -90 | 4 | 7 |
| DEX-CZ7934 | 416204.221 | 9673125.331 | 350.375 | 36 | -90 | 33 | 0 |
| DEX-CZ7935 | 416181.200 | 9673128.188 | 348.647 | 33 | -90 | 31.04 | 0.63 |
| DEX-CZ7936 | 416152.105 | 9673122.845 | 349.123 | 43 | -90 | 30.8 | 11 |
| DEX-CZ7937 | 416124.195 | 9673120.731 | 351.054 | 28 | -90 | 22.25 | 4 |
| DEX-CZ7938 | 416088.447 | 9673127.124 | 355.288 | 19 | -90 | 14 | 5 |
| DEX-CZ7939 | 416071.560 | 9673126.197 | 359.358 | 29 | -90 | 26 | 2 |
| DEX-CZ7940 | 416041.065 | 9673127.704 | 363.936 | 27 | -90 | 17.62 | 11 |
| DEX-CZ7941 | 416020.632 | 9673119.100 | 367.400 | 23 | -90 | 17.8 | 5.27 |
| DEX-CZ7942 | 415975.374 | 9673128.240 | 369.207 | 9 | -90 | 2.38 | 3.62 |
| DEX-CZ7943 | 415947.751 | 9673127.892 | 359.494 | 12 | -90 | 2 | 7 |
| DEX-CZ7944 | 415927.533 | 9673122.348 | 352.716 | 7 | -90 | 4.67 | 0.33 |
| DEX-CZ7945 | 415903.492 | 9673119.696 | 343.212 | 13 | -90 | 7.25 | 2.63 |
| DEX-CZ7946 | 415879.765 | 9673120.667 | 332.761 | 19 | -90 | 4 | 13.23 |
| DEX-CZ7947 | 415854.309 | 9673122.423 | 322.065 | 14 | -90 | 3.5 | 8.5 |
| DEX-CZ7948 | 416179.025 | 9673098.197 | 354.256 | 26 | -90 | 23 | 0 |
| DEX-CZ7949 | 416128.500 | 9673097.600 | 355.525 | 32 | -90 | 26.37 | 6.37 |
| DEX-CZ7950 | 416071.261 | 9673102.930 | 357.908 | 20 | -90 | 14 | 4 |
| DEX-CZ7951 | 416024.441 | 9673095.382 | 368.000 | 24 | -90 | 15 | 9 |
| DEX-CZ7952 | 416000.617 | 9673101.297 | 370.706 | 41 | -90 | 17.36 | 25 |
| DEX-CZ7953 | 415974.789 | 9673100.816 | 371.264 | 20 | -90 | 11.26 | 9.25 |
| DEX-CZ7954 | 415928.486 | 9673094.308 | 358.686 | 15 | -90 | 7 | 7 |
| DEX-CZ7955 | 415881.981 | 9673089.990 | 339.853 | 16 | -90 | 2 | 14 |
| DEX-CZ7956 | 415825.153 | 9673096.534 | 315.117 | 14 | -90 | 4 | 8 |
| DEX-CZ7957 | 416305.451 | 9673073.504 | 378.224 | 12 | -90 | 8 | 2 |
| DEX-CZ7958 | 416277.023 | 9673073.393 | 371.718 | 15 | -90 | 10.5 | 2.5 |
| DEX-CZ7959 | 416249.689 | 9673072.422 | 367.831 | 10 | -90 | 7 | 1 |
| DEX-CZ7960 | 416227.017 | 9673072.419 | 364.903 | 20 | -90 | 9 | 7.5 |
| DEX-CZ7961 | 416201.678 | 9673073.014 | 361.961 | 30 | -90 | 30.54 | 1 |
| DEX-CZ7962 | 416179.286 | 9673071.682 | 359.938 | 33 | -90 | 29.62 | 4.15 |
| DEX-CZ7963 | 416152.345 | 9673076.100 | 358.026 | 31 | -90 | 28.71 | 0 |
| DEX-CZ7964 | 416126.079 | 9673072.147 | 360.757 | 25 | -90 | 21.76 | 3 |
| DEX-CZ7965 | 416098.648 | 9673081.560 | 360.543 | 34 | -90 | 25 | 5 |
| DEX-CZ7966 | 416072.407 | 9673074.979 | 361.940 | 27 | -90 | 19 | 6 |
| DEX-CZ7967 | 416051.414 | 9673076.291 | 364.666 | 27 | -90 | 17 | 8 |
| DEX-CZ7968 | 416025.939 | 9673070.903 | 364.294 | 22 | -90 | 10 | 10 |
| DEX-CZ7969 | 415999.434 | 9673071.037 | 363.474 | 12 | -90 | 7.52 | 2 |
| DEX-CZ7970 | 415971.726 | 9673077.234 | 364.413 | 23 | -90 | 11.08 | 10.54 |
| DEX-CZ7971 | 415950.216 | 9673072.600 | 361.002 | 21 | -90 | 11.47 | 10 |
| DEX-CZ7972 | 415926.452 | 9673075.503 | 357.331 | 21 | -90 | 12.32 | 7.34 |
| DEX-CZ7973 | 415902.165 | 9673075.596 | 349.496 | 25 | -90 | 8.75 | 16.25 |
| DEX-CZ7974 | 415877.711 | 9673073.421 | 340.141 | 24 | -90 | 10 | 13 |
| DEX-CZ7975 | 415851.524 | 9673072.933 | 329.902 | 35 | -90 | 6 | 23 |
| DEX-CZ7976 | 415828.733 | 9673076.367 | 319.637 | 7 | -90 | 2 | 3 |
| DEX-CZ7977 | 415801.609 | 9673076.293 | 310.531 | 15 | -90 | 8 | 4 |
| DEX-CZ7978 | 416323.806 | 9673050.536 | 386.451 | 15 | -90 | 12.23 | 1 |
| DEX-CZ7979 | 416272.872 | 9673052.467 | 374.254 | 24 | -90 | 8.5 | 12.5 |
| DEX-CZ7980 | 416228.492 | 9673049.272 | 368.517 | 16 | -90 | 9 | 6 |
| DEX-CZ7981 | 416174.424 | 9673050.250 | 358.468 | 18 | -90 | 14.77 | 4 |
| DEX-CZ7982 | 416122.650 | 9673046.521 | 366.634 | 19 | -90 | 17.32 | 0.25 |
| DEX-CZ7983 | 416078.478 | 9673052.237 | 366.557 | 27 | -90 | 19 | 5 |
| DEX-CZ7984 | 416024.342 | 9673047.665 | 363.289 | 25 | -90 | 13 | 8 |
| DEX-CZ7985 | 415973.973 | 9673052.281 | 356.021 | 22 | -90 | 9.68 | 8.6 |
| DEX-CZ7986 | 415925.025 | 9673047.398 | 350.665 | 26 | -90 | 16.55 | 6 |
| DEX-CZ7987 | 415876.564 | 9673052.703 | 341.058 | 36 | -90 | 16.88 | 20 |
| DEX-CZ7988 | 415828.053 | 9673049.392 | 330.286 | 17 | -90 | 8 | 1 |
| DEX-CZ7989 | 416296.541 | 9673028.243 | 375.779 | 10 | -90 | 4.5 | 4.5 |
| DEX-CZ7990 | 416279.018 | 9673027.408 | 370.807 | 27 | -90 | 5 | 19 |
| DEX-CZ7991 | 416175.878 | 9673028.726 | 354.814 | 7 | -90 | 3 | 2 |
| DEX-CZ7992 | 416141.974 | 9673030.509 | 364.612 | 12 | -90 | 5 | 4 |
| DEX-CZ7993 | 416119.548 | 9673029.184 | 370.042 | 19 | -90 | 10 | 8 |
| DEX-CZ7994 | 416024.176 | 9673023.581 | 358.309 | 18 | -90 | 9 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB082 | 413845.178 | 9675406.294 | 395.001 | 7 | -90 | 2 | 1 |
| DEX-MIA052 | 413102.498 | 9675908.553 | 364.919 | 6 | -90 | 0 | 0 |
| DX00018 | 414902.305 | 9675805.585 | 482.578 | 28 | -90 | 13.37 | 4.99 |
| DEX-BB001 | 413790.286 | 9675864.858 | 484.139 | 7 | -90 | 4 | 1 |
| BB190085 | 414102.179 | 9675760.135 | 524.183 | 10 | -90 | 6 | 2.14 |
| DEX-BB2057 | 413387.866 | 9675710.715 | 385.430 | 18 | -90 | 3 | 6 |
| DEX-BB088 | 413947.494 | 9675306.664 | 402.815 | 8 | -90 | 5.81 | 0 |
| DEX-MIA050 | 413316.645 | 9675920.258 | 362.658 | 16 | -90 | 0 | 15.53 |
| DEX-BB074 | 413656.362 | 9675610.972 | 394.401 | 24 | -90 | 12.31 | 11.74 |
| BB190015 | 413950.986 | 9676305.513 | 497.944 | 10 | -90 | 4.11 | 6.58 |
| BB190006 | 414003.303 | 9676013.782 | 506.911 | 19 | -90 | 11.58 | 4.05 |
| BB190016 | 413900.284 | 9676306.103 | 485.915 | 14 | -90 | 8.41 | 5.45 |
| DX00043 | 415101.772 | 9675705.106 | 467.826 | 41 | -90 | 8.45 | 26.14 |
| DX00161 | 414755.529 | 9675762.535 | 485.715 | 31 | -90 | 19.81 | 12.8 |
| BB190044 | 414504.929 | 9675655.683 | 482.598 | 12 | -90 | 4.8 | 2.9 |
| DX00167 | 414782.738 | 9675745.038 | 477.371 | 20 | -90 | 11.83 | 4.56 |
| DEX-BB028 | 413954.627 | 9676212.573 | 512.097 | 15 | -90 | 13.85 | 1.6 |
| BB190045 | 414560.667 | 9675657.003 | 482.452 | 16 | -90 | 8.09 | 5.42 |
| BB190100 | 414154.450 | 9676114.324 | 517.917 | 21 | -90 | 11.1 | 9.47 |
| DX00137 | 414653.049 | 9675606.731 | 461.716 | 18 | -90 | 11.6 | 7.34 |
| DEX-BB102 | 414394.256 | 9675369.335 | 456.541 | 6 | -90 | 2 | 2.55 |
| DEX-BB079 | 413742.408 | 9675514.714 | 406.952 | 16 | -90 | 6.29 | 7.44 |
| DEX-BB100 | 414202.870 | 9675353.939 | 444.486 | 14 | -90 | 3.71 | 7.9 |
| DX00012 | 414596.104 | 9676197.806 | 497.015 | 20 | -90 | 12.02 | 5.35 |
| DEX-BB085 | 413899.233 | 9675362.321 | 397.859 | 9 | -90 | 3 | 2 |
| BB190035 | 413851.490 | 9676295.160 | 477.485 | 9 | -90 | 1.4 | 5 |
| DEX-MIA049 | 413398.966 | 9675928.647 | 363.079 | 5 | -90 | 1 | 1 |
| DEX-BB069 | 413532.051 | 9675727.701 | 386.129 | 8 | -90 | 2 | 1 |
| BB190103 | 414155.641 | 9676160.481 | 517.626 | 17 | -90 | 10.54 | 6.93 |
| DEX-BB2052 | 413651.052 | 9675409.743 | 381.212 | 19 | -90 | 9.85 | 3 |
| DEX-BB095 | 414107.568 | 9675448.199 | 468.773 | 16 | -90 | 3.5 | 9.76 |
| DX00097 | 415008.608 | 9676296.153 | 483.514 | 11 | -90 | 1 | 5 |
| BB190098 | 414451.755 | 9676335.051 | 517.685 | 14 | -90 | 11.12 | 0.75 |
| BB190020 | 413954.354 | 9676060.814 | 505.280 | 22 | -90 | 10.48 | 12.78 |
| BB190067 | 414255.705 | 9675453.752 | 456.033 | 8 | -90 | 2.38 | 3 |
| DEX-BB1912 | 415008.860 | 9675568.500 | 443.025 | 21 | -90 | 14.21 | 5 |
| BBFW-1060 | 408560.620 | 9675551.060 | 705.470 | 10 | -90 | 6 | 1 |
| BBFW-1001 | 408149.120 | 9675151.050 | 783.640 | 16 | -90 | 7 | 6 |
| BBFW-1002 | 408046.540 | 9675150.380 | 777.390 | 28 | -90 | 14 | 6 |
| BBFW-1003 | 407945.430 | 9675143.170 | 777.140 | 22 | -90 | 12 | 6 |
| BBFW-1004 | 407850.960 | 9675147.460 | 780.870 | 18 | -90 | 9 | 5 |
| BBFW-1005 | 407745.090 | 9675145.460 | 792.910 | 9 | -90 | 3 | 4 |
| BBFW-1006 | 407749.410 | 9675077.800 | 786.930 | 29 | -90 | 13 | 3 |
| BBFW-1007 | 407855.660 | 9675075.790 | 772.000 | 15 | -90 | 10 | 4 |
| BBFW-1008 | 407948.620 | 9675070.480 | 779.640 | 15 | -90 | 4 | 7 |
| BBFW-1009 | 408050.160 | 9675076.050 | 775.520 | 20 | -90 | 11 | 7 |
| BBFW-1010 | 408151.090 | 9675074.420 | 766.730 | 16 | -90 | 6 | 7 |
| BBFW-1011 | 408248.850 | 9675074.650 | 770.480 | 16 | -90 | 3 | 8 |
| BBFW-1013 | 408248.760 | 9675247.130 | 775.540 | 6 | -90 | 2 | 0 |
| BBFW-1014 | 408147.830 | 9675253.800 | 810.480 | 21 | -90 | 5 | 2 |
| BBFW-1015 | 408151.620 | 9675350.510 | 808.010 | 15 | -90 | 5 | 5 |
| BBFW-1016 | 408138.240 | 9675458.300 | 776.920 | 15 | -90 | 6 | 7 |
| BBFW-1017 | 408251.620 | 9675344.450 | 778.950 | 16 | -90 | 4 | 9 |
| BBFW-1018 | 408050.800 | 9675246.560 | 805.520 | 19 | -90 | 5 | 6 |
| BBFW-1019 | 408047.440 | 9675344.700 | 833.040 | 14 | -90 | 8 | 3 |
| BBFW-1020 | 408070.880 | 9675443.560 | 803.060 | 21 | -90 | 7 | 10 |
| BBFW-1021 | 407955.530 | 9675352.950 | 798.670 | 15 | -90 | 3 | 3 |
| BBFW-1023 | 407951.550 | 9675250.370 | 798.180 | 24 | -90 | 3 | 1 |
| BBFW-1024 | 407859.260 | 9675250.940 | 792.920 | 18 | -90 | 9 | 4 |
| BBFW-1025 | 407749.540 | 9675253.370 | 776.960 | 15 | -90 | 9 | 3 |
| BBFW-1026 | 407773.730 | 9675342.770 | 766.220 | 10 | -90 | 3 | 2 |
| BBFW-1028 | 407854.760 | 9675351.020 | 789.060 | 19 | -90 | 6 | 13 |
| BBFW-1033 | 408129.360 | 9675530.840 | 774.990 | 20 | -90 | 4 | 6 |
| BBFW-1034 | 408351.380 | 9675242.960 | 749.120 | 14 | -90 | 4 | 0 |
| BBFW-1035 | 408345.430 | 9675153.370 | 784.650 | 10 | -90 | 5 | 1 |
| BBFW-1037 | 408450.360 | 9675074.400 | 752.800 | 14 | -90 | 3.6 | 3.4 |
| BBFW-1039 | 408548.630 | 9675154.310 | 756.980 | 12 | -90 | 7 | 0 |
| BBFW-1040 | 408547.020 | 9675072.630 | 742.610 | 10 | -90 | 4 | 4 |
| BBFW-1041 | 408646.200 | 9675073.270 | 723.880 | 14 | -90 | 4 | 1 |
| BBFW-1042 | 408749.640 | 9675072.030 | 724.220 | 23 | -90 | 5 | 2 |
| BBFW-1043 | 408848.030 | 9675078.250 | 733.650 | 13 | -90 | 3.52 | 0 |
| BBFW-1045 | 409048.580 | 9675073.140 | 685.010 | 18 | -90 | 4 | 0 |
| BBFW-1046 | 409149.260 | 9675069.100 | 651.140 | 9 | -90 | 3 | 2 |
| BBFW-1047 | 409248.910 | 9675075.000 | 646.530 | 13 | -90 | 4 | 2 |
| BBFW-1048 | 409256.060 | 9675143.130 | 635.020 | 21 | -90 | 4 | 12 |
| BBFW-1049 | 409150.350 | 9675155.070 | 656.570 | 23 | -90 | 4 | 4 |
| BBFW-1050 | 409048.260 | 9675146.940 | 691.740 | 22 | -90 | 4 | 0 |
| BBFW-1051 | 408953.780 | 9675145.530 | 719.220 | 18 | -90 | 4 | 3 |
| BBFW-1052 | 408842.540 | 9675146.910 | 725.260 | 21 | -90 | 1.5 | 9.5 |
| BBFW-1053 | 408643.330 | 9675150.380 | 737.400 | 10 | -90 | 6 | 1 |
| BBFW-1054 | 408651.830 | 9675246.330 | 746.330 | 19 | -90 | 8 | 6 |
| BBFW-1055 | 408648.700 | 9675346.080 | 738.780 | 12 | -90 | 8 | 1 |
| BBFW-1056 | 408656.350 | 9675431.560 | 748.510 | 16 | -90 | 6 | 2 |
| BBFW-1057 | 408648.570 | 9675553.980 | 739.170 | 35 | -90 | 21 | 6 |
| BBFW-1058 | 408640.940 | 9675655.380 | 720.460 | 15 | -90 | 3 | 0 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7995 | 416001.800 | 9673030.435 | 356.372 | 27 | -90 | 12.41 | 8.25 |
| DEX-CZ7996 | 415970.215 | 9673033.696 | 349.138 | 34.61 | -90 | 8.78 | 20.23 |
| DEX-CZ7997 | 415946.217 | 9673035.917 | 348.359 | 34 | -90 | 18.34 | 10.24 |
| DEX-CZ7998 | 415918.978 | 9673026.003 | 343.961 | 31.25 | -90 | 14.95 | 15.64 |
| DEX-CZ7999 | 415897.129 | 9673027.776 | 343.649 | 32 | -90 | 19 | 9.55 |
| DEX-CZ8000 | 415878.241 | 9673026.350 | 341.239 | 31 | -90 | 23.3 | 6 |
| DEX-CZ8001 | 415854.288 | 9673020.976 | 338.340 | 25 | -90 | 17.35 | 4 |
| DEX-CZ8002 | 415826.040 | 9673021.389 | 336.414 | 14 | -90 | 5 | 5 |
| DEX-CZ8003 | 415801.095 | 9673018.258 | 335.000 | 5 | -90 | 1.78 | 0.22 |
| DEX-CZ8005 | 416025.504 | 9673006.549 | 350.306 | 7 | -90 | 4 | 0 |
| DEX-CZ8007 | 415973.123 | 9673007.081 | 342.229 | 16 | -90 | 4 | 7 |
| DEX-CZ8008 | 415923.401 | 9673006.419 | 337.136 | 11 | -90 | 5 | 5 |
| DEX-CZ8009 | 415875.001 | 9673002.716 | 334.567 | 19 | -90 | 3.45 | 8.55 |
| DEX-CZ8010 | 415826.663 | 9672997.721 | 332.696 | 12 | -90 | 1.3 | 5.7 |
| DEX-CZ8013 | 415983.332 | 9672977.603 | 322.790 | 10 | -90 | 3 | 2 |
| DEX-CZ8014 | 415946.163 | 9672987.335 | 330.512 | 10 | -90 | 2 | 5 |
| DEX-CZ8015 | 415926.269 | 9672979.941 | 323.622 | 5 | -90 | 2.36 | 0.64 |
| DEX-CZ8017 | 415880.583 | 9672974.091 | 322.843 | 11 | -90 | 4 | 4 |
| DEX-CZ8018 | 415854.148 | 9672981.033 | 323.110 | 12 | -90 | 1.35 | 1.65 |
| DEX-CZ8019 | 415827.025 | 9672977.450 | 323.115 | 15 | -90 | 4 | 9 |
| DEX-CZ8020 | 415799.630 | 9672970.818 | 324.479 | 19 | -90 | 6 | 10.6 |
| DEX-CZ8021 | 416380.845 | 9672977.897 | 375.894 | 8 | -90 | 5 | 0 |
| DEX-CZ8022 | 416475.090 | 9672977.070 | 371.418 | 14 | -90 | 7 | 5 |
| DEX-CZ8023 | 416500.463 | 9672977.885 | 367.098 | 13 | -90 | 7 | 4 |
| DEX-CZ8024 | 416523.703 | 9672969.881 | 359.970 | 12 | -90 | 3 | 6 |
| DEX-CZ8025 | 416559.008 | 9672974.120 | 358.480 | 11 | -90 | 6.6 | 1.4 |
| DEX-CZ8026 | 416584.611 | 9672981.497 | 360.617 | 11 | -90 | 5 | 4 |
| DEX-CZ8027 | 416607.956 | 9672972.033 | 354.780 | 11 | -90 | 7 | 1 |
| DEX-CZ8028 | 416630.474 | 9672968.626 | 361.241 | 12 | -90 | 2 | 7 |
| DEX-CZ8029 | 416652.810 | 9672967.869 | 364.833 | 31 | -90 | 11 | 15 |
| DEX-CZ8030 | 416677.567 | 9672964.397 | 364.531 | 17 | -90 | 8 | 7 |
| DEX-CZ8031 | 416383.299 | 9673003.352 | 388.726 | 13 | -90 | 7 | 2 |
| DEX-CZ8032 | 416478.571 | 9673006.467 | 382.321 | 20 | -90 | 8 | 11 |
| DEX-CZ8033 | 416523.667 | 9673002.754 | 377.630 | 24 | -90 | 4 | 18 |
| DEX-CZ8034 | 416588.841 | 9673006.681 | 371.597 | 9 | -90 | 4 | 3 |
| DEX-CZ8035 | 416374.127 | 9673025.176 | 395.360 | 16 | -90 | 13.9 | 1 |
| DEX-CZ8036 | 416404.126 | 9673023.211 | 394.869 | 20 | -90 | 9.3 | 9 |
| DEX-CZ8037 | 416423.865 | 9673028.081 | 396.543 | 16 | -90 | 9 | 3.3 |
| DEX-CZ8038 | 416472.897 | 9673030.609 | 392.344 | 16 | -90 | 9 | 5 |
| DEX-CZ8039 | 416504.255 | 9673021.796 | 388.104 | 17 | -90 | 10 | 5 |
| DEX-CZ8040 | 416526.149 | 9673028.320 | 389.753 | 13 | -90 | 9.65 | 0.35 |
| DEX-CZ8041 | 416547.802 | 9673029.694 | 388.968 | 19 | -90 | 16 | 1 |
| DEX-CZ8042 | 416576.695 | 9673025.424 | 383.462 | 15 | -90 | 12.7 | 1 |
| DEX-CZ8043 | 416374.393 | 9673051.197 | 396.843 | 22 | -90 | 11.06 | 4.48 |
| DEX-CZ8044 | 416424.613 | 9673050.245 | 400.097 | 24 | -90 | 17.3 | 5 |
| DEX-CZ8045 | 416476.093 | 9673053.253 | 397.800 | 18 | -90 | 13 | 3 |
| DEX-CZ8046 | 416525.365 | 9673051.017 | 397.884 | 16 | -90 | 10 | 3 |
| DEX-CZ8047 | 416573.956 | 9673056.133 | 397.276 | 15 | -90 | 11 | 2 |
| DEX-CZ8048 | 416377.716 | 9673072.936 | 394.086 | 13 | -90 | 10.61 | 0 |
| DEX-CZ8049 | 416402.693 | 9673076.793 | 396.938 | 18 | -90 | 10 | 4 |
| DEX-CZ8050 | 416425.271 | 9673074.696 | 399.423 | 13 | -90 | 9 | 2 |
| DEX-CZ8051 | 416479.312 | 9673074.598 | 400.549 | 22 | -90 | 14 | 5 |
| DEX-CZ8052 | 416500.719 | 9673077.875 | 402.761 | 31 | -90 | 22.7 | 9 |
| DEX-CZ8053 | 416527.553 | 9673075.021 | 404.400 | 21 | -90 | 18.72 | 1 |
| DEX-CZ8054 | 416549.652 | 9673074.764 | 404.940 | 14 | -90 | 11 | 1 |
| DEX-CZ8055 | 416002.555 | 9672974.499 | 324.166 | 8 | -90 | 3 | 3 |
| DEX-CZ8056 | 416035.652 | 9672968.366 | 324.117 | 29 | -90 | 5 | 17.23 |
| DEX-CZ8057 | 416094.354 | 9673024.951 | 370.651 | 20 | -90 | 13.86 | 4 |
| DEX-CZ8058 | 416074.642 | 9673027.263 | 368.178 | 23 | -90 | 9.3 | 15.23 |
| DEX-CZ8059 | 416201.689 | 9673025.681 | 362.852 | 10 | -90 | 2 | 5 |
| DEX-CZ8060 | 416232.508 | 9673028.929 | 368.933 | 12 | -90 | 5 | 2 |
| DEX-CZ8061 | 416252.918 | 9673035.126 | 371.088 | 13 | -90 | 8 | 3 |
| DEX-CZ8062 | 416202.311 | 9673223.962 | 361.472 | 17 | -90 | 13 | 2 |
| DEX-CZ8063 | 416234.202 | 9673100.427 | 358.686 | 30 | -90 | 27.18 | 3 |
| DEX-CZ8064 | 416229.855 | 9673121.285 | 353.190 | 26 | -90 | 23 | 0 |
| DEX-CZ8065 | 416230.972 | 9673146.272 | 349.791 | 27 | -90 | 22 | 2 |
| DEX-CZ8066 | 416228.020 | 9673174.874 | 348.389 | 31 | -90 | 24 | 4 |
| DEX-CZ8067 | 416226.078 | 9673198.546 | 352.842 | 37 | -90 | 26.25 | 3 |
| DEX-CZ8068 | 416226.667 | 9673224.984 | 359.788 | 17 | -90 | 14 | 1 |
| DEX-CZ8069 | 416382.530 | 9672958.985 | 365.351 | 10 | -90 | 3 | 4 |
| DEX-CZ8071 | 415827.050 | 9673122.668 | 309.107 | 13 | -90 | 6 | 2 |
| DEX-CZ8074 | 415923.522 | 9672946.249 | 309.032 | 5 | -90 | 2 | 0 |
| DEX-CZ8075 | 415878.212 | 9672921.095 | 307.143 | 15 | -90 | 9 | 4 |
| DEX-CZ8076 | 415902.058 | 9672924.026 | 307.079 | 20 | -90 | 12 | 5 |
| DEX-CZ8077 | 415932.427 | 9672924.789 | 304.476 | 21 | -90 | 11 | 4.6 |
| DEX-CZ8078 | 416295.733 | 9672870.240 | 370.353 | 26 | -90 | 18.28 | 6 |
| DEX-CZ8079 | 416332.006 | 9672872.386 | 369.603 | 14 | -90 | 6 | 6 |
| DEX-CZ8080 | 416361.090 | 9672873.751 | 367.263 | 8 | -90 | 5 | 1 |
| DEX-CZ8081 | 416378.784 | 9672870.056 | 368.334 | 8 | -90 | 5 | 0 |
| DEX-CZ8082 | 416321.699 | 9672848.265 | 379.134 | 18 | -90 | 13 | 3 |
| DEX-CZ8083 | 416367.679 | 9672826.951 | 386.946 | 20 | -90 | 16 | 1 |
| DEX-CZ8084 | 416373.476 | 9672852.257 | 378.390 | 15 | -90 | 11.62 | 1.38 |
| DEX-CZ8085 | 416342.504 | 9672828.348 | 384.957 | 26 | -90 | 18.28 | 6 |
| DEX-CZ8086 | 416320.102 | 9672823.094 | 384.524 | 18 | -90 | 13 | 3 |
| DEX-CZ8087 | 416298.873 | 9672825.533 | 384.331 | 25 | -90 | 21.82 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| BBFW-1059 | 408564.030 | 9675654.830 | 683.750 | 16 | -90 | 9 | 1 |
| BBFW-1061 | 408557.270 | 9675454.660 | 711.300 | 8 | -90 | 3 | 3 |
| BBFW-1062 | 408546.830 | 9675346.880 | 717.530 | 9 | -90 | 5 | 0 |
| BBFW-1063 | 408550.600 | 9675244.780 | 752.210 | 14 | -90 | 8 | 2 |
| BBFW-1064 | 408746.830 | 9675258.000 | 722.790 | 10 | -90 | 6.3 | 1 |
| BBFW-1065 | 408757.780 | 9675353.500 | 709.510 | 8 | -90 | 3 | 0 |
| BBFW-1066 | 408747.200 | 9675451.380 | 740.630 | 16 | -90 | 5 | 0.37 |
| BBFW-1067 | 408760.310 | 9675563.960 | 762.070 | 30 | -90 | 15 | 8 |
| BBFW-1068 | 408756.390 | 9675648.260 | 746.010 | 26 | -90 | 18 | 0 |
| BBFW-1069 | 408851.890 | 9675660.040 | 734.990 | 26 | -90 | 6.45 | 2 |
| BBFW-1070 | 408837.640 | 9675545.590 | 740.240 | 10 | -90 | 3 | 1 |
| BBFW-1071 | 408845.660 | 9675448.380 | 704.930 | 27 | -90 | 3 | 4 |
| BBFW-1072 | 408850.030 | 9675353.870 | 682.590 | 11 | -90 | 4 | 1 |
| BBFW-1073 | 409047.800 | 9675250.790 | 685.540 | 16 | -90 | 2 | 0 |
| BBFW-1074 | 408954.390 | 9675245.660 | 685.250 | 13 | -90 | 2 | 5 |
| BBFW-1076 | 409338.860 | 9675142.760 | 608.310 | 16 | -90 | 10 | 2 |
| BBFW-1077 | 409246.410 | 9675245.810 | 609.080 | 16 | -90 | 4 | 0 |
| BBFW-1078 | 409347.560 | 9675247.720 | 592.270 | 43 | -90 | 15 | 10 |
| BBFW-1079 | 409350.530 | 9675348.610 | 588.480 | 14 | -90 | 3 | 9 |
| BBFW-1080 | 408559.610 | 9675746.260 | 686.570 | 15 | -90 | 5 | 1 |
| BBFW-1082 | 408550.890 | 9676050.270 | 586.970 | 12 | -90 | 3 | 1 |
| BBFW-1083 | 408551.150 | 9676155.920 | 556.480 | 17 | -90 | 3 | 2 |
| BBFW-1084 | 408557.850 | 9676252.700 | 533.630 | 19 | -90 | 7 | 4 |
| BBFW-1089 | 408951.760 | 9675656.290 | 699.270 | 13 | -90 | 4.47 | 2 |
| BBFW-1090 | 409049.940 | 9675650.180 | 674.580 | 19 | -90 | 1 | 2 |
| BBFW-1091 | 409147.570 | 9675657.400 | 652.630 | 9 | -90 | 4 | 1 |
| BBFW-1092 | 409243.180 | 9675646.860 | 617.000 | 10 | -90 | 2 | 4 |
| BBFW-1093 | 408647.370 | 9675744.930 | 695.220 | 8 | -90 | 4 | 1 |
| BBFW-1095 | 408648.970 | 9675950.720 | 636.860 | 24 | -90 | 7 | 2 |
| BBFW-1096 | 408652.940 | 9676048.040 | 604.300 | 23 | -90 | 4 | 7 |
| BBFW-1097 | 408653.970 | 9676145.160 | 578.670 | 20 | -90 | 4 | 6 |
| BBFW-1098 | 408652.950 | 9676239.370 | 553.620 | 24 | -90 | 8 | 0 |
| BBFW-1099 | 408745.720 | 9676252.130 | 561.560 | 32 | -90 | 7.22 | 4 |
| BBFW-1100 | 408755.800 | 9676148.590 | 595.980 | 18 | -90 | 2 | 0 |
| BBFW-1101 | 408746.910 | 9676051.460 | 636.610 | 12 | -90 | 4 | 1 |
| BBFW-1103 | 408752.280 | 9675851.240 | 686.270 | 9 | -90 | 4 | 0 |
| BBFW-1104 | 408751.390 | 9675749.070 | 714.650 | 16 | -90 | 4 | 0 |
| BBFW-1105 | 408844.730 | 9675759.740 | 723.000 | 24 | -90 | 6.41 | 7 |
| BBFW-1107 | 408850.080 | 9675943.750 | 674.280 | 15 | -90 | 3 | 5 |
| BBFW-1110 | 408956.950 | 9675749.080 | 696.190 | 12 | -90 | 8.81 | 1 |
| BBFW-1111 | 408940.520 | 9675845.680 | 681.500 | 7 | -90 | 3.61 | 1 |
| BBFW-1112 | 408956.540 | 9675949.060 | 655.430 | 9 | -90 | 2 | 1 |
| BBFW-1113 | 408948.690 | 9676049.770 | 615.260 | 5 | -90 | 1 | 0 |
| BBFW-1115 | 409055.760 | 9676143.860 | 588.690 | 6 | -90 | 1 | 1 |
| BBFW-1116 | 409048.500 | 9676051.660 | 627.930 | 14 | -90 | 4.21 | 7 |
| BBFW-1117 | 409045.690 | 9675943.120 | 629.260 | 22 | -90 | 4.36 | 1 |
| BBFW-1118 | 409057.070 | 9675848.850 | 646.610 | 10 | -90 | 3 | 2 |
| BBFW-1119 | 409055.360 | 9675746.950 | 669.520 | 13 | -90 | 4 | 5 |
| BBFW-1120 | 409149.210 | 9675744.860 | 636.880 | 11 | -90 | 5 | 2 |
| BBFW-1124 | 409155.650 | 9676143.870 | 565.440 | 5 | -90 | 1.4 | 0 |
| BBFW-1127 | 409246.790 | 9675951.470 | 580.000 | 25 | -90 | 15.62 | 7 |
| BBFW-1128 | 409256.730 | 9675845.650 | 594.010 | 9 | -90 | 2 | 4.56 |
| BBFW-1129 | 409248.350 | 9675755.340 | 609.940 | 14 | -90 | 6.69 | 6 |
| BBFW-1130 | 409337.500 | 9675750.580 | 582.350 | 15 | -90 | 2 | 9 |
| BBFW-1131 | 409448.350 | 9675763.180 | 534.450 | 11 | -90 | 4.28 | 3 |
| BBFW-1132 | 409446.560 | 9675851.070 | 539.800 | 10 | -90 | 5 | 2 |
| BBFW-1133 | 409348.840 | 9675847.540 | 582.480 | 26 | -90 | 5 | 3 |
| BBFW-1134 | 409350.320 | 9675944.640 | 556.770 | 24 | -90 | 14 | 6 |
| BBFW-1135 | 409437.920 | 9675949.750 | 531.510 | 21 | -90 | 4 | 3 |
| BBFW-1137 | 409351.590 | 9676051.240 | 531.500 | 10 | -90 | 3 | 0 |
| BBFW-1142 | 408553.960 | 9676341.420 | 528.010 | 11 | -90 | 1 | 2 |
| BBFW-1143 | 408744.980 | 9676341.540 | 525.050 | 15 | -90 | 1 | 6 |
| DEX-BB6736 | 408552.700 | 9676293.463 | 533.824 | 17 | -90 | 3 | 6 |
| DEX-BB6737 | 408605.020 | 9676291.718 | 530.617 | 14 | -90 | 7 | 4 |
| DEX-BB6738 | 408652.690 | 9676290.437 | 527.338 | 8 | -90 | 4.5 | 0.5 |
| DEX-BB6740 | 408752.700 | 9676292.599 | 547.538 | 11 | -90 | 5 | 2 |
| DEX-BB6741 | 408800.160 | 9676290.599 | 541.218 | 5 | -90 | 2 | 0.5 |
| DEX-BB6742 | 408605.040 | 9676237.184 | 547.611 | 13 | -90 | 4 | 3 |
| DEX-BB6743 | 408706.201 | 9676234.358 | 562.959 | 16 | -90 | 7 | 2 |
| DEX-BB6744 | 408805.700 | 9676241.194 | 566.102 | 7 | -90 | 3 | 1 |
| DEX-BB6745 | 408555.690 | 9676194.190 | 538.855 | 9 | -90 | 3 | 2 |
| DEX-BB6746 | 408605.970 | 9676190.201 | 552.075 | 21 | -90 | 3 | 12 |
| DEX-BB6747 | 408654.650 | 9676189.245 | 571.034 | 16 | -90 | 9 | 5 |
| DEX-BB6748 | 408710.052 | 9676189.646 | 577.381 | 9 | -90 | 2 | 1 |
| DEX-BB6749 | 408754.450 | 9676190.533 | 580.774 | 10 | -90 | 5 | 2 |
| DEX-BB6750 | 408803.320 | 9676188.984 | 583.273 | 10 | -90 | 4 | 1 |
| DEX-BB6751 | 408605.720 | 9676145.357 | 564.785 | 9 | -90 | 2 | 1 |
| DEX-BB6752 | 408709.561 | 9676137.075 | 592.614 | 8 | -90 | 3.5 | 0 |
| DEX-BB6753 | 408594.800 | 9676091.201 | 584.992 | 11 | -90 | 6.5 | 0 |
| DEX-BB6754 | 408650.580 | 9676087.354 | 592.291 | 8 | -90 | 3.65 | 0 |
| DEX-BB6755 | 408704.290 | 9676088.477 | 608.653 | 17 | -90 | 5 | 9 |
| DEX-BB6756 | 409203.759 | 9676092.444 | 578.304 | 13 | -90 | 4 | 6 |
| DEX-BB6757 | 409251.889 | 9676094.300 | 572.908 | 22 | -90 | 3 | 15 |
| DEX-BB6758 | 409306.352 | 9676092.782 | 553.236 | 13 | -90 | 11 | 0 |
| DEX-BB6759 | 408604.700 | 9676040.834 | 602.798 | 13 | -90 | 7 | 1 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8088 | 416580.482 | 9673079.713 | 405.415 | 18 | -90 | 9 | 7 |
| DEX-CZ8089 | 416431.825 | 9672877.214 | 369.702 | 12 | -90 | 4 | 3 |
| DEX-CZ8090 | 416426.107 | 9672852.255 | 380.771 | 22 | -90 | 19 | 0.6 |
| DEX-CZ8091 | 416423.933 | 9672827.600 | 387.003 | 38 | -90 | 27.42 | 8 |
| DEX-CZ8092 | 416429.529 | 9672802.650 | 389.882 | 23 | -90 | 15 | 6 |
| DEX-CZ8093 | 416436.677 | 9672769.414 | 390.000 | 34 | -90 | 24 | 10 |
| DEX-CZ8094 | 416431.687 | 9672750.861 | 390.204 | 38 | -90 | 22.51 | 7 |
| DEX-CZ8095 | 416425.447 | 9672728.802 | 389.076 | 42 | -90 | 29.69 | 11.19 |
| DEX-CZ8096 | 416431.225 | 9672697.420 | 385.872 | 22 | -90 | 19.38 | 0 |
| DEX-CZ8097 | 416425.389 | 9672620.778 | 392.208 | 41 | -90 | 33.47 | 7 |
| DEX-CZ8098 | 416440.829 | 9672600.995 | 394.000 | 22 | -90 | 11 | 9 |
| DEX-CZ8099 | 416425.490 | 9672574.000 | 394.597 | 19 | -90 | 12 | 3 |
| DEX-CZ8100 | 416428.373 | 9672551.757 | 393.091 | 21 | -90 | 13.3 | 2 |
| DEX-CZ8101 | 416427.650 | 9672523.624 | 386.368 | 18 | -90 | 10.9 | 6.54 |
| DEX-CZ8102 | 416376.535 | 9672802.404 | 389.000 | 19 | -90 | 15 | 1.6 |
| DEX-CZ8103 | 416375.041 | 9672776.164 | 388.586 | 17 | -90 | 10 | 4 |
| DEX-CZ8104 | 416381.198 | 9672752.982 | 387.379 | 24 | -90 | 20.74 | 2 |
| DEX-CZ8105 | 416378.449 | 9672726.131 | 385.117 | 6 | -90 | 4 | 0 |
| DEX-CZ8106 | 416371.053 | 9672697.565 | 380.390 | 32 | -90 | 12 | 17.2 |
| DEX-CZ8107 | 416375.270 | 9672667.479 | 382.614 | 38 | -90 | 4 | 31 |
| DEX-CZ8108 | 416374.131 | 9672645.891 | 386.824 | 32 | -90 | 13 | 13 |
| DEX-CZ8109 | 416374.844 | 9672629.324 | 389.968 | 19 | -90 | 7 | 9 |
| DEX-CZ8110 | 416376.055 | 9672593.562 | 393.000 | 31 | -90 | 24 | 5.34 |
| DEX-CZ8111 | 416374.108 | 9672575.270 | 393.000 | 35 | -90 | 18 | 14.65 |
| DEX-CZ8112 | 416377.023 | 9672547.741 | 389.745 | 20 | -90 | 15.79 | 2 |
| DEX-CZ8113 | 416374.981 | 9672526.367 | 387.365 | 16 | -90 | 6 | 8 |
| DEX-CZ8114 | 416369.105 | 9672501.779 | 380.412 | 16 | -90 | 11 | 2 |
| DEX-CZ8115 | 416369.448 | 9672478.995 | 369.734 | 7 | -90 | 3 | 1 |
| DEX-CZ8117 | 416424.854 | 9672504.144 | 380.076 | 15 | -90 | 8.49 | 5 |
| DEX-CZ8118 | 416425.968 | 9672479.593 | 368.354 | 11 | -90 | 3 | 7 |
| DEX-CZ8119 | 416421.256 | 9672459.528 | 359.330 | 8 | -90 | 3 | 5 |
| DEX-CZ8120 | 416394.587 | 9672827.032 | 387.662 | 20 | -90 | 15 | 6 |
| DEX-CZ8121 | 416402.557 | 9672769.968 | 390.000 | 24 | -90 | 20.85 | 2.25 |
| DEX-CZ8122 | 416398.904 | 9672740.229 | 388.392 | 20 | -90 | 13 | 5 |
| DEX-CZ8123 | 416401.935 | 9672668.380 | 385.372 | 27 | -90 | 16 | 8 |
| DEX-CZ8124 | 416401.855 | 9672629.423 | 390.467 | 22 | -90 | 8 | 9 |
| DEX-CZ8126 | 416401.557 | 9672574.826 | 393.978 | 31 | -90 | 19 | 9 |
| DEX-CZ8127 | 416402.818 | 9672526.669 | 387.804 | 23 | -90 | 13.3 | 3.65 |
| DEX-CZ8128 | 416404.019 | 9672476.878 | 370.979 | 9 | -90 | 3 | 4 |
| DEX-CZ8129 | 416352.361 | 9672775.775 | 387.152 | 37 | -90 | 18 | 17 |
| DEX-CZ8130 | 416580.036 | 9672872.484 | 384.608 | 19 | -90 | 15 | 1 |
| DEX-CZ8131 | 416575.156 | 9672847.568 | 386.873 | 14 | -90 | 5 | 4 |
| DEX-CZ8132 | 416571.066 | 9672830.927 | 386.368 | 10 | -90 | 6 | 1 |
| DEX-CZ8133 | 416574.231 | 9672802.869 | 385.595 | 30 | -90 | 11.32 | 17 |
| DEX-CZ8134 | 416578.390 | 9672775.122 | 388.813 | 35 | -90 | 26.55 | 6 |
| DEX-CZ8135 | 416603.374 | 9672869.057 | 385.007 | 33 | -90 | 11 | 18 |
| DEX-CZ8136 | 416635.221 | 9672872.522 | 378.541 | 29 | -90 | 24.89 | 1 |
| DEX-CZ8137 | 416655.647 | 9672870.744 | 372.779 | 23 | -90 | 11 | 2 |
| DEX-CZ8138 | 416676.431 | 9672873.409 | 379.692 | 41 | -90 | 15.28 | 23 |
| DEX-CZ8139 | 416703.308 | 9672878.518 | 386.462 | 37 | -90 | 17.65 | 18 |
| DEX-CZ8140 | 416728.259 | 9672877.381 | 387.572 | 26 | -90 | 19 | 5 |
| DEX-CZ8141 | 416755.332 | 9672882.177 | 385.990 | 24 | -90 | 17.65 | 5 |
| DEX-CZ8142 | 416776.115 | 9672875.102 | 387.731 | 29 | -90 | 26 | 1 |
| DEX-CZ8143 | 416771.190 | 9672904.223 | 375.958 | 15 | -90 | 6 | 8 |
| DEX-CZ8144 | 416628.798 | 9672848.558 | 383.675 | 18 | -90 | 7 | 8 |
| DEX-CZ8145 | 416675.592 | 9672847.334 | 381.939 | 19 | -90 | 15 | 1 |
| DEX-CZ8146 | 416725.561 | 9672847.247 | 393.249 | 34 | -90 | 17.26 | 15 |
| DEX-CZ8147 | 416770.370 | 9672846.482 | 394.628 | 25 | -90 | 19.33 | 3 |
| DEX-CZ8148 | 416600.604 | 9672832.142 | 388.463 | 19 | -90 | 8 | 9 |
| DEX-CZ8149 | 416625.217 | 9672824.459 | 387.791 | 20 | -90 | 12 | 5 |
| DEX-CZ8150 | 416656.427 | 9672823.973 | 381.000 | 21 | -90 | 9 | 10 |
| DEX-CZ8151 | 416675.352 | 9672827.369 | 384.981 | 34 | -90 | 16 | 14 |
| DEX-CZ8152 | 416699.767 | 9672823.466 | 392.220 | 23 | -90 | 20.04 | 1.57 |
| DEX-CZ8153 | 416728.208 | 9672825.068 | 396.476 | 23 | -90 | 17.32 | 4 |
| DEX-CZ8154 | 416749.939 | 9672825.182 | 397.977 | 23 | -90 | 20.58 | 0 |
| DEX-CZ8155 | 416777.704 | 9672824.822 | 398.025 | 29 | -90 | 19.28 | 5.2 |
| DEX-CZ8156 | 416619.560 | 9672804.175 | 389.372 | 32 | -90 | 28.93 | 1 |
| DEX-CZ8157 | 416675.883 | 9672804.636 | 389.255 | 25 | -90 | 17 | 6 |
| DEX-CZ8158 | 416725.825 | 9672804.338 | 399.035 | 29 | -90 | 26.92 | 1 |
| DEX-CZ8159 | 416528.038 | 9672799.222 | 372.174 | 19 | -90 | 7 | 10 |
| DEX-CZ8160 | 416526.022 | 9672826.920 | 373.979 | 14 | -90 | 6 | 6 |
| DEX-CZ8161 | 416528.393 | 9672777.271 | 377.936 | 20 | -90 | 8 | 10 |
| DEX-CZ8162 | 416553.289 | 9672819.126 | 381.855 | 15 | -90 | 9 | 1 |
| DEX-CZ8163 | 416553.259 | 9672776.457 | 383.181 | 28 | -90 | 9 | 16 |
| DEX-CZ8164 | 416596.151 | 9672772.814 | 389.077 | 22 | -90 | 16 | 3 |
| DEX-CZ8165 | 416628.912 | 9672776.026 | 389.069 | 35 | -90 | 12 | 19 |
| DEX-CZ8166 | 416650.045 | 9672773.103 | 391.810 | 31 | -90 | 21.28 | 8 |
| DEX-CZ8167 | 416680.309 | 9672781.280 | 395.872 | 32 | -90 | 20 | 10 |
| DEX-CZ8168 | 416697.066 | 9672776.429 | 400.412 | 28 | -90 | 22.28 | 2 |
| DEX-CZ8169 | 416727.415 | 9672774.736 | 406.252 | 18 | -90 | 14 | 2 |
| DEX-CZ8170 | 416626.374 | 9672749.989 | 392.664 | 43 | -90 | 29.55 | 10 |
| DEX-CZ8171 | 416626.175 | 9672728.528 | 396.851 | 26 | -90 | 13.32 | 8 |
| DEX-CZ8172 | 416652.044 | 9672724.291 | 398.964 | 18 | -90 | 15 | 0 |
| DEX-CZ8173 | 416676.034 | 9672748.804 | 402.430 | 18 | -90 | 14 | 3 |
| DEX-CZ8174 | 416674.938 | 9672725.373 | 403.978 | 14 | -90 | 8 | 4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6760 | 408702.628 | 9676039.041 | 625.636 | 17 | -90 | 4.64 | 0.36 |
| DEX-BB6761 | 409200.077 | 9676036.194 | 578.424 | 10 | -90 | 3 | 4 |
| DEX-BB6762 | 409304.127 | 9676047.726 | 552.583 | 7 | -90 | 2 | 0 |
| DEX-BB6763 | 408560.190 | 9676004.619 | 605.092 | 10 | -90 | 3.42 | 0 |
| DEX-BB6764 | 408603.050 | 9675989.352 | 622.095 | 15 | -90 | 6 | 5 |
| DEX-BB6765 | 408649.820 | 9675981.943 | 622.640 | 11 | -90 | 3 | 5 |
| DEX-BB6766 | 408708.667 | 9675986.790 | 640.077 | 15 | -90 | 6 | 3 |
| DEX-BB6767 | 408757.726 | 9675993.266 | 654.139 | 11 | -90 | 5 | 3 |
| DEX-BB6768 | 408802.859 | 9675984.987 | 653.126 | 12 | -90 | 3 | 4 |
| DEX-BB6769 | 409149.363 | 9675996.619 | 599.561 | 8 | -90 | 3 | 1 |
| DEX-BB6770 | 409198.029 | 9676012.791 | 580.042 | 11 | -90 | 2 | 1 |
| DEX-BB6771 | 409267.133 | 9675993.784 | 556.764 | 8 | -90 | 3 | 1 |
| DEX-BB6772 | 409301.843 | 9675995.500 | 556.096 | 12 | -90 | 2 | 4 |
| DEX-BB6773 | 409341.688 | 9675996.128 | 539.503 | 18 | -90 | 10 | 3 |
| DEX-BB6774 | 409401.054 | 9675993.890 | 532.009 | 10 | -90 | 3 | 2 |
| DEX-BB6775 | 408605.040 | 9675944.822 | 631.682 | 9 | -90 | 2 | 0 |
| DEX-BB6776 | 408714.500 | 9675943.184 | 652.419 | 17 | -90 | 5 | 5 |
| DEX-BB6777 | 408809.242 | 9675940.066 | 675.530 | 9 | -90 | 5 | 1.43 |
| DEX-BB6778 | 409201.271 | 9675949.289 | 595.241 | 8 | -90 | 2 | 1 |
| DEX-BB6779 | 409309.152 | 9675935.308 | 559.522 | 16 | -90 | 8 | 5 |
| DEX-BB6780 | 409404.420 | 9675938.546 | 536.301 | 10 | -90 | 2 | 4 |
| DEX-BB6781 | 408653.550 | 9675892.501 | 653.447 | 12 | -90 | 6 | 1 |
| DEX-BB6782 | 408696.460 | 9675894.221 | 665.593 | 13 | -90 | 3 | 3 |
| DEX-BB6783 | 408751.900 | 9675898.294 | 674.398 | 15 | -90 | 9 | 3 |
| DEX-BB6784 | 408806.493 | 9675888.547 | 691.761 | 17 | -90 | 3 | 9 |
| DEX-BB6785R | 408852.318 | 9675888.201 | 690.002 | 15 | -90 | 5 | 6 |
| DEX-BB6786 | 409156.074 | 9675898.948 | 622.138 | 6 | -90 | 2.37 | 1.08 |
| DEX-BB6787 | 409206.516 | 9675890.619 | 593.248 | 7 | -90 | 1 | 3 |
| DEX-BB6788 | 409250.488 | 9675903.393 | 577.554 | 15 | -90 | 2 | 3 |
| DEX-BB6789 | 409303.936 | 9675892.633 | 578.044 | 15 | -90 | 6 | 6 |
| DEX-BB6790 | 409348.850 | 9675895.368 | 572.727 | 13 | -90 | 2 | 5 |
| DEX-BB6791 | 409418.008 | 9675891.689 | 544.217 | 13 | -90 | 3 | 7 |
| DEX-BB6792 | 408707.780 | 9675840.075 | 683.458 | 12 | -90 | 5 | 3 |
| DEX-BB6793 | 408801.360 | 9675839.235 | 702.673 | 12 | -90 | 4 | 2 |
| DEX-BB6794 | 408899.509 | 9675842.170 | 695.192 | 14 | -90 | 3 | 4 |
| DEX-BB6795 | 409114.968 | 9675847.797 | 648.702 | 12 | -90 | 2 | 7 |
| DEX-BB6797 | 409203.797 | 9675846.073 | 597.471 | 8 | -90 | 2 | 1 |
| DEX-BB6798 | 409304.111 | 9675843.881 | 594.629 | 17 | -90 | 10 | 4.5 |
| DEX-BB6799 | 409408.574 | 9675847.511 | 552.851 | 11 | -90 | 4 | 1 |
| DEX-BB6800 | 408754.450 | 9675794.491 | 708.664 | 8 | -90 | 4 | 0 |
| DEX-BB6801 | 408805.170 | 9675794.582 | 720.877 | 15 | -90 | 11 | 2 |
| DEX-BB6802 | 408848.851 | 9675791.316 | 714.675 | 24 | -90 | 14 | 6 |
| DEX-BB6803 | 408908.836 | 9675783.837 | 705.942 | 21 | -90 | 12 | 7 |
| DEX-BB6804 | 408952.244 | 9675792.482 | 699.689 | 17 | -90 | 9 | 2 |
| DEX-BB6805 | 409006.722 | 9675793.504 | 679.144 | 13 | -90 | 6 | 2 |
| DEX-BB6806 | 409057.829 | 9675790.505 | 666.307 | 15 | -90 | 2.43 | 0.57 |
| DEX-BB6807 | 409104.499 | 9675791.458 | 658.682 | 21 | -90 | 3 | 11 |
| DEX-BB6808 | 409158.794 | 9675796.087 | 628.950 | 11 | -90 | 2 | 2 |
| DEX-BB6809 | 409204.168 | 9675799.476 | 605.065 | 13 | -90 | 2 | 4 |
| DEX-BB6810 | 409256.723 | 9675791.352 | 602.872 | 20 | -90 | 9 | 5 |
| DEX-BB6811 | 409304.236 | 9675792.848 | 590.308 | 14 | -90 | 7 | 2.7 |
| DEX-BB6812 | 409353.944 | 9675788.591 | 575.094 | 15 | -90 | 2 | 6 |
| DEX-BB6813 | 409410.039 | 9675803.456 | 552.213 | 10 | -90 | 3 | 3 |
| DEX-BB6814 | 408701.040 | 9675739.355 | 708.226 | 14 | -90 | 8 | 2 |
| DEX-BB6815 | 408803.660 | 9675736.507 | 734.289 | 20 | -90 | 12 | 3 |
| DEX-BB6816 | 408851.435 | 9675738.956 | 723.869 | 17 | -90 | 4 | 10 |
| DEX-BB6817 | 408905.125 | 9675744.532 | 715.482 | 16 | -90 | 7 | 7 |
| DEX-BB6818 | 409007.410 | 9675757.123 | 679.511 | 6 | -90 | 3 | 0 |
| DEX-BB6819 | 409100.976 | 9675738.743 | 658.556 | 20 | -90 | 4 | 9 |
| DEX-BB6820 | 409197.164 | 9675744.198 | 624.972 | 8 | -90 | 4 | 1 |
| DEX-BB6821 | 409309.212 | 9675739.825 | 592.012 | 20 | -90 | 5 | 11 |
| DEX-BB6822 | 409417.602 | 9675762.430 | 544.854 | 7 | -90 | 2 | 1 |
| DEX-BB6823 | 408560.710 | 9675693.261 | 684.752 | 10 | -90 | 4 | 1 |
| DEX-BB6824 | 408697.060 | 9675686.732 | 722.101 | 10 | -90 | 6 | 1 |
| DEX-BB6825 | 408763.840 | 9675685.890 | 734.150 | 15 | -90 | 11.72 | 1.28 |
| DEX-BB6826 | 408814.730 | 9675685.595 | 744.038 | 18 | -90 | 15 | 1 |
| DEX-BB6827 | 408855.770 | 9675691.060 | 734.337 | 20 | -90 | 6 | 10 |
| DEX-BB6828 | 408904.280 | 9675684.595 | 721.759 | 15 | -90 | 4 | 3 |
| DEX-BB6829 | 408948.120 | 9675696.285 | 706.416 | 18 | -90 | 9 | 2.4 |
| DEX-BB6830 | 409361.923 | 9675687.830 | 565.887 | 6 | -90 | 2 | 1 |
| DEX-BB6831 | 409402.456 | 9675684.193 | 546.754 | 11 | -90 | 2 | 1 |
| DEX-BB6832 | 409455.850 | 9675698.208 | 536.765 | 16 | -90 | 9 | 5 |
| DEX-BB6833 | 408599.820 | 9675641.521 | 705.600 | 10 | -90 | 3 | 3.6 |
| DEX-BB6834 | 408703.690 | 9675640.755 | 726.582 | 10 | -90 | 3 | 2 |
| DEX-BB6835 | 408806.630 | 9675640.681 | 751.890 | 25 | -90 | 16 | 6.35 |
| DEX-BB6836 | 408858.720 | 9675645.191 | 733.642 | 12 | -90 | 3 | 6 |
| DEX-BB6837 | 408899.890 | 9675642.308 | 718.747 | 15 | -90 | 3 | 4 |
| DEX-BB6838 | 408550.090 | 9675596.266 | 700.147 | 13 | -90 | 9 | 2 |
| DEX-BB6839 | 408610.870 | 9675600.463 | 722.473 | 10 | -90 | 3 | 4.55 |
| DEX-BB6840 | 408655.040 | 9675601.002 | 736.726 | 21 | -90 | 14 | 5 |
| DEX-BB6841 | 408707.450 | 9675596.124 | 738.336 | 10 | -90 | 4 | 1 |
| DEX-BB6842 | 408762.740 | 9675591.830 | 758.047 | 23 | -90 | 15 | 4 |
| DEX-BB6843 | 408806.100 | 9675590.904 | 756.426 | 23 | -90 | 9 | 4 |
| DEX-BB6844 | 408853.210 | 9675587.868 | 736.156 | 10 | -90 | 3 | 3 |
| DEX-BB6845 | 408602.790 | 9675544.760 | 721.480 | 20 | -90 | 5 | 7 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8175 | 416728.059 | 9672749.318 | 410.172 | 25 | -90 | 20.3 | 3 |
| DEX-CZ8176 | 416775.851 | 9672747.826 | 411.550 | 21 | -90 | 9 | 11 |
| DEX-CZ8177 | 416705.680 | 9672726.501 | 409.507 | 30 | -90 | 16 | 12 |
| DEX-CZ8178 | 416725.306 | 9672724.195 | 411.798 | 38 | -90 | 26.3 | 11 |
| DEX-CZ8179 | 416752.011 | 9672726.482 | 414.231 | 16 | -90 | 13.25 | 0.75 |
| DEX-CZ8180 | 416778.108 | 9672724.111 | 415.037 | 5 | -90 | 2 | 3 |
| DEX-CZ8181 | 416752.382 | 9672774.581 | 408.519 | 23 | -90 | 16 | 7 |
| DEX-CZ8182 | 416772.742 | 9672773.746 | 409.136 | 32 | -90 | 21.3 | 9 |
| DEX-CZ8183 | 416753.103 | 9672673.802 | 416.303 | 27 | -90 | 20.37 | 5 |
| DEX-CZ8184 | 416752.606 | 9672621.468 | 421.890 | 31 | -90 | 27.6 | 1.4 |
| DEX-CZ8185 | 416672.075 | 9672701.051 | 404.913 | 28 | -90 | 14.44 | 10 |
| DEX-CZ8186 | 416723.462 | 9672699.821 | 412.189 | 35 | -90 | 32.62 | 1 |
| DEX-CZ8187 | 416772.975 | 9672704.285 | 416.161 | 6 | -90 | 4 | 0 |
| DEX-CZ8188 | 416773.411 | 9672675.143 | 418.490 | 22 | -90 | 19.8 | 0 |
| DEX-CZ8189 | 416728.897 | 9672672.654 | 414.139 | 33 | -90 | 23 | 8 |
| DEX-CZ8190 | 416701.173 | 9672674.352 | 412.308 | 25 | -90 | 19 | 3 |
| DEX-CZ8191 | 416678.497 | 9672677.167 | 409.690 | 37 | -90 | 27 | 7 |
| DEX-CZ8192 | 416725.282 | 9672650.439 | 416.844 | 37 | -90 | 25 | 10 |
| DEX-CZ8193 | 416775.203 | 9672650.342 | 421.156 | 32 | -90 | 25.5 | 4.15 |
| DEX-CZ8194 | 416725.470 | 9672621.758 | 419.546 | 24 | -90 | 18 | 4 |
| DEX-CZ8195 | 416777.692 | 9672622.375 | 423.960 | 38 | -90 | 32 | 4 |
| DEX-CZ8196 | 416454.740 | 9672868.405 | 369.018 | 10 | -90 | 7 | 2 |
| DEX-CZ8197 | 416445.533 | 9672824.426 | 384.744 | 14 | -90 | 11 | 0.65 |
| DEX-CZ8198 | 416461.190 | 9672772.189 | 390.000 | 31 | -90 | 23.55 | 6 |
| DEX-CZ8199 | 416453.463 | 9672718.985 | 390.040 | 23 | -90 | 15 | 6 |
| DEX-CZ8200 | 416479.349 | 9672872.198 | 356.396 | 6 | -90 | 3.2 | 0 |
| DEX-CZ8201 | 416486.635 | 9672851.066 | 361.000 | 15 | -90 | 9 | 4 |
| DEX-CZ8202 | 416475.651 | 9672774.170 | 387.459 | 17 | -90 | 14 | 1 |
| DEX-CZ8203 | 416481.277 | 9672746.825 | 389.946 | 17 | -90 | 14.23 | 1 |
| DEX-CZ8204 | 416469.176 | 9672723.590 | 390.821 | 22 | -90 | 20.17 | 0 |
| DEX-CZ8205 | 416475.747 | 9672700.371 | 389.000 | 13 | -90 | 10 | 1 |
| DEX-CZ8206 | 416474.284 | 9672623.550 | 395.101 | 18 | -90 | 13 | 3 |
| DEX-CZ8207 | 416479.280 | 9672605.082 | 396.320 | 23 | -90 | 17 | 4 |
| DEX-CZ8208 | 416473.012 | 9672583.580 | 397.370 | 42 | -90 | 39 | 0.53 |
| DEX-CZ8209 | 416455.844 | 9672669.683 | 388.529 | 32 | -90 | 28 | 1 |
| DEX-CZ8210 | 416452.526 | 9672623.382 | 393.053 | 36 | -90 | 19 | 14 |
| DEX-CZ8211 | 416449.364 | 9672577.060 | 395.607 | 27 | -90 | 24 | 1.29 |
| DEX-CZ8212 | 416426.958 | 9672670.938 | 386.133 | 27 | -90 | 9 | 16 |
| DEX-CZ8213 | 416478.816 | 9672650.796 | 393.155 | 24 | -90 | 19 | 1 |
| DEX-CZ8214 | 416599.983 | 9672707.825 | 398.229 | 25 | -90 | 17.51 | 2 |
| DEX-CZ8215 | 416575.658 | 9672722.518 | 393.784 | 30 | -90 | 18 | 9 |
| DEX-CZ8216 | 416551.551 | 9672723.791 | 391.043 | 30 | -90 | 22.4 | 6 |
| DEX-CZ8217 | 416553.320 | 9672674.390 | 394.173 | 28 | -90 | 15.57 | 4 |
| DEX-CZ8218 | 416549.665 | 9672625.266 | 400.871 | 29 | -90 | 17 | 10 |
| DEX-CZ8219 | 416572.069 | 9672702.936 | 394.324 | 21 | -90 | 18.73 | 2 |
| DEX-CZ8220 | 416577.972 | 9672674.974 | 396.932 | 45 | -90 | 26.62 | 19 |
| DEX-CZ8221 | 416571.787 | 9672644.630 | 400.081 | 33 | -90 | 16 | 13 |
| DEX-CZ8222 | 416580.294 | 9672624.551 | 403.551 | 22 | -90 | 18 | 1 |
| DEX-CZ8223 | 416602.818 | 9672672.436 | 401.441 | 26 | -90 | 21.36 | 3 |
| DEX-CZ8224 | 416602.635 | 9672624.615 | 405.482 | 25 | -90 | 16 | 2 |
| DEX-CZ8225 | 416599.956 | 9672575.242 | 409.756 | 13 | -90 | 11 | 0 |
| DEX-CZ8226 | 416501.332 | 9672623.633 | 397.019 | 15 | -90 | 12 | 1 |
| DEX-CZ8227 | 416528.488 | 9672714.515 | 391.333 | 9 | -90 | 5 | 1.4 |
| DEX-CZ8228 | 416519.516 | 9672698.589 | 390.464 | 35 | -90 | 14 | 20.4 |
| DEX-CZ8229 | 416530.345 | 9672673.712 | 392.082 | 26 | -90 | 15 | 11 |
| DEX-CZ8230 | 416526.244 | 9672650.419 | 395.756 | 28 | -90 | 15 | 9 |
| DEX-CZ8231 | 416525.314 | 9672621.036 | 399.770 | 32 | -90 | 23 | 3 |
| DEX-CZ8232 | 416526.109 | 9672597.168 | 402.025 | 30 | -90 | 23 | 5 |
| DEX-CZ8233 | 416526.003 | 9672571.639 | 403.621 | 17 | -90 | 14 | 1 |
| DEX-CZ8234 | 416526.083 | 9672553.247 | 404.120 | 13 | -90 | 8 | 5 |
| DEX-CZ8235 | 416528.158 | 9672520.958 | 401.901 | 16 | -90 | 6 | 8 |
| DEX-CZ8236 | 416531.366 | 9672495.107 | 395.121 | 8 | -90 | 2 | 4 |
| DEX-CZ8237 | 416532.041 | 9672474.549 | 388.672 | 12 | -90 | 8 | 2.5 |
| DEX-CZ8238 | 416529.727 | 9672460.052 | 382.993 | 23 | -90 | 14 | 7.5 |
| DEX-CZ8239 | 416556.726 | 9672521.342 | 404.942 | 13 | -90 | 9 | 2 |
| DEX-CZ8240 | 416557.308 | 9672466.841 | 392.005 | 17 | -90 | 10 | 5 |
| DEX-CZ8241 | 416578.552 | 9672596.627 | 405.864 | 23 | -90 | 19 | 1.42 |
| DEX-CZ8242 | 416574.760 | 9672574.021 | 407.486 | 19 | -90 | 7 | 9 |
| DEX-CZ8243 | 416577.277 | 9672544.941 | 408.851 | 14 | -90 | 11 | 1 |
| DEX-CZ8244 | 416575.433 | 9672526.545 | 407.000 | 14 | -90 | 10 | 2 |
| DEX-CZ8245 | 416578.758 | 9672490.819 | 399.243 | 21 | -90 | 8 | 10 |
| DEX-CZ8246 | 416575.702 | 9672469.648 | 395.314 | 22 | -90 | 18 | 4 |
| DEX-CZ8247 | 416595.004 | 9672494.985 | 402.508 | 26 | -90 | 10 | 14 |
| DEX-CZ8248 | 416596.432 | 9672469.393 | 397.722 | 34 | -90 | 13 | 12 |
| DEX-CZ8249 | 416624.441 | 9672601.636 | 410.183 | 14 | -90 | 11 | 3 |
| DEX-CZ8250 | 416682.231 | 9672596.681 | 417.524 | 26 | -90 | 15 | 6 |
| DEX-CZ8251 | 416621.384 | 9672568.125 | 412.046 | 12 | -90 | 5 | 7 |
| DEX-CZ8252 | 416653.779 | 9672576.219 | 415.713 | 15 | -90 | 7 | 8 |
| DEX-CZ8253 | 416678.147 | 9672576.468 | 419.210 | 18 | -90 | 7 | 4 |
| DEX-CZ8254 | 416700.122 | 9672577.162 | 420.392 | 15 | -90 | 5 | 10 |
| DEX-CZ8255 | 416724.738 | 9672578.426 | 422.218 | 20 | -90 | 9 | 8 |
| DEX-CZ8256 | 416701.860 | 9672524.915 | 422.252 | 10 | -90 | 7 | 1 |
| DEX-CZ8257 | 416725.499 | 9672550.115 | 425.231 | 10 | -90 | 6 | 2 |
| DEX-CZ8258 | 416677.873 | 9672547.951 | 421.143 | 10 | -90 | 3 | 7 |
| DEX-CZ8259 | 416777.803 | 9672543.095 | 428.736 | 18 | -90 | 16 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6846 | 408704.600 | 9675545.509 | 753.284 | 26 | -90 | 16 | 7 |
| DEX-BB6847 | 408753.940 | 9675548.603 | 760.339 | 14 | -90 | 9 | 1 |
| DEX-BB6848 | 408801.460 | 9675540.993 | 752.020 | 10 | -90 | 4 | 3 |
| DEX-BB6849 | 408562.710 | 9675493.302 | 699.317 | 11 | -90 | 3 | 5 |
| DEX-BB6850 | 408613.210 | 9675494.262 | 722.521 | 9 | -90 | 4 | 2 |
| DEX-BB6851 | 408660.650 | 9675494.114 | 745.636 | 22 | -90 | 17.55 | 1.45 |
| DEX-BB6852 | 408698.260 | 9675493.156 | 754.000 | 12 | -90 | 7 | 2 |
| DEX-BB6853 | 408750.040 | 9675495.023 | 740.063 | 16 | -90 | 8 | 3.4 |
| DEX-BB6854 | 408799.080 | 9675505.558 | 731.620 | 6 | -90 | 2 | 0 |
| DEX-BB6855 | 408598.410 | 9675429.381 | 728.069 | 15 | -90 | 3 | 4 |
| DEX-BB6856 | 408698.210 | 9675445.510 | 751.154 | 10 | -90 | 4.45 | 1.55 |
| DEX-BB6857 | 408604.080 | 9675388.437 | 732.308 | 16 | -90 | 10 | 3 |
| DEX-BB6858 | 408651.950 | 9675395.615 | 745.537 | 19 | -90 | 9 | 4 |
| DEX-BB6859 | 408701.770 | 9675388.876 | 734.576 | 8 | -90 | 4.35 | 0 |
| DEX-BB6860 | 408751.780 | 9675395.580 | 722.003 | 8 | -90 | 4 | 2 |
| DEX-BB6861 | 408597.040 | 9675338.637 | 733.509 | 16 | -90 | 6 | 7 |
| DEX-BB6862 | 408703.360 | 9675342.022 | 720.760 | 9 | -90 | 3 | 3 |
| DEX-BB6863 | 408107.210 | 9675337.892 | 824.035 | 12 | -90 | 8.57 | 0 |
| DEX-BB6864 | 408005.240 | 9675336.066 | 821.278 | 8 | -90 | 2 | 1.45 |
| DEX-BB6865 | 407797.410 | 9675334.193 | 774.610 | 17 | -90 | 6 | 9 |
| DEX-BB6866 | 407757.680 | 9675281.657 | 765.726 | 14 | -90 | 7 | 2 |
| DEX-BB6867 | 407798.820 | 9675286.743 | 767.901 | 15 | -90 | 6 | 6 |
| DEX-BB6868 | 407859.030 | 9675292.011 | 785.883 | 7 | -90 | 3 | 0 |
| DEX-BB6869 | 407905.620 | 9675289.715 | 794.054 | 7 | -90 | 2 | 2 |
| DEX-BB6870 | 407955.860 | 9675282.205 | 807.000 | 6 | -90 | 2 | 1 |
| DEX-BB6871 | 408004.050 | 9675289.816 | 821.788 | 10 | -90 | 2 | 1 |
| DEX-BB6872 | 408049.680 | 9675292.437 | 826.427 | 15 | -90 | 4 | 7 |
| DEX-BB6873 | 408102.770 | 9675286.734 | 829.388 | 9 | -90 | 4 | 1 |
| DEX-BB6874 | 408501.650 | 9675294.158 | 735.330 | 14 | -90 | 5 | 1.4 |
| DEX-BB6875 | 408543.520 | 9675293.722 | 739.965 | 12 | -90 | 8 | 2 |
| DEX-BB6876 | 408603.480 | 9675293.767 | 746.239 | 14 | -90 | 5 | 6 |
| DEX-BB6877 | 408652.400 | 9675291.012 | 743.280 | 13 | -90 | 8.3 | 2.7 |
| DEX-BB6878 | 408703.910 | 9675289.809 | 733.321 | 13 | -90 | 8 | 2 |
| DEX-BB6879 | 408752.890 | 9675294.995 | 715.082 | 7 | -90 | 4 | 0 |
| DEX-BB6880 | 407804.740 | 9675236.178 | 785.952 | 15 | -90 | 8 | 5 |
| DEX-BB6881 | 407903.350 | 9675239.372 | 793.559 | 20 | -90 | 5 | 11 |
| DEX-BB6882 | 408008.410 | 9675233.354 | 795.148 | 13 | -90 | 4 | 4.8 |
| DEX-BB6883 | 408099.180 | 9675240.344 | 808.419 | 20 | -90 | 3 | 5 |
| DEX-BB6884 | 408455.020 | 9675242.964 | 726.510 | 10 | -90 | 3 | 1 |
| DEX-BB6885 | 408494.730 | 9675239.584 | 744.119 | 8 | -90 | 3 | 0 |
| DEX-BB6886 | 408599.880 | 9675242.347 | 754.000 | 13 | -90 | 5 | 4 |
| DEX-BB6887 | 408704.020 | 9675242.897 | 733.253 | 17 | -90 | 10 | 5 |
| DEX-BB6888 | 407751.010 | 9675192.937 | 796.485 | 17 | -90 | 11 | 4 |
| DEX-BB6889 | 407799.420 | 9675191.777 | 792.962 | 26 | -90 | 12 | 2.65 |
| DEX-BB6890 | 407850.690 | 9675193.826 | 781.191 | 14 | -90 | 9 | 2 |
| DEX-BB6891 | 407905.430 | 9675192.767 | 789.287 | 19 | -90 | 15 | 2 |
| DEX-BB6892 | 407944.850 | 9675189.897 | 784.120 | 13 | -90 | 9 | 1 |
| DEX-BB6893 | 408000.920 | 9675186.143 | 783.537 | 17 | -90 | 8 | 4 |
| DEX-BB6894 | 408050.230 | 9675189.021 | 786.555 | 17 | -90 | 9 | 6 |
| DEX-BB6895 | 408102.900 | 9675191.839 | 790.197 | 18 | -90 | 9 | 5 |
| DEX-BB6896 | 408154.850 | 9675196.198 | 795.240 | 10 | -90 | 6 | 1 |
| DEX-BB6897 | 408254.520 | 9675189.894 | 782.541 | 11 | -90 | 3 | 4.45 |
| DEX-BB6898 | 408453.000 | 9675188.140 | 743.146 | 7 | -90 | 3 | 2 |
| DEX-BB6899 | 408504.890 | 9675191.325 | 758.358 | 23 | -90 | 9 | 3.35 |
| DEX-BB6900 | 408554.900 | 9675190.445 | 754.442 | 17 | -90 | 10 | 4 |
| DEX-BB6901 | 408604.070 | 9675190.057 | 746.120 | 13 | -90 | 8 | 1 |
| DEX-BB6902 | 408654.020 | 9675193.312 | 735.226 | 8 | -90 | 4 | 0 |
| DEX-BB6903 | 408706.160 | 9675190.966 | 722.656 | 16 | -90 | 8 | 7 |
| DEX-BB6904 | 409001.750 | 9675187.679 | 702.329 | 9 | -90 | 5 | 0.4 |
| DEX-BB6905 | 409056.650 | 9675191.257 | 685.219 | 7 | -90 | 3 | 1.5 |
| DEX-BB6906 | 409105.120 | 9675188.872 | 669.722 | 8 | -90 | 3 | 2 |
| DEX-BB6907 | 409155.240 | 9675193.079 | 656.444 | 10 | -90 | 3 | 4.5 |
| DEX-BB6908 | 409207.190 | 9675190.992 | 633.346 | 10 | -90 | 3 | 2 |
| DEX-BB6909 | 409257.840 | 9675186.278 | 610.336 | 10 | -90 | 4 | 1 |
| DEX-BB6910 | 409303.220 | 9675193.369 | 602.712 | 12 | -90 | 4 | 1 |
| DEX-BB6911 | 409351.570 | 9675194.548 | 598.479 | 30 | -90 | 17 | 8 |
| DEX-BB6912 | 407801.550 | 9675141.441 | 782.526 | 13 | -90 | 6 | 5 |
| DEX-BB6913 | 407896.760 | 9675140.577 | 777.255 | 17 | -90 | 13 | 0 |
| DEX-BB6914 | 407997.800 | 9675142.201 | 774.714 | 16 | -90 | 10 | 3 |
| DEX-BB6915 | 408099.650 | 9675145.200 | 778.007 | 23 | -90 | 11 | 10 |
| DEX-BB6916 | 408204.800 | 9675148.702 | 785.613 | 19 | -90 | 13 | 3 |
| DEX-BB6917 | 408297.450 | 9675140.735 | 794.342 | 15 | -90 | 4 | 6 |
| DEX-BB6918 | 408398.870 | 9675143.382 | 767.176 | 15 | -90 | 3 | 9.6 |
| DEX-BB6919 | 408502.980 | 9675141.941 | 761.834 | 12 | -90 | 5 | 2 |
| DEX-BB6920 | 408601.410 | 9675141.696 | 747.637 | 13 | -90 | 9 | 1 |
| DEX-BB6921 | 408704.010 | 9675144.542 | 720.067 | 8 | -90 | 4 | 0 |
| DEX-BB6922 | 408752.560 | 9675142.082 | 713.495 | 7 | -90 | 4 | 1 |
| DEX-BB6923 | 408803.240 | 9675141.853 | 722.246 | 8 | -90 | 4 | 1 |
| DEX-BB6924 | 408902.370 | 9675145.617 | 724.316 | 13 | -90 | 8 | 3 |
| DEX-BB6925 | 409003.520 | 9675146.131 | 703.818 | 10 | -90 | 4 | 2 |
| DEX-BB6926 | 409103.480 | 9675139.379 | 669.879 | 11 | -90 | 4 | 4 |
| DEX-BB6927 | 409201.930 | 9675141.915 | 645.856 | 14 | -90 | 4 | 5 |
| DEX-BB6928 | 409308.980 | 9675140.242 | 618.465 | 16 | -90 | 6 | 4 |
| DEX-BB6930 | 407801.800 | 9675093.723 | 780.988 | 20 | -90 | 14 | 4 |
| DEX-BB6931 | 407895.520 | 9675089.837 | 770.785 | 15 | -90 | 7 | 5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8260 | 416827.727 | 9672552.000 | 429.000 | 14 | -90 | 11 | 1 |
| DEX-CZ8261 | 416874.798 | 9672556.198 | 430.000 | 27 | -90 | 22 | 3 |
| DEX-CZ8262 | 416900.006 | 9672557.558 | 428.744 | 20 | -90 | 10 | 8 |
| DEX-CZ8263 | 416727.070 | 9672523.251 | 425.253 | 8 | -90 | 6 | 0 |
| DEX-CZ8264 | 416748.002 | 9672522.465 | 426.063 | 9 | -90 | 4 | 3 |
| DEX-CZ8265 | 416777.063 | 9672529.815 | 428.058 | 36 | -90 | 11 | 23 |
| DEX-CZ8266 | 416800.168 | 9672528.811 | 429.000 | 32 | -90 | 26 | 3 |
| DEX-CZ8267 | 416826.111 | 9672530.799 | 428.258 | 32 | -90 | 26 | 4 |
| DEX-CZ8268 | 416852.412 | 9672527.966 | 429.354 | 44 | -90 | 22 | 20 |
| DEX-CZ8269 | 416879.482 | 9672522.359 | 432.000 | 20 | -90 | 6 | 8 |
| DEX-CZ8270 | 416899.592 | 9672528.475 | 431.466 | 16 | -90 | 9 | 5 |
| DEX-CZ8271 | 416774.818 | 9672505.719 | 421.905 | 25 | -90 | 15.4 | 10 |
| DEX-CZ8272 | 416821.962 | 9672501.759 | 419.224 | 44 | -90 | 25 | 15 |
| DEX-CZ8273 | 416876.911 | 9672501.909 | 431.780 | 9 | -90 | 5 | 2 |
| DEX-CZ8274 | 416902.363 | 9672504.299 | 432.000 | 12 | -90 | 7 | 2 |
| DEX-CZ8275 | 416795.015 | 9672479.338 | 416.766 | 25 | -90 | 17.46 | 4 |
| DEX-CZ8276 | 416802.159 | 9672427.450 | 403.968 | 24 | -90 | 18 | 2 |
| DEX-CZ8277 | 416827.331 | 9672482.038 | 418.666 | 38 | -90 | 22 | 15 |
| DEX-CZ8278 | 416901.009 | 9672478.662 | 431.234 | 34 | -90 | 18 | 15 |
| DEX-CZ8279 | 416674.712 | 9672521.640 | 418.121 | 9 | -90 | 4 | 3 |
| DEX-CZ8280 | 416675.727 | 9672502.640 | 412.964 | 9 | -90 | 3 | 4 |
| DEX-CZ8281 | 416724.464 | 9672499.199 | 416.761 | 8 | -90 | 6 | 0 |
| DEX-CZ8282 | 416853.856 | 9672575.261 | 429.127 | 31 | -90 | 23 | 6 |
| DEX-CZ8283 | 416874.197 | 9672576.629 | 429.244 | 27 | -90 | 13 | 11 |
| DEX-CZ8284 | 416829.421 | 9672579.007 | 429.000 | 24 | -90 | 21 | 1 |
| DEX-CZ8285 | 416776.155 | 9672463.395 | 408.364 | 19 | -90 | 13.45 | 4 |
| DEX-CZ8286 | 416783.053 | 9672449.435 | 403.346 | 40 | -90 | 16.32 | 22 |
| DEX-CZ8287 | 416829.018 | 9672454.335 | 416.452 | 29 | -90 | 9 | 17 |
| DEX-CZ8288 | 416778.457 | 9672427.187 | 393.317 | 28 | -90 | 21 | 5 |
| DEX-CZ8289 | 416751.904 | 9672419.011 | 387.016 | 24 | -90 | 6 | 15 |
| DEX-CZ8290 | 416727.817 | 9672417.117 | 384.551 | 26 | -90 | 6 | 18 |
| DEX-CZ8291 | 416709.244 | 9672410.425 | 385.668 | 29 | -90 | 2 | 23 |
| DEX-CZ8292 | 416773.127 | 9672397.834 | 395.765 | 22 | -90 | 2 | 17 |
| DEX-CZ8293 | 416729.859 | 9672394.627 | 395.161 | 24 | -90 | 13 | 8 |
| DEX-CZ8294 | 416685.724 | 9672397.372 | 383.141 | 12 | -90 | 6 | 5 |
| DEX-CZ8295 | 416682.593 | 9672425.645 | 382.977 | 25 | -90 | 11 | 12 |
| DEX-CZ8296 | 416451.241 | 9672476.322 | 372.216 | 22 | -90 | 6 | 14 |
| DEX-CZ8297 | 416753.585 | 9672470.612 | 405.085 | 29 | -90 | 18.39 | 10 |
| DEX-CZ8298 | 416324.582 | 9672504.849 | 382.246 | 13 | -90 | 6 | 2 |
| DEX-CZ8300 | 416280.728 | 9672495.472 | 382.343 | 26 | -90 | 6 | 11 |
| DEX-CZ8301 | 416221.352 | 9672499.727 | 372.892 | 15 | -90 | 3 | 7 |
| DEX-CZ8302 | 416202.548 | 9672499.697 | 367.506 | 23 | -90 | 3 | 8 |
| DEX-CZ8304 | 416323.977 | 9672555.491 | 393.880 | 33 | -90 | 25.77 | 8 |
| DEX-CZ8305 | 416272.568 | 9672549.702 | 390.821 | 13 | -90 | 5 | 7 |
| DEX-CZ8306 | 416224.252 | 9672547.604 | 382.589 | 24 | -90 | 5 | 13 |
| DEX-CZ8307 | 416173.165 | 9672549.642 | 374.731 | 24 | -90 | 16 | 3 |
| DEX-CZ8308 | 416352.021 | 9672527.569 | 388.364 | 14 | -90 | 7 | 3 |
| DEX-CZ8309 | 416317.224 | 9672522.114 | 389.060 | 19 | -90 | 6 | 13 |
| DEX-CZ8310 | 416299.366 | 9672524.674 | 389.953 | 22 | -90 | 6 | 13 |
| DEX-CZ8311 | 416274.521 | 9672524.729 | 389.112 | 14 | -90 | 3.5 | 6.5 |
| DEX-CZ8312 | 416251.019 | 9672530.737 | 386.787 | 15 | -90 | 3 | 10 |
| DEX-CZ8313 | 416224.375 | 9672524.702 | 379.990 | 25 | -90 | 5 | 15 |
| DEX-CZ8314 | 416199.210 | 9672524.602 | 373.746 | 34 | -90 | 5 | 15 |
| DEX-CZ8315 | 416175.768 | 9672527.960 | 369.872 | 14 | -90 | 3 | 6 |
| DEX-CZ8316 | 416352.565 | 9672476.351 | 370.795 | 24 | -90 | 8 | 14 |
| DEX-CZ8317 | 416323.863 | 9672467.422 | 365.567 | 20 | -90 | 5 | 14 |
| DEX-CZ8318 | 416298.882 | 9672468.473 | 371.021 | 20 | -90 | 3 | 16 |
| DEX-CZ8319 | 416274.256 | 9672469.754 | 371.278 | 21 | -90 | 7 | 8 |
| DEX-CZ8320 | 416254.569 | 9672476.261 | 369.806 | 18 | -90 | 3 | 11 |
| DEX-CZ8327 | 416202.296 | 9672826.664 | 366.638 | 22 | -90 | 14 | 5 |
| DEX-CZ8328 | 416198.561 | 9672774.546 | 369.942 | 23 | -90 | 8.6 | 12.4 |
| DEX-CZ8329 | 416201.785 | 9672722.683 | 366.588 | 18 | -90 | 12.75 | 0 |
| DEX-CZ8330 | 416211.742 | 9672670.800 | 361.485 | 43 | -90 | 15 | 26 |
| DEX-CZ8331 | 416173.496 | 9672828.376 | 358.079 | 14 | -90 | 6 | 6 |
| DEX-CZ8332 | 416177.175 | 9672799.884 | 366.410 | 12 | -90 | 3 | 7 |
| DEX-CZ8333 | 416171.189 | 9672773.980 | 364.841 | 23 | -90 | 10 | 10.6 |
| DEX-CZ8334 | 416178.635 | 9672750.742 | 364.917 | 33 | -90 | 17 | 3 |
| DEX-CZ8335 | 416174.995 | 9672719.079 | 356.813 | 33 | -90 | 14.82 | 10 |
| DEX-CZ8336 | 416179.216 | 9672699.710 | 354.655 | 38 | -90 | 10 | 23 |
| DEX-CZ8337 | 416185.070 | 9672670.036 | 353.853 | 20 | -90 | 10 | 8 |
| DEX-CZ8338 | 416582.667 | 9672443.757 | 389.280 | 17 | -90 | 15 | 0 |
| DEX-CZ8339 | 415921.969 | 9672872.192 | 304.976 | 21 | -90 | 8 | 11 |
| DEX-CZ8340 | 415947.294 | 9672876.496 | 309.275 | 6 | -90 | 1 | 1 |
| DEX-CZ8341 | 415979.912 | 9672876.745 | 318.205 | 10 | -90 | 4 | 3 |
| DEX-CZ8342 | 416002.688 | 9672876.161 | 319.766 | 16 | -90 | 6 | 3 |
| DEX-CZ8343 | 416023.432 | 9672867.505 | 324.916 | 8 | -90 | 3 | 3 |
| DEX-CZ8344 | 416044.240 | 9672868.142 | 324.139 | 8 | -90 | 4 | 1.5 |
| DEX-CZ8345 | 416070.681 | 9672869.313 | 323.594 | 9 | -90 | 3 | 2 |
| DEX-CZ8346 | 416151.279 | 9672818.969 | 353.156 | 12 | -90 | 5 | 1 |
| DEX-CZ8347 | 416131.696 | 9672822.249 | 343.347 | 7 | -90 | 3.47 | 0.43 |
| DEX-CZ8348 | 416099.626 | 9672827.867 | 337.274 | 6 | -90 | 2 | 1.3 |
| DEX-CZ8349 | 416072.118 | 9672820.892 | 340.000 | 15 | -90 | 2 | 10.3 |
| DEX-CZ8350 | 416054.667 | 9672823.857 | 338.773 | 8 | -90 | 3.5 | 0.5 |
| DEX-CZ8351 | 416028.538 | 9672825.295 | 337.785 | 12 | -90 | 4 | 5 |
| DEX-CZ8352 | 416125.839 | 9672797.010 | 349.997 | 7 | -90 | 3 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6932 | 408005.040 | 9675088.913 | 773.714 | 14 | -90 | 3 | 9 |
| DEX-BB6933 | 408103.020 | 9675091.549 | 771.350 | 10 | -90 | 7 | 1 |
| DEX-BB6934 | 408194.890 | 9675101.247 | 770.790 | 15 | -90 | 11 | 1 |
| DEX-BB6935 | 408299.670 | 9675101.333 | 785.476 | 17 | -90 | 3 | 12 |
| DEX-BB6936 | 408408.000 | 9675094.913 | 768.955 | 8 | -90 | 3 | 2 |
| DEX-BB6937 | 408497.310 | 9675091.568 | 749.168 | 12 | -90 | 6 | 0.65 |
| DEX-BB6938 | 408598.710 | 9675099.551 | 745.093 | 9 | -90 | 3 | 0 |
| DEX-BB6939 | 408704.290 | 9675089.899 | 712.836 | 14 | -90 | 5 | 6 |
| DEX-BB6940 | 408803.600 | 9675093.801 | 732.369 | 10 | -90 | 7 | 0 |
| DEX-BB6941 | 408903.380 | 9675097.805 | 730.000 | 20 | -90 | 8 | 6.5 |
| DEX-BB6942 | 409001.540 | 9675095.544 | 699.317 | 12 | -90 | 7 | 3 |
| DEX-BB6943 | 409102.160 | 9675091.658 | 674.090 | 14 | -90 | 6 | 5 |
| DEX-BB6944 | 409151.810 | 9675092.392 | 656.426 | 9 | -90 | 4 | 2 |
| DEX-BB6945 | 409205.860 | 9675089.962 | 647.549 | 21 | -90 | 9 | 5 |
| DEX-BB6946 | 409302.310 | 9675086.803 | 628.085 | 14 | -90 | 6 | 3 |
| DEX-BB6947 | 409354.870 | 9675092.981 | 606.004 | 10 | -90 | 3 | 5 |
| DEX-BB6950 | 408021.660 | 9675390.601 | 816.234 | 8 | -90 | 2 | 3 |
| DEX-BB6951 | 408062.640 | 9675390.523 | 819.429 | 15 | -90 | 9.37 | 0 |
| DEX-BB6952 | 408125.970 | 9675386.144 | 803.395 | 10 | -90 | 6 | 2 |
| DEX-BB6953 | 408119.720 | 9675442.029 | 785.419 | 16 | -90 | 2 | 0 |
| DEX-BB6954 | 408517.130 | 9675647.357 | 668.441 | 6 | -90 | 2 | 1 |
| DEX-BB6955 | 408500.890 | 9675596.512 | 675.735 | 10 | -90 | 4.5 | 3.5 |
| DEX-BB6956 | 408508.920 | 9675547.923 | 678.251 | 7 | -90 | 3 | 1.45 |
| DEX-BB6957 | 408506.814 | 9676191.019 | 538.432 | 8 | -90 | 3 | 0.55 |
| DEX-BB6958 | 408502.107 | 9676244.059 | 523.187 | 7 | -90 | 2 | 1 |
| BBFW-1012 | 408251.930 | 9675155.120 | 789.470 | 20 | -90 | 6 | 11 |
| BBFW-1036 | 408350.780 | 9675072.510 | 776.120 | 8 | -90 | 2 | 0 |
| BBFW-1038 | 408448.950 | 9675154.880 | 755.140 | 16 | -90 | 8 | 3 |
| BBFW-1044 | 408951.080 | 9675074.270 | 714.980 | 15 | -90 | 5 | 0 |
| BBFW-1075 | 409152.720 | 9675241.790 | 644.940 | 16 | -90 | 1 | 9 |
| BBFW-1102 | 408751.840 | 9675950.250 | 665.810 | 13 | -90 | 4.68 | 0.32 |
| BBFW-1106 | 408847.080 | 9675847.640 | 701.260 | 15 | -90 | 8 | 4 |
| BBFW-1122 | 409154.730 | 9675947.810 | 611.990 | 8 | -90 | 1 | 3 |
| BBFW-1148 | 409057.230 | 9676451.660 | 478.000 | 5 | -90 | 3 | 1.55 |
| BBFW-1146 | 409342.200 | 9676355.380 | 517.700 | 29 | -90 | 6.39 | 14.1 |
| BBFW-1147 | 409157.330 | 9676349.060 | 498.600 | 20 | -90 | 7.24 | 7.58 |
| BBFW-1123 | 409139.460 | 9676049.230 | 604.840 | 13 | -90 | 4 | 3 |
| BBFW-1125 | 409243.770 | 9676137.440 | 563.240 | 25 | -90 | 4 | 4 |
| DEX-CZ030 | 414792.790 | 9674211.488 | 400.267 | 22 | -90 | 17.48 | 3.52 |
| BB_STH-1020 | 413915.525 | 9674409.192 | 348.428 | 12 | -90 | 4.3 | 6 |
| DEX-CZ014 | 414592.965 | 9674610.968 | 458.751 | 26 | -90 | 4 | 19.8 |
| DEX-CZ360 | 416141.642 | 9674452.118 | 392.191 | 19 | -90 | 7.46 | 11.54 |
| DEX-CZ090 | 415298.967 | 9674604.657 | 448.441 | 13 | -90 | 6.67 | 5.48 |
| DX00081 | 414897.209 | 9675498.842 | 431.067 | 7 | -90 | 3.2 | 2.43 |
| DEX-CZ069 | 415090.988 | 9674492.191 | 440.957 | 21 | -90 | 9.88 | 11.23 |
| DEX-CZ085 | 415201.885 | 9674995.806 | 435.958 | 32 | -90 | 25.99 | 12.34 |
| DEX-CZ105 | 415395.573 | 9674500.225 | 453.175 | 22 | -90 | 10 | 10.32 |
| DEX-CZ006 | 414502.452 | 9674898.968 | 400.348 | 9 | -90 | 3 | 4 |
| DEX-CZ082 | 415201.435 | 9674702.056 | 433.040 | 16 | -90 | 12.3 | 3 |
| DEX-CZ195 | 416299.227 | 9674413.785 | 382.455 | 18 | -90 | 2 | 14 |
| DEX-CZ002 | 414301.743 | 9674705.066 | 415.121 | 25 | -90 | 13.2 | 13.95 |
| DEX-CZ036 | 414805.140 | 9674805.105 | 418.121 | 13 | -90 | 1.85 | 8.82 |
| DX00142 | 414704.608 | 9675257.556 | 430.652 | 9 | -90 | 4.96 | 4.63 |
| DEX-CZ088 | 415298.168 | 9674798.432 | 444.429 | 26 | -90 | 19.95 | 7.64 |
| DX00004 | 414605.883 | 9675297.502 | 433.062 | 13 | -90 | 9.13 | 4 |
| BB_STH-1012 | 413828.135 | 9674800.186 | 397.869 | 11 | -90 | 5.89 | 4.52 |
| DEX-CZ027 | 414695.212 | 9674299.208 | 391.045 | 16 | -90 | 13.92 | 1 |
| DEX-CZ081 | 415187.030 | 9674607.128 | 462.444 | 23 | -90 | 25.23 | 2.19 |
| DEX-CZ042 | 414895.031 | 9674904.308 | 441.685 | 21 | -90 | 20.02 | 5.19 |
| DX00169 | 414846.242 | 9675405.230 | 429.631 | 21 | -90 | 7.7 | 10.55 |
| BB_STH-1005 | 414187.139 | 9674499.234 | 433.878 | 15 | -90 | 7.44 | 8.16 |
| DEX-CZ111 | 415498.943 | 9674804.253 | 410.847 | 37 | -90 | 14 | 21 |
| DX00005 | 414594.726 | 9675199.654 | 422.031 | 19 | -90 | 5.17 | 13.9 |
| DEX-CZ089 | 415298.354 | 9674699.059 | 423.981 | 36 | -90 | 15.67 | 22.11 |
| DEX-CZ352 | 416206.235 | 9674543.055 | 407.617 | 30 | -90 | 15.89 | 18.26 |
| DEX-CZ028 | 414702.687 | 9674205.061 | 380.917 | 21 | -90 | 17.98 | 3 |
| DEX-CZ026 | 414696.642 | 9674413.132 | 419.520 | 10 | -90 | 4.41 | 3.93 |
| DEX-CZ066 | 415108.710 | 9674794.896 | 457.585 | 27 | -90 | 20.27 | 4.43 |
| DEX-CZ019 | 414701.074 | 9675117.271 | 416.046 | 13 | -90 | 6.82 | 5.37 |
| NCZ21-10005 | 415699.871 | 9675393.626 | 408.744 | 13 | -90 | 13.44 | 1.52 |
| NCZ21-10009 | 415297.743 | 9675193.634 | 435.293 | 31 | -90 | 10.4 | 20.7 |
| NCZ21-10010 | 415406.229 | 9675199.267 | 433.474 | 21 | -90 | 19.28 | 4.79 |
| NCZ21-10011 | 415407.867 | 9675301.336 | 438.877 | 22 | -90 | 12.98 | 11.22 |
| NCZ21-10015 | 415601.720 | 9675093.256 | 433.597 | 27 | -90 | 26.28 | 5.62 |
| NCZ21-10016 | 415600.751 | 9675202.204 | 447.899 | 40 | -90 | 23.23 | 22.91 |
| NCZ21-10017 | 415605.686 | 9675294.407 | 434.376 | 23 | -90 | 16.09 | 11.42 |
| NCZ21-10018 | 415687.995 | 9675305.352 | 430.886 | 14 | -90 | 3 | 9.53 |
| NCZ21-10019 | 415809.517 | 9675295.679 | 409.486 | 21 | -90 | 17.14 | 6.12 |
| NCZ21-10021 | 416005.216 | 9675304.007 | 397.364 | 17 | -90 | 8.05 | 6 |
| NCZ21-10022 | 416010.372 | 9675191.828 | 412.996 | 12 | -90 | 8.78 | 2.17 |
| NCZ21-10025 | 415693.955 | 9675204.403 | 438.200 | 12 | -90 | 4 | 6 |
| NCZ21-10026 | 415708.766 | 9675100.464 | 439.500 | 31 | -90 | 22.87 | 10 |
| NCZ21-10027 | 415701.326 | 9675005.781 | 423.959 | 29 | -90 | 24.61 | 9.88 |
| NCZ21-10028 | 415587.224 | 9674993.211 | 411.830 | 20 | -90 | 8.23 | 14.38 |
| NCZ21-10029 | 415600.942 | 9674901.597 | 396.760 | 13 | -90 | 12.39 | 2 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8353 | 416064.770 | 9672799.261 | 337.383 | 17 | -90 | 12 | 3.2 |
| DEX-CZ8354 | 416025.530 | 9672799.517 | 331.864 | 11 | -90 | 4 | 4 |
| DEX-CZ8355 | 416150.244 | 9672773.180 | 359.098 | 28 | -90 | 5 | 20.5 |
| DEX-CZ8356 | 416128.260 | 9672763.184 | 346.476 | 17 | -90 | 8 | 7 |
| DEX-CZ8357 | 416095.864 | 9672775.055 | 345.018 | 7 | -90 | 4 | 1 |
| DEX-CZ8358 | 416077.633 | 9672773.209 | 348.120 | 14 | -90 | 5 | 7 |
| DEX-CZ8359 | 416052.133 | 9672763.965 | 350.755 | 14 | -90 | 8 | 3 |
| DEX-CZ8360 | 416027.727 | 9672777.064 | 340.363 | 20 | -90 | 10 | 6 |
| DEX-CZ8361 | 416027.153 | 9672748.249 | 353.006 | 5 | -90 | 2.3 | 0 |
| DEX-CZ8362 | 416069.045 | 9672756.380 | 353.871 | 9 | -90 | 6 | 1.2 |
| DEX-CZ8363 | 416126.022 | 9672743.008 | 345.866 | 10 | -90 | 6 | 2.3 |
| DEX-CZ8364 | 416146.301 | 9672719.913 | 347.562 | 29 | -90 | 24.93 | 3 |
| DEX-CZ8365 | 416127.201 | 9672717.158 | 352.102 | 20 | -90 | 8 | 9.5 |
| DEX-CZ8366 | 416100.385 | 9672714.404 | 361.681 | 14 | -90 | 11 | 1 |
| DEX-CZ8367 | 416076.596 | 9672727.028 | 361.925 | 23 | -90 | 14 | 8 |
| DEX-CZ8368 | 416051.006 | 9672724.087 | 363.903 | 25 | -90 | 19.67 | 5.3 |
| DEX-CZ8369 | 416030.806 | 9672729.313 | 361.887 | 25 | -90 | 9 | 14.25 |
| DEX-CZ8370 | 416001.587 | 9672720.434 | 359.864 | 11 | -90 | 4 | 6 |
| DEX-CZ8371 | 415979.414 | 9672713.029 | 358.729 | 17 | -90 | 2 | 13 |
| DEX-CZ8372 | 416123.850 | 9672698.640 | 359.334 | 29 | -90 | 25.36 | 2 |
| DEX-CZ8373 | 416082.234 | 9672699.472 | 366.884 | 17 | -90 | 11 | 5 |
| DEX-CZ8374 | 416029.286 | 9672703.142 | 368.708 | 31 | -90 | 27.67 | 1 |
| DEX-CZ8375 | 415975.034 | 9672690.846 | 364.988 | 41 | -90 | 14 | 17 |
| DEX-CZ8376 | 416153.376 | 9672669.238 | 357.655 | 40 | -90 | 27 | 5 |
| DEX-CZ8377 | 416127.143 | 9672671.954 | 363.512 | 29 | -90 | 20.2 | 3 |
| DEX-CZ8378 | 416101.421 | 9672666.642 | 369.670 | 26 | -90 | 19 | 5 |
| DEX-CZ8379 | 416077.703 | 9672670.793 | 371.074 | 46 | -90 | 20 | 23 |
| DEX-CZ8380 | 416054.013 | 9672668.174 | 371.794 | 22 | -90 | 16 | 3 |
| DEX-CZ8381 | 416023.686 | 9672668.878 | 371.846 | 28 | -90 | 17 | 4 |
| DEX-CZ8382 | 415998.407 | 9672672.393 | 370.106 | 31 | -90 | 16 | 13.38 |
| DEX-CZ8383 | 415975.653 | 9672670.517 | 367.565 | 29 | -90 | 17 | 9.45 |
| DEX-CZ8384 | 416223.120 | 9672703.486 | 364.139 | 27 | -90 | 23.58 | 3 |
| DEX-CZ8385 | 416230.928 | 9672673.271 | 364.961 | 40 | -90 | 16 | 21 |
| DEX-CZ8386 | 416254.027 | 9672673.273 | 367.730 | 28 | -90 | 12 | 12 |
| DEX-CZ8387 | 416276.802 | 9672674.195 | 368.414 | 22 | -90 | 12 | 7 |
| DEX-CZ8388 | 416300.254 | 9672663.283 | 377.492 | 28 | -90 | 17 | 3 |
| DEX-CZ8389 | 416478.167 | 9672674.167 | 390.026 | 23 | -90 | 16.23 | 5 |
| DEX-CZ8390 | 416824.073 | 9672424.619 | 413.479 | 26 | -90 | 21 | 3 |
| DEX-CZ8391 | 416499.539 | 9672577.208 | 400.580 | 31 | -90 | 22 | 7 |
| DEX-CZ8392 | 416508.340 | 9672873.701 | 368.512 | 16 | -90 | 5 | 8.5 |
| DEX-CZ8393 | 416281.168 | 9672647.676 | 377.085 | 23 | -90 | 12 | 2 |
| DEX-CZ8394 | 416234.267 | 9672647.860 | 363.235 | 40 | -90 | 30 | 2 |
| DEX-CZ8395 | 416181.970 | 9672646.326 | 358.637 | 12 | -90 | 7 | 3 |
| DEX-CZ8396 | 416126.384 | 9672649.613 | 367.647 | 33 | -90 | 24.24 | 5 |
| DEX-CZ8397 | 416127.337 | 9672624.019 | 370.753 | 37 | -90 | 17.4 | 4 |
| DEX-CZ8398 | 416152.293 | 9672615.654 | 368.306 | 38 | -90 | 39.01 | 1 |
| DEX-CZ8399 | 416275.313 | 9672706.804 | 374.509 | 26 | -90 | 23.86 | 4 |
| DEX-CZ8400 | 416301.159 | 9672729.127 | 379.755 | 24 | -90 | 17.99 | 4 |
| DEX-CZ8401 | 416275.434 | 9672724.770 | 377.156 | 36 | -90 | 18.76 | 15 |
| DEX-CZ8402 | 416270.513 | 9672755.226 | 379.781 | 34 | -90 | 29.72 | 8 |
| DEX-CZ8403 | 416325.336 | 9672663.287 | 381.883 | 22 | -90 | 14 | 5 |
| DEX-CZ8404 | 416330.313 | 9672699.845 | 375.923 | 27 | -90 | 21.48 | 4 |
| DEX-CZ8405 | 416322.438 | 9672730.975 | 381.442 | 29 | -90 | 22 | 4.6 |
| DEX-CZ8406 | 416327.786 | 9672752.919 | 383.246 | 38 | -90 | 26.47 | 3 |
| DEX-CZ8407 | 416175.439 | 9672622.768 | 368.268 | 33 | -90 | 8 | 21 |
| DEX-CZ8408 | 416598.823 | 9672517.971 | 405.842 | 20 | -90 | 8 | 9 |
| DEX-CZ8409 | 416626.196 | 9672404.668 | 379.996 | 25 | -90 | 16 | 7 |
| DEX-CZ8410 | 416575.579 | 9672407.023 | 374.508 | 29 | -90 | 6 | 12 |
| DEX-CZ8411 | 416630.213 | 9672377.829 | 370.213 | 19 | -90 | 13 | 4 |
| DEX-CZ8412 | 416629.313 | 9672345.066 | 370.788 | 15 | -90 | 1 | 11 |
| DEX-CZ8413 | 416598.520 | 9672374.285 | 365.891 | 10 | -90 | 3 | 6 |
| DEX-CZ8414 | 416571.482 | 9672380.274 | 364.045 | 8 | -90 | 4 | 1 |
| DEX-CZ8415 | 416552.264 | 9672380.727 | 366.161 | 9 | -90 | 3 | 2 |
| DEX-CZ8416 | 416577.101 | 9672349.061 | 371.388 | 23 | -90 | 11 | 9 |
| DEX-CZ8417 | 416603.104 | 9672320.406 | 385.634 | 21 | -90 | 16 | 4 |
| DEX-CZ8418 | 416585.376 | 9672319.635 | 383.538 | 20 | -90 | 13 | 5 |
| DEX-CZ8419 | 416630.020 | 9672438.874 | 390.631 | 19 | -90 | 14.68 | 5 |
| DEX-CZ8420 | 416676.420 | 9672445.796 | 392.876 | 15 | -90 | 11 | 2 |
| DEX-CZ8421 | 416725.759 | 9672439.637 | 388.932 | 18 | -90 | 9 | 7 |
| DEX-CZ8422 | 416646.563 | 9672418.818 | 382.634 | 24 | -90 | 13 | 9 |
| DEX-CZ8423 | 416619.145 | 9672425.195 | 386.065 | 24 | -90 | 19 | 3 |
| DEX-CZ8424 | 416599.299 | 9672425.289 | 383.941 | 19 | -90 | 16 | 2 |
| DEX-CZ8425 | 416570.129 | 9672423.565 | 381.107 | 30 | -90 | 13 | 16 |
| DEX-CZ8426 | 416551.031 | 9672418.948 | 374.255 | 31 | -90 | 15 | 11 |
| DEX-CZ8427 | 416273.712 | 9672905.931 | 354.061 | 13 | -90 | 2 | 9 |
| DEX-CZ8428 | 416280.206 | 9672928.075 | 342.333 | 5 | -90 | 1 | 1 |
| DEX-CZ8429 | 416422.094 | 9672924.853 | 346.000 | 12 | -90 | 8 | 2 |
| DEX-CZ8430 | 415778.965 | 9672963.625 | 322.851 | 13 | -90 | 2 | 7 |
| DEX-CZ8431 | 416279.755 | 9672875.812 | 369.706 | 6 | -90 | 3 | 0 |
| DEX-CZ8432 | 415877.460 | 9672848.092 | 303.066 | 24 | -90 | 10 | 13.94 |
| DEX-CZ8433 | 415933.251 | 9672855.475 | 309.404 | 17 | -90 | 7 | 7 |
| DEX-CZ8434 | 416332.602 | 9672801.380 | 385.805 | 26 | -90 | 15.21 | 9 |
| DEX-CZ8435 | 416274.106 | 9672571.229 | 390.090 | 14 | -90 | 10 | 1 |
| DEX-CZ8436 | 416300.146 | 9672571.542 | 392.800 | 30 | -90 | 14 | 6 |
| DEX-CZ8437 | 416324.373 | 9672570.453 | 393.283 | 24 | -90 | 12.34 | 9 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| NCZ21-10030 | 415717.580 | 9674899.917 | 410.265 | 24 | -90 | 13.77 | 11.36 |
| NCZ21-10031 | 415803.427 | 9674899.034 | 409.174 | 26 | -90 | 13.87 | 15.31 |
| NCZ21-10032 | 415798.249 | 9674998.692 | 426.217 | 25 | -90 | 24.88 | 4 |
| NCZ21-10036 | 415885.502 | 9674904.376 | 405.824 | 30 | -90 | 10 | 18 |
| NCZ21-10039 | 416009.694 | 9674907.850 | 422.175 | 29 | -90 | 26.49 | 6.45 |
| NCZ21-10040 | 416001.242 | 9675009.733 | 441.667 | 16 | -90 | 12 | 2 |
| NCZ21-10041 | 416005.486 | 9675092.493 | 434.941 | 20 | -90 | 13 | 5 |
| NCZ21-10042 | 416109.529 | 9675199.735 | 406.343 | 14 | -90 | 11 | 1 |
| NCZ21-10043 | 416100.515 | 9675094.165 | 430.202 | 34 | -90 | 20 | 11.6 |
| NCZ21-10044 | 416103.063 | 9674985.769 | 433.620 | 17 | -90 | 7 | 9 |
| NCZ21-10045 | 416103.579 | 9674898.675 | 420.576 | 24 | -90 | 16 | 6 |
| NCZ21-10046 | 416102.513 | 9674792.477 | 406.237 | 14 | -90 | 6 | 5.62 |
| NCZ21-10047 | 416100.601 | 9674698.338 | 409.204 | 19 | -90 | 10 | 7 |
| NCZ21-10048 | 416201.738 | 9674590.324 | 406.999 | 33 | -90 | 22 | 9 |
| NCZ21-10049 | 416217.215 | 9674688.514 | 406.726 | 26 | -90 | 10 | 14 |
| NCZ21-10050 | 416202.353 | 9674806.220 | 409.019 | 29 | -90 | 21 | 6 |
| NCZ21-10051 | 416205.083 | 9674901.460 | 413.215 | 20 | -90 | 9 | 9 |
| NCZ21-10052 | 416208.592 | 9674993.008 | 424.843 | 31 | -90 | 14 | 14.5 |
| NCZ21-10053 | 416201.197 | 9675096.954 | 407.365 | 14 | -90 | 9 | 2 |
| NCZ21-10054 | 416209.077 | 9675182.340 | 400.495 | 14 | -90 | 10 | 2 |
| NCZ21-10055 | 416307.726 | 9675168.324 | 391.373 | 14 | -90 | 11 | 1 |
| NCZ21-10056 | 416306.365 | 9675084.546 | 397.557 | 11 | -90 | 7 | 1 |
| NCZ21-10057 | 416297.107 | 9675004.323 | 411.048 | 22 | -90 | 13 | 6 |
| NCZ21-10058 | 416304.138 | 9674898.323 | 423.051 | 12 | -90 | 3 | 6.6 |
| NCZ21-10059 | 416301.717 | 9674797.698 | 411.761 | 36 | -90 | 16 | 18 |
| NCZ21-10060 | 416304.910 | 9674696.019 | 409.505 | 21 | -90 | 16 | 3 |
| NCZ21-10061 | 416304.857 | 9674599.560 | 409.502 | 34 | -90 | 21 | 11 |
| NCZ21-10062 | 416302.033 | 9674511.934 | 398.374 | 29 | -90 | 10 | 17 |
| NCZ21-10063 | 416413.608 | 9674495.490 | 401.256 | 36 | -90 | 32 | 4 |
| NCZ21-10064 | 416393.745 | 9674600.682 | 397.862 | 47 | -90 | 17 | 29 |
| NCZ21-10065 | 416406.132 | 9674697.448 | 422.360 | 31 | -90 | 21 | 8 |
| NCZ21-10066 | 416403.997 | 9674898.328 | 428.570 | 28 | -90 | 19 | 7 |
| NCZ21-10067 | 416408.852 | 9675006.150 | 419.369 | 35 | -90 | 13 | 20 |
| NCZ21-10068 | 416403.766 | 9675174.874 | 395.270 | 9 | -90 | 4 | 2 |
| NCZ21-10069 | 416510.149 | 9675201.299 | 388.522 | 14 | -90 | 8 | 4 |
| NCZ21-10070 | 416507.458 | 9675097.002 | 398.990 | 23 | -90 | 11 | 10 |
| NCZ21-10071 | 416501.555 | 9674995.777 | 417.578 | 25 | -90 | 13 | 10 |
| NCZ21-10072 | 416505.326 | 9674895.309 | 431.135 | 38 | -90 | 15 | 22 |
| NCZ21-10074 | 416505.320 | 9674684.565 | 440.358 | 22 | -90 | 7 | 13 |
| NCZ21-10075 | 416500.598 | 9674596.098 | 419.557 | 27 | -90 | 12 | 13 |
| NCZ21-10076 | 416505.611 | 9674483.313 | 403.869 | 36 | -90 | 11 | 23 |
| NCZ21-10086 | 416590.203 | 9674980.856 | 408.002 | 26 | -90 | 12 | 12 |
| NCZ21-10087 | 416599.454 | 9675103.464 | 396.105 | 21 | -90 | 4 | 15 |
| NCZ21-10088 | 416611.635 | 9675199.981 | 387.449 | 14 | -90 | 10 | 1.6 |
| NCZ21-10089 | 416702.833 | 9675192.190 | 391.501 | 15 | -90 | 7 | 5.45 |
| NCZ21-10090 | 416797.136 | 9675197.480 | 392.596 | 10 | -90 | 3 | 4 |
| NCZ21-10091 | 416891.761 | 9675200.729 | 399.560 | 18 | -90 | 8 | 8.5 |
| NCZ21-10092 | 417110.419 | 9675088.120 | 399.629 | 26 | -90 | 6 | 18 |
| NCZ21-10093 | 416993.992 | 9675097.500 | 402.016 | 26 | -90 | 9 | 15 |
| NCZ21-10094 | 416892.754 | 9675106.887 | 412.409 | 13 | -90 | 4.5 | 6.5 |
| NCZ21-10095 | 416789.685 | 9675106.323 | 408.167 | 22 | -90 | 8 | 11 |
| NCZ21-10096 | 416696.716 | 9675100.515 | 400.963 | 27 | -90 | 9 | 16 |
| NCZ21-10097 | 416705.505 | 9674995.214 | 418.305 | 17 | -90 | 8 | 7 |
| NCZ21-10173 | 415210.844 | 9675126.578 | 425.482 | 20 | -90 | 15 | 3 |
| NCZ21-10174 | 415304.506 | 9675128.230 | 424.243 | 18 | -90 | 10 | 6 |
| NCZ21-10177 | 415801.953 | 9675386.139 | 403.524 | 26 | -90 | 17 | 7 |
| NCZ21-10180 | 416091.226 | 9675299.027 | 395.553 | 16 | -90 | 5 | 9 |
| DEX-CZ015 | 414599.857 | 9674702.105 | 466.920 | 24 | -90 | 27.04 | 2.5 |
| DEX-CZ1183 | 416438.744 | 9674398.315 | 386.458 | 39 | -90 | 27.08 | 12 |
| BB_STH-1061 | 414288.418 | 9673912.096 | 337.314 | 16 | -90 | 11.94 | 5 |
| DEX-CZ024 | 414707.636 | 9674597.401 | 462.614 | 31 | -90 | 24.29 | 9.8 |
| DEX-CZ086 | 415297.076 | 9675003.033 | 430.098 | 9 | -90 | 6 | 1 |
| DX00143 | 414695.991 | 9675349.105 | 432.832 | 12 | -90 | 4.76 | 7.04 |
| DEX-CZ003 | 414397.090 | 9674604.997 | 415.980 | 25 | -90 | 14.59 | 12.46 |
| DEX-NCZ033 | 415093.148 | 9675191.426 | 424.031 | 20 | -90 | 17.56 | 3 |
| DEX-CZ004 | 414395.609 | 9674696.273 | 447.203 | 15 | -90 | 7.84 | 6.63 |
| DEX-CZ016 | 414590.887 | 9674799.199 | 437.331 | 21 | -90 | 13.49 | 10.02 |
| BB_STH-1039 | 413798.046 | 9674201.607 | 355.089 | 11 | -90 | 4 | 5.35 |
| DEX-CZ128 | 415592.965 | 9674505.648 | 404.616 | 24 | -90 | 13.17 | 13.06 |
| DEX-CZ005 | 414407.176 | 9674883.947 | 404.202 | 12 | -90 | 2 | 8 |
| DEX-CZ013 | 414619.435 | 9674504.130 | 410.758 | 10 | -90 | 6.68 | 2.2 |
| DEX-CZ055 | 414990.590 | 9674313.273 | 413.227 | 10 | -90 | 1 | 7 |
| BB_STH-1060 | 414199.833 | 9673925.443 | 320.200 | 17 | -90 | 11.07 | 6 |
| DEX-CZ768 | 416493.335 | 9674446.172 | 390.565 | 53 | -90 | 15.2 | 36.8 |
| DX00111 | 414602.108 | 9675254.552 | 431.231 | 25 | -90 | 6.15 | 17.37 |
| BB_STH-1042 | 413815.119 | 9674102.730 | 356.679 | 13 | -90 | 5.71 | 6 |
| DEX-CZ035 | 414793.033 | 9674708.000 | 435.503 | 17 | -90 | 9.74 | 6.35 |
| DX00082 | 414995.450 | 9675499.378 | 428.859 | 6 | -90 | 3.18 | 1 |
| DEX-CZ034 | 414801.369 | 9674606.890 | 438.756 | 28 | -90 | 19.79 | 9.7 |
| DEX-CZ039 | 414796.937 | 9675095.309 | 419.029 | 30 | -90 | 20 | 15.12 |
| DEX-CZ017 | 414609.492 | 9674906.794 | 413.358 | 12 | -90 | 3 | 8 |
| DEX-CZ112 | 415491.311 | 9674698.394 | 413.533 | 31 | -90 | 18.97 | 13.78 |
| DEX-CZ359 | 416095.204 | 9674458.280 | 407.381 | 23 | -90 | 12.53 | 9.42 |
| DEX-CZ080 | 415197.940 | 9674500.392 | 465.743 | 28 | -90 | 17.4 | 11.55 |
| DEX-CZ062 | 414999.534 | 9675000.657 | 443.297 | 26 | -90 | 20.32 | 6.73 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8438 | 416489.159 | 9672454.053 | 373.497 | 10 | -90 | 5 | 3 |
| DEX-CZ8439 | 416511.011 | 9672456.304 | 379.678 | 21 | -90 | 12 | 5 |
| DEX-CZ8440 | 416321.172 | 9672779.661 | 384.985 | 30 | -90 | 28.65 | 2 |
| DEX-CZ8441 | 416476.622 | 9672794.586 | 383.967 | 20 | -90 | 17.59 | 1 |
| DEX-CZ8442 | 416624.318 | 9672706.280 | 401.108 | 10 | -90 | 3 | 3 |
| DEX-CZ8443 | 416619.189 | 9672678.062 | 403.249 | 22 | -90 | 15 | 6 |
| DEX-CZ8444 | 416476.891 | 9672818.246 | 375.367 | 15 | -90 | 9 | 4 |
| DEX-CZ8445 | 416428.860 | 9672641.002 | 390.054 | 24 | -90 | 17 | 4 |
| DEX-CZ8446 | 416620.906 | 9672623.276 | 407.780 | 26 | -90 | 24 | 0 |
| DEX-CZ8447 | 416479.688 | 9672546.588 | 398.189 | 23 | -90 | 16 | 3 |
| DEX-CZ8448 | 416448.997 | 9672528.329 | 389.720 | 26 | -90 | 17 | 7 |
| DEX-CZ8449 | 416470.091 | 9672527.114 | 393.331 | 24 | -90 | 16 | 6 |
| DEX-CZ8450 | 416494.933 | 9672528.862 | 397.942 | 16 | -90 | 13 | 1 |
| DEX-CZ8451 | 416475.303 | 9672500.936 | 386.668 | 22 | -90 | 14 | 5 |
| DEX-CZ8452 | 416554.452 | 9672576.058 | 405.459 | 34 | -90 | 21 | 11 |
| DEX-CZ8453 | 416479.069 | 9672479.225 | 380.014 | 9 | -90 | 4 | 3 |
| DEX-CZ8454 | 415875.566 | 9672870.732 | 301.000 | 18 | -90 | 10 | 6 |
| DEX-CZ8455 | 415901.702 | 9672881.292 | 303.368 | 21 | -90 | 16 | 2 |
| DEX-CZ8456 | 415871.224 | 9672828.253 | 304.000 | 14 | -90 | 9 | 5 |
| DEX-CZ8457 | 415903.575 | 9672829.665 | 306.617 | 19 | -90 | 11.45 | 5.37 |
| DEX-CZ8458 | 415930.768 | 9672823.395 | 313.469 | 6 | -90 | 1 | 3 |
| DEX-CZ8459 | 415950.771 | 9672819.943 | 320.851 | 10 | -90 | 2 | 5 |
| DEX-CZ8460 | 415929.108 | 9672802.530 | 309.068 | 11 | -90 | 4 | 5 |
| DEX-CZ8461 | 415873.417 | 9672797.026 | 306.179 | 24 | -90 | 10 | 6.83 |
| DEX-CZ8462 | 415921.056 | 9672770.064 | 317.949 | 14 | -90 | 2 | 10 |
| DEX-CZ8463 | 415898.710 | 9672771.479 | 313.430 | 26 | -90 | 7 | 13 |
| DEX-CZ8464 | 415873.199 | 9672777.302 | 310.661 | 19 | -90 | 14.2 | 1 |
| DEX-CZ8465 | 416528.364 | 9672402.400 | 362.000 | 6 | -90 | 2 | 1 |
| DEX-CZ8466 | 416532.314 | 9672386.307 | 367.164 | 10 | -90 | 3 | 3 |
| DEX-CZ8467 | 416622.607 | 9672326.406 | 380.546 | 16 | -90 | 7 | 9 |
| DEX-CZ8468 | 416526.642 | 9672421.236 | 369.192 | 21 | -90 | 3 | 18 |
| DEX-CZ8469 | 416479.532 | 9672426.088 | 359.000 | 21 | -90 | 5 | 11 |
| DEX-CZ8470 | 416462.056 | 9672421.459 | 363.652 | 9 | -90 | 5 | 3 |
| DEX-CZ8471 | 416433.864 | 9672422.108 | 365.315 | 18 | -90 | 7 | 9 |
| DEX-CZ8472 | 416406.795 | 9672424.503 | 357.859 | 5 | -90 | 1 | 1 |
| DEX-CZ8473 | 416381.337 | 9672419.058 | 353.813 | 8 | -90 | 3.5 | 0 |
| DEX-CZ8474 | 416319.219 | 9672428.536 | 343.000 | 7 | -90 | 4 | 2 |
| DEX-CZ8475 | 416299.275 | 9672421.867 | 341.417 | 9 | -90 | 4 | 3 |
| DEX-CZ8476 | 416273.626 | 9672418.687 | 338.084 | 8 | -90 | 3 | 2 |
| DEX-CZ8750 | 417392.788 | 9673445.661 | 382.408 | 20 | -90 | 15.24 | 3 |
| DEX-CZ8751 | 417292.683 | 9673444.106 | 375.765 | 25 | -90 | 22.85 | 1 |
| DEX-CZ8752 | 417446.221 | 9673398.927 | 400.320 | 26 | -90 | 7 | 18.24 |
| DEX-CZ8753 | 417401.469 | 9673410.211 | 394.291 | 22 | -90 | 6 | 9.24 |
| DEX-CZ8754 | 417339.113 | 9673398.462 | 393.905 | 37 | -90 | 34.6 | 1 |
| DEX-CZ8755 | 417300.034 | 9673409.996 | 385.829 | 30 | -90 | 24.28 | 3 |
| DEX-CZ8756 | 417246.983 | 9673399.963 | 381.900 | 15 | -90 | 5.45 | 4.55 |
| DEX-CZ8757 | 417200.597 | 9673398.864 | 384.083 | 7 | -90 | 2 | 1 |
| DEX-CZ8758 | 417146.075 | 9673399.179 | 378.532 | 14 | -90 | 8 | 4 |
| DEX-CZ8759 | 417102.688 | 9673392.460 | 371.802 | 9 | -90 | 6 | 0 |
| DEX-CZ8760 | 417402.905 | 9673351.283 | 411.145 | 27 | -90 | 17.36 | 7 |
| DEX-CZ8761 | 417296.347 | 9673354.199 | 400.476 | 22 | -90 | 19.24 | 1 |
| DEX-CZ8762 | 417198.940 | 9673345.295 | 395.147 | 21 | -90 | 14.34 | 2 |
| DEX-CZ8763 | 417100.993 | 9673353.232 | 374.959 | 13 | -90 | 6 | 5 |
| DEX-CZ8764 | 417443.474 | 9673303.597 | 416.464 | 10 | -90 | 6 | 1 |
| DEX-CZ8765 | 417397.261 | 9673300.438 | 419.451 | 12 | -90 | 5 | 3 |
| DEX-CZ8766 | 417346.781 | 9673300.726 | 410.558 | 14 | -90 | 9 | 3 |
| DEX-CZ8767 | 417299.986 | 9673295.776 | 403.753 | 29 | -90 | 19.22 | 8 |
| DEX-CZ8768 | 417244.421 | 9673300.692 | 396.602 | 16 | -90 | 13 | 0 |
| DEX-CZ8769 | 417197.533 | 9673303.839 | 391.761 | 23 | -90 | 20.72 | 0.48 |
| DEX-CZ8770 | 417147.309 | 9673303.019 | 389.598 | 16 | -90 | 13 | 0.55 |
| DEX-CZ8771 | 417099.912 | 9673296.116 | 374.933 | 15 | -90 | 5 | 8 |
| DEX-CZ8772 | 417405.042 | 9673258.640 | 404.325 | 16 | -90 | 6 | 6 |
| DEX-CZ8773 | 417298.088 | 9673251.465 | 395.860 | 23 | -90 | 13 | 8 |
| DEX-CZ8774 | 417197.020 | 9673250.856 | 383.690 | 22 | -90 | 19.71 | 1 |
| DEX-CZ8775 | 417107.177 | 9673247.598 | 367.864 | 25 | -90 | 19 | 3 |
| DEX-CZ8779 | 415905.200 | 9672273.020 | 378.964 | 10 | -90 | 4 | 4 |
| DEX-CZ8780 | 415880.037 | 9672271.555 | 381.889 | 8 | -90 | 2 | 4 |
| DEX-CZ8782 | 415928.454 | 9672238.985 | 384.452 | 25 | -90 | 4 | 14 |
| DEX-CZ8783 | 415875.817 | 9672249.576 | 383.041 | 8 | -90 | 4 | 3 |
| DEX-CZ8787 | 416002.595 | 9672216.128 | 392.195 | 11 | -90 | 3 | 6 |
| DEX-CZ8788 | 415976.761 | 9672217.694 | 392.354 | 15 | -90 | 2 | 11 |
| DEX-CZ8789 | 415948.393 | 9672222.321 | 387.598 | 6 | -90 | 2 | 2 |
| DEX-CZ8790 | 415926.028 | 9672217.648 | 382.935 | 22 | -90 | 10 | 9 |
| DEX-CZ8791 | 415897.410 | 9672226.533 | 377.049 | 17 | -90 | 10 | 5 |
| DEX-CZ8792 | 415874.002 | 9672233.058 | 378.292 | 24 | -90 | 5 | 13 |
| DEX-CZ8793 | 416074.916 | 9672198.752 | 407.619 | 12 | -90 | 6 | 4 |
| DEX-CZ8794 | 416028.350 | 9672199.310 | 399.019 | 21 | -90 | 6 | 12 |
| DEX-CZ8795 | 415978.911 | 9672200.873 | 394.406 | 27 | -90 | 8 | 13 |
| DEX-CZ8796 | 415928.018 | 9672199.926 | 380.428 | 27 | -90 | 6 | 16 |
| DEX-CZ8797 | 415870.105 | 9672208.692 | 369.680 | 12 | -90 | 9 | 0 |
| DEX-CZ8798 | 416124.976 | 9672173.652 | 417.539 | 11 | -90 | 3 | 5 |
| DEX-CZ8799 | 416102.012 | 9672178.132 | 413.838 | 14 | -90 | 5 | 6 |
| DEX-CZ8800 | 416076.665 | 9672175.038 | 406.879 | 23 | -90 | 10 | 8.64 |
| DEX-CZ8801 | 416059.776 | 9672181.339 | 404.263 | 31 | -90 | 7 | 13 |
| DEX-CZ8802 | 416025.493 | 9672170.169 | 399.245 | 13 | -90 | 9 | 4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1190 | 416454.539 | 9674439.743 | 388.904 | 30 | -90 | 15.47 | 14 |
| DEX-CZ011 | 414499.855 | 9674399.501 | 384.693 | 46 | -90 | 38.54 | 12.3 |
| DEX-CZ194 | 416199.123 | 9674506.342 | 399.323 | 13 | -90 | 5.28 | 6.1 |
| DX00122 | 414646.631 | 9675153.967 | 419.215 | 16 | -90 | 7.5 | 7.55 |
| DEX-CZ047 | 414884.311 | 9674412.154 | 438.096 | 35 | -90 | 18.08 | 16.96 |
| DX00177 | 414950.278 | 9675453.711 | 427.742 | 10 | -90 | 6.37 | 2 |
| DEX-CZ041 | 414890.237 | 9675003.798 | 439.588 | 26 | -90 | 24.15 | 6.15 |
| DEX-CZ181 | 415992.374 | 9674504.107 | 425.182 | 21 | -90 | 14.97 | 6.01 |
| DX00006 | 414595.102 | 9675105.429 | 417.014 | 13 | -90 | 5.16 | 7.36 |
| DX00126 | 414652.379 | 9675298.662 | 433.464 | 22 | -90 | 8.62 | 12.55 |
| BB_STH-1032 | 414498.276 | 9674212.426 | 407.434 | 6 | -90 | 1 | 3 |
| DEX-CZ057 | 415000.721 | 9674502.630 | 453.001 | 29 | -90 | 12.56 | 17.19 |
| DX00173 | 414901.993 | 9675453.956 | 430.190 | 14 | -90 | 1 | 10 |
| BB_STH-1049 | 414495.072 | 9674078.832 | 426.611 | 7 | -90 | 1 | 4 |
| DEX-CZ038 | 414804.759 | 9675004.606 | 435.180 | 19 | -90 | 19.87 | 2.98 |
| DX00176 | 414954.846 | 9675400.711 | 425.434 | 20 | -90 | 12.61 | 8.37 |
| DEX-CZ065 | 415096.969 | 9674898.597 | 450.788 | 37 | -90 | 24.23 | 18.08 |
| DEX-CZ084 | 415204.183 | 9674903.309 | 453.464 | 54 | -90 | 60.81 | 5 |
| DEX-CZ348 | 416000.855 | 9674549.933 | 422.964 | 23 | -90 | 16.58 | 9.35 |
| BB_STH-1058 | 413829.960 | 9674019.349 | 337.025 | 17 | -90 | 3 | 12 |
| DEX-CZ064 | 415095.378 | 9674999.252 | 428.402 | 36 | -90 | 14.17 | 22.47 |
| DEX-CZ184 | 416100.175 | 9674603.389 | 411.518 | 22 | -90 | 14.96 | 8.19 |
| DX00155 | 414745.319 | 9675299.506 | 428.027 | 17 | -90 | 12.86 | 7.49 |
| DX00106 | 414701.968 | 9675304.698 | 432.221 | 11 | -90 | 7.47 | 3.25 |
| DX00127 | 414648.285 | 9675201.070 | 429.812 | 18 | -90 | 12.27 | 8.06 |
| DX00181 | 414551.402 | 9675206.853 | 426.387 | 15 | -90 | 4.06 | 10.31 |
| BB_STH-1066 | 414292.610 | 9673844.319 | 327.693 | 26 | -90 | 13.92 | 11 |
| DEX-CZ056 | 415001.829 | 9674390.782 | 413.821 | 23 | -90 | 15.97 | 7.56 |
| DEX-CZ083 | 415204.162 | 9674810.128 | 453.147 | 30 | -90 | 20 | 8 |
| DEX-CZ109 | 415405.712 | 9675000.868 | 412.536 | 16 | -90 | 13.37 | 1.42 |
| BB_STH-1027 | 414124.892 | 9674291.291 | 385.316 | 38 | -90 | 19.19 | 25.61 |
| DX00164 | 414804.217 | 9675453.620 | 449.975 | 9 | -90 | 3.35 | 4.38 |
| BB_STH-1062 | 414414.832 | 9673914.161 | 357.822 | 9 | -90 | 4 | 3 |
| DEX-CZ046 | 414885.138 | 9674502.300 | 436.196 | 38 | -90 | 39.5 | 3.8 |
| DX00157 | 414750.279 | 9675346.826 | 427.716 | 15 | -90 | 12.99 | 4.44 |
| BB_STH-1014 | 414003.577 | 9674693.381 | 401.492 | 13 | -90 | 1 | 10 |
| DEX-CZ067 | 415092.759 | 9674699.229 | 465.705 | 30 | -90 | 29.57 | 5.89 |
| DEX-CZ001 | 414307.382 | 9674802.717 | 419.170 | 14 | -90 | 2 | 9.7 |
| DEX-CZ061 | 414999.851 | 9674901.845 | 451.086 | 43 | -90 | 29.6 | 23.24 |
| DX00108 | 414699.818 | 9675202.367 | 425.755 | 9 | -90 | 6.1 | 3.61 |
| BB_STH-1019 | 414104.907 | 9674413.533 | 386.531 | 5 | -90 | 2 | 1 |
| BB_STH-1056 | 414108.377 | 9674007.117 | 335.000 | 20 | -90 | 15.27 | 5 |
| DX00182 | 414548.764 | 9675255.496 | 437.734 | 14 | -90 | 0 | 13.53 |
| BB_STH-1023 | 413762.925 | 9674289.131 | 348.286 | 25 | -90 | 2 | 22.55 |
| DEX-CZ012 | 414596.814 | 9674408.728 | 396.992 | 14 | -90 | 3 | 4 |
| DEX-CZ353 | 416151.646 | 9674500.580 | 403.044 | 21 | -90 | 5.19 | 14.72 |
| DEX-CZ354 | 416051.752 | 9674505.056 | 416.748 | 23 | -90 | 16.59 | 8.28 |
| DX00107 | 414800.410 | 9675304.781 | 421.900 | 23 | -90 | 11.33 | 16.76 |
| BB_STH-1006 | 414203.568 | 9674599.835 | 420.604 | 14 | -90 | 1 | 11.58 |
| DEX-BB6071 | 413902.200 | 9674776.000 | 391.512 | 11 | -90 | 7 | 1 |
| DEX-BB6093 | 414048.100 | 9674720.000 | 393.550 | 21 | -90 | 8 | 10.47 |
| DX00110 | 414596.398 | 9675152.119 | 422.813 | 11 | -90 | 9.45 | 2.56 |
| DEX-CZ087 | 415306.732 | 9674899.170 | 440.967 | 39 | -90 | 38.01 | 6 |
| DX00180 | 414552.364 | 9675150.842 | 424.776 | 16 | -90 | 10.93 | 5 |
| BB_STH-1016 | 414370.728 | 9674413.903 | 417.880 | 12 | -90 | 2 | 9.2 |
| BB_STH-1034 | 414297.948 | 9674194.737 | 386.539 | 20 | -90 | 7.74 | 12.13 |
| DEX-CZ350 | 416105.253 | 9674557.263 | 406.681 | 29 | -90 | 36.75 | 2.55 |
| BB_STH-1041 | 413762.561 | 9674096.491 | 348.613 | 8 | -90 | 2 | 6 |
| DEX-CZ363 | 416296.974 | 9674454.262 | 392.290 | 14 | -90 | 11.61 | 4.32 |
| BB_STH-1026 | 414018.506 | 9674274.044 | 369.530 | 21 | -90 | 5.45 | 16.66 |
| BB_STH-1031 | 414483.486 | 9674300.632 | 400.111 | 5 | -90 | 2 | 0.42 |
| DEX-BB6073 | 413948.300 | 9674766.000 | 388.122 | 27 | -90 | 14 | 9.85 |
| DEX-CZ022 | 414696.683 | 9674798.621 | 441.271 | 24 | -90 | 9.91 | 13.2 |
| BB_STH-1035 | 414203.083 | 9674180.031 | 367.355 | 9 | -90 | 2 | 6 |
| DEX-BB6074 | 413970.500 | 9674768.000 | 387.066 | 33 | -90 | 21 | 9.5 |
| DEX-CZ107 | 415392.694 | 9674701.865 | 412.957 | 24 | -90 | 17.62 | 8.56 |
| BB_STH-1001 | 413834.895 | 9674527.962 | 358.451 | 19 | -90 | 7.32 | 10.77 |
| BB_STH-1024 | 413831.081 | 9674293.782 | 354.757 | 23 | -90 | 12.01 | 10.57 |
| BB_STH-1048 | 414407.173 | 9674081.690 | 420.610 | 17 | -90 | 10.47 | 6 |
| BB_STH-1051 | 414606.008 | 9673970.537 | 382.057 | 6 | -90 | 1 | 3 |
| DEX-CZ018 | 414616.554 | 9675002.407 | 392.970 | 7 | -90 | 2 | 3 |
| BB_STH-1045 | 414103.270 | 9674084.623 | 348.000 | 10 | -90 | 5.77 | 3.87 |
| DEX-CZ182 | 416007.034 | 9674609.716 | 416.883 | 42 | -90 | 29.74 | 18.5 |
| DX00133 | 414650.695 | 9675344.569 | 438.720 | 19 | -90 | 6.19 | 15.09 |
| DEX-BB6077 | 414050.900 | 9674768.000 | 388.524 | 26 | -90 | 11 | 11.85 |
| DEX-BB6094 | 414075.500 | 9674722.000 | 392.899 | 30 | -90 | 20 | 7.85 |
| DX00156 | 414746.120 | 9675245.216 | 425.361 | 23 | -90 | 14.9 | 11.63 |
| DEX-BB2058 | 414758.625 | 9674348.874 | 413.169 | 25 | -90 | 17.03 | 7 |
| DEX-BB2059 | 414799.886 | 9674345.046 | 435.412 | 27 | -90 | 18.08 | 8 |
| DEX-BB2060 | 414845.853 | 9674345.973 | 439.314 | 20 | -90 | 15.77 | 3 |
| DEX-BB2061 | 414909.504 | 9674352.515 | 418.801 | 18 | -90 | 11.95 | 5.25 |
| DEX-BB2062 | 414957.526 | 9674350.624 | 403.010 | 16 | -90 | 4 | 10 |
| DEX-BB2063 | 415002.632 | 9674351.128 | 422.082 | 26 | -90 | 7.22 | 17 |
| DEX-BB2064 | 415055.232 | 9674351.447 | 428.216 | 35 | -90 | 9 | 24 |
| DEX-BB2065 | 415108.575 | 9674340.521 | 433.356 | 27 | -90 | 6 | 19 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8803 | 416003.444 | 9672171.577 | 396.658 | 45 | -90 | 23.56 | 20 |
| DEX-CZ8804 | 415978.127 | 9672176.782 | 392.125 | 26 | -90 | 8 | 16 |
| DEX-CZ8805 | 415953.518 | 9672175.704 | 383.556 | 21 | -90 | 9 | 8 |
| DEX-CZ8806 | 415928.237 | 9672176.774 | 375.039 | 13 | -90 | 4 | 7 |
| DEX-CZ8807 | 415903.013 | 9672179.790 | 368.637 | 24 | -90 | 12 | 5 |
| DEX-CZ8808 | 415883.851 | 9672179.312 | 363.301 | 32 | -90 | 24 | 6 |
| DEX-CZ8809 | 416126.566 | 9672142.141 | 407.454 | 33 | -90 | 26.59 | 5 |
| DEX-CZ8810 | 416074.200 | 9672148.810 | 403.510 | 29 | -90 | 8 | 16 |
| DEX-CZ8811 | 416028.067 | 9672151.856 | 397.986 | 22 | -90 | 10 | 13 |
| DEX-CZ8812 | 416229.130 | 9672124.008 | 417.913 | 40 | -90 | 32.87 | 7 |
| DEX-CZ8813 | 416204.625 | 9672124.035 | 415.629 | 25 | -90 | 14.27 | 9 |
| DEX-CZ8814 | 416173.875 | 9672119.590 | 412.653 | 19 | -90 | 15.29 | 2 |
| DEX-CZ8815 | 416147.413 | 9672125.811 | 406.069 | 21 | -90 | 17.24 | 2 |
| DEX-CZ8816 | 416128.893 | 9672125.897 | 401.917 | 22 | -90 | 16.26 | 4 |
| DEX-CZ8817 | 416107.852 | 9672127.032 | 401.510 | 44 | -90 | 33.42 | 10 |
| DEX-CZ8818 | 416068.375 | 9672127.934 | 400.440 | 29 | -90 | 13 | 13 |
| DEX-CZ8819 | 416053.502 | 9672130.529 | 398.955 | 31 | -90 | 13 | 6 |
| DEX-CZ8820 | 416031.102 | 9672132.179 | 395.894 | 24 | -90 | 13.26 | 8 |
| DEX-CZ8821 | 416228.268 | 9672101.639 | 420.690 | 26 | -90 | 22.89 | 1 |
| DEX-CZ8822 | 416173.569 | 9672098.090 | 415.020 | 18 | -90 | 14.26 | 2 |
| DEX-CZ8823 | 416124.802 | 9672098.934 | 404.779 | 44 | -90 | 25.55 | 4 |
| DEX-CZ8824 | 416072.267 | 9672104.580 | 394.923 | 28 | -90 | 16 | 6 |
| DEX-CZ8825 | 416325.869 | 9672079.349 | 412.480 | 25 | -90 | 18 | 4 |
| DEX-CZ8826 | 416304.573 | 9672077.222 | 415.370 | 37 | -90 | 35.26 | 1 |
| DEX-CZ8827 | 416279.107 | 9672064.424 | 417.964 | 14 | -90 | 7 | 3 |
| DEX-CZ8828 | 416250.702 | 9672066.838 | 423.267 | 5 | -90 | 2 | 1 |
| DEX-CZ8829 | 416230.235 | 9672077.998 | 424.000 | 8 | -90 | 5 | 1 |
| DEX-CZ8830 | 416205.258 | 9672076.008 | 420.296 | 10 | -90 | 6 | 3 |
| DEX-CZ8831 | 416175.767 | 9672074.896 | 415.295 | 17 | -90 | 12 | 3 |
| DEX-CZ8832 | 416160.651 | 9672070.841 | 412.958 | 26 | -90 | 16.26 | 9 |
| DEX-CZ8833 | 416124.822 | 9672073.270 | 405.145 | 27 | -90 | 24.31 | 1 |
| DEX-CZ8834 | 416101.141 | 9672071.325 | 399.435 | 50 | -90 | 45.12 | 4 |
| DEX-CZ8835 | 416079.710 | 9672067.826 | 391.723 | 22 | -90 | 16.45 | 3 |
| DEX-CZ8836 | 416055.479 | 9672068.125 | 381.907 | 34 | -90 | 23.89 | 5 |
| DEX-CZ8837 | 416026.542 | 9672070.490 | 385.785 | 40 | -90 | 7 | 30 |
| DEX-CZ8838 | 415997.396 | 9672077.030 | 383.882 | 13 | -90 | 10 | 1 |
| DEX-CZ8839 | 415975.998 | 9672070.523 | 377.176 | 26 | -90 | 14 | 9 |
| DEX-CZ8840 | 415949.690 | 9672071.797 | 364.532 | 19 | -90 | 5 | 11 |
| DEX-CZ8841 | 415929.394 | 9672078.336 | 357.594 | 11 | -90 | 3 | 7 |
| DEX-CZ8842 | 416325.363 | 9672053.849 | 400.306 | 28 | -90 | 15 | 11 |
| DEX-CZ8843 | 416279.728 | 9672039.855 | 409.469 | 19 | -90 | 8 | 7 |
| DEX-CZ8844 | 416224.170 | 9672045.032 | 416.573 | 10 | -90 | 6 | 2 |
| DEX-CZ8845 | 416180.966 | 9672059.238 | 414.842 | 18 | -90 | 10 | 8 |
| DEX-CZ8846 | 416123.522 | 9672049.138 | 403.701 | 25 | -90 | 20.3 | 3 |
| DEX-CZ8847 | 416078.621 | 9672049.433 | 393.328 | 30 | -90 | 15 | 10 |
| DEX-CZ8848 | 416024.976 | 9672043.778 | 374.000 | 25 | -90 | 10 | 12 |
| DEX-CZ8849 | 415977.539 | 9672050.089 | 372.605 | 20 | -90 | 5 | 6 |
| DEX-CZ8850 | 415924.495 | 9672060.569 | 352.134 | 15 | -90 | 6 | 7 |
| DEX-CZ8851 | 416379.588 | 9672024.416 | 400.076 | 23 | -90 | 19.91 | 2 |
| DEX-CZ8852 | 416349.930 | 9672021.593 | 390.204 | 20 | -90 | 11 | 8.5 |
| DEX-CZ8853 | 416318.883 | 9672031.384 | 392.417 | 11 | -90 | 6 | 3 |
| DEX-CZ8854 | 416293.122 | 9672025.722 | 401.473 | 25 | -90 | 22.35 | 3 |
| DEX-CZ8855 | 416273.799 | 9672012.003 | 400.107 | 26 | -90 | 21.13 | 3 |
| DEX-CZ8856 | 416253.199 | 9672026.404 | 407.825 | 20 | -90 | 10 | 8 |
| DEX-CZ8857 | 416227.955 | 9672028.838 | 410.871 | 22 | -90 | 11 | 10 |
| DEX-CZ8858 | 416204.132 | 9672018.856 | 409.891 | 38 | -90 | 31.59 | 9 |
| DEX-CZ8859 | 416175.867 | 9672024.386 | 409.893 | 36 | -90 | 24.88 | 12 |
| DEX-CZ8860 | 416149.310 | 9672027.854 | 407.410 | 29 | -90 | 24.8 | 2 |
| DEX-CZ8861 | 416127.748 | 9672027.883 | 404.132 | 26 | -90 | 21.34 | 2 |
| DEX-CZ8862 | 416105.325 | 9672021.107 | 398.711 | 29 | -90 | 21.53 | 7 |
| DEX-CZ8863 | 416078.892 | 9672026.196 | 393.669 | 34 | -90 | 29.9 | 3 |
| DEX-CZ8864 | 416052.918 | 9672022.558 | 387.917 | 41 | -90 | 25 | 4 |
| DEX-CZ8865 | 416026.062 | 9672025.666 | 377.278 | 32 | -90 | 10 | 16 |
| DEX-CZ8866 | 415997.641 | 9672025.577 | 366.641 | 28 | -90 | 5 | 11.4 |
| DEX-CZ8867 | 415972.523 | 9672028.416 | 365.463 | 38 | -90 | 9 | 25 |
| DEX-CZ8868 | 415953.764 | 9672020.459 | 356.830 | 22 | -90 | 6 | 12.29 |
| DEX-CZ8869 | 415930.987 | 9672029.503 | 349.997 | 10 | -90 | 7 | 1 |
| DEX-CZ8870 | 416382.445 | 9672000.971 | 389.360 | 16 | -90 | 12 | 1 |
| DEX-CZ8871 | 416317.794 | 9672001.126 | 385.736 | 23 | -90 | 9 | 7 |
| DEX-CZ8872 | 416275.023 | 9671995.268 | 394.107 | 28 | -90 | 24.69 | 3.22 |
| DEX-CZ8873 | 416228.917 | 9671998.917 | 402.929 | 30 | -90 | 18.65 | 9 |
| DEX-CZ8874 | 416178.476 | 9672001.227 | 406.242 | 38 | -90 | 22 | 13 |
| DEX-CZ8875 | 416124.481 | 9671999.224 | 401.592 | 31 | -90 | 20.78 | 5 |
| DEX-CZ8876 | 416080.911 | 9672006.157 | 393.681 | 36 | -90 | 18.43 | 16 |
| DEX-CZ8877 | 416028.393 | 9672003.104 | 383.199 | 38 | -90 | 31.26 | 2 |
| DEX-CZ8878 | 415977.237 | 9672009.823 | 357.942 | 28 | -90 | 16 | 5 |
| DEX-CZ8879 | 415934.103 | 9671999.155 | 351.436 | 21 | -90 | 16 | 2 |
| DEX-CZ8880 | 416374.318 | 9671975.797 | 379.882 | 20 | -90 | 11 | 5 |
| DEX-CZ8881 | 416353.707 | 9671973.117 | 374.614 | 25 | -90 | 7 | 14.46 |
| DEX-CZ8882 | 416321.514 | 9671978.218 | 371.649 | 26 | -90 | 8 | 15 |
| DEX-CZ8883 | 416301.155 | 9671980.390 | 379.648 | 16 | -90 | 8 | 6 |
| DEX-CZ8884 | 416281.977 | 9671974.060 | 383.373 | 16 | -90 | 11 | 3 |
| DEX-CZ8885 | 416249.343 | 9671973.034 | 385.091 | 14 | -90 | 6 | 6 |
| DEX-CZ8886 | 416224.060 | 9671970.880 | 396.429 | 21 | -90 | 18.39 | 1.25 |
| DEX-CZ8887 | 416191.020 | 9671975.943 | 400.193 | 20 | -90 | 15 | 3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB2066 | 415153.022 | 9674345.155 | 449.113 | 31 | -90 | 6.23 | 23.51 |
| DEX-BB2067 | 414745.699 | 9674396.006 | 417.619 | 14 | -90 | 2 | 10 |
| DEX-BB2068 | 414847.832 | 9674399.655 | 442.740 | 43 | -90 | 33.66 | 9 |
| DEX-BB2069 | 414955.904 | 9674403.164 | 418.481 | 25 | -90 | 9.54 | 14 |
| DEX-BB2070 | 415051.501 | 9674391.347 | 430.188 | 37 | -90 | 9 | 26 |
| DEX-BB2071 | 415150.171 | 9674403.423 | 453.533 | 34 | -90 | 18.46 | 14.22 |
| DEX-BB2072 | 414690.321 | 9674455.845 | 444.039 | 30 | -90 | 22.74 | 6 |
| DEX-BB2073 | 414752.301 | 9674447.369 | 445.518 | 22 | -90 | 12.22 | 8 |
| DEX-BB2074 | 414800.878 | 9674453.070 | 444.359 | 16 | -90 | 9 | 5 |
| DEX-BB2075 | 414847.988 | 9674444.874 | 446.551 | 34 | -90 | 26.62 | 6 |
| DEX-BB2076 | 414903.847 | 9674450.575 | 426.473 | 16 | -90 | 11.23 | 2.35 |
| DEX-BB2077 | 414955.975 | 9674447.501 | 431.112 | 20 | -90 | 13 | 5 |
| DEX-BB2078 | 415000.814 | 9674455.183 | 445.090 | 10 | -90 | 5 | 3 |
| DEX-BB2079 | 415050.123 | 9674456.167 | 436.976 | 25 | -90 | 16.87 | 7.23 |
| DEX-BB2080 | 415097.485 | 9674465.308 | 432.749 | 29 | -90 | 3 | 23 |
| DEX-BB2081 | 415149.299 | 9674450.082 | 456.219 | 48 | -90 | 21.8 | 28.7 |
| DEX-BB2082 | 414752.565 | 9674502.726 | 454.152 | 35 | -90 | 24.98 | 12 |
| DEX-BB2083 | 414848.252 | 9674499.206 | 446.422 | 28 | -90 | 20.38 | 6 |
| DEX-BB2084 | 414953.698 | 9674499.028 | 449.044 | 29 | -90 | 21.8 | 6 |
| DEX-BB2085 | 415056.823 | 9674506.381 | 455.391 | 31 | -90 | 19 | 10 |
| DEX-BB2087 | 414750.732 | 9674552.797 | 454.308 | 26 | -90 | 20.44 | 4 |
| DEX-BB2088 | 414797.097 | 9674551.114 | 445.349 | 22 | -90 | 19.41 | 3 |
| DEX-BB2089 | 414848.788 | 9674550.083 | 437.354 | 22 | -90 | 16 | 4 |
| DEX-BB2090 | 414896.592 | 9674548.759 | 440.505 | 29 | -90 | 10 | 17.46 |
| DEX-BB2091 | 414946.630 | 9674548.553 | 447.336 | 25 | -90 | 15.54 | 8 |
| DEX-BB2092 | 414993.728 | 9674544.683 | 452.462 | 33 | -90 | 28.5 | 4 |
| DEX-BB2093 | 415051.607 | 9674549.175 | 458.094 | 33 | -90 | 24.79 | 8 |
| DEX-BB2094 | 415098.059 | 9674545.771 | 459.642 | 21 | -90 | 18.98 | 1 |
| DEX-BB2095 | 415150.967 | 9674546.222 | 463.645 | 32 | -90 | 21.24 | 10.94 |
| DEX-BB2097 | 415405.568 | 9674551.949 | 442.599 | 13 | -90 | 2 | 9 |
| DEX-BB2098 | 415345.251 | 9674555.693 | 456.967 | 18 | -90 | 13.43 | 3 |
| DEX-BB2099 | 414748.406 | 9674599.606 | 454.787 | 22 | -90 | 14 | 6 |
| DEX-BB2100 | 414851.013 | 9674598.988 | 430.228 | 27 | -90 | 15.3 | 10 |
| DEX-BB2101 | 414949.645 | 9674599.565 | 437.822 | 44 | -90 | 21 | 21 |
| DEX-BB2102 | 415053.669 | 9674593.040 | 449.434 | 21 | -90 | 14 | 5.26 |
| DEX-BB2103 | 415151.675 | 9674595.002 | 463.274 | 47 | -90 | 35.3 | 13 |
| DEX-BB2104 | 415354.691 | 9674595.333 | 443.596 | 26 | -90 | 15.82 | 9.19 |
| DEX-BB2105 | 414549.158 | 9674651.881 | 470.000 | 30 | -90 | 25.95 | 4.37 |
| DEX-BB2106 | 414599.883 | 9674650.520 | 470.363 | 45 | -90 | 18.83 | 26 |
| DEX-BB2107 | 414650.656 | 9674653.711 | 469.784 | 32 | -90 | 30.36 | 3 |
| DEX-BB2108 | 414700.106 | 9674653.134 | 465.329 | 27 | -90 | 20.27 | 7 |
| DEX-BB2109 | 414749.944 | 9674652.488 | 450.239 | 30 | -90 | 17.61 | 10.18 |
| DEX-BB2110 | 414800.875 | 9674649.363 | 433.743 | 30 | -90 | 17.96 | 11 |
| DEX-BB2111 | 414850.343 | 9674649.828 | 436.679 | 23 | -90 | 13 | 8 |
| DEX-BB2112 | 414900.728 | 9674650.678 | 450.079 | 28 | -90 | 17.24 | 9 |
| DEX-BB2113 | 414952.129 | 9674646.774 | 458.100 | 20 | -90 | 11 | 7 |
| DEX-BB2114 | 414996.966 | 9674651.234 | 460.766 | 38 | -90 | 13.3 | 22.26 |
| DEX-BB2115 | 415050.666 | 9674651.109 | 457.391 | 31 | -90 | 18.76 | 11 |
| DEX-BB2116 | 415103.878 | 9674650.818 | 453.916 | 39 | -90 | 32.41 | 7.74 |
| DEX-BB2117 | 415146.368 | 9674651.267 | 452.850 | 31 | -90 | 27.33 | 4 |
| DEX-BB2118 | 415404.250 | 9674651.114 | 427.299 | 22 | -90 | 12.49 | 8 |
| DEX-BB2119 | 415356.825 | 9674641.675 | 428.074 | 20 | -90 | 9.48 | 9 |
| DEX-BB2120 | 414548.683 | 9674699.530 | 466.124 | 37 | -90 | 27.3 | 11.2 |
| DEX-BB2121 | 414650.544 | 9674702.007 | 467.920 | 39 | -90 | 20.62 | 17.82 |
| DEX-BB2122 | 414748.354 | 9674700.795 | 453.434 | 20 | -90 | 11 | 7 |
| DEX-BB2123 | 414854.628 | 9674697.947 | 442.875 | 15 | -90 | 6 | 7 |
| DEX-BB2124 | 414950.185 | 9674703.578 | 468.768 | 18 | -90 | 11 | 5 |
| DEX-BB2125 | 415049.541 | 9674702.520 | 473.769 | 24 | -90 | 22.93 | 1 |
| DEX-BB2126 | 415148.863 | 9674702.825 | 455.660 | 45 | -90 | 39.69 | 7 |
| DEX-BB2127 | 415444.901 | 9674694.837 | 410.814 | 13 | -90 | 6 | 5 |
| DEX-BB2128 | 415350.835 | 9674699.336 | 420.472 | 31 | -90 | 20.51 | 10 |
| DEX-BB2129 | 414552.100 | 9674750.915 | 450.770 | 23 | -90 | 21.38 | 2 |
| DEX-BB2130 | 414602.507 | 9674745.547 | 456.397 | 40 | -90 | 42.83 | 4.29 |
| DEX-BB2131 | 414652.827 | 9674765.945 | 453.092 | 37 | -90 | 21.43 | 16.31 |
| DEX-BB2132 | 414699.402 | 9674746.591 | 457.551 | 36 | -90 | 27.13 | 11 |
| DEX-BB2133 | 414753.857 | 9674751.716 | 446.743 | 12 | -90 | 7 | 3 |
| DEX-BB2134 | 414798.633 | 9674749.026 | 429.927 | 10 | -90 | 3 | 6 |
| DEX-BB2135 | 414850.081 | 9674749.583 | 431.750 | 9 | -90 | 3 | 4 |
| DEX-BB2136 | 414898.494 | 9674748.501 | 439.638 | 16 | -90 | 2 | 12 |
| DEX-BB2137 | 414949.836 | 9674754.050 | 451.147 | 14 | -90 | 1 | 11 |
| DEX-BB2138 | 415003.528 | 9674751.446 | 471.393 | 11 | -90 | 4 | 5 |
| DEX-BB2139 | 415045.319 | 9674749.254 | 472.106 | 26 | -90 | 12 | 12.44 |
| DEX-BB2140 | 415099.991 | 9674750.908 | 463.092 | 39 | -90 | 30.02 | 10.69 |
| DEX-BB2141 | 415146.269 | 9674746.224 | 450.659 | 28 | -90 | 22.25 | 5 |
| DEX-BB2142 | 415451.818 | 9674753.181 | 416.690 | 20 | -90 | 12.5 | 6 |
| DEX-BB2143 | 415397.968 | 9674751.518 | 426.172 | 22 | -90 | 18.05 | 3 |
| DEX-BB2144 | 415350.745 | 9674751.082 | 422.469 | 20 | -90 | 13.71 | 5 |
| DEX-BB2145 | 414551.370 | 9674794.329 | 434.689 | 29 | -90 | 6 | 21.64 |
| DEX-BB2146 | 414650.595 | 9674799.510 | 442.446 | 20 | -90 | 9 | 9 |
| DEX-BB2147 | 414749.542 | 9674799.936 | 436.114 | 23 | -90 | 11.27 | 10 |
| DEX-BB2148 | 414849.026 | 9674799.620 | 426.213 | 7 | -90 | 2 | 3 |
| DEX-BB2149 | 414949.503 | 9674799.925 | 461.360 | 14 | -90 | 3 | 9 |
| DEX-BB2150 | 415049.044 | 9674800.242 | 463.470 | 25 | -90 | 17.27 | 6.35 |
| DEX-BB2151 | 415148.831 | 9674800.857 | 452.985 | 40 | -90 | 20 | 18 |
| DEX-BB2152 | 415553.204 | 9674802.148 | 398.337 | 22 | -90 | 6 | 14 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8888 | 416175.354 | 9671976.849 | 400.766 | 21 | -90 | 14 | 4 |
| DEX-CZ8889 | 416151.251 | 9671966.470 | 399.476 | 40 | -90 | 12 | 19 |
| DEX-CZ8890 | 416118.063 | 9671975.966 | 397.836 | 39 | -90 | 15 | 21.49 |
| DEX-CZ8891 | 416093.968 | 9671973.953 | 394.770 | 11 | -90 | 8 | 1 |
| DEX-CZ8892 | 416073.155 | 9671974.069 | 391.491 | 30 | -90 | 21.87 | 5 |
| DEX-CZ8893 | 416052.201 | 9671978.882 | 388.036 | 26 | -90 | 22.35 | 4 |
| DEX-CZ8894 | 416029.518 | 9671976.777 | 383.081 | 41 | -90 | 27.47 | 11 |
| DEX-CZ8895 | 416002.718 | 9671979.345 | 375.436 | 35 | -90 | 23.85 | 8 |
| DEX-CZ8896 | 415979.791 | 9671985.312 | 365.369 | 32 | -90 | 22.67 | 3 |
| DEX-CZ8897 | 415950.440 | 9671979.741 | 360.296 | 25 | -90 | 15.3 | 8 |
| DEX-CZ8898 | 415921.532 | 9671981.446 | 360.459 | 33 | -90 | 19.65 | 12 |
| DEX-CZ8899 | 415895.655 | 9671981.261 | 360.940 | 25 | -90 | 11 | 12 |
| DEX-CZ8900 | 415868.801 | 9671977.015 | 360.912 | 22 | -90 | 10 | 9 |
| DEX-CZ8901 | 415846.815 | 9671977.668 | 360.680 | 11 | -90 | 6 | 3 |
| DEX-CZ8902 | 415818.156 | 9671972.280 | 358.964 | 11 | -90 | 2 | 6 |
| DEX-CZ8903 | 415801.895 | 9671965.516 | 354.507 | 11 | -90 | 4 | 2 |
| DEX-CZ8904 | 415777.682 | 9671965.908 | 346.857 | 15 | -90 | 8 | 5 |
| DEX-CZ8905 | 415731.121 | 9671968.084 | 332.380 | 16 | -90 | 8 | 6 |
| DEX-CZ8906 | 415703.971 | 9671973.148 | 323.170 | 23 | -90 | 16 | 5 |
| DEX-CZ8907 | 415673.234 | 9671970.007 | 314.181 | 20 | -90 | 8 | 10 |
| DEX-CZ8908 | 416379.866 | 9671951.552 | 367.714 | 23 | -90 | 8 | 11 |
| DEX-CZ8909 | 416327.288 | 9671955.389 | 361.613 | 8 | -90 | 4 | 2 |
| DEX-CZ8910 | 416226.506 | 9671946.452 | 388.910 | 28 | -90 | 14.64 | 9 |
| DEX-CZ8911 | 416180.644 | 9671946.348 | 396.044 | 32 | -90 | 8 | 21.5 |
| DEX-CZ8912 | 416020.801 | 9671954.416 | 381.246 | 32 | -90 | 17.75 | 15 |
| DEX-CZ8913 | 415979.353 | 9671941.748 | 373.529 | 28 | -90 | 14 | 12 |
| DEX-CZ8914 | 415924.563 | 9671943.932 | 368.000 | 45 | -90 | 21.56 | 22.5 |
| DEX-CZ8915 | 415880.971 | 9671953.196 | 365.443 | 16 | -90 | 6 | 10 |
| DEX-CZ8916 | 415829.725 | 9671951.849 | 364.546 | 10 | -90 | 2 | 5 |
| DEX-CZ8917 | 415780.263 | 9671951.057 | 349.261 | 30 | -90 | 12 | 17.29 |
| DEX-CZ8918 | 415735.308 | 9671953.714 | 334.933 | 39 | -90 | 13 | 14 |
| DEX-CZ8919 | 415676.384 | 9671947.865 | 317.495 | 22 | -90 | 10 | 7 |
| DEX-CZ8920 | 416383.033 | 9671933.410 | 367.094 | 8 | -90 | 5 | 1 |
| DEX-CZ8921 | 416350.970 | 9671925.174 | 361.869 | 18 | -90 | 10 | 4 |
| DEX-CZ8922 | 416327.630 | 9671931.583 | 357.152 | 18 | -90 | 11 | 5 |
| DEX-CZ8923 | 416222.590 | 9671922.095 | 382.429 | 23 | -90 | 15 | 8 |
| DEX-CZ8924 | 416205.532 | 9671923.496 | 387.855 | 25 | -90 | 19 | 5 |
| DEX-CZ8925 | 416175.672 | 9671926.806 | 391.957 | 49 | -90 | 21.36 | 14.95 |
| DEX-CZ8926 | 416023.178 | 9671926.618 | 377.486 | 27 | -90 | 12 | 10 |
| DEX-CZ8927 | 415998.998 | 9671925.289 | 372.547 | 35 | -90 | 6 | 14 |
| DEX-CZ8928 | 415974.652 | 9671921.235 | 367.377 | 30 | -90 | 1 | 16 |
| DEX-CZ8929 | 415948.903 | 9671920.647 | 367.499 | 21 | -90 | 11 | 4 |
| DEX-CZ8930 | 415921.879 | 9671923.009 | 366.664 | 32 | -90 | 10 | 22 |
| DEX-CZ8931 | 415898.212 | 9671928.871 | 366.293 | 20 | -90 | 4 | 11 |
| DEX-CZ8932 | 415871.727 | 9671931.277 | 366.000 | 21 | -90 | 5 | 12 |
| DEX-CZ8933 | 415824.367 | 9671932.170 | 361.512 | 9 | -90 | 3 | 4.25 |
| DEX-CZ8934 | 415797.638 | 9671927.491 | 353.192 | 16 | -90 | 11 | 5 |
| DEX-CZ8935 | 415780.376 | 9671927.647 | 347.867 | 17 | -90 | 7 | 8.3 |
| DEX-CZ8936 | 415726.883 | 9671927.268 | 333.219 | 34 | -90 | 16 | 12 |
| DEX-CZ8937 | 415693.719 | 9671922.682 | 323.753 | 16 | -90 | 7 | 7 |
| DEX-CZ8938 | 415666.526 | 9671919.690 | 317.512 | 35 | -90 | 15 | 19.03 |
| DEX-CZ8939 | 417043.679 | 9672398.929 | 430.327 | 25 | -90 | 16 | 7 |
| DEX-CZ8940 | 417103.873 | 9672449.530 | 423.102 | 36 | -90 | 15 | 14 |
| DEX-CZ8941 | 417146.083 | 9672409.028 | 432.000 | 18 | -90 | 8 | 6 |
| DEX-CZ8942 | 416948.655 | 9672395.866 | 421.090 | 45 | -90 | 19 | 20 |
| DEX-CZ8943 | 416906.695 | 9672393.977 | 415.863 | 19 | -90 | 7 | 6 |
| DEX-CZ8944 | 416903.143 | 9672352.316 | 419.013 | 14 | -90 | 3 | 2.55 |
| DEX-CZ8945 | 416948.771 | 9672354.777 | 422.533 | 41 | -90 | 24 | 13 |
| DEX-CZ8946 | 416999.628 | 9672351.340 | 432.421 | 34 | -90 | 24 | 5 |
| DEX-CZ8947 | 417049.652 | 9672351.248 | 436.974 | 34 | -90 | 26 | 3 |
| DEX-CZ8948 | 417100.028 | 9672347.838 | 438.751 | 28 | -90 | 11 | 15 |
| DEX-CZ8949 | 417151.253 | 9672353.897 | 434.952 | 21 | -90 | 16 | 2.4 |
| DEX-CZ8950 | 416951.291 | 9672299.718 | 431.827 | 20 | -90 | 9 | 6 |
| DEX-CZ8951 | 417044.868 | 9672292.969 | 443.672 | 21 | -90 | 9 | 7 |
| DEX-CZ8952 | 417149.898 | 9672297.514 | 437.778 | 36 | -90 | 10 | 23.35 |
| DEX-CZ8953 | 416943.530 | 9672243.840 | 434.684 | 22 | -90 | 12 | 4 |
| DEX-CZ8954 | 416996.902 | 9672251.757 | 443.734 | 15 | -90 | 10 | 3 |
| DEX-CZ8955 | 417046.712 | 9672252.277 | 446.451 | 36 | -90 | 14 | 19 |
| DEX-CZ8956 | 417092.828 | 9672251.799 | 445.090 | 23 | -90 | 11 | 3 |
| DEX-CZ8957 | 417152.679 | 9672249.447 | 437.472 | 43 | -90 | 21 | 19 |
| DEX-CZ8958 | 417201.368 | 9672248.830 | 430.714 | 31 | -90 | 24 | 5 |
| DEX-CZ8959 | 417244.931 | 9672254.788 | 422.849 | 43 | -90 | 20 | 15 |
| DEX-CZ8960 | 417306.149 | 9672251.903 | 421.920 | 41 | -90 | 17 | 21.54 |
| DEX-CZ8961 | 416944.877 | 9672198.861 | 429.458 | 40 | -90 | 18 | 17 |
| DEX-CZ8962 | 417050.865 | 9672197.330 | 442.468 | 17 | -90 | 9 | 2 |
| DEX-CZ8963 | 417153.941 | 9672198.150 | 437.614 | 35 | -90 | 26 | 6 |
| DEX-CZ8964 | 417247.621 | 9672200.469 | 427.273 | 37 | -90 | 22 | 11 |
| DEX-CZ8965 | 416949.293 | 9672145.311 | 426.175 | 22 | -90 | 16 | 3.46 |
| DEX-CZ8966 | 416995.420 | 9672149.764 | 431.702 | 28 | -90 | 20 | 5 |
| DEX-CZ8967 | 417054.590 | 9672145.476 | 435.625 | 36 | -90 | 16 | 18 |
| DEX-CZ8968 | 417101.552 | 9672153.704 | 438.972 | 24 | -90 | 14 | 8 |
| DEX-CZ8969 | 417146.896 | 9672154.395 | 438.909 | 30 | -90 | 26 | 2 |
| DEX-CZ8970 | 417202.661 | 9672152.802 | 437.317 | 23 | -90 | 13 | 6 |
| DEX-CZ8971 | 417255.050 | 9672159.367 | 430.038 | 28 | -90 | 21 | 5 |
| DEX-CZ8972 | 417296.649 | 9672150.485 | 417.569 | 17 | -90 | 3 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB2153 | 415450.151 | 9674802.753 | 422.210 | 19 | -90 | 16 | 1 |
| DEX-BB2154 | 415600.982 | 9674799.562 | 406.795 | 38 | -90 | 21.5 | 16 |
| DEX-BB2155 | 415649.437 | 9674800.034 | 398.391 | 25 | -90 | 7.29 | 16.59 |
| DEX-BB2156 | 414553.112 | 9674853.522 | 420.537 | 15 | -90 | 6 | 6 |
| DEX-BB2157 | 414598.303 | 9674845.515 | 419.311 | 12 | -90 | 3 | 5.47 |
| DEX-BB2158 | 414649.680 | 9674851.904 | 429.902 | 13 | -90 | 6 | 5 |
| DEX-BB2159 | 414699.240 | 9674852.448 | 422.363 | 13 | -90 | 4 | 7 |
| DEX-BB2160 | 414750.704 | 9674848.158 | 421.918 | 16 | -90 | 4 | 10.25 |
| DEX-BB2161 | 414804.628 | 9674853.178 | 416.453 | 10 | -90 | 3 | 5 |
| DEX-BB2162 | 414851.730 | 9674853.803 | 438.152 | 18 | -90 | 4 | 12 |
| DEX-BB2163 | 414898.921 | 9674848.616 | 457.302 | 13 | -90 | 7 | 4 |
| DEX-BB2164 | 414950.114 | 9674851.117 | 464.545 | 27 | -90 | 12 | 14 |
| DEX-BB2165 | 414997.705 | 9674848.785 | 460.240 | 34 | -90 | 27.34 | 6 |
| DEX-BB2166 | 415048.341 | 9674850.290 | 457.387 | 28 | -90 | 16.44 | 10 |
| DEX-BB2167 | 415100.785 | 9674847.803 | 455.233 | 42 | -90 | 32.49 | 8.5 |
| DEX-BB2168 | 415151.334 | 9674848.285 | 456.000 | 32 | -90 | 21.73 | 9 |
| DEX-BB2169 | 415199.588 | 9674850.705 | 455.000 | 24 | -90 | 20.27 | 2 |
| DEX-BB2170 | 415248.501 | 9674850.520 | 453.077 | 42 | -90 | 25.24 | 16 |
| DEX-BB2171 | 415299.329 | 9674849.034 | 444.936 | 25 | -90 | 19.04 | 5 |
| DEX-BB2172 | 415347.656 | 9674853.171 | 435.803 | 16 | -90 | 13.41 | 1 |
| DEX-BB2173 | 415398.021 | 9674852.699 | 426.202 | 16 | -90 | 11.61 | 3 |
| DEX-BB2174 | 415448.645 | 9674849.069 | 421.120 | 40 | -90 | 12.51 | 25.31 |
| DEX-BB2175 | 415500.497 | 9674848.375 | 411.110 | 29 | -90 | 21.52 | 7 |
| DEX-BB2176 | 415545.910 | 9674852.269 | 402.592 | 23 | -90 | 17 | 5 |
| DEX-BB2177 | 415598.354 | 9674848.805 | 394.673 | 20 | -90 | 8.57 | 10 |
| DEX-BB2178 | 415650.292 | 9674852.131 | 391.614 | 15 | -90 | 8.26 | 1 |
| DEX-BB2179 | 414748.514 | 9674896.391 | 408.000 | 10 | -90 | 5 | 2 |
| DEX-BB2180 | 414844.340 | 9674899.131 | 433.328 | 22 | -90 | 4 | 16 |
| DEX-BB2181 | 414948.773 | 9674899.516 | 452.239 | 30 | -90 | 21.74 | 6.95 |
| DEX-BB2182 | 415050.945 | 9674896.180 | 447.958 | 27 | -90 | 18.85 | 7 |
| DEX-BB2183 | 415150.468 | 9674898.020 | 453.366 | 38 | -90 | 24.42 | 11 |
| DEX-BB2184 | 415250.626 | 9674898.004 | 448.477 | 41 | -90 | 32.06 | 10 |
| DEX-BB2185 | 415349.439 | 9674900.588 | 429.086 | 38 | -90 | 23.71 | 14.35 |
| DEX-BB2186 | 415401.132 | 9674899.185 | 417.614 | 29 | -90 | 17.48 | 10 |
| DEX-BB2187 | 415551.209 | 9674897.323 | 400.890 | 27 | -90 | 14.72 | 11.3 |
| DEX-BB2188 | 414651.446 | 9674949.394 | 399.495 | 13 | -90 | 3 | 8.39 |
| DEX-BB2189 | 414699.608 | 9674946.297 | 407.059 | 9 | -90 | 3 | 4 |
| DEX-BB2190 | 414750.357 | 9674950.973 | 423.178 | 11 | -90 | 1 | 8 |
| DEX-BB2191 | 414801.046 | 9674953.384 | 430.973 | 23 | -90 | 16.42 | 5 |
| DEX-BB2192 | 414848.433 | 9674949.481 | 442.767 | 24 | -90 | 8.26 | 14 |
| DEX-BB2193 | 414895.686 | 9674951.157 | 446.000 | 35 | -90 | 15.85 | 14.92 |
| DEX-BB2194 | 414950.709 | 9674951.009 | 446.288 | 31 | -90 | 22.57 | 8 |
| DEX-BB2195 | 414998.622 | 9674949.648 | 446.206 | 23 | -90 | 15.95 | 6.48 |
| DEX-BB2196 | 415049.452 | 9674948.639 | 437.265 | 25 | -90 | 13.25 | 11.28 |
| DEX-BB2197 | 415099.530 | 9674953.441 | 439.349 | 28 | -90 | 17.56 | 10 |
| DEX-BB2198 | 415148.321 | 9674942.930 | 448.412 | 39 | -90 | 28.4 | 11 |
| DEX-BB2199 | 415199.869 | 9674948.896 | 449.457 | 36 | -90 | 19.73 | 15.92 |
| DEX-BB2200 | 415249.672 | 9674949.153 | 445.756 | 34 | -90 | 21.82 | 12.94 |
| DEX-BB2201 | 415294.490 | 9674951.592 | 439.766 | 20 | -90 | 10.56 | 8 |
| DEX-BB2202 | 415350.058 | 9674949.267 | 422.915 | 20 | -90 | 15 | 3 |
| DEX-BB2203 | 414653.764 | 9674999.749 | 404.310 | 13 | -90 | 1 | 9 |
| DEX-BB2204 | 414752.156 | 9674998.861 | 431.870 | 24 | -90 | 10.31 | 11.4 |
| DEX-BB2205 | 414849.754 | 9674996.900 | 438.297 | 27 | -90 | 20 | 5 |
| DEX-BB2206 | 414950.266 | 9675000.541 | 444.188 | 25 | -90 | 15.21 | 9.71 |
| DEX-BB2207 | 415049.939 | 9674999.136 | 436.815 | 25 | -90 | 12.38 | 11 |
| DEX-BB2208 | 415144.286 | 9674992.182 | 435.481 | 29 | -90 | 26.45 | 3.29 |
| DEX-BB2209 | 415249.154 | 9675000.847 | 434.167 | 35 | -90 | 25.44 | 11 |
| DEX-BB2210 | 414652.775 | 9675051.833 | 407.256 | 10 | -90 | 2 | 3 |
| DEX-BB2211 | 414703.379 | 9675050.227 | 423.763 | 27 | -90 | 3 | 22 |
| DEX-BB2212 | 414749.113 | 9675050.434 | 427.367 | 23 | -90 | 12.67 | 9.59 |
| DEX-BB2213 | 414798.779 | 9675049.804 | 425.651 | 41 | -90 | 32.91 | 8 |
| DEX-BB2214 | 414850.280 | 9675049.609 | 431.801 | 32 | -90 | 19.03 | 13.25 |
| DEX-BB2215 | 414900.000 | 9675050.119 | 435.999 | 37 | -90 | 19.44 | 17.25 |
| DEX-BB2216 | 414950.325 | 9675046.237 | 440.951 | 21 | -90 | 15.79 | 4 |
| DEX-BB2217 | 414996.026 | 9675046.960 | 437.385 | 18 | -90 | 15.14 | 2 |
| DEX-BB2218 | 415050.237 | 9675048.340 | 430.074 | 21 | -90 | 8 | 11.47 |
| DEX-BB2219 | 415099.511 | 9675050.553 | 422.693 | 34 | -90 | 22.45 | 11.38 |
| DEX-BB2220 | 415149.219 | 9675048.798 | 421.890 | 21 | -90 | 17.24 | 3 |
| DEX-BB2221 | 415199.828 | 9675051.206 | 421.716 | 26 | -90 | 21.46 | 4 |
| DEX-BB2222 | 415250.522 | 9675050.314 | 420.893 | 17 | -90 | 13.73 | 1 |
| DEX-BB2223 | 415298.301 | 9675048.336 | 419.007 | 8 | -90 | 5.25 | 1 |
| DEX-BB2224 | 415355.110 | 9675049.479 | 415.507 | 12 | -90 | 8 | 1 |
| DEX-BB2225 | 415399.454 | 9675047.455 | 409.274 | 29 | -90 | 22.67 | 7 |
| DEX-BB2226 | 414749.452 | 9675100.461 | 420.279 | 18 | -90 | 8.32 | 8 |
| DEX-BB2227 | 414848.937 | 9675101.367 | 421.968 | 23 | -90 | 17.13 | 6 |
| DEX-BB2228 | 414950.992 | 9675099.574 | 428.491 | 15 | -90 | 6.2 | 6 |
| DEX-BB2229 | 414750.676 | 9675149.563 | 414.000 | 10 | -90 | 5 | 2 |
| DEX-BB2230 | 414798.005 | 9675151.010 | 415.076 | 15 | -90 | 5 | 9 |
| DEX-BB2231 | 414848.892 | 9675150.764 | 415.923 | 24 | -90 | 6.43 | 15.57 |
| DEX-BB2232 | 414899.607 | 9675144.614 | 419.163 | 27 | -90 | 10.79 | 15 |
| DEX-BB2233 | 414950.170 | 9675148.259 | 418.569 | 24 | -90 | 11.64 | 12 |
| DEX-BB2234 | 415699.642 | 9674802.835 | 391.886 | 17 | -90 | 4 | 11 |
| DEX-BB2235 | 415749.465 | 9674799.627 | 402.959 | 20 | -90 | 15.87 | 1 |
| DEX-BB2236 | 416050.416 | 9674799.953 | 407.479 | 36 | -90 | 18.96 | 17.2 |
| DEX-BB2237 | 415703.432 | 9674850.554 | 402.809 | 23 | -90 | 11.57 | 10 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8973 | 416698.614 | 9672346.635 | 393.052 | 22 | -90 | 8 | 10 |
| DEX-CZ8974 | 416694.016 | 9672242.956 | 389.177 | 24 | -90 | 10 | 11 |
| DEX-CZ8975 | 416748.560 | 9672299.790 | 399.633 | 35 | -90 | 20 | 12 |
| DEX-CZ8976 | 416769.624 | 9672265.853 | 400.641 | 17 | -90 | 12 | 2 |
| DEX-CZ8977 | 416751.172 | 9672347.266 | 402.933 | 50 | -90 | 24 | 23 |
| DEX-CZ8978 | 416600.283 | 9672051.987 | 421.000 | 25 | -90 | 18 | 4 |
| DEX-CZ8979 | 416646.914 | 9672099.445 | 421.344 | 16 | -90 | 6 | 6 |
| DEX-CZ8982 | 416648.217 | 9672150.583 | 410.574 | 45 | -90 | 22.73 | 13 |
| DEX-CZ8983 | 416548.799 | 9672006.691 | 418.132 | 14 | -90 | 9 | 3 |
| DEX-CZ8984 | 416647.675 | 9672247.703 | 396.523 | 25 | -90 | 14 | 7 |
| DEX-CZ8985 | 416802.233 | 9672577.504 | 429.000 | 24 | -90 | 12 | 6 |
| DEX-CZ8986 | 416773.036 | 9672573.919 | 427.548 | 22 | -90 | 6 | 14 |
| DEX-CZ8987 | 416271.522 | 9672096.420 | 420.393 | 33 | -90 | 25.27 | 8 |
| DEX-CZ8988 | 416278.401 | 9672121.457 | 419.000 | 28 | -90 | 21.23 | 6 |
| DEX-CZ8989 | 416298.855 | 9672121.519 | 418.304 | 26 | -90 | 21.1 | 4 |
| DEX-CZ8990 | 416322.334 | 9672126.176 | 418.000 | 25 | -90 | 16 | 7 |
| DEX-CZ8991 | 416322.070 | 9672102.069 | 417.001 | 24 | -90 | 18 | 4 |
| DEX-CZ8992 | 416231.456 | 9672721.929 | 370.258 | 31 | -90 | 14 | 14 |
| DEX-CZ8993 | 416244.928 | 9672734.914 | 374.113 | 34 | -90 | 22 | 6 |
| DEX-CZ8994 | 416230.727 | 9672751.616 | 374.600 | 39 | -90 | 28.61 | 9 |
| DEX-CZ8995 | 416360.845 | 9672617.409 | 392.001 | 19 | -90 | 15 | 1 |
| DEX-CZ8996 | 416352.961 | 9672572.779 | 392.791 | 33 | -90 | 27.01 | 3 |
| DEX-CZ8997 | 416499.716 | 9672720.558 | 383.467 | 37 | -90 | 18 | 13 |
| DEX-CZ8998 | 416501.114 | 9672674.168 | 392.054 | 29 | -90 | 8 | 7 |
| DEX-CZ8999 | 415450.355 | 9671830.126 | 252.628 | 17 | -90 | 7 | 6 |
| DEX-CZ9000 | 415404.349 | 9671825.371 | 241.980 | 14 | -90 | 3 | 0 |
| DEX-CZ9001 | 415536.074 | 9671827.232 | 263.144 | 14 | -90 | 6 | 2 |
| DEX-CZ9002 | 415606.623 | 9671828.271 | 294.233 | 24 | -90 | 15 | 4 |
| DEX-CZ9003 | 415599.239 | 9671875.452 | 295.331 | 16 | -90 | 4 | 10 |
| DEX-CZ9004 | 415565.911 | 9671874.747 | 285.134 | 20 | -90 | 2 | 8 |
| DEX-CZ9005 | 415501.123 | 9671876.437 | 260.583 | 16 | -90 | 6 | 4 |
| DEX-CZ9006 | 415458.701 | 9671879.073 | 256.279 | 18 | -90 | 3 | 3 |
| DEX-CZ9007 | 415411.989 | 9671884.777 | 251.253 | 12 | -90 | 7 | 3 |
| DEX-CZ9043 | 417501.514 | 9673398.741 | 401.571 | 14 | -90 | 11 | 1.23 |
| DEX-CZ9044 | 417551.419 | 9673399.375 | 397.383 | 18 | -90 | 8 | 8 |
| DEX-CZ9045 | 417501.185 | 9673348.427 | 412.819 | 32 | -90 | 10 | 13 |
| DEX-CZ9046 | 417499.717 | 9673308.224 | 416.018 | 10 | -90 | 6 | 1 |
| DEX-CZ9047 | 417540.927 | 9673300.826 | 421.054 | 14 | -90 | 4 | 7 |
| DEX-CZ9048 | 417883.106 | 9673948.745 | 337.649 | 9 | -90 | 3 | 4 |
| DEX-CZ9049 | 417913.457 | 9673949.402 | 348.531 | 35 | -90 | 2 | 27 |
| DEX-CZ9050 | 417935.622 | 9673944.941 | 350.010 | 37 | -90 | 9.94 | 28.28 |
| DEX-CZ9051 | 417955.478 | 9673947.218 | 355.430 | 18 | -90 | 5 | 9 |
| DEX-CZ9052 | 417903.755 | 9673929.581 | 339.000 | 35 | -90 | 14 | 18.65 |
| DEX-CZ9053 | 417926.044 | 9673922.469 | 340.000 | 30 | -90 | 26 | 3.65 |
| DEX-CZ9054 | 417954.999 | 9673931.460 | 348.971 | 17 | -90 | 8 | 4.66 |
| DEX-CZ9055 | 417924.574 | 9673898.895 | 344.366 | 49 | -90 | 43 | 0 |
| DEX-CZ9056 | 417947.524 | 9673899.290 | 344.704 | 34 | -90 | 22.04 | 13 |
| DEX-CZ9057 | 417905.242 | 9673870.714 | 345.642 | 46 | -90 | 43 | 1 |
| DEX-CZ9058 | 417927.645 | 9673876.240 | 345.555 | 52 | -90 | 48 | 2 |
| DEX-CZ9059 | 417950.313 | 9673878.852 | 346.000 | 52 | -90 | 47 | 3 |
| DEX-CZ9060 | 417903.228 | 9673849.670 | 346.104 | 60 | -90 | 60.22 | 0 |
| DEX-CZ9061 | 417928.099 | 9673845.770 | 346.285 | 60 | -90 | 60.27 | 0 |
| DEX-CZ9062 | 417952.660 | 9673848.771 | 346.690 | 48 | -90 | 40 | 6 |
| DEX-CZ9063 | 417901.647 | 9673826.568 | 348.614 | 42 | -90 | 39.29 | 1 |
| DEX-CZ9064 | 417930.440 | 9673827.275 | 347.000 | 48 | -90 | 46.9 | 0 |
| DEX-CZ9065 | 417954.221 | 9673822.193 | 347.236 | 60 | -90 | 60.3 | 0 |
| DEX-CZ9066 | 417852.609 | 9673797.891 | 357.945 | 30 | -90 | 6 | 20 |
| DEX-CZ9067 | 417880.555 | 9673802.021 | 353.835 | 14 | -90 | 10 | 2 |
| DEX-CZ9068 | 418469.919 | 9674254.681 | 340.327 | 25 | -90 | 20 | 3 |
| DEX-CZ9069 | 418473.806 | 9674271.984 | 337.549 | 32 | -90 | 19 | 11 |
| DEX-CZ9070 | 418474.368 | 9674298.342 | 329.308 | 23 | -90 | 13 | 9 |
| DEX-CZ9071 | 418503.047 | 9674295.453 | 316.919 | 10 | -90 | 3 | 5 |
| DEX-CZ9072 | 418497.890 | 9674279.187 | 325.146 | 8 | -90 | 3 | 3 |
| DEX-CZ9073 | 418494.697 | 9674248.780 | 329.345 | 21 | -90 | 13 | 6 |
| DEX-CZ9074 | 418528.064 | 9674295.550 | 301.418 | 5 | -90 | 3 | 0 |
| DEX-CZ9075 | 418524.172 | 9674272.437 | 310.000 | 11 | -90 | 2 | 7 |
| DEX-CZ9076 | 418521.685 | 9674250.016 | 315.000 | 12 | -90 | 8 | 2 |
| DEX-CZ9135 | 417371.820 | 9673493.674 | 368.377 | 32 | -90 | 15 | 16 |
| DEX-CZ9136 | 417395.294 | 9673497.291 | 367.479 | 34 | -90 | 25.34 | 8 |
| DEX-CZ9137 | 417421.146 | 9673492.716 | 370.597 | 32 | -90 | 19 | 11 |
| DEX-CZ9138 | 417449.271 | 9673488.617 | 372.879 | 24 | -90 | 21 | 1 |
| DEX-CZ9139 | 417342.281 | 9673474.398 | 373.433 | 35 | -90 | 25 | 9.35 |
| DEX-CZ9140 | 417371.891 | 9673474.755 | 372.600 | 29 | -90 | 21.74 | 6 |
| DEX-CZ9141 | 417396.553 | 9673474.060 | 375.091 | 33 | -90 | 23.6 | 9 |
| DEX-CZ9142 | 417416.535 | 9673476.954 | 375.067 | 30 | -90 | 21 | 6 |
| DEX-CZ9143 | 417448.362 | 9673472.538 | 377.455 | 34 | -90 | 24 | 8 |
| DEX-CZ9144 | 417470.189 | 9673474.346 | 377.165 | 29 | -90 | 14 | 12 |
| DEX-CZ9145 | 417371.023 | 9673445.662 | 381.582 | 31 | -90 | 19 | 10 |
| DEX-CZ9146 | 417419.490 | 9673449.257 | 383.512 | 24 | -90 | 13 | 9 |
| DEX-CZ9147 | 417476.427 | 9673450.756 | 385.457 | 31 | -90 | 25 | 4 |
| DEX-CZ9148 | 417320.250 | 9673424.210 | 384.236 | 22 | -90 | 18 | 2 |
| DEX-CZ9149 | 417346.461 | 9673420.199 | 387.894 | 38 | -90 | 20.5 | 10 |
| DEX-CZ9150 | 417441.599 | 9673425.253 | 392.176 | 12 | -90 | 8 | 2 |
| DEX-CZ9151 | 417474.440 | 9673422.691 | 394.235 | 20 | -90 | 13 | 0 |
| DEX-CZ9152 | 417498.036 | 9673419.965 | 396.330 | 20 | -90 | 12 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB2238 | 415748.273 | 9674849.109 | 406.806 | 17 | -90 | 12.56 | 3 |
| DEX-BB2239 | 415803.888 | 9674850.300 | 400.579 | 21 | -90 | 14.24 | 5 |
| DEX-BB2241 | 415953.684 | 9674855.830 | 410.686 | 21 | -90 | 15.81 | 4 |
| DEX-BB2242 | 415996.583 | 9674850.765 | 410.144 | 34 | -90 | 28 | 4 |
| DEX-BB2243 | 415652.763 | 9674901.512 | 405.944 | 29 | -90 | 11.53 | 16.61 |
| DEX-BB2244 | 415749.883 | 9674899.767 | 410.371 | 26 | -90 | 14.48 | 10 |
| DEX-BB2245 | 415850.411 | 9674901.340 | 404.461 | 25 | -90 | 18.72 | 5 |
| DEX-BB2246 | 415954.632 | 9674901.335 | 415.559 | 31 | -90 | 19 | 10 |
| DEX-BB2247 | 415650.380 | 9674950.738 | 407.024 | 36 | -90 | 11.5 | 23 |
| DEX-BB2248 | 415700.828 | 9674948.330 | 414.379 | 34 | -90 | 14.83 | 18.75 |
| DEX-BB2249 | 415750.947 | 9674951.003 | 417.072 | 22 | -90 | 8.18 | 14 |
| DEX-BB2250 | 415799.110 | 9674951.607 | 416.579 | 27 | -90 | 24.29 | 2 |
| DEX-BB2251 | 415849.749 | 9674950.461 | 409.683 | 33 | -90 | 8 | 23 |
| DEX-BB2252 | 415901.225 | 9674949.749 | 419.410 | 22 | -90 | 14 | 6 |
| DEX-BB2253 | 415949.341 | 9674949.737 | 423.107 | 14 | -90 | 10 | 2 |
| DEX-BB2254 | 415652.074 | 9674999.638 | 418.551 | 28 | -90 | 15.57 | 11 |
| DEX-BB2255 | 415749.515 | 9674998.550 | 426.306 | 35 | -90 | 15.48 | 18.28 |
| DEX-BB2256 | 415850.389 | 9675001.666 | 418.050 | 22 | -90 | 7 | 13 |
| DEX-BB4076 | 416492.845 | 9674422.224 | 386.000 | 35 | -90 | 27.58 | 9 |
| DEX-BB4077 | 416365.668 | 9674425.895 | 393.136 | 14 | -90 | 10.36 | 2 |
| DEX-BB4078 | 416297.947 | 9674430.176 | 387.463 | 14 | -90 | 5 | 6.72 |
| DEX-BB4079 | 416199.836 | 9674626.237 | 401.049 | 26 | -90 | 11.75 | 13.24 |
| DEX-BB4080 | 415499.859 | 9674822.677 | 413.715 | 34 | -90 | 16.41 | 17 |
| DEX-BB4081 | 415451.322 | 9674728.078 | 408.395 | 29 | -90 | 5.27 | 22 |
| DEX-BB4082 | 415250.545 | 9674926.367 | 448.337 | 30 | -90 | 20.91 | 10 |
| DEX-BB4083 | 415247.275 | 9674825.721 | 453.436 | 48 | -90 | 25.58 | 22.9 |
| DEX-BB4084 | 415203.790 | 9674921.040 | 451.257 | 44 | -90 | 22.88 | 20.5 |
| DEX-BB4085 | 415148.163 | 9674570.391 | 463.622 | 22 | -90 | 15.46 | 5.23 |
| DEX-BB4086 | 415151.691 | 9674823.575 | 456.007 | 38 | -90 | 27 | 9 |
| DEX-BB4087 | 415153.812 | 9674530.807 | 460.748 | 38 | -90 | 13.22 | 23 |
| DEX-BB4088 | 415151.052 | 9674874.404 | 455.019 | 46 | -90 | 20.26 | 24.32 |
| DEX-BB4089 | 415149.287 | 9674779.416 | 455.319 | 35 | -90 | 26.12 | 9 |
| DEX-BB4090 | 415147.255 | 9674922.657 | 450.863 | 42 | -90 | 28.43 | 15 |
| DEX-BB4091 | 415142.611 | 9674969.592 | 442.314 | 30 | -90 | 19.49 | 9 |
| DEX-BB4092 | 415101.151 | 9674820.575 | 457.221 | 43 | -90 | 18.25 | 23.2 |
| DEX-BB4093 | 415098.434 | 9675026.361 | 424.697 | 31 | -90 | 16.27 | 13 |
| DEX-BB4094 | 415093.426 | 9674519.769 | 453.556 | 26 | -90 | 16.58 | 8 |
| DEX-BB4095 | 415102.713 | 9674439.211 | 437.177 | 18 | -90 | 11.71 | 4.56 |
| DEX-BB4096 | 415059.230 | 9674325.700 | 426.058 | 15 | -90 | 4 | 9 |
| DEX-BB4097 | 415050.794 | 9674434.762 | 425.909 | 24 | -90 | 5 | 12.45 |
| DEX-BB4098 | 415008.981 | 9674722.961 | 476.086 | 11 | -90 | 8.7 | 1 |
| DEX-BB4099 | 414995.829 | 9674625.554 | 448.439 | 28 | -90 | 15.6 | 11 |
| DEX-BB4100 | 414949.257 | 9674829.786 | 467.000 | 17 | -90 | 11 | 4 |
| DEX-BB4101 | 414898.998 | 9674632.755 | 443.752 | 37 | -90 | 24.31 | 12.54 |
| DEX-BB4102 | 414856.796 | 9674573.334 | 432.684 | 35 | -90 | 17.97 | 16 |
| DEX-BB4103 | 414843.639 | 9674877.298 | 430.410 | 24 | -90 | 7 | 15 |
| DEX-BB4104 | 414803.200 | 9674627.237 | 435.649 | 23 | -90 | 15 | 6 |
| DEX-BB4105 | 416495.456 | 9674469.792 | 397.814 | 45 | -90 | 24.17 | 20 |
| DEX-BB4106 | 416436.489 | 9674424.231 | 391.422 | 31 | -90 | 31.4 | 3 |
| DEX-BB4107 | 416407.532 | 9674470.933 | 398.686 | 18 | -90 | 15 | 1 |
| DEX-BB4108 | 416370.440 | 9674475.082 | 396.738 | 27 | -90 | 27.37 | 1 |
| DEX-BB4109 | 416353.675 | 9674514.322 | 389.408 | 15 | -90 | 11.32 | 2 |
| DEX-BB4110 | 416205.002 | 9674562.511 | 409.000 | 28 | -90 | 15 | 11 |
| DEX-BB4111 | 416202.884 | 9674673.804 | 406.746 | 22 | -90 | 20.59 | 3.71 |
| DEX-BB4112 | 415449.601 | 9674777.703 | 419.816 | 55 | -90 | 16.63 | 37.8 |
| DEX-BB4113 | 415450.028 | 9674827.732 | 421.790 | 49 | -90 | 13.96 | 33.7 |
| DEX-BB4114 | 415448.242 | 9674875.010 | 418.820 | 30 | -90 | 11.57 | 18 |
| DEX-BB4115 | 415253.454 | 9674974.671 | 440.480 | 34 | -90 | 19.28 | 14 |
| DEX-BB4116 | 415247.313 | 9675028.190 | 426.579 | 13 | -90 | 9.2 | 0.8 |
| DEX-BB4117 | 415245.493 | 9674874.952 | 451.653 | 33 | -90 | 28.21 | 4.35 |
| DEX-BB4118 | 415197.698 | 9674972.340 | 444.556 | 32 | -90 | 24.66 | 8 |
| DEX-BB4119 | 415198.748 | 9674875.087 | 455.000 | 39 | -90 | 33.82 | 1 |
| DEX-BB4120 | 415156.149 | 9674614.755 | 461.273 | 33 | -90 | 28.25 | 2 |
| DEX-BB4121 | 415149.293 | 9674425.526 | 446.240 | 24 | -90 | 8.23 | 14 |
| DEX-BB4122 | 415152.286 | 9674484.530 | 454.680 | 31 | -90 | 16.6 | 13.5 |
| DEX-BB4123 | 415146.216 | 9674729.053 | 450.864 | 29 | -90 | 23 | 4 |
| DEX-BB4124 | 415141.850 | 9674672.272 | 452.159 | 46 | -90 | 45.22 | 2 |
| DEX-BB4125 | 415142.612 | 9675011.447 | 429.843 | 26 | -90 | 17 | 7 |
| DEX-BB4126 | 415108.295 | 9674368.245 | 435.345 | 43 | -90 | 5 | 36 |
| DEX-BB4127 | 415104.378 | 9674678.581 | 462.212 | 37 | -90 | 19.13 | 17 |
| DEX-BB4128 | 415095.691 | 9674876.645 | 451.948 | 40 | -90 | 25.52 | 13 |
| DEX-BB4129 | 415094.977 | 9674770.211 | 462.520 | 44 | -90 | 34.59 | 10 |
| DEX-BB4130 | 415095.753 | 9674573.753 | 459.684 | 38 | -90 | 34.38 | 3.65 |
| DEX-BB4131 | 415059.450 | 9674533.614 | 459.223 | 38 | -90 | 23.36 | 14 |
| DEX-BB4132 | 415059.906 | 9674373.641 | 436.466 | 41 | -90 | 12.19 | 27 |
| DEX-BB4133 | 415055.998 | 9674622.887 | 448.235 | 35 | -90 | 29.12 | 5 |
| DEX-BB4134 | 415052.651 | 9674578.223 | 452.590 | 28 | -90 | 21.28 | 6 |
| DEX-BB4135 | 415046.521 | 9674416.256 | 420.993 | 20 | -90 | 11 | 7 |
| DEX-BB4136 | 415047.166 | 9674681.505 | 469.743 | 36 | -90 | 31.77 | 6 |
| DEX-BB4137 | 415047.656 | 9674486.964 | 451.436 | 35 | -90 | 32.59 | 2 |
| DEX-BB4138 | 415046.304 | 9674729.835 | 474.890 | 26 | -90 | 12.59 | 12 |
| DEX-BB4139 | 415039.245 | 9674767.822 | 469.886 | 22 | -90 | 17.59 | 4 |
| DEX-BB4140 | 414998.811 | 9674676.756 | 471.098 | 34 | -90 | 22.25 | 12 |
| DEX-BB4141 | 414951.669 | 9674672.119 | 466.196 | 14 | -90 | 9.22 | 3 |
| DEX-BB4142 | 414952.687 | 9674725.839 | 460.154 | 19 | -90 | 4 | 13 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9153 | 417319.007 | 9673397.140 | 392.277 | 21 | -90 | 18 | 0.46 |
| DEX-CZ9154 | 417473.196 | 9673400.667 | 402.366 | 16 | -90 | 5 | 7 |
| DEX-CZ9155 | 417219.855 | 9673375.487 | 391.433 | 21 | -90 | 16.61 | 3 |
| DEX-CZ9156 | 417246.203 | 9673374.145 | 391.927 | 15 | -90 | 10 | 2 |
| DEX-CZ9157 | 417270.101 | 9673374.161 | 393.123 | 24 | -90 | 23.97 | 0 |
| DEX-CZ9158 | 417298.185 | 9673371.380 | 394.935 | 27 | -90 | 10.36 | 10 |
| DEX-CZ9159 | 417324.502 | 9673369.467 | 399.307 | 25 | -90 | 13.35 | 9 |
| DEX-CZ9160 | 417443.885 | 9673371.894 | 408.662 | 16 | -90 | 13 | 1 |
| DEX-CZ9161 | 417349.569 | 9673370.730 | 402.799 | 28 | -90 | 19 | 6.6 |
| DEX-CZ9162 | 417475.063 | 9673375.618 | 409.432 | 24 | -90 | 9 | 6 |
| DEX-CZ9163 | 417497.196 | 9673373.658 | 408.028 | 35 | -90 | 4 | 27 |
| DEX-CZ9164 | 417221.049 | 9673346.923 | 397.000 | 21 | -90 | 16.48 | 3 |
| DEX-CZ9165 | 417274.863 | 9673350.016 | 399.520 | 49 | -90 | 47.39 | 7 |
| DEX-CZ9166 | 417321.657 | 9673342.451 | 404.967 | 31 | -90 | 16.34 | 9 |
| DEX-CZ9167 | 417218.534 | 9673322.493 | 396.005 | 27 | -90 | 20.19 | 5.8 |
| DEX-CZ9168 | 417242.952 | 9673323.502 | 398.547 | 28 | -90 | 19.64 | 5.46 |
| DEX-CZ9169 | 417269.395 | 9673323.956 | 402.190 | 37 | -90 | 32.66 | 6 |
| DEX-CZ9170 | 417292.550 | 9673321.290 | 404.751 | 27 | -90 | 13.43 | 3 |
| DEX-CZ9171 | 417121.815 | 9673416.814 | 371.773 | 14 | -90 | 8 | 4 |
| DEX-CZ9172 | 417321.994 | 9673319.175 | 407.975 | 27 | -90 | 15.3 | 10.54 |
| DEX-CZ9173 | 417141.337 | 9673418.045 | 374.222 | 11 | -90 | 8 | 0 |
| DEX-CZ9174 | 417121.927 | 9673398.177 | 375.403 | 13 | -90 | 6 | 5 |
| DEX-CZ9175 | 417169.921 | 9673424.214 | 373.991 | 11 | -90 | 8 | 0 |
| DEX-CZ9176 | 417172.858 | 9673397.872 | 381.273 | 14 | -90 | 7 | 5 |
| DEX-CZ9177 | 417069.082 | 9673350.094 | 364.051 | 11 | -90 | 6 | 2 |
| DEX-CZ9178 | 417120.983 | 9673374.527 | 379.716 | 16 | -90 | 6 | 8 |
| DEX-CZ9179 | 417145.171 | 9673375.445 | 385.019 | 19 | -90 | 10 | 3 |
| DEX-CZ9180 | 417170.030 | 9673373.673 | 388.375 | 15 | -90 | 11 | 1 |
| DEX-CZ9181 | 417126.418 | 9673350.432 | 385.298 | 11 | -90 | 7 | 2 |
| DEX-CZ9182 | 417174.746 | 9673344.248 | 394.698 | 20 | -90 | 15 | 2 |
| DEX-CZ9183 | 417071.862 | 9673328.599 | 370.159 | 12 | -90 | 4 | 3 |
| DEX-CZ9184 | 417094.228 | 9673327.056 | 377.522 | 13 | -90 | 5 | 4 |
| DEX-CZ9185 | 417072.856 | 9673302.018 | 367.826 | 12 | -90 | 3.52 | 1.48 |
| DEX-CZ9186 | 417074.000 | 9673280.598 | 358.532 | 9 | -90 | 1.68 | 3.32 |
| DEX-CZ9187 | 417117.029 | 9673275.190 | 378.415 | 19 | -90 | 15.4 | 2.15 |
| DEX-CZ9188 | 417146.460 | 9673280.001 | 383.173 | 15 | -90 | 11.7 | 1.3 |
| DEX-CZ9189 | 417171.189 | 9673280.503 | 381.000 | 14 | -90 | 8 | 3 |
| DEX-CZ9190 | 417196.551 | 9673270.397 | 386.281 | 27 | -90 | 15 | 10 |
| DEX-CZ9191 | 417099.130 | 9673274.319 | 369.913 | 12 | -90 | 7 | 1 |
| DEX-CZ9192 | 417073.807 | 9673247.480 | 355.152 | 12 | -90 | 2 | 8 |
| DEX-CZ9193 | 417121.599 | 9673256.775 | 375.426 | 25 | -90 | 21.65 | 2.45 |
| DEX-CZ9194 | 417173.118 | 9673250.205 | 379.372 | 30 | -90 | 15.78 | 12.45 |
| DEX-CZ9195 | 417322.254 | 9673463.926 | 372.846 | 18 | -90 | 10 | 6 |
| DEX-CZ9196 | 417496.820 | 9673468.415 | 381.174 | 30 | -90 | 22 | 6 |
| DEX-CZ9197 | 417518.987 | 9673471.406 | 377.816 | 23 | -90 | 7 | 15 |
| DEX-CZ9198 | 417272.871 | 9673447.796 | 372.543 | 21 | -90 | 18 | 1 |
| DEX-CZ9199 | 417322.871 | 9673438.192 | 379.280 | 25 | -90 | 16 | 7 |
| DEX-CZ9200 | 417497.698 | 9673444.807 | 388.895 | 32 | -90 | 23 | 7 |
| DEX-CZ9201 | 417574.332 | 9673439.797 | 383.263 | 18 | -90 | 11 | 4 |
| DEX-CZ9202 | 417222.502 | 9673423.304 | 374.111 | 26 | -90 | 12.26 | 8.27 |
| DEX-CZ9203 | 417248.085 | 9673425.854 | 373.221 | 33 | -90 | 15.3 | 13 |
| DEX-CZ9204 | 417272.699 | 9673424.744 | 377.408 | 30 | -90 | 28.56 | 2 |
| DEX-CZ9205 | 417298.377 | 9673423.491 | 381.847 | 35 | -90 | 29.12 | 6 |
| DEX-CZ9206 | 417375.037 | 9673422.116 | 389.330 | 38 | -90 | 29.7 | 7 |
| DEX-CZ9207 | 417397.407 | 9673426.569 | 388.644 | 42 | -90 | 33 | 4 |
| DEX-CZ9208 | 417417.545 | 9673423.420 | 392.012 | 27 | -90 | 20 | 5 |
| DEX-CZ9209 | 417521.102 | 9673426.461 | 392.374 | 22 | -90 | 5 | 9 |
| DEX-CZ9210 | 417544.760 | 9673422.858 | 392.844 | 8 | -90 | 4 | 2 |
| DEX-CZ9211 | 417568.423 | 9673424.876 | 389.177 | 13 | -90 | 3 | 8 |
| DEX-CZ9212 | 417597.761 | 9673428.295 | 380.489 | 24 | -90 | 19 | 2 |
| DEX-CZ9213 | 417614.613 | 9673418.338 | 378.358 | 41 | -90 | 8 | 22 |
| DEX-CZ9214 | 417269.816 | 9673400.877 | 383.127 | 20 | -90 | 16.72 | 1 |
| DEX-CZ9215 | 417369.413 | 9673397.553 | 397.028 | 37 | -90 | 30.66 | 4 |
| DEX-CZ9216 | 417421.169 | 9673398.061 | 399.728 | 23 | -90 | 14 | 5 |
| DEX-CZ9217 | 417525.890 | 9673398.123 | 399.354 | 22 | -90 | 7 | 10 |
| DEX-CZ9218 | 417573.216 | 9673396.174 | 393.122 | 36 | -90 | 10 | 21.61 |
| DEX-CZ9219 | 417622.946 | 9673398.060 | 380.618 | 44 | -90 | 26 | 9 |
| DEX-CZ9220 | 417195.840 | 9673376.161 | 389.618 | 20 | -90 | 5 | 8 |
| DEX-CZ9221 | 417369.776 | 9673374.091 | 403.079 | 30 | -90 | 28.46 | 1 |
| DEX-CZ9222 | 417404.339 | 9673374.884 | 404.924 | 31 | -90 | 19 | 3 |
| DEX-CZ9223 | 417422.998 | 9673372.065 | 407.292 | 36 | -90 | 26.41 | 7.41 |
| DEX-CZ9224 | 417521.113 | 9673375.706 | 404.764 | 24 | -90 | 4 | 14 |
| DEX-CZ9225 | 417548.949 | 9673375.799 | 401.689 | 29 | -90 | 10 | 6 |
| DEX-CZ9226 | 417572.380 | 9673371.560 | 397.244 | 33 | -90 | 16 | 15 |
| DEX-CZ9227 | 417595.642 | 9673372.593 | 393.445 | 24 | -90 | 8 | 11.45 |
| DEX-CZ9228 | 417622.892 | 9673374.614 | 387.345 | 47 | -90 | 25 | 12 |
| DEX-CZ9229 | 417382.940 | 9673362.249 | 407.346 | 26 | -90 | 21.1 | 2 |
| DEX-CZ9230 | 417424.422 | 9673350.281 | 412.263 | 21 | -90 | 16 | 3 |
| DEX-CZ9231 | 417471.434 | 9673352.663 | 413.841 | 29 | -90 | 11 | 10 |
| DEX-CZ9232 | 417522.730 | 9673349.260 | 410.826 | 22 | -90 | 13 | 5 |
| DEX-CZ9233 | 417570.565 | 9673347.325 | 403.428 | 17 | -90 | 9 | 4.53 |
| DEX-CZ9234 | 417623.287 | 9673346.776 | 392.840 | 44 | -90 | 9 | 10 |
| DEX-CZ9235 | 417125.933 | 9673326.482 | 386.945 | 14 | -90 | 8 | 3 |
| DEX-CZ9236 | 417146.918 | 9673324.492 | 391.289 | 21 | -90 | 17.32 | 2 |
| DEX-CZ9237 | 417174.658 | 9673326.352 | 395.000 | 16 | -90 | 11.86 | 1 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4143 | 414948.332 | 9674873.902 | 459.189 | 27 | -90 | 14.15 | 11 |
| DEX-BB4144 | 414947.746 | 9674622.163 | 445.462 | 36 | -90 | 20 | 14 |
| DEX-BB4145 | 414910.133 | 9674675.446 | 458.648 | 22 | -90 | 13.45 | 7 |
| DEX-BB4146 | 414897.883 | 9674575.356 | 437.120 | 25 | -90 | 16 | 7 |
| DEX-BB4147 | 414848.751 | 9674922.570 | 440.053 | 23 | -90 | 10.15 | 11 |
| DEX-BB4148 | 414794.629 | 9674668.943 | 435.808 | 19 | -90 | 7 | 10 |
| DEX-BB4149 | 416468.938 | 9674447.542 | 387.015 | 47 | -90 | 35.06 | 16 |
| DEX-BB4151 | 416382.042 | 9674450.190 | 396.955 | 21 | -90 | 13.93 | 5 |
| DEX-BB4152 | 416340.500 | 9674448.414 | 385.363 | 15 | -90 | 10.66 | 3 |
| DEX-BB4153 | 416175.954 | 9674651.809 | 405.463 | 41 | -90 | 27.26 | 15 |
| DEX-BB4154 | 415528.889 | 9674802.750 | 402.564 | 25 | -90 | 18 | 5 |
| DEX-BB4155 | 415474.451 | 9674848.895 | 417.251 | 27 | -90 | 9.07 | 17.35 |
| DEX-BB4156 | 415426.335 | 9674753.171 | 422.392 | 28 | -90 | 15 | 10.5 |
| DEX-BB4157 | 415424.253 | 9674803.064 | 424.775 | 39 | -90 | 19.13 | 20.28 |
| DEX-BB4158 | 415424.390 | 9674850.304 | 423.442 | 44 | -90 | 13.26 | 30 |
| DEX-BB4160 | 415224.611 | 9675005.026 | 432.697 | 29 | -90 | 27.98 | 1 |
| DEX-BB4161 | 415127.126 | 9674597.168 | 460.138 | 37 | -90 | 17.62 | 18.27 |
| DEX-BB4162 | 415126.388 | 9674846.698 | 455.700 | 40 | -90 | 31.95 | 9 |
| DEX-BB4163 | 415130.277 | 9674544.505 | 461.156 | 40 | -90 | 22.94 | 16 |
| DEX-BB4164 | 415135.770 | 9674896.211 | 452.215 | 39 | -90 | 26.95 | 11 |
| DEX-BB4165 | 415123.475 | 9674401.502 | 447.000 | 41 | -90 | 22.08 | 18 |
| DEX-BB4166 | 415130.964 | 9674446.039 | 451.635 | 41 | -90 | 16.69 | 23 |
| DEX-BB4167 | 415121.836 | 9674700.526 | 458.681 | 29 | -90 | 18 | 9 |
| DEX-BB4168 | 415126.269 | 9674803.671 | 456.548 | 41 | -90 | 23.9 | 17.26 |
| DEX-BB4169 | 415124.728 | 9674945.999 | 444.984 | 32 | -90 | 23.46 | 8 |
| DEX-BB4170 | 415122.877 | 9674743.053 | 458.487 | 42 | -90 | 40.95 | 1 |
| DEX-BB4171 | 415113.569 | 9674990.679 | 433.102 | 31 | -90 | 21.37 | 7 |
| DEX-BB4172 | 415081.030 | 9674655.819 | 457.891 | 42 | -90 | 31.68 | 10 |
| DEX-BB4173 | 415072.679 | 9674752.331 | 466.648 | 25 | -90 | 20.29 | 2.6 |
| DEX-BB4174 | 415074.016 | 9674547.551 | 460.000 | 32 | -90 | 20.77 | 10 |
| DEX-BB4175 | 415075.324 | 9674469.349 | 436.740 | 13 | -90 | 3 | 8 |
| DEX-BB4176 | 415035.202 | 9674507.556 | 454.477 | 22 | -90 | 15 | 5 |
| DEX-BB4177 | 415030.977 | 9674354.655 | 426.616 | 43 | -90 | 35.57 | 7 |
| DEX-BB4178 | 415030.808 | 9674591.888 | 445.526 | 27 | -90 | 16.33 | 10 |
| DEX-BB4179 | 415028.598 | 9674650.617 | 458.469 | 38 | -90 | 23.51 | 13.5 |
| DEX-BB4180 | 415022.139 | 9674706.651 | 478.000 | 24 | -90 | 23.63 | 1 |
| DEX-BB4181 | 414972.707 | 9674651.005 | 460.169 | 42 | -90 | 16 | 24 |
| DEX-BB4182 | 414927.390 | 9674843.109 | 465.534 | 19 | -90 | 11.5 | 6 |
| DEX-BB4183 | 414926.245 | 9674599.590 | 436.472 | 38 | -90 | 29.37 | 8 |
| DEX-BB4184 | 414879.590 | 9674652.553 | 445.883 | 30 | -90 | 18.33 | 12.39 |
| DEX-BB4185 | 414822.525 | 9674593.145 | 434.746 | 26 | -90 | 14 | 10 |
| DEX-BB4186 | 414820.528 | 9674901.821 | 430.392 | 17 | -90 | 10.19 | 5 |
| DEX-BB4187 | 414772.181 | 9674653.678 | 443.847 | 34 | -90 | 20.76 | 12.57 |
| DEX-BB4188 | 416382.249 | 9674423.293 | 395.000 | 24 | -90 | 21.22 | 2 |
| DEX-BB4189 | 416344.372 | 9674422.594 | 387.152 | 23 | -90 | 17.38 | 5 |
| DEX-BB4190 | 416270.303 | 9674437.626 | 381.998 | 10 | -90 | 6 | 2 |
| DEX-BB4191 | 415527.857 | 9674778.629 | 399.543 | 17 | -90 | 14.19 | 1.5 |
| DEX-BB4192 | 415424.633 | 9674729.534 | 414.461 | 21 | -90 | 5 | 14.5 |
| DEX-BB4194 | 415125.775 | 9674569.173 | 461.522 | 33 | -90 | 28.33 | 4 |
| DEX-BB4195 | 415129.900 | 9674524.087 | 452.038 | 52 | -90 | 37.56 | 15 |
| DEX-BB4196 | 415122.594 | 9674871.009 | 454.002 | 39 | -90 | 23.43 | 14 |
| DEX-BB4197 | 415122.456 | 9674380.560 | 439.130 | 29 | -90 | 16.47 | 11 |
| DEX-BB4198 | 415125.120 | 9674779.623 | 457.225 | 39 | -90 | 28 | 12 |
| DEX-BB4199 | 415124.776 | 9674927.252 | 446.754 | 34 | -90 | 20.74 | 12 |
| DEX-BB4200 | 415127.582 | 9674968.475 | 441.088 | 41 | -90 | 22.22 | 14 |
| DEX-BB4201 | 415074.038 | 9675019.820 | 428.496 | 33 | -90 | 17 | 14 |
| DEX-BB4202 | 415069.974 | 9674523.942 | 458.518 | 30 | -90 | 18.09 | 11.04 |
| DEX-BB4203 | 415076.259 | 9674434.525 | 427.101 | 26 | -90 | 9.21 | 15 |
| DEX-BB4204 | 415028.592 | 9674324.991 | 411.779 | 8 | -90 | 3 | 2.57 |
| DEX-BB4205 | 415021.951 | 9674626.239 | 448.893 | 33 | -90 | 22.54 | 10 |
| DEX-BB4206 | 414926.774 | 9674824.402 | 465.642 | 31 | -90 | 9 | 21.06 |
| DEX-BB4207 | 414881.431 | 9674636.985 | 441.810 | 23 | -90 | 19.84 | 3 |
| DEX-BB4208 | 414827.978 | 9674617.280 | 430.658 | 25 | -90 | 18.06 | 6 |
| DEX-BB4209 | 414769.836 | 9674628.461 | 443.571 | 32 | -90 | 30.75 | 2 |
| DEX-BB4210 | 416469.981 | 9674471.218 | 392.595 | 38 | -90 | 26.11 | 13 |
| DEX-BB4211 | 416414.299 | 9674423.148 | 393.134 | 17 | -90 | 13.72 | 2 |
| DEX-BB4212 | 416383.236 | 9674471.852 | 398.558 | 24 | -90 | 17.29 | 5.3 |
| DEX-BB4213 | 416343.259 | 9674475.315 | 387.081 | 10 | -90 | 4.78 | 3.03 |
| DEX-BB4214 | 416177.481 | 9674674.265 | 408.491 | 27 | -90 | 19.26 | 9.13 |
| DEX-BB4215 | 415527.882 | 9674825.464 | 407.222 | 27 | -90 | 18.21 | 7 |
| DEX-BB4216 | 415474.406 | 9674872.212 | 414.877 | 34 | -90 | 15.81 | 18.22 |
| DEX-BB4217 | 415429.905 | 9674779.547 | 423.697 | 40 | -90 | 19.84 | 21 |
| DEX-BB4218 | 415422.099 | 9674826.761 | 425.201 | 27 | -90 | 11.97 | 14 |
| DEX-BB4219 | 415424.176 | 9674875.297 | 420.539 | 40 | -90 | 15.14 | 25 |
| DEX-BB4220 | 415226.308 | 9674975.363 | 442.280 | 32 | -90 | 25.31 | 7.22 |
| DEX-BB4221 | 415222.635 | 9675024.704 | 427.918 | 11 | -90 | 7.65 | 1.35 |
| DEX-BB4222 | 415132.736 | 9674614.724 | 458.008 | 34 | -90 | 27.31 | 7 |
| DEX-BB4223 | 415127.619 | 9674432.362 | 446.601 | 35 | -90 | 22.71 | 12 |
| DEX-BB4224 | 415129.534 | 9674482.196 | 448.377 | 30 | -90 | 17.73 | 11 |
| DEX-BB4225 | 415122.021 | 9674726.198 | 459.329 | 46 | -90 | 38.94 | 10.31 |
| DEX-BB4226 | 415119.677 | 9675014.907 | 427.563 | 22 | -90 | 17.21 | 3 |
| DEX-BB4227 | 415079.389 | 9674676.320 | 465.780 | 39 | -90 | 28.47 | 8.53 |
| DEX-BB4228 | 415074.606 | 9674876.692 | 450.720 | 32 | -90 | 20.4 | 10 |
| DEX-BB4229 | 415068.332 | 9674574.147 | 455.856 | 30 | -90 | 25.42 | 4 |
| DEX-BB4230 | 415035.282 | 9674530.541 | 455.466 | 50 | -90 | 42.55 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9238 | 417197.247 | 9673323.695 | 394.924 | 17 | -90 | 12.4 | 2 |
| DEX-CZ9239 | 417347.291 | 9673324.655 | 411.144 | 24 | -90 | 8 | 1 |
| DEX-CZ9240 | 417370.574 | 9673322.911 | 415.648 | 20 | -90 | 3 | 5.85 |
| DEX-CZ9241 | 417398.330 | 9673326.711 | 418.902 | 13 | -90 | 1.5 | 1.5 |
| DEX-CZ9242 | 417417.686 | 9673319.021 | 419.136 | 10 | -90 | 3 | 4 |
| DEX-CZ9243 | 417454.214 | 9673326.052 | 416.220 | 19 | -90 | 14 | 2 |
| DEX-CZ9244 | 417478.194 | 9673322.364 | 416.000 | 36 | -90 | 26.65 | 8 |
| DEX-CZ9245 | 417496.408 | 9673326.171 | 416.508 | 40 | -90 | 21 | 13 |
| DEX-CZ9246 | 417524.860 | 9673321.560 | 418.051 | 24 | -90 | 4 | 16.9 |
| DEX-CZ9247 | 417575.307 | 9673322.939 | 410.230 | 15 | -90 | 4 | 8 |
| DEX-CZ9248 | 417598.284 | 9673320.463 | 405.205 | 26 | -90 | 4 | 13 |
| DEX-CZ9249 | 417626.493 | 9673322.450 | 396.754 | 19 | -90 | 10 | 3 |
| DEX-CZ9250 | 417645.396 | 9673323.823 | 390.076 | 29 | -90 | 7 | 12 |
| DEX-CZ9251 | 417119.027 | 9673301.054 | 383.331 | 19 | -90 | 13.33 | 1 |
| DEX-CZ9252 | 417171.216 | 9673301.189 | 389.392 | 14 | -90 | 11.24 | 0 |
| DEX-CZ9253 | 417221.243 | 9673295.490 | 392.054 | 17 | -90 | 12.67 | 3 |
| DEX-CZ9254 | 417270.768 | 9673301.433 | 400.099 | 21 | -90 | 16.35 | 3 |
| DEX-CZ9255 | 417320.823 | 9673297.079 | 405.466 | 21 | -90 | 9 | 8 |
| DEX-CZ9256 | 417373.922 | 9673301.383 | 415.439 | 9 | -90 | 3 | 0 |
| DEX-CZ9257 | 417421.426 | 9673296.179 | 419.271 | 7 | -90 | 2 | 2 |
| DEX-CZ9258 | 417472.218 | 9673298.258 | 412.359 | 27 | -90 | 24.2 | 2 |
| DEX-CZ9259 | 417516.522 | 9673297.019 | 418.786 | 20 | -90 | 9 | 9 |
| DEX-CZ9260 | 417223.077 | 9673272.721 | 389.775 | 33 | -90 | 30.13 | 3 |
| DEX-CZ9261 | 417246.211 | 9673273.855 | 392.791 | 33 | -90 | 31.17 | 1 |
| DEX-CZ9262 | 417275.600 | 9673270.103 | 396.122 | 31 | -90 | 16.36 | 14 |
| DEX-CZ9263 | 417298.281 | 9673270.839 | 399.320 | 17 | -90 | 9 | 6 |
| DEX-CZ9264 | 417322.255 | 9673272.324 | 403.132 | 24 | -90 | 13 | 1 |
| DEX-CZ9265 | 417348.412 | 9673276.128 | 406.878 | 22 | -90 | 17 | 2.3 |
| DEX-CZ9266 | 417374.757 | 9673271.909 | 409.238 | 21 | -90 | 9 | 8.3 |
| DEX-CZ9267 | 417497.867 | 9673278.572 | 409.317 | 39 | -90 | 14.3 | 21 |
| DEX-CZ9268 | 417647.101 | 9673277.973 | 399.406 | 18 | -90 | 6 | 6 |
| DEX-CZ9269 | 417668.251 | 9673275.666 | 392.017 | 30 | -90 | 10 | 7 |
| DEX-CZ9270 | 417223.099 | 9673249.718 | 385.951 | 18 | -90 | 13.52 | 2.48 |
| DEX-CZ9271 | 417245.197 | 9673251.580 | 386.643 | 22 | -90 | 6 | 15 |
| DEX-CZ9272 | 417274.082 | 9673249.035 | 391.513 | 15 | -90 | 12 | 0 |
| DEX-CZ9273 | 417324.979 | 9673248.997 | 398.427 | 30 | -90 | 17 | 6.4 |
| DEX-CZ9274 | 417374.276 | 9673254.046 | 403.899 | 27 | -90 | 17.28 | 3.7 |
| DEX-CZ9275 | 417395.376 | 9673250.045 | 403.554 | 17 | -90 | 8 | 9 |
| DEX-CZ9276 | 417502.886 | 9673249.818 | 409.549 | 14 | -90 | 10 | 1 |
| DEX-CZ9277 | 417670.572 | 9673250.186 | 395.877 | 20 | -90 | 5 | 12 |
| DEX-CZ9711 | 416592.353 | 9673443.222 | 364.829 | 35 | -90 | 36.36 | 1 |
| DEX-CZ9713 | 416546.864 | 9673394.052 | 366.183 | 20 | -90 | 16.18 | 1 |
| DEX-CZ9714 | 416590.785 | 9673396.643 | 374.856 | 31 | -90 | 29.46 | 2 |
| DEX-CZ9715 | 416639.345 | 9673394.454 | 382.063 | 37 | -90 | 34.94 | 1 |
| DEX-CZ9716 | 416691.994 | 9673397.255 | 378.248 | 18 | -90 | 14 | 2 |
| DEX-CZ9718 | 416394.684 | 9673342.717 | 358.184 | 13 | -90 | 9 | 1 |
| DEX-CZ9719 | 416491.324 | 9673349.649 | 369.044 | 21 | -90 | 18.48 | 2 |
| DEX-CZ9722 | 416245.287 | 9673292.494 | 359.045 | 25 | -90 | 9 | 2 |
| DEX-CZ9723 | 416291.012 | 9673296.821 | 361.157 | 24 | -90 | 11 | 10 |
| DEX-CZ9724 | 416389.735 | 9673295.063 | 363.740 | 36 | -90 | 31.21 | 4 |
| DEX-CZ9725 | 416441.162 | 9673295.528 | 367.480 | 22 | -90 | 17 | 0 |
| DEX-CZ9727 | 416642.698 | 9673306.470 | 376.603 | 32 | -90 | 29.1 | 2 |
| DEX-CZ9729 | 416189.905 | 9673244.674 | 363.000 | 13 | -90 | 6 | 4.82 |
| DEX-CZ9730 | 416291.141 | 9673247.471 | 354.321 | 36 | -90 | 26.3 | 10 |
| DEX-CZ9731 | 416390.055 | 9673248.594 | 353.118 | 41 | -90 | 34.33 | 3 |
| DEX-CZ9732 | 416489.967 | 9673249.574 | 359.872 | 50 | -90 | 42.99 | 3 |
| DEX-CZ9734 | 416695.437 | 9673247.638 | 395.131 | 32 | -90 | 22.96 | 8 |
| DEX-CZ9735 | 416792.588 | 9673247.066 | 401.220 | 22 | -90 | 18.28 | 1 |
| DEX-CZ9736 | 416887.506 | 9673244.656 | 388.060 | 32 | -90 | 26.4 | 6 |
| DEX-CZ9864 | 415834.937 | 9672507.493 | 318.790 | 43 | -90 | 30.01 | 11.85 |
| DEX-CZ9865 | 415885.515 | 9672507.586 | 318.175 | 32 | -90 | 21 | 7.85 |
| DEX-CZ9866 | 415936.464 | 9672514.082 | 327.001 | 25 | -90 | 17 | 4 |
| DEX-CZ9867 | 415981.951 | 9672514.204 | 334.009 | 19 | -90 | 5 | 9 |
| DEX-CZ9869 | 415836.763 | 9672489.697 | 313.812 | 31 | -90 | 25.07 | 4 |
| DEX-CZ9870 | 415876.082 | 9672481.316 | 313.872 | 45 | -90 | 29.27 | 12 |
| DEX-CZ9871 | 415928.360 | 9672492.870 | 319.316 | 38 | -90 | 25.93 | 12.39 |
| DEX-CZ9872 | 415987.356 | 9672488.611 | 322.668 | 23 | -90 | 6.6 | 12.3 |
| DEX-CZ9873 | 415886.212 | 9672445.845 | 315.634 | 8 | -90 | 6 | 1 |
| DEX-CZ9874 | 415924.461 | 9672446.874 | 316.000 | 41 | -90 | 23.66 | 15.85 |
| DEX-CZ9875 | 415982.125 | 9672450.218 | 316.000 | 31 | -90 | 14 | 6 |
| DEX-CZ9876R | 416032.692 | 9672460.512 | 317.624 | 41 | -90 | 12.45 | 12.4 |
| DEX-CZ9877 | 416376.475 | 9672340.995 | 388.506 | 17 | -90 | 11 | 1 |
| DEX-CZ9878 | 416423.278 | 9672343.856 | 390.542 | 26 | -90 | 16 | 2 |
| DEX-CZ9879 | 416474.341 | 9672344.092 | 392.817 | 25 | -90 | 13 | 9 |
| DEX-CZ9880 | 416524.190 | 9672341.627 | 387.897 | 25 | -90 | 17 | 6 |
| DEX-CZ9881 | 416330.069 | 9672304.965 | 388.155 | 41 | -90 | 23.75 | 11 |
| DEX-CZ9882 | 416377.209 | 9672299.407 | 393.410 | 36 | -90 | 23.12 | 11 |
| DEX-CZ9883 | 416434.735 | 9672298.249 | 395.744 | 28 | -90 | 23 | 1 |
| DEX-CZ9884 | 416481.581 | 9672299.337 | 395.476 | 32 | -90 | 17 | 12 |
| DEX-CZ9885 | 416529.101 | 9672298.535 | 391.517 | 21 | -90 | 13 | 5 |
| DEX-CZ9886 | 416582.804 | 9672297.126 | 389.494 | 20 | -90 | 9 | 9 |
| DEX-CZ9887 | 416629.965 | 9672306.944 | 384.607 | 29 | -90 | 18 | 8 |
| DEX-CZ9888 | 416336.822 | 9672273.344 | 398.904 | 16 | -90 | 7 | 4 |
| DEX-CZ9889 | 416353.337 | 9672275.458 | 400.060 | 17 | -90 | 10.47 | 4 |
| DEX-CZ9890 | 416383.010 | 9672273.588 | 401.934 | 18 | -90 | 8.29 | 3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4231R | 415038.053 | 9674381.581 | 428.265 | 44 | -90 | 20.78 | 21 |
| DEX-BB4232 | 415026.515 | 9674683.596 | 472.498 | 34 | -90 | 22.93 | 11 |
| DEX-BB4233 | 415029.065 | 9674729.172 | 477.380 | 32 | -90 | 13.28 | 18 |
| DEX-BB4234 | 414975.425 | 9674679.458 | 470.806 | 24 | -90 | 18.52 | 4 |
| DEX-BB4235 | 414926.855 | 9674671.423 | 462.002 | 22 | -90 | 19.44 | 1 |
| DEX-BB4236 | 414934.742 | 9674878.837 | 457.450 | 27 | -90 | 17.2 | 8 |
| DEX-BB4237 | 414830.964 | 9674926.318 | 435.829 | 21 | -90 | 10.18 | 9 |
| DEX-BB4239 | 416465.974 | 9674401.861 | 380.529 | 33 | -90 | 31.66 | 5 |
| DEX-BB4240 | 416431.192 | 9674449.130 | 395.641 | 29 | -90 | 18 | 9 |
| DEX-BB4241 | 416378.029 | 9674491.903 | 398.101 | 27 | -90 | 14.28 | 11 |
| DEX-BB4242 | 416322.279 | 9674451.899 | 385.729 | 26 | -90 | 19.6 | 5 |
| DEX-BB4243 | 416225.458 | 9674652.757 | 402.000 | 20 | -90 | 14.69 | 6 |
| DEX-BB4244 | 415526.153 | 9674847.631 | 407.280 | 28 | -90 | 19.11 | 8 |
| DEX-BB4245 | 415476.772 | 9674754.845 | 408.996 | 22 | -90 | 4.22 | 16 |
| DEX-BB4246 | 415476.177 | 9674802.877 | 417.450 | 45 | -90 | 15.49 | 31.02 |
| DEX-BB4247 | 415276.184 | 9674949.899 | 443.235 | 34 | -90 | 25.24 | 10 |
| DEX-BB4248 | 415269.628 | 9675000.544 | 433.897 | 12 | -90 | 7 | 3 |
| DEX-BB4249 | 415270.422 | 9674849.858 | 450.060 | 39 | -90 | 29.21 | 12 |
| DEX-BB4250 | 415222.290 | 9674948.545 | 448.061 | 28 | -90 | 23.97 | 4 |
| DEX-BB4251 | 415220.647 | 9674852.446 | 454.434 | 31 | -90 | 21.49 | 8 |
| DEX-BB4252 | 415176.503 | 9674599.579 | 463.925 | 24 | -90 | 19.36 | 4 |
| DEX-BB4253 | 415174.999 | 9674850.322 | 455.344 | 26 | -90 | 14.78 | 10.78 |
| DEX-BB4254 | 415175.499 | 9674549.719 | 466.721 | 27 | -90 | 20.67 | 4.75 |
| DEX-BB4255 | 415174.531 | 9674895.635 | 454.049 | 42 | -90 | 26 | 14 |
| DEX-BB4256 | 415175.275 | 9674448.753 | 456.083 | 45 | -90 | 17.65 | 26 |
| DEX-BB4258 | 415168.318 | 9674802.549 | 449.118 | 22 | -90 | 13.29 | 8 |
| DEX-BB4259 | 415171.518 | 9674943.751 | 449.750 | 45 | -90 | 32.4 | 14.26 |
| DEX-BB4260 | 415175.492 | 9674649.184 | 446.506 | 33 | -90 | 20.35 | 12.24 |
| DEX-BB4261 | 415168.231 | 9674744.240 | 448.548 | 28 | -90 | 23.91 | 2.55 |
| DEX-BB4262 | 415169.268 | 9674990.877 | 438.714 | 23 | -90 | 20.23 | 1 |
| DEX-BB4263 | 415123.812 | 9674651.880 | 451.892 | 50 | -90 | 28.67 | 22.44 |
| DEX-BB4264 | 415080.189 | 9674355.087 | 432.001 | 37 | -90 | 12.68 | 23.27 |
| DEX-BB4265 | 415078.766 | 9674390.106 | 440.936 | 36 | -90 | 17.7 | 17.2 |
| DEX-BB4266 | 415072.059 | 9674705.158 | 470.022 | 32 | -90 | 16.96 | 16.19 |
| DEX-BB4267 | 415073.195 | 9674798.592 | 461.955 | 42 | -90 | 27.48 | 14 |
| DEX-BB4268 | 415028.314 | 9674746.812 | 476.000 | 20 | -90 | 12.22 | 6 |
| DEX-BB4269 | 415018.856 | 9674545.645 | 451.190 | 36 | -90 | 13 | 22.74 |
| DEX-BB4270 | 414961.871 | 9674709.089 | 469.034 | 26 | -90 | 18.23 | 6 |
| DEX-BB4271 | 414974.591 | 9674849.300 | 461.826 | 26 | -90 | 19 | 5 |
| DEX-BB4272 | 414975.270 | 9674598.184 | 439.797 | 20 | -90 | 14 | 4 |
| DEX-BB4273 | 414929.264 | 9674653.974 | 456.923 | 20 | -90 | 11.52 | 7 |
| DEX-BB4274 | 414875.061 | 9674597.094 | 432.000 | 22 | -90 | 15.28 | 5.21 |
| DEX-BB4275 | 414877.221 | 9674554.672 | 436.150 | 23 | -90 | 10.29 | 11.88 |
| DEX-BB4276 | 414877.480 | 9674901.637 | 439.204 | 20 | -90 | 16.48 | 2 |
| DEX-BB4277 | 414826.982 | 9674643.893 | 428.000 | 28 | -90 | 19 | 7 |
| DEX-BB4278 | 416324.146 | 9674428.771 | 380.264 | 16 | -90 | 12.32 | 1 |
| DEX-BB4279 | 416225.429 | 9674628.071 | 404.065 | 23 | -90 | 15.28 | 8.4 |
| DEX-BB4280 | 415478.543 | 9674725.691 | 406.417 | 20 | -90 | 13.74 | 6.74 |
| DEX-BB4281 | 415272.390 | 9674927.628 | 445.415 | 25 | -90 | 22.15 | 2 |
| DEX-BB4282 | 415273.363 | 9674825.696 | 450.779 | 51 | -90 | 41.2 | 12 |
| DEX-BB4283 | 415225.986 | 9674924.754 | 451.670 | 32 | -90 | 25.53 | 7 |
| DEX-BB4284 | 415223.399 | 9674825.466 | 455.000 | 40 | -90 | 32.22 | 7.5 |
| DEX-BB4285 | 415176.651 | 9674571.556 | 466.523 | 51 | -90 | 15 | 34.28 |
| DEX-BB4286 | 415175.629 | 9674827.010 | 452.389 | 37 | -90 | 26.69 | 12 |
| DEX-BB4287 | 415175.226 | 9674873.036 | 455.230 | 32 | -90 | 20.81 | 10 |
| DEX-BB4288 | 415169.365 | 9674775.470 | 451.315 | 39 | -90 | 30.62 | 14.87 |
| DEX-BB4289 | 415170.318 | 9674919.433 | 452.384 | 47 | -90 | 34.64 | 13 |
| DEX-BB4290 | 415172.835 | 9674964.933 | 445.571 | 42 | -90 | 30.06 | 3 |
| DEX-BB4291 | 415126.180 | 9674825.250 | 457.000 | 46 | -90 | 33.4 | 15.63 |
| DEX-BB4292 | 414974.439 | 9674822.474 | 467.367 | 26 | -90 | 13.46 | 11.24 |
| DEX-BB4293 | 414923.918 | 9674627.833 | 445.880 | 30 | -90 | 24.24 | 4.63 |
| DEX-BB4294 | 414883.225 | 9674672.719 | 451.979 | 26 | -90 | 17.25 | 7.21 |
| DEX-BB4295 | 414868.581 | 9674877.727 | 439.764 | 12 | -90 | 4 | 6 |
| DEX-BB4297 | 416462.090 | 9674424.938 | 385.336 | 35 | -90 | 31.91 | 5 |
| DEX-BB4298 | 416433.078 | 9674472.907 | 397.817 | 24 | -90 | 13 | 9 |
| DEX-BB4299 | 416382.913 | 9674516.055 | 398.557 | 15 | -90 | 12.29 | 1 |
| DEX-BB4300 | 416316.305 | 9674479.633 | 392.669 | 17 | -90 | 12.24 | 3 |
| DEX-BB4301 | 416225.768 | 9674674.306 | 403.410 | 25 | -90 | 14.87 | 11.72 |
| DEX-BB4302 | 415474.226 | 9674779.027 | 411.587 | 25 | -90 | 7 | 16 |
| DEX-BB4303 | 415473.029 | 9674827.449 | 419.135 | 43 | -90 | 13.76 | 29.6 |
| DEX-BB4304 | 415271.432 | 9674972.307 | 440.802 | 48 | -90 | 24.22 | 23 |
| DEX-BB4305 | 415273.238 | 9675026.906 | 425.775 | 15 | -90 | 8 | 5 |
| DEX-BB4306 | 415270.196 | 9674879.719 | 448.920 | 29 | -90 | 20.68 | 8 |
| DEX-BB4307 | 415222.350 | 9674875.207 | 454.197 | 36 | -90 | 31.28 | 7 |
| DEX-BB4308 | 415180.251 | 9674618.139 | 461.663 | 35 | -90 | 23.75 | 11.34 |
| DEX-BB4309 | 415173.127 | 9674425.850 | 454.099 | 36 | -90 | 5 | 29 |
| DEX-BB4310 | 415173.001 | 9674476.401 | 462.011 | 43 | -90 | 25.92 | 16 |
| DEX-BB4311 | 415171.095 | 9674723.538 | 441.929 | 22 | -90 | 17.9 | 3 |
| DEX-BB4312 | 415171.254 | 9674668.973 | 440.949 | 33 | -90 | 29.16 | 4.57 |
| DEX-BB4313 | 415167.690 | 9675009.788 | 432.101 | 40 | -90 | 13.14 | 24 |
| DEX-BB4314 | 415121.127 | 9674677.193 | 457.778 | 40 | -90 | 22.08 | 17.52 |
| DEX-BB4315 | 415081.404 | 9674374.700 | 439.179 | 21 | -90 | 14.22 | 4 |
| DEX-BB4316 | 415081.990 | 9674626.639 | 449.000 | 32 | -90 | 20.36 | 11 |
| DEX-BB4317 | 415083.313 | 9674410.477 | 433.571 | 40 | -90 | 12.4 | 26 |
| DEX-BB4318 | 415071.086 | 9674484.606 | 444.878 | 48 | -90 | 7.23 | 36.62 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9891 | 416404.356 | 9672277.305 | 401.685 | 15 | -90 | 8 | 4 |
| DEX-CZ9892 | 416431.048 | 9672277.678 | 400.048 | 28 | -90 | 18 | 5 |
| DEX-CZ9893 | 416453.966 | 9672279.452 | 398.509 | 32 | -90 | 24 | 5 |
| DEX-CZ9894 | 416480.926 | 9672277.751 | 396.450 | 28 | -90 | 21 | 5 |
| DEX-CZ9895 | 416500.940 | 9672280.385 | 392.981 | 30 | -90 | 20 | 8 |
| DEX-CZ9896 | 416526.466 | 9672275.955 | 390.190 | 28 | -90 | 21 | 5 |
| DEX-CZ9897 | 416557.721 | 9672270.303 | 390.995 | 21 | -90 | 10 | 8 |
| DEX-CZ9898 | 416581.913 | 9672273.480 | 393.924 | 25 | -90 | 17 | 5 |
| DEX-CZ9899 | 416604.248 | 9672281.041 | 392.818 | 27 | -90 | 20.16 | 4 |
| DEX-CZ9900 | 416632.002 | 9672274.700 | 388.933 | 23 | -90 | 12 | 7 |
| DEX-CZ9901 | 416654.757 | 9672273.552 | 389.106 | 31 | -90 | 23 | 4 |
| DEX-CZ9902 | 416332.601 | 9672253.254 | 405.959 | 18 | -90 | 4 | 8 |
| DEX-CZ9903 | 416374.034 | 9672250.467 | 410.506 | 26 | -90 | 7.28 | 11.85 |
| DEX-CZ9904 | 416430.489 | 9672249.852 | 408.604 | 20 | -90 | 3 | 11 |
| DEX-CZ9905 | 416475.812 | 9672252.929 | 400.653 | 19 | -90 | 14 | 1.63 |
| DEX-CZ9906 | 416527.668 | 9672257.826 | 394.753 | 24 | -90 | 16 | 5 |
| DEX-CZ9907 | 416578.144 | 9672252.052 | 398.701 | 27 | -90 | 20 | 3.45 |
| DEX-CZ9908 | 416627.077 | 9672257.385 | 394.959 | 20 | -90 | 16.34 | 3 |
| DEX-CZ9913 | 416917.449 | 9672395.054 | 417.536 | 15 | -90 | 9 | 4 |
| DEX-CZ9914 | 416970.842 | 9672398.377 | 422.666 | 43 | -90 | 22 | 2 |
| DEX-CZ9915 | 416967.521 | 9672422.351 | 423.906 | 34 | -90 | 17.21 | 14 |
| DEX-CZ9916 | 416994.706 | 9672425.366 | 423.000 | 33 | -90 | 20.52 | 11.31 |
| DEX-CZ9917 | 417019.888 | 9672422.850 | 425.188 | 37 | -90 | 18 | 1.56 |
| DEX-CZ9918 | 417046.271 | 9672422.484 | 427.458 | 46 | -90 | 3 | 33.85 |
| DEX-CZ9919 | 417069.796 | 9672423.580 | 427.692 | 45 | -90 | 2 | 24.85 |
| DEX-CZ9920 | 417067.527 | 9672448.174 | 423.861 | 23 | -90 | 2 | 14.8 |
| DEX-CZ9921 | 417093.604 | 9672423.615 | 427.107 | 32 | -90 | 11.15 | 14 |
| DEX-CZ9922 | 417120.994 | 9672427.340 | 428.029 | 21 | -90 | 14 | 5 |
| DEX-CZ9923 | 417143.899 | 9672429.397 | 429.150 | 22 | -90 | 8 | 6 |
| DEX-CZ9924 | 416992.173 | 9672401.290 | 424.186 | 42 | -90 | 18.65 | 17.76 |
| DEX-CZ9925 | 417015.417 | 9672398.145 | 427.763 | 45 | -90 | 9 | 34.32 |
| DEX-CZ9926 | 417068.998 | 9672400.958 | 430.989 | 36 | -90 | 19.6 | 4.4 |
| DEX-CZ9927 | 417118.508 | 9672398.279 | 430.907 | 30 | -90 | 14.26 | 7 |
| DEX-CZ9928 | 417171.867 | 9672396.949 | 432.693 | 26 | -90 | 8 | 15.21 |
| DEX-CZ9929 | 417067.784 | 9672369.650 | 435.769 | 25 | -90 | 20.28 | 3 |
| DEX-CZ9930 | 417091.260 | 9672366.593 | 436.792 | 26 | -90 | 15 | 7 |
| DEX-CZ9931 | 417114.690 | 9672371.455 | 435.210 | 23 | -90 | 15.2 | 3.65 |
| DEX-CZ9932 | 417144.533 | 9672374.875 | 434.249 | 26 | -90 | 13.25 | 10 |
| DEX-CZ9933 | 417171.302 | 9672376.322 | 432.514 | 23 | -90 | 10 | 7.21 |
| DEX-CZ9934 | 417198.403 | 9672369.647 | 430.574 | 27 | -90 | 24.45 | 1 |
| DEX-CZ9935 | 417068.292 | 9672345.714 | 439.351 | 27 | -90 | 16 | 3 |
| DEX-CZ9936 | 417167.897 | 9672351.322 | 433.163 | 24 | -90 | 8.75 | 12.25 |
| DEX-CZ9937 | 417188.957 | 9672352.976 | 431.017 | 26 | -90 | 17.4 | 8 |
| DEX-CZ9938 | 417222.213 | 9672348.894 | 428.460 | 34 | -90 | 15.2 | 11.2 |
| DEX-CZ9939 | 417065.380 | 9672324.630 | 441.356 | 25 | -90 | 14 | 7 |
| DEX-CZ9940 | 417096.140 | 9672323.483 | 441.470 | 30 | -90 | 10 | 14.27 |
| DEX-CZ9941 | 417124.122 | 9672319.410 | 440.348 | 25 | -90 | 10 | 10 |
| DEX-CZ9942 | 417140.448 | 9672326.040 | 438.243 | 31 | -90 | 16.66 | 8 |
| DEX-CZ9943 | 417170.520 | 9672325.820 | 434.119 | 29 | -90 | 24.27 | 3.35 |
| DEX-CZ9944 | 417196.018 | 9672325.626 | 430.399 | 25 | -90 | 19.79 | 4 |
| DEX-CZ9945 | 417215.865 | 9672326.923 | 428.253 | 28 | -90 | 19.44 | 5 |
| DEX-CZ9946 | 417245.982 | 9672326.943 | 427.000 | 19 | -90 | 13.15 | 4.24 |
| DEX-CZ9947 | 417069.206 | 9672300.100 | 443.937 | 32 | -90 | 8 | 17.9 |
| DEX-CZ9948 | 417121.039 | 9672297.218 | 441.140 | 30 | -90 | 20.71 | 4 |
| DEX-CZ9949 | 417167.273 | 9672304.659 | 435.187 | 42 | -90 | 20.66 | 10 |
| DEX-CZ9950 | 417215.126 | 9672307.144 | 428.110 | 30 | -90 | 24.26 | 1 |
| DEX-CZ9951 | 417244.935 | 9672299.756 | 427.964 | 27 | -90 | 15.22 | 6 |
| DEX-CZ9952 | 417275.173 | 9672298.018 | 429.716 | 41 | -90 | 14 | 17 |
| DEX-CZ9953 | 417298.307 | 9672297.001 | 432.600 | 36 | -90 | 3 | 16 |
| DEX-CZ9954 | 417123.286 | 9672274.792 | 440.623 | 44 | -90 | 20.68 | 20 |
| DEX-CZ9955 | 417144.375 | 9672278.696 | 438.172 | 47 | -90 | 19.66 | 21.8 |
| DEX-CZ9956 | 417170.114 | 9672279.120 | 434.836 | 36 | -90 | 19.74 | 11.75 |
| DEX-CZ9957 | 417194.422 | 9672278.366 | 431.290 | 47 | -90 | 27.38 | 14.1 |
| DEX-CZ9958 | 417216.622 | 9672276.717 | 429.030 | 31 | -90 | 21.63 | 3.7 |
| DEX-CZ9959 | 417242.334 | 9672277.046 | 426.400 | 37 | -90 | 23 | 9 |
| DEX-CZ9960 | 417268.813 | 9672271.705 | 426.731 | 33 | -90 | 13 | 17 |
| DEX-CZ9961 | 417294.415 | 9672273.718 | 427.724 | 30 | -90 | 4 | 9 |
| DEX-CZ9962 | 417319.255 | 9672276.486 | 430.102 | 37 | -90 | 5 | 17 |
| DEX-CZ9963 | 417343.309 | 9672276.313 | 431.056 | 38 | -90 | 17 | 13 |
| DEX-CZ9964 | 417120.315 | 9672251.085 | 441.383 | 25 | -90 | 17 | 5.37 |
| DEX-CZ9965 | 417167.341 | 9672252.094 | 435.036 | 38 | -90 | 19.67 | 4 |
| DEX-CZ9966 | 417218.062 | 9672253.427 | 428.710 | 35 | -90 | 19 | 10 |
| DEX-CZ9967 | 417263.975 | 9672251.392 | 418.747 | 39 | -90 | 15.24 | 17.29 |
| DEX-CZ9968 | 417319.438 | 9672243.842 | 419.555 | 47 | -90 | 9 | 36 |
| DEX-CZ9969 | 417345.490 | 9672247.254 | 422.169 | 33 | -90 | 12 | 17 |
| DEX-CZ9970 | 417371.293 | 9672249.260 | 423.389 | 27 | -90 | 9 | 5 |
| DEX-CZ9971 | 417141.343 | 9672230.526 | 438.707 | 38 | -90 | 28.61 | 8 |
| DEX-CZ9972 | 416644.493 | 9672224.392 | 400.941 | 28 | -90 | 16.36 | 4 |
| DEX-CZ9973 | 416668.398 | 9672217.628 | 400.673 | 35 | -90 | 11 | 21 |
| DEX-CZ9974 | 416691.142 | 9672223.878 | 394.977 | 25 | -90 | 16 | 1.85 |
| DEX-CZ9975 | 416720.277 | 9672223.982 | 392.442 | 23 | -90 | 16.33 | 4 |
| DEX-CZ9980 | 416849.253 | 9672231.484 | 411.942 | 28 | -90 | 9 | 9 |
| DEX-CZ9981 | 416916.841 | 9672227.474 | 427.215 | 24 | -90 | 5 | 14.3 |
| DEX-CZ9982 | 416945.046 | 9672228.136 | 433.540 | 31 | -90 | 25.6 | 4 |
| DEX-CZ9983 | 416969.487 | 9672228.598 | 439.004 | 20 | -90 | 5 | 5 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4319 | 415079.023 | 9674727.139 | 467.498 | 30 | -90 | 16 | 12 |
| DEX-BB4320 | 415067.700 | 9674771.782 | 465.348 | 42 | -90 | 28.95 | 13 |
| DEX-BB4321 | 415018.430 | 9674569.222 | 447.318 | 30 | -90 | 13.55 | 15 |
| DEX-BB4322 | 414971.097 | 9674728.752 | 465.969 | 21 | -90 | 4 | 16 |
| DEX-BB4323 | 414974.191 | 9674868.747 | 457.916 | 32 | -90 | 29.83 | 2 |
| DEX-BB4324 | 414972.104 | 9674626.792 | 448.471 | 53 | -90 | 18.27 | 33 |
| DEX-BB4325 | 414877.439 | 9674575.955 | 435.056 | 30 | -90 | 19.6 | 9 |
| DEX-BB4326 | 414870.163 | 9674926.485 | 444.313 | 18 | -90 | 8 | 8 |
| DEX-BB4327 | 414830.010 | 9674881.061 | 425.095 | 12 | -90 | 5 | 5 |
| DEX-BB4328 | 414595.946 | 9674200.466 | 365.109 | 44 | -90 | 29.4 | 18.18 |
| DEX-BB4329 | 414598.520 | 9674099.734 | 371.646 | 36 | -90 | 7.48 | 30.66 |
| DEX-BB4330 | 414701.728 | 9674100.758 | 356.691 | 22 | -90 | 11 | 8 |
| DEX-BB4331 | 414054.944 | 9674731.091 | 391.680 | 33 | -90 | 13.43 | 18 |
| DEX-BB4335 | 414227.329 | 9675030.719 | 385.852 | 29 | -90 | 22.48 | 7 |
| DEX-BB4336 | 414100.265 | 9675045.544 | 384.147 | 20 | -90 | 16.38 | 2 |
| DEX-BB4337 | 414101.612 | 9674980.412 | 383.458 | 21 | -90 | 18 | 1 |
| DEX-BB4338 | 414229.141 | 9674976.851 | 385.622 | 26 | -90 | 17 | 7 |
| DEX-BB4339 | 414089.017 | 9674921.718 | 383.659 | 11 | -90 | 8.43 | 1 |
| DEX-BB4341 | 414986.839 | 9674347.881 | 417.628 | 21 | -90 | 3.23 | 16 |
| DEX-BB4342 | 415556.962 | 9674777.399 | 406.829 | 17 | -90 | 7 | 8 |
| DEX-BB4343 | 414984.088 | 9674328.445 | 417.254 | 13 | -90 | 2 | 9 |
| DEX-BB4344 | 415002.357 | 9674328.646 | 417.639 | 23 | -90 | 6.26 | 15 |
| DEX-BB4345 | 415323.236 | 9674916.856 | 432.706 | 38 | -90 | 22.84 | 15 |
| DEX-BB4346 | 415345.250 | 9674925.489 | 425.072 | 32 | -90 | 20.87 | 10 |
| DEX-BB4347 | 415370.861 | 9674918.178 | 420.620 | 22 | -90 | 16.28 | 3.65 |
| DEX-BB4348 | 415397.823 | 9674920.050 | 414.825 | 22 | -90 | 15.22 | 5 |
| DEX-BB4349 | 415417.403 | 9674923.676 | 411.039 | 25 | -90 | 14.04 | 10 |
| DEX-BB4350 | 415442.149 | 9674919.122 | 411.648 | 17 | -90 | 11.65 | 4 |
| DEX-BB4351 | 415472.090 | 9674916.691 | 406.327 | 8 | -90 | 5 | 1 |
| DEX-BB4352 | 415326.452 | 9674895.777 | 436.885 | 45 | -90 | 17 | 26 |
| DEX-BB4353 | 415377.464 | 9674899.013 | 422.514 | 29 | -90 | 14.24 | 13 |
| DEX-BB4354 | 415424.741 | 9674903.457 | 415.160 | 30 | -90 | 16 | 13 |
| DEX-BB4355 | 415453.562 | 9674900.896 | 413.754 | 32 | -90 | 12.66 | 18 |
| DEX-BB4356 | 415470.646 | 9674903.622 | 410.084 | 21 | -90 | 14 | 4 |
| DEX-BB4357 | 415325.148 | 9674869.046 | 439.763 | 20 | -90 | 16.17 | 2 |
| DEX-BB4358 | 415346.500 | 9674876.000 | 433.403 | 37 | -90 | 14.88 | 21 |
| DEX-BB4359 | 415373.318 | 9674866.082 | 428.387 | 21 | -90 | 14 | 4.4 |
| DEX-BB4360 | 415395.471 | 9674877.313 | 422.610 | 17 | -90 | 12.16 | 4 |
| DEX-BB4361 | 414981.530 | 9674373.157 | 411.680 | 12 | -90 | 3 | 7 |
| DEX-BB4362 | 415015.364 | 9674374.363 | 422.728 | 19 | -90 | 9.25 | 8 |
| DEX-BB4363 | 415528.224 | 9674753.521 | 403.000 | 21 | -90 | 9 | 10 |
| DEX-BB4364 | 415477.822 | 9674699.915 | 413.341 | 36 | -90 | 16.7 | 18 |
| DEX-BB4365 | 415525.600 | 9674700.765 | 413.808 | 38 | -90 | 15.91 | 21.19 |
| DEX-BB4366 | 415502.080 | 9674726.065 | 407.524 | 20 | -90 | 15.71 | 3 |
| DEX-BB4367 | 415526.150 | 9674729.380 | 405.402 | 37 | -90 | 11.46 | 24 |
| DEX-BB4368 | 415551.588 | 9674728.513 | 415.094 | 45 | -90 | 23.76 | 21 |
| DEX-BB4369 | 415502.873 | 9674780.052 | 404.526 | 31 | -90 | 8.26 | 21 |
| DEX-BB4370 | 415477.725 | 9674673.779 | 416.556 | 48 | -90 | 30.57 | 17 |
| DEX-BB4371 | 415498.574 | 9674673.843 | 413.377 | 33 | -90 | 15.9 | 16 |
| DEX-BB4547 | 414927.465 | 9675452.324 | 428.559 | 15 | -90 | 7 | 4 |
| DEX-BB4549 | 414849.714 | 9675429.571 | 432.757 | 13 | -90 | 5.25 | 5.8 |
| DEX-BB4550 | 414874.481 | 9675425.068 | 428.620 | 12 | -90 | 4.42 | 6 |
| DEX-BB4551 | 414899.386 | 9675424.526 | 426.700 | 12 | -90 | 5.47 | 5 |
| DEX-BB4552 | 414929.561 | 9675429.029 | 427.061 | 17 | -90 | 11.49 | 4 |
| DEX-BB4553 | 414950.174 | 9675428.420 | 426.666 | 18 | -90 | 12 | 4.3 |
| DEX-BB4555 | 414868.676 | 9675406.087 | 426.956 | 14 | -90 | 7.2 | 5.3 |
| DEX-BB4556 | 414928.408 | 9675403.695 | 425.512 | 16 | -90 | 12 | 2 |
| DEX-BB4557 | 414975.001 | 9675402.082 | 425.000 | 20 | -90 | 14.57 | 4 |
| DEX-BB4558 | 415000.830 | 9675404.201 | 422.569 | 14 | -90 | 7 | 5.2 |
| DEX-BB4559 | 414849.360 | 9675385.176 | 426.665 | 16 | -90 | 7.48 | 7.85 |
| DEX-BB4560 | 414871.113 | 9675378.825 | 423.870 | 13 | -90 | 8 | 3 |
| DEX-BB4561 | 414898.754 | 9675379.792 | 424.224 | 22 | -90 | 11.43 | 8.48 |
| DEX-BB4562 | 414926.886 | 9675375.996 | 424.571 | 21 | -90 | 11.81 | 6.75 |
| DEX-BB4563 | 414951.074 | 9675379.723 | 425.000 | 16 | -90 | 13.2 | 1 |
| DEX-BB4564 | 414974.618 | 9675378.380 | 424.242 | 25 | -90 | 15.24 | 8.66 |
| DEX-BB4565 | 415004.579 | 9675387.006 | 419.750 | 14 | -90 | 12.29 | 1 |
| DEX-BB4566 | 414730.692 | 9675355.932 | 429.881 | 16 | -90 | 10 | 4 |
| DEX-BB4567 | 414776.736 | 9675350.671 | 426.573 | 19 | -90 | 11 | 6 |
| DEX-BB4568 | 414822.965 | 9675352.311 | 424.360 | 19 | -90 | 11 | 6.28 |
| DEX-BB4569 | 414875.644 | 9675356.368 | 422.500 | 12 | -90 | 8.8 | 1 |
| DEX-BB4570 | 414930.390 | 9675351.145 | 423.916 | 19 | -90 | 12 | 5 |
| DEX-BB4571 | 414950.463 | 9675355.573 | 424.180 | 26 | -90 | 14 | 10 |
| DEX-BB4572 | 414975.654 | 9675353.724 | 424.000 | 27 | -90 | 14.33 | 11.12 |
| DEX-BB4573 | 414999.492 | 9675349.617 | 424.000 | 25 | -90 | 12 | 11.52 |
| DEX-BB4574 | 414727.805 | 9675326.869 | 429.852 | 19 | -90 | 12 | 4 |
| DEX-BB4575 | 414749.902 | 9675329.729 | 427.470 | 27 | -90 | 12 | 13 |
| DEX-BB4576 | 414779.772 | 9675324.737 | 424.601 | 22 | -90 | 15 | 4 |
| DEX-BB4577 | 414800.264 | 9675328.898 | 423.185 | 22 | -90 | 10 | 9.37 |
| DEX-BB4578 | 414827.696 | 9675327.432 | 420.927 | 21 | -90 | 10 | 9 |
| DEX-BB4579 | 414849.472 | 9675330.202 | 420.800 | 21 | -90 | 14 | 4 |
| DEX-BB4580 | 414876.711 | 9675332.248 | 421.434 | 17 | -90 | 11 | 4 |
| DEX-BB4581 | 414898.807 | 9675329.315 | 422.307 | 17 | -90 | 10 | 5 |
| DEX-BB4582 | 414925.276 | 9675331.388 | 423.114 | 22 | -90 | 13 | 6.89 |
| DEX-BB4583 | 414950.673 | 9675331.338 | 423.557 | 19 | -90 | 14 | 1.6 |
| DEX-BB4584 | 414975.301 | 9675331.836 | 423.618 | 23 | -90 | 17 | 4 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9984 | 416993.458 | 9672226.243 | 442.648 | 11 | -90 | 6 | 2 |
| DEX-CZ9985 | 417018.473 | 9672220.700 | 443.864 | 25 | -90 | 8 | 13 |
| DEX-CZ9986 | 417041.828 | 9672222.239 | 445.442 | 18 | -90 | 14.63 | 1 |
| DEX-CZ9987 | 417065.740 | 9672227.303 | 446.325 | 16 | -90 | 9 | 4 |
| DEX-CZ9988 | 417089.579 | 9672226.915 | 444.936 | 18 | -90 | 11 | 1 |
| DEX-CZ9989 | 417117.910 | 9672225.944 | 441.153 | 18 | -90 | 10 | 5.7 |
| DEX-CZ9990 | 417167.849 | 9672225.183 | 434.691 | 26 | -90 | 16.37 | 6 |
| DEX-CZ9991 | 417195.139 | 9672225.134 | 432.058 | 27 | -90 | 13.24 | 11.26 |
| DEX-CZ9992 | 417218.564 | 9672226.911 | 429.467 | 34 | -90 | 16.5 | 10 |
| DEX-CZ9993 | 417248.513 | 9672222.429 | 420.475 | 29 | -90 | 17.26 | 6 |
| DEX-CZ9994 | 417270.862 | 9672215.016 | 414.539 | 30 | -90 | 23.96 | 3.14 |
| DEX-CZ9995 | 417294.824 | 9672215.039 | 405.430 | 31 | -90 | 9 | 18 |
| DEX-CZ9996 | 417320.023 | 9672222.419 | 409.361 | 53 | -90 | 14 | 12 |
| DEX-CZ9997 | 417345.157 | 9672221.450 | 413.532 | 60 | -90 | 8 | 46 |
| DEX-CZ9998 | 417370.803 | 9672219.959 | 417.647 | 60 | -90 | 17 | 13 |
| DEX-CZ9999 | 417392.676 | 9672226.609 | 421.577 | 52 | -90 | 20.67 | 15 |
| CZ210005 | 418455.324 | 9673404.264 | 430.126 | 9 | -90 | 5.5 | 1 |
| CZ210275 | 417977.222 | 9673398.864 | 417.472 | 27 | -90 | 31.04 | 0 |
| DEX-CZ4728 | 417506.500 | 9674003.000 | 354.616 | 22 | -90 | 8 | 6 |
| DEX-CZ4766 | 418398.700 | 9674297.000 | 344.935 | 20 | -90 | 6 | 12 |
| CZ210171 | 418652.784 | 9673648.003 | 427.386 | 15 | -90 | 4 | 8.13 |
| CZ210192 | 418249.160 | 9673423.395 | 420.681 | 12 | -90 | 10.02 | 2 |
| DEX-CZ4756 | 418509.200 | 9674204.000 | 323.866 | 20 | -90 | 13 | 5 |
| CZ210106 | 418398.796 | 9673356.594 | 435.741 | 28 | -90 | 21 | 3.5 |
| CZ210163 | 418853.284 | 9673749.687 | 390.824 | 20 | -90 | 10.29 | 7.52 |
| CZ210235 | 418277.098 | 9673278.845 | 426.780 | 48 | -90 | 26.2 | 21.05 |
| CZ210105 | 418353.533 | 9673348.340 | 431.349 | 27 | -90 | 18.72 | 7 |
| CZ210161 | 418747.886 | 9673744.078 | 400.420 | 20 | -90 | 7.71 | 12 |
| CZ210270 | 418028.452 | 9673253.161 | 428.345 | 24 | -90 | 3 | 12 |
| CZ210297 | 418175.198 | 9673298.166 | 434.626 | 46 | -90 | 15.68 | 26.28 |
| CZ210301 | 418153.453 | 9673318.682 | 432.637 | 24 | -90 | 12.87 | 6 |
| CZ210193 | 418225.080 | 9673401.020 | 424.056 | 36 | -90 | 34.95 | 4.34 |
| DEX-CZ4742 | 417916.800 | 9674099.000 | 352.699 | 21 | -90 | 15.99 | 3.43 |
| CZ210032 | 418401.750 | 9673650.122 | 408.870 | 25 | -90 | 12.02 | 9.64 |
| CZ210274 | 418072.285 | 9673279.063 | 429.660 | 25 | -90 | 13.37 | 12.31 |
| CZ210003 | 418346.068 | 9673302.353 | 434.802 | 24 | -90 | 11.46 | 9.33 |
| CZ210015 | 418355.204 | 9673212.176 | 442.667 | 28 | -90 | 11.95 | 12.14 |
| CZ210051 | 417950.612 | 9673548.441 | 400.104 | 22 | -90 | 18.41 | 4 |
| CZ210091 | 418354.761 | 9673448.138 | 421.189 | 23 | -90 | 18.43 | 6.13 |
| CZ210098 | 417949.442 | 9673344.699 | 405.249 | 20 | -90 | 19.5 | 3 |
| CZ210111 | 417903.996 | 9673449.061 | 408.121 | 20 | -90 | 10.01 | 9.26 |
| CZ210201 | 418248.141 | 9673278.415 | 425.911 | 21 | -90 | 24.94 | 0 |
| CZ210307 | 418474.083 | 9673576.367 | 419.892 | 38 | -90 | 24.4 | 17 |
| CZ210039 | 418295.329 | 9673342.303 | 426.215 | 45 | -90 | 22.02 | 18.59 |
| CZ210110 | 417902.883 | 9673353.127 | 407.174 | 16 | -90 | 4.45 | 10 |
| CZ210269 | 418049.635 | 9673276.102 | 426.703 | 24 | -90 | 6 | 8.3 |
| DEX-CZ9721 | 416689.037 | 9673342.642 | 380.655 | 27 | -90 | 18 | 6 |
| CZ210007 | 418450.430 | 9673599.481 | 416.191 | 24 | -90 | 14.06 | 9.44 |
| CZ210112 | 417898.932 | 9673557.342 | 386.779 | 23 | -90 | 20.62 | 4 |
| CZ210245 | 417974.378 | 9673498.722 | 411.781 | 26 | -90 | 26.77 | 3.35 |
| CZ210285 | 418497.869 | 9673525.623 | 426.700 | 35 | -90 | 10 | 4 |
| CZ210294 | 418127.902 | 9673272.712 | 436.644 | 37 | -90 | 27.3 | 15.26 |
| DEX-CZ4804 | 418000.800 | 9674104.000 | 364.766 | 17 | -90 | 10 | 5 |
| CZ210026 | 418501.137 | 9673645.695 | 414.398 | 36 | -90 | 20.95 | 17 |
| CZ210230 | 418524.904 | 9673430.117 | 439.236 | 31 | -90 | 25.55 | 4 |
| CZ210239 | 418028.191 | 9673359.258 | 415.694 | 20 | -90 | 14.89 | 6.95 |
| CZ210004 | 418451.806 | 9673500.563 | 418.958 | 48 | -90 | 31.89 | 26.03 |
| CZ210179 | 418699.145 | 9673599.794 | 448.308 | 26 | -90 | 20.67 | 5.21 |
| CZ210046 | 418501.976 | 9673801.331 | 376.904 | 38 | -90 | 30.16 | 10.28 |
| CZ210178 | 418648.833 | 9673601.558 | 439.884 | 23 | -90 | 14.98 | 1.21 |
| CZ210081 | 418247.926 | 9673595.619 | 381.013 | 38 | -90 | 11.5 | 25.95 |
| CZ210229 | 418523.427 | 9673452.443 | 437.217 | 35 | -90 | 15.98 | 14.74 |
| CZ210289 | 418098.529 | 9673299.038 | 431.371 | 35 | -90 | 10.16 | 20.04 |
| CZ210290 | 418102.967 | 9673319.219 | 429.012 | 36 | -90 | 22.73 | 14.59 |
| CZ210020 | 418250.116 | 9673261.607 | 425.149 | 29 | -90 | 25.8 | 7.85 |
| CZ210227 | 418474.929 | 9673432.311 | 431.780 | 28 | -90 | 20.42 | 8.22 |
| CZ210001 | 418151.164 | 9673300.834 | 434.904 | 23 | -90 | 10.12 | 1 |
| CZ210023 | 417905.778 | 9673214.198 | 392.836 | 20 | -90 | 9.02 | 9.99 |
| CZ210065 | 418054.562 | 9673450.730 | 428.214 | 36 | -90 | 15.8 | 9.68 |
| CZ210092 | 418359.025 | 9673398.714 | 426.320 | 29 | -90 | 18.45 | 12.25 |
| CZ210095 | 418452.221 | 9673653.057 | 409.158 | 32 | -90 | 26.21 | 9.49 |
| CZ210221 | 418195.959 | 9673324.310 | 430.800 | 25 | -90 | 21.12 | 5.34 |
| CZ210286RD | 418495.547 | 9673579.050 | 421.181 | 35 | -90 | 21.75 | 10.44 |
| CZ210299 | 418198.226 | 9673298.819 | 432.631 | 33 | -90 | 26.62 | 8.85 |
| CZ210273 | 418028.119 | 9673276.254 | 420.810 | 17 | -90 | 11.69 | 3.58 |
| CZ210019 | 418203.320 | 9673259.936 | 431.263 | 25 | -90 | 17.09 | 10.2 |
| CZ210011 | 418152.622 | 9673210.864 | 431.540 | 32 | -90 | 14.99 | 16 |
| CZ210097 | 418449.717 | 9673449.838 | 427.273 | 36 | -90 | 21.24 | 15.1 |
| CZ210116 | 417551.592 | 9673209.794 | 416.615 | 14 | -90 | 10 | 1 |
| CZ210190 | 418598.913 | 9673449.214 | 457.282 | 26 | -90 | 7.25 | 10.31 |
| CZ210053 | 417951.462 | 9673447.142 | 417.567 | 16 | -90 | 2 | 10.35 |
| CZ210103 | 418150.120 | 9673352.866 | 427.082 | 39 | -90 | 35.43 | 8.13 |
| CZ210220 | 418197.086 | 9673375.029 | 426.231 | 29 | -90 | 12.52 | 16.49 |
| CZ210276 | 418000.402 | 9673395.419 | 418.361 | 28 | -90 | 20.71 | 6.95 |
| CZ210295 | 418151.034 | 9673273.791 | 437.237 | 28 | -90 | 5.38 | 18.38 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4586 | 414772.325 | 9675303.775 | 425.000 | 26 | -90 | 12 | 11 |
| DEX-BB4587 | 414825.662 | 9675306.479 | 420.007 | 30 | -90 | 18 | 10 |
| DEX-BB4588 | 414849.568 | 9675304.833 | 420.000 | 27 | -90 | 12 | 12 |
| DEX-BB4589 | 414872.106 | 9675306.193 | 420.423 | 19 | -90 | 10 | 7 |
| DEX-BB4590 | 414897.791 | 9675303.008 | 421.575 | 22 | -90 | 16 | 4 |
| DEX-BB4591 | 414922.282 | 9675300.767 | 422.142 | 18 | -90 | 14 | 2 |
| DEX-BB4592 | 414948.325 | 9675300.684 | 422.660 | 20 | -90 | 15 | 2 |
| DEX-BB4593 | 414974.379 | 9675306.328 | 423.016 | 28 | -90 | 25 | 0.63 |
| DEX-BB4595 | 414775.487 | 9675284.098 | 423.887 | 28 | -90 | 15 | 10.85 |
| DEX-BB4596 | 414798.865 | 9675279.955 | 421.100 | 36 | -90 | 20 | 14 |
| DEX-BB4597 | 414822.926 | 9675281.463 | 419.379 | 27 | -90 | 17 | 8 |
| DEX-BB4598 | 414851.780 | 9675279.707 | 418.993 | 31 | -90 | 14 | 15 |
| DEX-BB4599 | 414775.220 | 9675253.536 | 422.002 | 23 | -90 | 12 | 9 |
| DEX-BB4600 | 414806.072 | 9675255.565 | 418.879 | 22 | -90 | 10 | 9.6 |
| DEX-BB4601 | 414828.983 | 9675258.205 | 418.000 | 27 | -90 | 14 | 11 |
| DEX-BB4602 | 414500.682 | 9674669.169 | 468.384 | 30 | -90 | 11.26 | 17.3 |
| DEX-BB4603 | 414500.594 | 9674718.646 | 458.461 | 27 | -90 | 6 | 14.65 |
| DEX-BB4604 | 414500.125 | 9674772.763 | 438.088 | 36 | -90 | 6 | 28 |
| DEX-BB4605 | 414501.798 | 9674816.443 | 418.347 | 17 | -90 | 2 | 13 |
| DEX-BB4606 | 414498.659 | 9674866.384 | 406.435 | 8 | -90 | 2 | 4 |
| DEX-BB4607 | 414524.140 | 9674866.202 | 414.672 | 15 | -90 | 3 | 10 |
| DEX-BB4608 | 414547.991 | 9674866.277 | 416.776 | 21 | -90 | 7 | 12 |
| DEX-BB4609 | 414524.994 | 9674816.907 | 420.420 | 20 | -90 | 5 | 13 |
| DEX-BB4610 | 414551.044 | 9674821.796 | 427.493 | 31 | -90 | 7 | 22.46 |
| DEX-BB4611 | 414575.346 | 9674822.694 | 430.587 | 27 | -90 | 12 | 13.94 |
| DEX-BB4612 | 414608.856 | 9674824.791 | 424.604 | 24 | -90 | 8 | 14.29 |
| DEX-BB4613 | 414638.780 | 9674821.546 | 435.349 | 33 | -90 | 10 | 21 |
| DEX-BB4614 | 414658.344 | 9674822.049 | 436.759 | 24 | -90 | 14 | 8 |
| DEX-BB4615 | 414678.980 | 9674821.135 | 436.333 | 29 | -90 | 8 | 19 |
| DEX-BB4616 | 414699.439 | 9674821.434 | 431.289 | 24 | -90 | 11 | 11.56 |
| DEX-BB4617 | 414727.103 | 9674820.859 | 432.263 | 14 | -90 | 6.35 | 6 |
| DEX-BB4618 | 414750.566 | 9674827.232 | 429.111 | 15 | -90 | 4 | 9 |
| DEX-BB4619 | 414780.271 | 9674815.213 | 422.723 | 10 | -90 | 3 | 5 |
| DEX-BB4620 | 414528.688 | 9674789.210 | 428.689 | 15 | -90 | 4 | 9 |
| DEX-BB4621 | 414577.267 | 9674797.570 | 439.196 | 34 | -90 | 13.48 | 19 |
| DEX-BB4622 | 414641.426 | 9674795.885 | 441.532 | 31 | -90 | 14.23 | 14.71 |
| DEX-BB4623 | 414672.927 | 9674797.553 | 443.763 | 22 | -90 | 15.4 | 5 |
| DEX-BB4624 | 414723.027 | 9674790.560 | 442.437 | 23 | -90 | 12 | 9 |
| DEX-BB4625 | 414776.711 | 9674796.686 | 426.931 | 17 | -90 | 9 | 5.86 |
| DEX-BB4626 | 414522.020 | 9674758.263 | 443.171 | 29 | -90 | 22.71 | 4 |
| DEX-BB4627 | 414553.004 | 9674773.113 | 442.169 | 19 | -90 | 10 | 7.47 |
| DEX-BB4628 | 414572.179 | 9674774.528 | 447.146 | 30 | -90 | 19.26 | 9 |
| DEX-BB4629 | 414598.946 | 9674770.413 | 448.399 | 30 | -90 | 18.26 | 11.11 |
| DEX-BB4630 | 414625.620 | 9674771.603 | 445.626 | 30 | -90 | 20.35 | 8 |
| DEX-BB4631 | 414648.769 | 9674769.460 | 451.463 | 26 | -90 | 21 | 3.82 |
| DEX-BB4632 | 414677.135 | 9674768.206 | 452.723 | 28 | -90 | 16.7 | 10 |
| DEX-BB4633 | 414703.241 | 9674765.460 | 451.532 | 25 | -90 | 22.75 | 1 |
| DEX-BB4634 | 414726.859 | 9674770.682 | 446.331 | 19 | -90 | 10 | 7 |
| DEX-BB4635 | 414745.202 | 9674770.274 | 442.711 | 17 | -90 | 9 | 6 |
| DEX-BB4636 | 414773.156 | 9674769.813 | 436.290 | 32 | -90 | 16 | 16 |
| DEX-BB4637 | 414515.399 | 9674741.762 | 450.970 | 20 | -90 | 8 | 9.61 |
| DEX-BB4638 | 414577.273 | 9674744.459 | 457.358 | 21 | -90 | 17.8 | 2 |
| DEX-BB4639 | 414624.011 | 9674743.897 | 454.914 | 33 | -90 | 25.42 | 7 |
| DEX-BB4640 | 414674.914 | 9674749.629 | 457.734 | 26 | -90 | 17.4 | 7 |
| DEX-BB4641 | 414722.465 | 9674748.995 | 453.480 | 22 | -90 | 11 | 8.76 |
| DEX-BB4642 | 414771.866 | 9674747.177 | 440.886 | 13 | -90 | 5 | 6 |
| DEX-BB4643 | 414524.878 | 9674719.309 | 458.849 | 27 | -90 | 19.28 | 6 |
| DEX-BB4644 | 414552.636 | 9674720.056 | 461.515 | 32 | -90 | 31.11 | 1.64 |
| DEX-BB4645 | 414576.373 | 9674719.559 | 462.984 | 33 | -90 | 28.41 | 5 |
| DEX-BB4646 | 414600.872 | 9674720.978 | 463.047 | 29 | -90 | 22.32 | 5.25 |
| DEX-BB4647 | 414625.457 | 9674721.402 | 461.349 | 38 | -90 | 30.29 | 6.75 |
| DEX-BB4648 | 414648.297 | 9674723.340 | 462.740 | 27 | -90 | 21.37 | 4 |
| DEX-BB4649 | 414675.560 | 9674716.624 | 464.501 | 37 | -90 | 31.76 | 7 |
| DEX-BB4650 | 414699.380 | 9674718.755 | 463.861 | 35 | -90 | 31.37 | 3 |
| DEX-BB4651 | 414723.284 | 9674720.701 | 460.526 | 28 | -90 | 13 | 12.75 |
| DEX-BB4652 | 414761.546 | 9674721.459 | 447.542 | 16 | -90 | 9 | 5 |
| DEX-BB4653 | 414774.179 | 9674722.894 | 442.108 | 18 | -90 | 12 | 4 |
| DEX-BB4654 | 414797.478 | 9674721.812 | 431.724 | 14 | -90 | 7 | 4.9 |
| DEX-BB4655 | 414822.676 | 9674720.393 | 425.029 | 6 | -90 | 2 | 2 |
| DEX-BB4656 | 414859.334 | 9674710.962 | 444.009 | 13 | -90 | 6 | 5 |
| DEX-BB4657 | 414883.380 | 9674713.200 | 450.734 | 21 | -90 | 7 | 11.87 |
| DEX-BB4658 | 414904.406 | 9674715.994 | 454.273 | 24 | -90 | 5 | 17 |
| DEX-BB4659 | 414938.297 | 9674715.250 | 462.024 | 37 | -90 | 22.2 | 15.16 |
| DEX-BB4660 | 414477.388 | 9674738.189 | 453.243 | 25 | -90 | 7 | 16 |
| DEX-BB4661 | 414472.193 | 9674720.767 | 457.726 | 54 | -90 | 7 | 45 |
| DEX-BB4662 | 414474.388 | 9674693.724 | 463.268 | 36 | -90 | 27.02 | 9.78 |
| DEX-BB4663 | 414476.155 | 9674666.776 | 464.076 | 17 | -90 | 10.5 | 5 |
| DEX-BB4664 | 414477.461 | 9674642.586 | 456.822 | 18 | -90 | 4 | 11.82 |
| DEX-BB4665 | 414521.754 | 9674692.100 | 466.166 | 32 | -90 | 25.76 | 5.73 |
| DEX-BB4666 | 414576.486 | 9674696.673 | 467.767 | 25 | -90 | 22.55 | 2 |
| DEX-BB4667 | 414628.218 | 9674693.694 | 468.826 | 28 | -90 | 19.22 | 7.35 |
| DEX-BB4668 | 414724.025 | 9674694.713 | 461.986 | 27 | -90 | 14.35 | 11.49 |
| DEX-BB4669 | 414776.593 | 9674695.687 | 441.086 | 14 | -90 | 7 | 5 |
| DEX-BB4670 | 414819.472 | 9674686.706 | 426.000 | 9 | -90 | 3 | 4 |
| DEX-BB4671 | 414881.124 | 9674694.471 | 453.174 | 29 | -90 | 12 | 15 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| CZ210277 | 418024.800 | 9673402.689 | 421.805 | 21 | -90 | 22 | 2.84 |
| CZ210038 | 418297.669 | 9673448.563 | 418.214 | 43 | -90 | 18.54 | 24.77 |
| CZ210196 | 418298.327 | 9673371.263 | 424.610 | 27 | -90 | 26.28 | 3.4 |
| CZ210108 | 417999.585 | 9673357.671 | 412.816 | 24 | -90 | 11.99 | 11.82 |
| CZ210044 | 418195.788 | 9673348.008 | 428.890 | 26 | -90 | 13.84 | 13.26 |
| CZ210240 | 418001.715 | 9673378.332 | 416.433 | 15 | -90 | 14.44 | 0.27 |
| CZ210064 | 418046.406 | 9673505.952 | 430.414 | 27 | -90 | 11.76 | 10.22 |
| CZ210084 | 418251.036 | 9673446.655 | 415.909 | 26 | -90 | 24.69 | 1.16 |
| CZ210088 | 418345.768 | 9673654.369 | 405.937 | 17 | -90 | 7.43 | 4.08 |
| CZ210188 | 418599.811 | 9673499.754 | 449.557 | 23 | -90 | 13.96 | 3.34 |
| CZ210077 | 418153.405 | 9673443.918 | 424.724 | 22 | -90 | 8.6 | 7.12 |
| CZ210189 | 418547.698 | 9673451.452 | 442.620 | 35 | -90 | 19.07 | 10.97 |
| CZ210012 | 418204.083 | 9673211.485 | 427.929 | 41 | -90 | 19.1 | 13.41 |
| CZ210129 | 417899.068 | 9673262.795 | 387.086 | 25 | -90 | 27.11 | 2 |
| CZ210187 | 418554.884 | 9673502.373 | 438.897 | 46 | -90 | 20.43 | 8.82 |
| DEX-CZ190 | 416207.780 | 9673269.620 | 359.333 | 17 | -90 | 9.68 | 6.46 |
| CZ210013 | 418253.685 | 9673210.910 | 426.523 | 19 | -90 | 14.48 | 2.15 |
| CZ210246 | 417998.787 | 9673472.675 | 420.283 | 30 | -90 | 4 | 22 |
| CZ210057 | 418003.026 | 9673553.880 | 414.798 | 14 | -90 | 9 | 3 |
| CZ210078 | 418155.073 | 9673396.323 | 424.614 | 29 | -90 | 17.5 | 11.8 |
| CZ210002 | 418256.612 | 9673298.869 | 425.492 | 36 | -90 | 18.91 | 13.49 |
| CZ210017 | 418099.047 | 9673255.892 | 437.687 | 11 | -90 | 12.21 | 0 |
| CZ210028 | 418498.839 | 9673451.971 | 432.619 | 32 | -90 | 20.38 | 6.62 |
| CZ210082 | 418239.838 | 9673553.500 | 388.813 | 16 | -90 | 4 | 8.38 |
| CZ210211 | 418275.876 | 9673322.016 | 425.573 | 40 | -90 | 32.04 | 12.8 |
| CZ210242 | 417999.442 | 9673522.142 | 415.339 | 24 | -90 | 17.88 | 6.25 |
| CZ210284 | 418497.358 | 9673500.976 | 429.132 | 40 | -90 | 17.55 | 17 |
| CZ210018 | 418152.573 | 9673262.798 | 437.487 | 24 | -90 | 6.57 | 7.54 |
| CZ210224 | 418428.708 | 9673448.448 | 422.333 | 50 | -90 | 25.72 | 15.18 |
| CZ210291 | 418117.239 | 9673340.293 | 426.878 | 29 | -90 | 14.02 | 14.95 |
| CZ210177 | 418597.658 | 9673602.417 | 429.046 | 28 | -90 | 17.08 | 5.84 |
| CZ210099 | 417944.178 | 9673298.889 | 394.703 | 24 | -90 | 20.46 | 7.24 |
| CZ210260 | 418026.748 | 9673378.542 | 419.544 | 39 | -90 | 25.64 | 18.9 |
| CZ210140 | 417802.261 | 9673352.705 | 379.271 | 19 | -90 | 10.8 | 7.19 |
| DEX-CZ178 | 415997.538 | 9673206.392 | 336.848 | 15 | -90 | 4 | 6 |
| DEX-CZ4731 | 417822.863 | 9674003.722 | 332.587 | 15 | -90 | 6 | 7 |
| CZ210010 | 418103.953 | 9673212.285 | 432.347 | 27 | -90 | 5 | 9 |
| CZ210021 | 418302.624 | 9673255.405 | 431.552 | 19 | -90 | 17.18 | 1 |
| CZ210006 | 418350.331 | 9673605.961 | 411.652 | 25 | -90 | 19.09 | 5 |
| CZ210238 | 418006.666 | 9673348.132 | 410.782 | 30 | -90 | 7.51 | 25.61 |
| CZ210237 | 418404.385 | 9673420.973 | 426.042 | 46 | -90 | 21.04 | 22.58 |
| CZ210033 | 418406.128 | 9673553.298 | 413.360 | 27 | -90 | 15.21 | 15.69 |
| DEX-CZ3489 | 418248.950 | 9672903.142 | 438.325 | 30 | -90 | 10.74 | 19 |
| DEX-CZ3414 | 418199.327 | 9673050.475 | 434.863 | 20 | -90 | 15 | 1 |
| CZ210247 | 418017.710 | 9673477.194 | 424.069 | 23 | -90 | 9.03 | 6 |
| DEX-CZ3415 | 418150.839 | 9673051.922 | 422.118 | 18 | -90 | 7 | 9 |
| DEX-CZ9717 | 416741.679 | 9673395.425 | 369.764 | 21 | -90 | 18.77 | 0 |
| CZ210115 | 417952.391 | 9673268.624 | 400.663 | 15 | -90 | 13.31 | 2 |
| DEX-CZ4730 | 417703.980 | 9674001.884 | 374.024 | 39 | -90 | 17.29 | 22.51 |
| DEX-CZ4716 | 417504.940 | 9673699.770 | 358.030 | 37 | -90 | 28.06 | 10 |
| CZ210141 | 417849.949 | 9673353.016 | 393.277 | 8 | -90 | 6.22 | 0 |
| DEX-CZ3458 | 418300.922 | 9672950.832 | 453.543 | 17 | -90 | 6.25 | 9 |
| DEX-CZ4722 | 417702.478 | 9673797.570 | 376.748 | 26 | -90 | 27.74 | 0 |
| DEX-CZ9728 | 416740.715 | 9673291.711 | 392.657 | 27 | -90 | 20.35 | 4 |
| DEX-CZ4721 | 417604.128 | 9673798.644 | 366.055 | 26 | -90 | 21.47 | 8.22 |
| DEX-CZ4723 | 417800.571 | 9673805.086 | 367.066 | 13 | -90 | 2.25 | 6.75 |
| DEX-CZ4781 | 417703.836 | 9673886.267 | 363.133 | 23 | -90 | 10.97 | 4.26 |
| CZ210102 | 418097.146 | 9673345.572 | 423.467 | 22 | -90 | 17.57 | 4.8 |
| DEX-CZ4812 | 417552.985 | 9673761.868 | 365.090 | 39 | -90 | 13.59 | 14 |
| DEX-CZ3393 | 418150.536 | 9673101.064 | 412.090 | 38 | -90 | 13.62 | 11 |
| DEX-CZ4780 | 417595.175 | 9673899.386 | 373.333 | 17 | -90 | 4 | 5 |
| DEX-CZ10083 | 416767.523 | 9672200.001 | 403.734 | 24 | -90 | 14.21 | 8 |
| DEX-CZ3441 | 418246.508 | 9673001.289 | 445.440 | 29 | -90 | 16 | 10.32 |
| DEX-CZ3488 | 418347.667 | 9672902.986 | 450.746 | 9 | -90 | 2 | 4 |
| DEX-CZ4715 | 417403.829 | 9673703.043 | 353.336 | 48 | -90 | 41.2 | 10 |
| DEX-CZ4724 | 417506.934 | 9673901.387 | 364.381 | 52 | -90 | 14.55 | 22 |
| DEX-CZ4713 | 417696.003 | 9673612.245 | 358.288 | 19 | -90 | 18.48 | 1 |
| CZ210261 | 417973.197 | 9673376.007 | 414.839 | 37 | -90 | 19.64 | 16.23 |
| DEX-CZ4719 | 417405.036 | 9673801.480 | 350.959 | 27 | -90 | 11.7 | 13 |
| DEX-CZ3457 | 418346.702 | 9672951.503 | 459.537 | 12 | -90 | 3 | 6 |
| DEX-CZ4717 | 417605.351 | 9673698.115 | 356.550 | 40 | -90 | 33.24 | 3 |
| DEX-CZ4714 | 417300.680 | 9673692.505 | 349.405 | 40 | -90 | 27.44 | 12 |
| DEX-CZ4785 | 417198.525 | 9673601.870 | 347.482 | 32 | -90 | 23.77 | 9 |
| DEX-CZ4718 | 417698.892 | 9673703.155 | 362.101 | 31 | -90 | 18.9 | 13 |
| CZ210226 | 418427.336 | 9673423.521 | 425.384 | 28 | -90 | 21.93 | 3.75 |
| DEX-CZ10070 | 416817.497 | 9672250.916 | 400.817 | 27 | -90 | 5 | 18.35 |
| DEX-CZ9712 | 416695.675 | 9673446.405 | 377.637 | 27 | -90 | 18.47 | 7 |
| DEX-CZ4720 | 417510.108 | 9673804.361 | 373.721 | 21 | -90 | 4 | 15 |
| DEX-CZ3460 | 418207.720 | 9672951.024 | 439.405 | 21 | -90 | 4 | 15 |
| DEX-CZ10018 | 416816.456 | 9672298.716 | 409.775 | 44 | -90 | 19.28 | 22 |
| DEX-CZ3505 | 418202.581 | 9672851.404 | 422.425 | 8 | -90 | 5 | 0.45 |
| DEX-CZ3459 | 418249.867 | 9672953.018 | 448.134 | 36 | -90 | 25 | 9 |
| DEX-CZ10356 | 417490.524 | 9674882.570 | 364.975 | 23 | -90 | 11 | 3 |
| DEX-CZ10357 | 417541.312 | 9674884.650 | 371.000 | 25 | -90 | 11 | 12 |
| DEX-CZ10358 | 417543.165 | 9674926.944 | 373.182 | 33 | -90 | 13 | 16.23 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4672 | 414929.266 | 9674694.457 | 465.529 | 19 | -90 | 16 | 1 |
| DEX-BB4673 | 414529.254 | 9674666.975 | 470.000 | 31 | -90 | 24.54 | 6 |
| DEX-BB4674 | 414550.684 | 9674670.672 | 470.000 | 26 | -90 | 17.39 | 7 |
| DEX-BB4675 | 414574.951 | 9674671.991 | 470.638 | 22 | -90 | 18.3 | 2 |
| DEX-BB4676 | 414602.779 | 9674668.412 | 471.000 | 30 | -90 | 25.07 | 4.25 |
| DEX-BB4677 | 414627.768 | 9674670.021 | 471.000 | 32 | -90 | 19.6 | 12.6 |
| DEX-BB4678 | 414645.768 | 9674670.974 | 471.000 | 46 | -90 | 31.59 | 14.83 |
| DEX-BB4679 | 414670.995 | 9674671.365 | 470.000 | 23 | -90 | 19 | 2 |
| DEX-BB4680 | 414698.223 | 9674669.840 | 466.673 | 23 | -90 | 11.26 | 10 |
| DEX-BB4681 | 414724.165 | 9674673.067 | 461.722 | 21 | -90 | 16 | 3 |
| DEX-BB4682 | 414746.712 | 9674672.693 | 454.271 | 13 | -90 | 8 | 3 |
| DEX-BB4683 | 414772.756 | 9674670.518 | 444.328 | 14 | -90 | 7 | 5 |
| DEX-BB4684 | 414827.745 | 9674667.560 | 427.000 | 15 | -90 | 6 | 7 |
| DEX-BB4685 | 414845.885 | 9674674.801 | 436.372 | 21 | -90 | 5 | 13.9 |
| DEX-BB4686 | 414697.938 | 9674620.288 | 463.817 | 21 | -90 | 17.52 | 2 |
| DEX-BB4687 | 414700.613 | 9674565.119 | 451.040 | 27 | -90 | 12 | 13 |
| DEX-BB4688 | 414700.950 | 9674519.329 | 433.181 | 16 | -90 | 8 | 6 |
| DEX-BB4689 | 414706.414 | 9674464.156 | 448.817 | 27 | -90 | 20 | 6 |
| DEX-BB4690 | 414526.422 | 9674645.023 | 466.829 | 27 | -90 | 26.79 | 2 |
| DEX-BB4691 | 414577.409 | 9674644.808 | 468.863 | 21 | -90 | 17.35 | 1.53 |
| DEX-BB4692 | 414625.453 | 9674635.544 | 456.719 | 15 | -90 | 8.32 | 4 |
| DEX-BB4693 | 414674.532 | 9674645.847 | 469.577 | 49 | -90 | 35.97 | 12 |
| DEX-BB4694 | 414723.164 | 9674643.620 | 456.995 | 32 | -90 | 14 | 13 |
| DEX-BB4695 | 414683.167 | 9674625.512 | 464.678 | 35 | -90 | 21.54 | 14.27 |
| DEX-BB4696 | 414651.563 | 9674627.589 | 456.006 | 29 | -90 | 23.88 | 4 |
| DEX-BB4697 | 414626.158 | 9674612.966 | 448.821 | 25 | -90 | 3 | 19.76 |
| DEX-BB4698 | 414597.329 | 9674619.625 | 463.811 | 41 | -90 | 26.7 | 13.11 |
| DEX-BB4699 | 414576.153 | 9674622.498 | 459.256 | 19 | -90 | 2 | 10 |
| DEX-BB4700 | 414722.466 | 9674623.112 | 457.895 | 29 | -90 | 14 | 13 |
| DEX-BB4701 | 414751.228 | 9674616.197 | 451.597 | 20 | -90 | 17 | 1 |
| DEX-BB4702 | 414674.967 | 9674596.452 | 449.753 | 20 | -90 | 13.36 | 5 |
| DEX-BB4703 | 414649.036 | 9674597.998 | 444.113 | 30 | -90 | 12.25 | 16 |
| DEX-BB4704 | 414621.779 | 9674590.478 | 442.023 | 24 | -90 | 10 | 11 |
| DEX-BB4705 | 414593.785 | 9674598.032 | 452.242 | 23 | -90 | 5 | 15.74 |
| DEX-BB4706 | 414578.620 | 9674594.909 | 445.679 | 8 | -90 | 2 | 4 |
| DEX-BB4707 | 414728.029 | 9674591.282 | 459.922 | 24 | -90 | 14.64 | 8 |
| DEX-BB4708 | 414775.822 | 9674594.433 | 447.821 | 21 | -90 | 17 | 2 |
| DEX-BB4709 | 414727.899 | 9674572.256 | 458.598 | 21 | -90 | 18 | 0.6 |
| DEX-BB4710 | 414750.736 | 9674572.577 | 455.050 | 25 | -90 | 18.35 | 5 |
| DEX-BB4711 | 414773.871 | 9674570.203 | 448.891 | 27 | -90 | 19.51 | 5.67 |
| DEX-BB4712 | 414730.358 | 9674541.521 | 449.132 | 31 | -90 | 21.36 | 8.37 |
| DEX-BB4713 | 414779.001 | 9674548.661 | 447.149 | 21 | -90 | 17 | 1.66 |
| DEX-BB4714 | 414826.477 | 9674546.627 | 442.550 | 19 | -90 | 15.84 | 2 |
| DEX-BB4716 | 414801.481 | 9674571.895 | 441.713 | 20 | -90 | 18.06 | 2 |
| DEX-BB4717 | 414832.540 | 9674571.881 | 435.841 | 22 | -90 | 14 | 6 |
| DEX-BB4718 | 414754.609 | 9674517.589 | 453.214 | 25 | -90 | 17.66 | 6.83 |
| DEX-BB4719 | 414783.241 | 9674518.324 | 453.455 | 28 | -90 | 20.11 | 7 |
| DEX-BB4720 | 414808.170 | 9674517.755 | 451.612 | 22 | -90 | 18.33 | 2 |
| DEX-BB4721 | 414833.862 | 9674507.419 | 448.344 | 23 | -90 | 18.54 | 1.5 |
| DEX-BB4722 | 414859.306 | 9674518.739 | 440.012 | 28 | -90 | 21.8 | 5 |
| DEX-BB4723 | 414884.393 | 9674516.057 | 437.683 | 33 | -90 | 20.53 | 11 |
| DEX-BB4724 | 414904.007 | 9674520.208 | 441.797 | 33 | -90 | 19.25 | 12.1 |
| DEX-BB4725 | 414928.523 | 9674518.043 | 445.917 | 33 | -90 | 24.53 | 7 |
| DEX-BB4726 | 414952.279 | 9674519.051 | 450.456 | 25 | -90 | 17.24 | 6 |
| DEX-BB4727 | 414974.052 | 9674510.589 | 451.952 | 24 | -90 | 16.26 | 6 |
| DEX-BB4729 | 414758.069 | 9674473.411 | 452.960 | 26 | -90 | 18.66 | 6 |
| DEX-BB4730 | 414782.053 | 9674472.589 | 452.069 | 24 | -90 | 17.61 | 5 |
| DEX-BB4731 | 414807.540 | 9674471.145 | 453.000 | 26 | -90 | 19.3 | 5 |
| DEX-BB4732 | 414833.081 | 9674466.082 | 449.773 | 30 | -90 | 26.07 | 3 |
| DEX-BB4733 | 414856.562 | 9674460.089 | 446.044 | 25 | -90 | 20.75 | 2 |
| DEX-BB4734 | 414870.534 | 9674475.151 | 436.278 | 29 | -90 | 17.63 | 10 |
| DEX-BB4735 | 414906.170 | 9674468.838 | 429.132 | 28 | -90 | 21.58 | 5 |
| DEX-BB4736 | 414935.480 | 9674470.522 | 440.242 | 29 | -90 | 25.75 | 2 |
| DEX-BB4737 | 414953.782 | 9674465.593 | 441.430 | 26 | -90 | 20.65 | 4 |
| DEX-BB4738 | 414986.049 | 9674463.784 | 446.132 | 21 | -90 | 9 | 10 |
| DEX-BB4739 | 415008.446 | 9674466.360 | 448.373 | 17 | -90 | 4 | 10.65 |
| DEX-BB4740 | 414735.896 | 9674432.351 | 434.827 | 17 | -90 | 7 | 7.67 |
| DEX-BB4741 | 414759.678 | 9674429.279 | 433.490 | 21 | -90 | 10 | 9.24 |
| DEX-BB4742 | 414790.111 | 9674416.791 | 427.022 | 22 | -90 | 10 | 8.3 |
| DEX-BB4743 | 414805.368 | 9674420.487 | 434.654 | 33 | -90 | 26.65 | 6.42 |
| DEX-BB4744 | 414834.224 | 9674427.302 | 444.484 | 43 | -90 | 34.76 | 8.6 |
| DEX-BB4745 | 414854.991 | 9674415.373 | 442.052 | 27 | -90 | 18.87 | 7.01 |
| DEX-BB4746 | 414908.616 | 9674418.187 | 427.630 | 30 | -90 | 11 | 17.34 |
| DEX-BB4747 | 414930.193 | 9674425.714 | 420.193 | 13 | -90 | 8 | 3 |
| DEX-BB4748 | 414956.236 | 9674418.052 | 422.636 | 31 | -90 | 18.25 | 10.9 |
| DEX-BB4749 | 414987.690 | 9674417.140 | 428.495 | 36 | -90 | 13 | 20.35 |
| DEX-BB4750 | 415006.189 | 9674420.324 | 427.784 | 19 | -90 | 11 | 6 |
| DEX-BB4751 | 414783.537 | 9674384.280 | 420.999 | 19 | -90 | 3 | 14 |
| DEX-BB4752 | 414832.118 | 9674387.563 | 443.000 | 34 | -90 | 29.39 | 4 |
| DEX-BB4753 | 414883.007 | 9674398.766 | 439.808 | 42 | -90 | 25.84 | 15 |
| DEX-BB4754 | 414932.910 | 9674391.558 | 416.644 | 17 | -90 | 8 | 7 |
| DEX-BB4755 | 414981.266 | 9674399.844 | 417.654 | 32 | -90 | 10 | 20.61 |
| DEX-BB4756 | 414795.762 | 9674367.149 | 430.429 | 28 | -90 | 7 | 19.4 |
| DEX-BB4757 | 414812.765 | 9674369.473 | 436.630 | 23 | -90 | 11.39 | 9.85 |
| DEX-BB4758 | 414837.242 | 9674365.370 | 441.462 | 23 | -90 | 12 | 9 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10359 | 417594.927 | 9674883.355 | 363.524 | 15 | -90 | 8 | 1 |
| DEX-CZ10360 | 417640.187 | 9674875.436 | 370.000 | 17 | -90 | 12.78 | 1.5 |
| DEX-CZ10361 | 417545.008 | 9674837.472 | 367.906 | 28 | -90 | 14 | 6.88 |
| DEX-CZ10362 | 417643.795 | 9674832.310 | 367.308 | 18 | -90 | 11.27 | 3.21 |
| DEX-CZ10363 | 417537.986 | 9674767.598 | 352.709 | 7 | -90 | 2 | 0 |
| DEX-CZ10364 | 417598.474 | 9674783.483 | 367.354 | 23 | -90 | 6 | 6 |
| DEX-CZ10365 | 417642.250 | 9674776.422 | 372.565 | 29 | -90 | 8 | 18.2 |
| DEX-CZ10366 | 417693.281 | 9674779.845 | 364.659 | 33 | -90 | 19.27 | 7.9 |
| DEX-CZ10367 | 417736.949 | 9674784.538 | 351.483 | 27 | -90 | 11 | 9.47 |
| DEX-CZ10368 | 417789.069 | 9674772.804 | 340.406 | 26 | -90 | 7 | 8 |
| DEX-CZ10369 | 417549.417 | 9674726.215 | 363.002 | 14 | -90 | 2 | 3 |
| DEX-CZ10370 | 417638.631 | 9674728.379 | 371.670 | 17 | -90 | 5 | 5.9 |
| DEX-CZ10371 | 417743.854 | 9674724.931 | 348.736 | 20 | -90 | 5 | 9 |
| DEX-CZ10372 | 417844.989 | 9674725.786 | 329.996 | 40 | -90 | 13 | 13 |
| DEX-CZ10373 | 417941.171 | 9674719.278 | 288.228 | 22 | -90 | 6 | 0 |
| DEX-CZ10374 | 418031.042 | 9674723.758 | 292.147 | 15 | -90 | 7 | 6 |
| DEX-CZ10375 | 417550.009 | 9674671.448 | 367.101 | 28 | -90 | 8 | 11.4 |
| DEX-CZ10376 | 417600.051 | 9674685.056 | 369.567 | 24 | -90 | 10 | 8 |
| DEX-CZ10377 | 417645.700 | 9674686.170 | 364.933 | 18 | -90 | 5.51 | 8.24 |
| DEX-CZ10378 | 417696.791 | 9674678.038 | 356.483 | 28 | -90 | 15 | 9 |
| DEX-CZ10379 | 417747.637 | 9674676.191 | 342.685 | 31 | -90 | 9 | 17.55 |
| DEX-CZ10380 | 417789.468 | 9674674.133 | 335.371 | 60 | -90 | 14.37 | 42.25 |
| DEX-CZ10381 | 417837.198 | 9674688.917 | 318.503 | 39 | -90 | 22.54 | 15 |
| DEX-CZ10382 | 417891.862 | 9674677.815 | 302.363 | 20 | -90 | 6 | 2 |
| DEX-CZ10383 | 417923.963 | 9674694.536 | 301.334 | 37 | -90 | 23.42 | 11.35 |
| DEX-CZ10384 | 417999.507 | 9674689.766 | 289.827 | 28 | -90 | 8 | 14.63 |
| DEX-CZ10385 | 417557.933 | 9674625.275 | 356.963 | 30 | -90 | 8 | 13 |
| DEX-CZ10386 | 417638.938 | 9674640.512 | 358.468 | 42 | -90 | 19 | 18.6 |
| DEX-CZ10387 | 417737.257 | 9674627.672 | 345.326 | 17 | -90 | 9.38 | 0 |
| DEX-CZ10388 | 417849.853 | 9674624.459 | 328.029 | 35 | -90 | 14.56 | 12.18 |
| DEX-CZ10389 | 417941.679 | 9674627.694 | 302.206 | 53 | -90 | 37.84 | 9 |
| DEX-CZ10390 | 417550.654 | 9674569.560 | 355.360 | 20 | -90 | 5 | 5.67 |
| DEX-CZ10391 | 417595.174 | 9674582.795 | 356.734 | 19 | -90 | 10 | 3 |
| DEX-CZ10392 | 417642.701 | 9674579.873 | 358.886 | 35 | -90 | 16 | 13 |
| DEX-CZ10393 | 417692.888 | 9674576.379 | 360.291 | 30 | -90 | 9 | 17 |
| DEX-CZ10394 | 417744.420 | 9674578.118 | 352.966 | 35 | -90 | 19.45 | 13 |
| DEX-CZ10395 | 417795.116 | 9674578.342 | 346.866 | 19 | -90 | 15.23 | 2 |
| DEX-CZ10396 | 417842.037 | 9674584.196 | 331.713 | 18 | -90 | 10 | 5.86 |
| DEX-CZ10397 | 417887.511 | 9674572.262 | 317.488 | 31 | -90 | 7 | 21.56 |
| DEX-CZ10398 | 417950.572 | 9674589.452 | 301.183 | 19 | -90 | 5 | 5.18 |
| DEX-CZ10399 | 417992.340 | 9674580.353 | 292.405 | 20 | -90 | 2 | 15 |
| DEX-CZ10401 | 417546.396 | 9674529.101 | 355.787 | 35 | -90 | 18 | 14 |
| DEX-CZ10402 | 417643.265 | 9674528.186 | 363.997 | 46 | -90 | 10 | 31.74 |
| DEX-CZ10403 | 417746.563 | 9674527.111 | 354.551 | 30 | -90 | 7 | 21 |
| DEX-CZ10404 | 417841.267 | 9674525.095 | 341.408 | 24 | -90 | 8 | 11.78 |
| DEX-CZ10405 | 417950.083 | 9674531.759 | 304.461 | 12 | -90 | 3 | 1 |
| DEX-CZ10406 | 417553.675 | 9674467.516 | 364.035 | 21 | -90 | 9 | 6 |
| DEX-CZ10407 | 417596.375 | 9674476.661 | 369.031 | 29 | -90 | 16.5 | 7.5 |
| DEX-CZ10408 | 417643.693 | 9674478.750 | 366.179 | 29 | -90 | 17.25 | 9 |
| DEX-CZ10409 | 417691.833 | 9674474.311 | 359.512 | 42 | -90 | 21 | 8 |
| DEX-CZ10410 | 417736.962 | 9674475.987 | 355.638 | 39 | -90 | 23 | 1 |
| DEX-CZ10411 | 417793.144 | 9674475.979 | 351.714 | 44 | -90 | 22 | 19.27 |
| DEX-CZ10412 | 417841.208 | 9674478.604 | 344.455 | 26 | -90 | 13 | 6 |
| DEX-CZ10413 | 417890.464 | 9674471.044 | 333.757 | 20 | -90 | 7 | 8 |
| DEX-CZ10414 | 417930.995 | 9674478.759 | 315.535 | 15 | -90 | 6 | 7 |
| DEX-CZ10415 | 417544.929 | 9674427.587 | 370.234 | 29 | -90 | 4 | 12.85 |
| DEX-CZ10416 | 417641.530 | 9674432.070 | 367.097 | 34 | -90 | 23 | 9 |
| DEX-CZ10417 | 417744.119 | 9674424.352 | 353.000 | 35 | -90 | 17.66 | 16 |
| DEX-CZ10418 | 417837.969 | 9674437.662 | 348.416 | 44 | -90 | 5 | 14.83 |
| DEX-CZ10419 | 417543.857 | 9674379.884 | 374.644 | 15 | -90 | 6 | 2 |
| DEX-CZ10420 | 417596.669 | 9674381.825 | 370.020 | 32 | -90 | 24.25 | 5 |
| DEX-CZ10421 | 417639.572 | 9674376.513 | 361.778 | 34 | -90 | 24.25 | 8 |
| DEX-CZ10422 | 417688.127 | 9674375.009 | 351.750 | 34 | -90 | 23.23 | 6.3 |
| DEX-CZ10423 | 417741.274 | 9674378.977 | 354.000 | 39 | -90 | 23.57 | 11 |
| DEX-CZ10424 | 417791.612 | 9674379.691 | 345.251 | 38 | -90 | 16 | 19 |
| DEX-CZ10425 | 417832.076 | 9674377.567 | 348.406 | 32 | -90 | 10.25 | 16 |
| DEX-CZ10426 | 417551.228 | 9674339.054 | 371.125 | 43 | -90 | 26.2 | 9 |
| DEX-CZ10427 | 417634.797 | 9674334.783 | 357.839 | 38 | -90 | 26.34 | 10 |
| DEX-CZ10428 | 417739.661 | 9674333.748 | 353.320 | 24 | -90 | 19 | 1 |
| DEX-CZ10429 | 417542.333 | 9674904.399 | 372.803 | 35 | -90 | 17 | 15 |
| DEX-CZ10430 | 417544.675 | 9674853.328 | 368.897 | 31 | -90 | 10 | 6 |
| DEX-CZ10431 | 417550.445 | 9674805.140 | 361.811 | 15 | -90 | 8 | 2 |
| DEX-CZ10432 | 417547.861 | 9674553.566 | 357.617 | 23 | -90 | 6 | 14 |
| DEX-CZ10433 | 417544.010 | 9674454.594 | 365.795 | 15 | -90 | 8 | 5 |
| DEX-CZ10434 | 417544.306 | 9674401.182 | 374.157 | 20 | -90 | 8 | 3 |
| DEX-CZ10435 | 417542.370 | 9674355.019 | 373.000 | 20 | -90 | 11.35 | 3.65 |
| DEX-CZ10436 | 417568.782 | 9674924.087 | 369.390 | 24 | -90 | 10 | 7 |
| DEX-CZ10437 | 417566.593 | 9674903.890 | 369.649 | 22 | -90 | 10 | 7 |
| DEX-CZ10438 | 417567.813 | 9674875.416 | 367.520 | 22 | -90 | 5 | 11.8 |
| DEX-CZ10439 | 417563.088 | 9674852.777 | 367.058 | 19 | -90 | 11 | 1 |
| DEX-CZ10440 | 417573.969 | 9674824.030 | 361.794 | 26 | -90 | 8 | 2 |
| DEX-CZ10441 | 417576.791 | 9674800.132 | 356.928 | 24 | -90 | 5 | 7 |
| DEX-CZ10442 | 417564.170 | 9674668.953 | 367.567 | 25 | -90 | 20 | 2 |
| DEX-CZ10443 | 417572.250 | 9674644.652 | 364.106 | 35 | -90 | 10 | 8 |
| DEX-CZ10444 | 417574.252 | 9674599.070 | 356.799 | 37 | -90 | 23 | 1 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4759 | 414859.844 | 9674369.898 | 440.610 | 28 | -90 | 24.75 | 2 |
| DEX-BB4760 | 414875.852 | 9674371.792 | 437.020 | 27 | -90 | 11 | 14.25 |
| DEX-BB4761 | 414906.711 | 9674381.279 | 430.599 | 23 | -90 | 15 | 6.25 |
| DEX-BB4762 | 414935.480 | 9674372.181 | 412.676 | 12 | -90 | 4 | 5.9 |
| DEX-BB4763 | 414955.338 | 9674361.738 | 403.790 | 8 | -90 | 4 | 1.9 |
| DEX-BB4764 | 414781.931 | 9674343.983 | 426.929 | 26 | -90 | 11 | 13.33 |
| DEX-BB4765 | 414834.669 | 9674336.377 | 437.965 | 30 | -90 | 14.32 | 14 |
| DEX-BB4766 | 414891.406 | 9674348.951 | 424.090 | 29 | -90 | 17 | 10.78 |
| DEX-BB4767 | 414932.872 | 9674345.652 | 408.238 | 8 | -90 | 2 | 4 |
| DEX-BB4768 | 414788.309 | 9674315.890 | 429.447 | 26 | -90 | 15.66 | 8.75 |
| DEX-BB4769 | 414809.384 | 9674318.351 | 433.342 | 28 | -90 | 19.8 | 6.52 |
| DEX-BB4770 | 414832.646 | 9674317.296 | 434.038 | 33 | -90 | 26.85 | 5.75 |
| DEX-BB4771 | 414856.445 | 9674315.806 | 432.695 | 37 | -90 | 31.92 | 5.61 |
| DEX-BB4772 | 414882.283 | 9674310.972 | 423.067 | 12 | -90 | 5 | 5 |
| DEX-BB4774 | 414937.656 | 9674314.676 | 396.875 | 11 | -90 | 7 | 2 |
| DEX-BB4775 | 414683.592 | 9674576.384 | 445.563 | 26 | -90 | 21.28 | 3 |
| DEX-BB4776 | 414737.447 | 9674522.544 | 445.719 | 24 | -90 | 20.35 | 2.29 |
| DEX-BB4777 | 414526.637 | 9674845.263 | 418.315 | 20 | -90 | 5 | 13.28 |
| DEX-BB4778 | 414724.820 | 9674497.002 | 442.823 | 24 | -90 | 18.59 | 4 |
| DEX-BB4779 | 414783.003 | 9674492.604 | 454.000 | 30 | -90 | 22.38 | 6.73 |
| DEX-BB4780 | 414825.681 | 9674493.990 | 451.313 | 24 | -90 | 16.26 | 6 |
| DEX-BB4781 | 414931.135 | 9674489.220 | 444.334 | 30 | -90 | 23.81 | 5 |
| DEX-BB4782 | 414898.943 | 9674491.497 | 433.981 | 21 | -90 | 14.92 | 4.36 |
| DEX-BB4783 | 414981.896 | 9674490.695 | 450.403 | 33 | -90 | 21.72 | 10 |
| DEX-BB4784 | 414722.496 | 9674447.951 | 444.998 | 21 | -90 | 16.37 | 3 |
| DEX-BB4785 | 414780.940 | 9674445.432 | 439.065 | 12 | -90 | 5 | 5 |
| DEX-BB4786 | 414830.540 | 9674445.226 | 448.456 | 31 | -90 | 18.38 | 10.85 |
| DEX-BB4787 | 414882.600 | 9674445.100 | 434.972 | 29 | -90 | 22.88 | 6 |
| DEX-BB4788 | 414928.118 | 9674450.731 | 426.910 | 24 | -90 | 13.61 | 9.22 |
| DEX-BB4789 | 414983.667 | 9674443.065 | 440.376 | 24 | -90 | 20 | 2 |
| DEX-BB4790 | 414772.694 | 9675227.532 | 420.117 | 23 | -90 | 10 | 11 |
| DEX-BB4791 | 414749.052 | 9675228.835 | 423.129 | 21 | -90 | 14.28 | 5 |
| DEX-BB4792 | 414723.789 | 9675229.863 | 426.381 | 27 | -90 | 12.34 | 13 |
| DEX-BB4793 | 414801.421 | 9675229.302 | 417.732 | 16 | -90 | 7 | 6 |
| DEX-BB4794 | 414725.612 | 9675206.270 | 422.929 | 21 | -90 | 9 | 10 |
| DEX-BB4795 | 414673.510 | 9675206.564 | 429.113 | 17 | -90 | 7 | 8 |
| DEX-BB4796 | 414621.536 | 9675201.663 | 428.530 | 16 | -90 | 8 | 6 |
| DEX-BB4797 | 414750.751 | 9675204.535 | 419.962 | 20 | -90 | 9 | 9 |
| DEX-BB4798 | 414775.378 | 9675206.559 | 417.422 | 14 | -90 | 5.88 | 6 |
| DEX-BB4799 | 414625.639 | 9675177.798 | 426.711 | 21 | -90 | 10 | 9 |
| DEX-BB4800 | 414649.393 | 9675177.587 | 424.858 | 15 | -90 | 7.26 | 6 |
| DEX-BB4801 | 414673.262 | 9675176.155 | 421.678 | 10 | -90 | 5 | 2 |
| DEX-BB4802 | 414701.521 | 9675181.511 | 421.157 | 8 | -90 | 3 | 3 |
| DEX-BB4803 | 414726.662 | 9675180.975 | 418.758 | 20 | -90 | 7 | 11 |
| DEX-BB4804 | 414749.632 | 9675179.144 | 416.304 | 16 | -90 | 6 | 8 |
| DEX-BB4805 | 414772.980 | 9675179.832 | 415.617 | 14 | -90 | 7 | 3.67 |
| DEX-BB4806 | 414798.036 | 9675177.563 | 416.000 | 15 | -90 | 9 | 4 |
| DEX-BB4807 | 414823.295 | 9675184.123 | 416.276 | 20 | -90 | 10 | 9 |
| DEX-BB4808 | 414852.938 | 9675180.402 | 417.257 | 25 | -90 | 11.17 | 12.1 |
| DEX-BB4809 | 414873.741 | 9675177.239 | 417.815 | 23 | -90 | 11.22 | 8 |
| DEX-BB4810 | 414899.858 | 9675179.265 | 418.000 | 28 | -90 | 15.21 | 10.9 |
| DEX-BB4811 | 414923.330 | 9675179.447 | 418.000 | 39 | -90 | 20.53 | 16.69 |
| DEX-BB4812 | 414953.208 | 9675175.096 | 417.148 | 41 | -90 | 19.58 | 20.08 |
| DEX-BB4813 | 414979.183 | 9675179.028 | 418.636 | 38 | -90 | 24.58 | 12.28 |
| DEX-BB4814 | 414677.107 | 9675151.082 | 415.184 | 8 | -90 | 3 | 3 |
| DEX-BB4815 | 414698.337 | 9675148.856 | 413.142 | 13 | -90 | 2 | 9 |
| DEX-BB4816 | 414724.611 | 9675155.532 | 413.135 | 14 | -90 | 3 | 9 |
| DEX-BB4817 | 414826.056 | 9675155.130 | 416.000 | 22 | -90 | 7 | 13.2 |
| DEX-BB4818 | 414875.159 | 9675158.453 | 417.348 | 27 | -90 | 14.32 | 10.87 |
| DEX-BB4819 | 414923.825 | 9675161.682 | 417.381 | 29 | -90 | 15.43 | 12 |
| DEX-BB4820 | 414973.595 | 9675154.267 | 418.317 | 41 | -90 | 15.27 | 23.99 |
| DEX-BB4821 | 414673.181 | 9675136.501 | 411.128 | 8 | -90 | 2 | 3 |
| DEX-BB4822 | 414727.992 | 9675127.838 | 414.636 | 13 | -90 | 4 | 7 |
| DEX-BB4823 | 414749.766 | 9675123.185 | 414.844 | 14 | -90 | 2 | 10 |
| DEX-BB4824 | 414775.603 | 9675126.123 | 415.991 | 17 | -90 | 8 | 7.26 |
| DEX-BB4825 | 414794.725 | 9675123.061 | 416.196 | 30 | -90 | 22.32 | 5 |
| DEX-BB4826 | 414825.694 | 9675125.578 | 418.111 | 26 | -90 | 17.61 | 6 |
| DEX-BB4827 | 414848.434 | 9675135.332 | 417.874 | 28 | -90 | 14.48 | 12.31 |
| DEX-BB4828 | 414878.377 | 9675131.858 | 420.249 | 28 | -90 | 12.3 | 14.34 |
| DEX-BB4829 | 414900.291 | 9675129.293 | 421.975 | 32 | -90 | 14.25 | 17.24 |
| DEX-BB4830 | 414925.963 | 9675126.411 | 422.828 | 36 | -90 | 13.32 | 21 |
| DEX-BB4831 | 414949.306 | 9675128.178 | 422.138 | 26 | -90 | 17.52 | 7.35 |
| DEX-BB4832 | 414974.911 | 9675128.313 | 421.139 | 51 | -90 | 15.53 | 33.79 |
| DEX-BB4833 | 414675.726 | 9675103.869 | 414.589 | 16 | -90 | 8 | 6 |
| DEX-BB4834 | 414722.558 | 9675102.218 | 420.192 | 22 | -90 | 14.54 | 6 |
| DEX-BB4835 | 414775.446 | 9675105.902 | 418.282 | 27 | -90 | 13.35 | 12.55 |
| DEX-BB4836 | 414829.664 | 9675107.556 | 420.409 | 25 | -90 | 17.35 | 6 |
| DEX-BB4837 | 414872.652 | 9675105.027 | 423.837 | 33 | -90 | 14.64 | 17 |
| DEX-BB4838 | 414925.294 | 9675101.551 | 428.093 | 23 | -90 | 11.25 | 10 |
| DEX-BB4839 | 414974.489 | 9675104.768 | 426.611 | 24 | -90 | 7 | 14.93 |
| DEX-BB4840 | 414726.118 | 9675077.954 | 423.767 | 26 | -90 | 11.32 | 13 |
| DEX-BB4841 | 414750.266 | 9675076.213 | 424.445 | 28 | -90 | 10.28 | 16 |
| DEX-BB4842 | 414775.478 | 9675081.005 | 422.324 | 19 | -90 | 15.28 | 2 |
| DEX-BB4843 | 414802.345 | 9675081.572 | 421.178 | 35 | -90 | 21.36 | 12 |
| DEX-BB4844 | 414827.090 | 9675078.217 | 424.274 | 29 | -90 | 16.36 | 11.28 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10445 | 417569.884 | 9674572.575 | 357.000 | 36 | -90 | 19 | 6 |
| DEX-CZ10446 | 417568.828 | 9674550.646 | 356.956 | 27 | -90 | 10 | 14 |
| DEX-CZ10447 | 417565.787 | 9674523.670 | 351.198 | 39 | -90 | 27 | 7 |
| DEX-CZ10448 | 417575.070 | 9674495.686 | 361.466 | 29 | -90 | 15 | 12 |
| DEX-CZ10449 | 417573.620 | 9674481.358 | 365.171 | 25 | -90 | 15 | 9 |
| DEX-CZ10450 | 417566.287 | 9674449.332 | 370.659 | 16 | -90 | 8 | 3.75 |
| DEX-CZ10451 | 417568.936 | 9674428.946 | 374.000 | 20 | -90 | 16 | 1 |
| DEX-CZ10452 | 417563.843 | 9674403.324 | 375.000 | 23 | -90 | 17 | 3 |
| DEX-CZ10453 | 417572.069 | 9674381.445 | 374.327 | 33 | -90 | 18 | 13 |
| DEX-CZ10454 | 417564.877 | 9674360.160 | 371.998 | 38 | -90 | 24 | 6 |
| DEX-CZ10455 | 417592.623 | 9674925.337 | 366.279 | 22 | -90 | 12 | 5 |
| DEX-CZ10456 | 417593.905 | 9674904.171 | 364.514 | 17 | -90 | 8 | 4 |
| DEX-CZ10457 | 417591.194 | 9674849.839 | 361.000 | 14 | -90 | 7 | 1 |
| DEX-CZ10458 | 417601.360 | 9674827.418 | 361.207 | 18 | -90 | 10 | 3 |
| DEX-CZ10459 | 417600.129 | 9674797.075 | 363.614 | 23 | -90 | 6 | 9 |
| DEX-CZ10460 | 417594.676 | 9674751.506 | 372.939 | 24 | -90 | 8 | 13 |
| DEX-CZ10461 | 417590.576 | 9674727.556 | 372.979 | 24 | -90 | 10 | 6 |
| DEX-CZ10462 | 417595.792 | 9674700.226 | 370.844 | 25 | -90 | 9 | 11 |
| DEX-CZ10463 | 417593.254 | 9674651.183 | 364.939 | 27 | -90 | 7 | 18.62 |
| DEX-CZ10464 | 417593.456 | 9674630.027 | 361.681 | 35 | -90 | 18 | 14.8 |
| DEX-CZ10465 | 417592.185 | 9674602.282 | 358.000 | 33 | -90 | 18 | 6 |
| DEX-CZ10466 | 417592.702 | 9674552.991 | 354.000 | 28 | -90 | 18 | 1.75 |
| DEX-CZ10467 | 417595.674 | 9674527.254 | 357.708 | 28 | -90 | 19 | 5 |
| DEX-CZ10468 | 417591.073 | 9674502.142 | 362.510 | 15 | -90 | 11 | 1 |
| DEX-CZ10469 | 417592.499 | 9674452.724 | 372.732 | 31 | -90 | 26 | 3 |
| DEX-CZ10470 | 417594.733 | 9674424.623 | 373.631 | 31 | -90 | 21 | 8 |
| DEX-CZ10471 | 417594.125 | 9674403.822 | 372.205 | 31 | -90 | 22 | 7 |
| DEX-CZ10472 | 417592.426 | 9674345.885 | 366.276 | 34 | -90 | 27 | 4 |
| DEX-CZ10473 | 417624.166 | 9674898.850 | 368.203 | 12 | -90 | 5 | 1 |
| DEX-CZ10474 | 417618.815 | 9674876.225 | 368.850 | 15 | -90 | 6 | 4 |
| DEX-CZ10475 | 417617.477 | 9674850.247 | 368.410 | 18 | -90 | 11 | 0 |
| DEX-CZ10476 | 417615.581 | 9674833.565 | 364.901 | 26 | -90 | 14 | 7 |
| DEX-CZ10477 | 417619.205 | 9674802.145 | 366.586 | 23 | -90 | 6 | 4 |
| DEX-CZ10478 | 417619.939 | 9674780.083 | 371.852 | 18 | -90 | 9 | 1 |
| DEX-CZ10479 | 417616.484 | 9674754.603 | 374.000 | 24 | -90 | 13 | 6 |
| DEX-CZ10480 | 417617.206 | 9674730.272 | 373.233 | 11 | -90 | 7 | 2 |
| DEX-CZ10481 | 417616.315 | 9674700.837 | 370.640 | 25 | -90 | 6 | 16 |
| DEX-CZ10482 | 417619.666 | 9674682.430 | 368.357 | 21 | -90 | 5 | 14 |
| DEX-CZ10483 | 417618.292 | 9674654.618 | 363.812 | 17 | -90 | 9 | 3.8 |
| DEX-CZ10484 | 417617.746 | 9674629.549 | 360.000 | 45 | -90 | 12 | 30.81 |
| DEX-CZ10485 | 417614.471 | 9674603.961 | 358.000 | 22 | -90 | 15 | 4.85 |
| DEX-CZ10486 | 417620.526 | 9674565.697 | 357.810 | 39 | -90 | 22 | 15 |
| DEX-CZ10487 | 417619.540 | 9674548.732 | 359.467 | 31 | -90 | 15 | 14 |
| DEX-CZ10488 | 417615.521 | 9674526.242 | 361.184 | 21 | -90 | 7 | 10 |
| DEX-CZ10489 | 417620.475 | 9674500.974 | 366.456 | 20 | -90 | 13 | 3 |
| DEX-CZ10490 | 417617.165 | 9674483.306 | 368.606 | 36 | -90 | 23 | 11 |
| DEX-CZ10491 | 417612.986 | 9674449.950 | 371.572 | 41 | -90 | 22 | 19 |
| DEX-CZ10492 | 417613.635 | 9674427.769 | 371.371 | 34 | -90 | 26 | 6 |
| DEX-CZ10493 | 417617.913 | 9674406.495 | 369.401 | 32 | -90 | 24 | 6 |
| DEX-CZ10494 | 417617.356 | 9674371.209 | 364.506 | 23 | -90 | 18 | 3 |
| DEX-CZ10495 | 417614.801 | 9674351.285 | 361.500 | 29 | -90 | 20 | 7 |
| DEX-CZ10496 | 417647.347 | 9674895.798 | 369.685 | 34 | -90 | 19 | 8.82 |
| DEX-CZ10497 | 417638.826 | 9674852.461 | 369.601 | 17 | -90 | 9 | 4 |
| DEX-CZ10498 | 417636.225 | 9674805.205 | 368.257 | 23 | -90 | 14 | 4 |
| DEX-CZ10499 | 417643.958 | 9674749.342 | 373.156 | 27 | -90 | 8 | 14 |
| DEX-CZ10500 | 417644.442 | 9674707.072 | 368.050 | 13 | -90 | 5 | 3 |
| DEX-CZ10501 | 417639.004 | 9674656.765 | 361.036 | 40 | -90 | 7 | 31 |
| DEX-CZ10502 | 417641.872 | 9674600.923 | 356.658 | 37 | -90 | 24 | 8 |
| DEX-CZ10503 | 417639.976 | 9674547.632 | 361.943 | 19 | -90 | 5 | 10.8 |
| DEX-CZ10504 | 417641.466 | 9674501.481 | 365.726 | 39 | -90 | 29 | 8 |
| DEX-CZ10505 | 417644.856 | 9674448.004 | 366.909 | 30 | -90 | 16 | 11 |
| DEX-CZ10506 | 417639.920 | 9674397.708 | 364.571 | 29 | -90 | 24 | 2 |
| DEX-CZ10507 | 417642.852 | 9674352.207 | 356.894 | 33 | -90 | 25 | 6 |
| DEX-CZ10508 | 417667.445 | 9674872.818 | 368.546 | 24 | -90 | 13 | 3 |
| DEX-CZ10509 | 417668.979 | 9674853.035 | 367.734 | 16 | -90 | 12 | 1 |
| DEX-CZ10510 | 417665.312 | 9674828.047 | 368.000 | 20 | -90 | 5 | 11 |
| DEX-CZ10511 | 417667.387 | 9674802.278 | 368.043 | 26 | -90 | 6 | 1 |
| DEX-CZ10512 | 417667.650 | 9674777.888 | 369.760 | 22 | -90 | 12 | 7 |
| DEX-CZ10513 | 417670.048 | 9674750.895 | 368.993 | 23 | -90 | 13 | 7 |
| DEX-CZ10514 | 417667.019 | 9674726.279 | 367.074 | 9 | -90 | 2 | 3 |
| DEX-CZ10515 | 417672.303 | 9674701.084 | 361.288 | 35 | -90 | 7 | 18 |
| DEX-CZ10516 | 417668.812 | 9674670.986 | 359.099 | 23 | -90 | 10 | 11 |
| DEX-CZ10517 | 417670.546 | 9674651.693 | 356.309 | 43 | -90 | 18 | 9 |
| DEX-CZ10518 | 417664.155 | 9674623.806 | 352.438 | 60 | -90 | 18 | 20 |
| DEX-CZ10519 | 417665.977 | 9674607.145 | 356.340 | 26 | -90 | 21 | 3 |
| DEX-CZ10520 | 417664.517 | 9674574.991 | 360.322 | 33 | -90 | 20 | 10.75 |
| DEX-CZ10521 | 417666.159 | 9674548.470 | 362.631 | 12 | -90 | 8 | 0 |
| DEX-CZ10522 | 417664.923 | 9674527.651 | 363.576 | 14 | -90 | 10 | 1.8 |
| DEX-CZ10523 | 417665.578 | 9674496.918 | 363.000 | 27 | -90 | 22 | 1 |
| DEX-CZ10524 | 417664.638 | 9674478.115 | 363.630 | 35 | -90 | 31 | 2 |
| DEX-CZ10525 | 417670.582 | 9674447.643 | 361.717 | 33 | -90 | 27 | 1 |
| DEX-CZ10526 | 417668.327 | 9674419.959 | 361.209 | 26 | -90 | 21 | 3 |
| DEX-CZ10527 | 417663.091 | 9674399.848 | 360.372 | 29 | -90 | 23 | 4 |
| DEX-CZ10528 | 417667.336 | 9674375.002 | 357.577 | 37 | -90 | 21 | 14 |
| DEX-CZ10529 | 417662.490 | 9674349.588 | 353.125 | 36 | -90 | 28 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4845 | 414847.676 | 9675080.261 | 425.723 | 31 | -90 | 12 | 17 |
| DEX-BB4846 | 414871.896 | 9675077.969 | 427.563 | 33 | -90 | 15.3 | 16.4 |
| DEX-BB4847 | 414897.975 | 9675080.024 | 430.594 | 31 | -90 | 17.24 | 13 |
| DEX-BB4848 | 414926.271 | 9675081.154 | 432.472 | 27 | -90 | 10.45 | 15 |
| DEX-BB4849 | 414950.494 | 9675082.036 | 432.653 | 30 | -90 | 7 | 21.27 |
| DEX-BB4850 | 414979.413 | 9675082.317 | 431.771 | 27 | -90 | 13 | 12.16 |
| DEX-BB4851 | 415001.823 | 9675073.242 | 431.230 | 28 | -90 | 6 | 20.72 |
| DEX-BB4852 | 414724.912 | 9675054.017 | 426.345 | 21 | -90 | 7.36 | 13 |
| DEX-BB4853 | 414774.943 | 9675052.738 | 426.112 | 28 | -90 | 22.78 | 3 |
| DEX-BB4854 | 414827.879 | 9675053.443 | 428.010 | 30 | -90 | 25.79 | 3 |
| DEX-BB4855 | 414873.793 | 9675052.608 | 431.308 | 24 | -90 | 15.37 | 7 |
| DEX-BB4856 | 414926.087 | 9675053.235 | 438.568 | 26 | -90 | 16.67 | 8 |
| DEX-BB4857 | 414974.413 | 9675053.288 | 438.251 | 32 | -90 | 18.55 | 12.5 |
| DEX-BB4858 | 415024.142 | 9675047.547 | 434.583 | 18 | -90 | 10.35 | 6 |
| DEX-BB4859 | 414726.922 | 9675031.751 | 426.815 | 17 | -90 | 6 | 9 |
| DEX-BB4860 | 414747.090 | 9675032.539 | 428.434 | 27 | -90 | 4.3 | 22.51 |
| DEX-BB4861 | 414772.019 | 9675026.810 | 430.851 | 24 | -90 | 16.32 | 6 |
| DEX-BB4862 | 414798.544 | 9675029.167 | 430.292 | 28 | -90 | 18.71 | 8.38 |
| DEX-BB4863 | 414827.408 | 9675029.848 | 431.612 | 31 | -90 | 16.35 | 13 |
| DEX-BB4864 | 414849.131 | 9675027.557 | 435.245 | 30 | -90 | 17 | 10.8 |
| DEX-BB4865 | 414875.074 | 9675027.522 | 436.887 | 31 | -90 | 25.29 | 6.34 |
| DEX-BB4866 | 414896.491 | 9675027.277 | 436.896 | 31 | -90 | 18.88 | 11 |
| DEX-BB4867 | 414926.392 | 9675023.460 | 441.981 | 32 | -90 | 24.97 | 6 |
| DEX-BB4868 | 414946.946 | 9675031.702 | 442.628 | 34 | -90 | 17.37 | 15.87 |
| DEX-BB4869 | 414970.528 | 9675031.366 | 442.058 | 24 | -90 | 14.5 | 7.72 |
| DEX-BB4870 | 414995.739 | 9675028.554 | 440.921 | 28 | -90 | 19.48 | 7 |
| DEX-BB4871 | 415016.888 | 9675026.019 | 439.106 | 18 | -90 | 8 | 7.77 |
| DEX-BB4872 | 414724.685 | 9675003.325 | 426.607 | 18 | -90 | 9.93 | 6.4 |
| DEX-BB4873 | 414775.427 | 9675002.866 | 434.750 | 28 | -90 | 23.22 | 5 |
| DEX-BB4874 | 414826.419 | 9675004.390 | 436.061 | 31 | -90 | 19.05 | 11 |
| DEX-BB4875 | 414875.960 | 9675003.825 | 439.020 | 22 | -90 | 15 | 5 |
| DEX-BB4876 | 414924.028 | 9675000.495 | 442.054 | 25 | -90 | 16.42 | 7.08 |
| DEX-BB4877 | 414973.035 | 9675000.036 | 445.000 | 28 | -90 | 19.93 | 7 |
| DEX-BB4878 | 415023.729 | 9675001.876 | 441.418 | 33 | -90 | 13.35 | 18 |
| DEX-BB4879 | 414726.995 | 9674985.148 | 425.861 | 22 | -90 | 3 | 17 |
| DEX-BB4880 | 414749.845 | 9674983.719 | 431.609 | 21 | -90 | 3.4 | 15.6 |
| DEX-BB4881 | 414775.029 | 9674980.940 | 434.499 | 36 | -90 | 21.32 | 13 |
| DEX-BB4882 | 414799.565 | 9674978.725 | 435.286 | 22 | -90 | 14.74 | 6 |
| DEX-BB4883 | 414830.166 | 9674979.773 | 438.916 | 21 | -90 | 16 | 2 |
| DEX-BB4884 | 414852.199 | 9674978.689 | 441.593 | 37 | -90 | 19.25 | 15.77 |
| DEX-BB4885 | 414871.874 | 9674976.649 | 443.169 | 21 | -90 | 13 | 5.9 |
| DEX-BB4886 | 414896.402 | 9674979.935 | 442.197 | 24 | -90 | 20.27 | 1.8 |
| DEX-BB4887 | 414927.064 | 9674975.955 | 443.071 | 43 | -90 | 22.21 | 18.48 |
| DEX-BB4888 | 414948.742 | 9674976.217 | 444.395 | 28 | -90 | 21.77 | 5 |
| DEX-BB4889 | 414975.688 | 9674977.299 | 445.000 | 24 | -90 | 15.29 | 6.69 |
| DEX-BB4890 | 415002.167 | 9674981.888 | 444.363 | 25 | -90 | 18.6 | 5.26 |
| DEX-BB4891 | 415028.865 | 9674975.013 | 442.713 | 28 | -90 | 19.82 | 7.26 |
| DEX-BB4892 | 414776.451 | 9674954.852 | 429.666 | 26 | -90 | 13.33 | 11 |
| DEX-BB4893 | 414824.047 | 9674945.654 | 434.948 | 19 | -90 | 6 | 10.9 |
| DEX-BB4894 | 414877.373 | 9674953.675 | 446.000 | 30 | -90 | 18.33 | 10.67 |
| DEX-BB4895 | 414919.379 | 9674948.594 | 444.884 | 39 | -90 | 29.68 | 8.88 |
| DEX-BB4896 | 414977.592 | 9674953.241 | 446.341 | 24 | -90 | 18.55 | 4 |
| DEX-BB4897 | 415026.385 | 9674954.237 | 443.388 | 30 | -90 | 23.3 | 5.13 |
| DEX-BB4898 | 414775.514 | 9674928.830 | 420.391 | 22 | -90 | 10.4 | 10 |
| DEX-BB4899 | 414797.519 | 9674931.573 | 423.562 | 18 | -90 | 3 | 12.76 |
| DEX-BB4900 | 414896.929 | 9674929.502 | 446.000 | 38 | -90 | 28.28 | 9.63 |
| DEX-BB4901 | 414923.708 | 9674922.611 | 446.806 | 26 | -90 | 16.2 | 8.83 |
| DEX-BB4902 | 414951.069 | 9674922.349 | 448.075 | 35 | -90 | 23 | 11.13 |
| DEX-BB4903 | 414971.662 | 9674931.214 | 448.087 | 35 | -90 | 25.67 | 8.51 |
| DEX-BB4904 | 414996.632 | 9674932.570 | 448.078 | 33 | -90 | 26.75 | 5 |
| DEX-BB4905 | 415022.922 | 9674927.491 | 447.029 | 40 | -90 | 24.66 | 15.24 |
| DEX-BB4906 | 416077.639 | 9674793.853 | 407.254 | 15 | -90 | 8 | 5 |
| DEX-BB4907 | 416050.754 | 9674761.165 | 402.000 | 30 | -90 | 18.19 | 11.5 |
| DEX-BB4908 | 416070.440 | 9674772.521 | 403.573 | 18 | -90 | 9 | 7 |
| DEX-BB4909 | 416093.882 | 9674769.576 | 404.797 | 27 | -90 | 12.32 | 14.32 |
| DEX-BB4910 | 416024.030 | 9674739.977 | 400.305 | 21 | -90 | 13.62 | 6 |
| DEX-BB4911 | 416066.125 | 9674742.563 | 405.713 | 22 | -90 | 12.33 | 7.71 |
| DEX-BB4912 | 416025.766 | 9674720.479 | 401.712 | 36 | -90 | 33.25 | 3 |
| DEX-BB4913 | 416050.776 | 9674718.429 | 404.929 | 29 | -90 | 22.02 | 6 |
| DEX-BB4914 | 416067.640 | 9674718.399 | 407.716 | 21 | -90 | 15.28 | 4 |
| DEX-BB4916 | 416025.097 | 9674694.663 | 406.317 | 25 | -90 | 20.54 | 5 |
| DEX-BB4917 | 416071.288 | 9674696.895 | 406.659 | 21 | -90 | 16.34 | 3 |
| DEX-BB4918 | 416024.996 | 9674663.129 | 411.349 | 27 | -90 | 13.3 | 11.88 |
| DEX-BB4919 | 415996.780 | 9674667.929 | 411.994 | 22 | -90 | 15.28 | 5 |
| DEX-BB4920 | 416048.483 | 9674667.086 | 409.000 | 26 | -90 | 16.38 | 7.83 |
| DEX-BB4921 | 416078.902 | 9674673.427 | 408.357 | 39 | -90 | 32.75 | 7.39 |
| DEX-BB4922 | 416101.580 | 9674659.355 | 409.393 | 27 | -90 | 19.07 | 7 |
| DEX-BB4925 | 416020.326 | 9674645.392 | 412.779 | 28 | -90 | 20.14 | 6.67 |
| DEX-BB4926 | 416078.239 | 9674638.594 | 412.280 | 24 | -90 | 16 | 6 |
| DEX-BB4927 | 416132.414 | 9674648.288 | 407.318 | 29 | -90 | 13 | 14 |
| DEX-BB4928 | 416024.372 | 9674609.080 | 415.874 | 28 | -90 | 19.85 | 6.69 |
| DEX-BB4929 | 416074.936 | 9674616.148 | 413.869 | 29 | -90 | 21.25 | 6 |
| DEX-BB4930 | 416131.848 | 9674617.118 | 406.255 | 23 | -90 | 16 | 5 |
| DEX-BB4933 | 415978.271 | 9674639.178 | 415.648 | 34 | -90 | 23.1 | 11.43 |
| DEX-BB4934 | 415980.731 | 9674665.730 | 412.233 | 26 | -90 | 17.67 | 7 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10530 | 417696.855 | 9674730.076 | 360.815 | 22 | -90 | 8 | 6 |
| DEX-CZ10531 | 417698.462 | 9674703.487 | 355.763 | 30 | -90 | 17 | 9 |
| DEX-CZ10532 | 417691.333 | 9674657.149 | 355.476 | 22 | -90 | 15 | 3 |
| DEX-CZ10533 | 417692.713 | 9674630.241 | 350.000 | 60 | -90 | 14 | 27.45 |
| DEX-CZ10534 | 417695.006 | 9674604.603 | 355.614 | 26 | -90 | 12.5 | 9.33 |
| DEX-CZ10535 | 417696.123 | 9674546.785 | 361.062 | 30 | -90 | 12 | 16 |
| DEX-CZ10536 | 417696.141 | 9674518.497 | 359.123 | 28 | -90 | 15 | 6 |
| DEX-CZ10537 | 417693.440 | 9674502.126 | 358.780 | 36 | -90 | 17 | 17 |
| DEX-CZ10538 | 417691.944 | 9674446.052 | 358.471 | 33 | -90 | 25 | 6 |
| DEX-CZ10539 | 417690.180 | 9674430.504 | 357.995 | 31 | -90 | 22 | 6 |
| DEX-CZ10540 | 417692.859 | 9674405.737 | 357.898 | 38 | -90 | 24 | 9 |
| DEX-CZ10541 | 417692.632 | 9674347.751 | 345.000 | 22 | -90 | 14 | 5 |
| DEX-CZ10542 | 417717.388 | 9674732.432 | 356.915 | 27 | -90 | 8 | 14 |
| DEX-CZ10543 | 417720.603 | 9674699.207 | 349.541 | 31 | -90 | 17 | 11 |
| DEX-CZ10544 | 417717.917 | 9674680.937 | 351.244 | 21 | -90 | 5 | 3 |
| DEX-CZ10545 | 417720.563 | 9674661.027 | 351.066 | 21 | -90 | 10 | 3 |
| DEX-CZ10546 | 417714.067 | 9674626.090 | 347.469 | 14 | -90 | 6 | 6 |
| DEX-CZ10547 | 417716.705 | 9674603.386 | 352.374 | 21 | -90 | 12 | 6 |
| DEX-CZ10548 | 417720.299 | 9674579.601 | 356.929 | 28 | -90 | 22 | 3 |
| DEX-CZ10549 | 417723.505 | 9674553.357 | 357.956 | 24 | -90 | 8 | 13 |
| DEX-CZ10550 | 417720.625 | 9674526.785 | 357.162 | 20 | -90 | 14 | 4 |
| DEX-CZ10551 | 417719.321 | 9674500.733 | 356.636 | 27 | -90 | 15 | 8 |
| DEX-CZ10552 | 417718.387 | 9674473.090 | 357.360 | 33 | -90 | 19 | 12 |
| DEX-CZ10553 | 417714.275 | 9674447.494 | 357.000 | 30 | -90 | 21 | 9 |
| DEX-CZ10554 | 417719.830 | 9674423.062 | 353.364 | 35 | -90 | 25 | 6 |
| DEX-CZ10555 | 417720.575 | 9674402.206 | 352.000 | 27 | -90 | 14 | 11 |
| DEX-CZ10556 | 417719.058 | 9674380.172 | 352.112 | 23 | -90 | 16 | 4.8 |
| DEX-CZ10557 | 417715.990 | 9674359.920 | 352.561 | 26 | -90 | 19 | 5 |
| DEX-CZ10558 | 417739.817 | 9674644.029 | 347.735 | 37 | -90 | 15.89 | 15.35 |
| DEX-CZ10559 | 417745.743 | 9674600.125 | 347.676 | 22 | -90 | 16 | 4 |
| DEX-CZ10560 | 417746.930 | 9674549.881 | 354.720 | 17 | -90 | 8 | 8 |
| DEX-CZ10561 | 417741.731 | 9674504.622 | 355.301 | 25 | -90 | 11 | 11.75 |
| DEX-CZ10562 | 417738.916 | 9674450.796 | 355.050 | 39 | -90 | 27 | 9 |
| DEX-CZ10563 | 417738.324 | 9674402.181 | 353.174 | 27 | -90 | 14 | 11 |
| DEX-CZ10564 | 417742.410 | 9674350.888 | 353.524 | 28 | -90 | 17 | 9 |
| DEX-CZ10565 | 417771.613 | 9674653.411 | 341.505 | 23 | -90 | 10 | 10.9 |
| DEX-CZ10566 | 417772.152 | 9674624.638 | 335.130 | 17 | -90 | 13 | 1 |
| DEX-CZ10567 | 417771.086 | 9674592.816 | 346.491 | 18 | -90 | 12 | 4 |
| DEX-CZ10568 | 417769.845 | 9674575.357 | 350.490 | 26 | -90 | 20 | 4 |
| DEX-CZ10569 | 417772.810 | 9674553.681 | 352.400 | 30 | -90 | 16 | 12 |
| DEX-CZ10570 | 417770.291 | 9674526.636 | 352.964 | 37 | -90 | 9 | 21 |
| DEX-CZ10571 | 417770.285 | 9674504.620 | 352.895 | 28 | -90 | 12 | 11 |
| DEX-CZ10572 | 417769.246 | 9674479.168 | 353.430 | 28 | -90 | 20 | 8 |
| DEX-CZ10573 | 417765.152 | 9674455.673 | 352.396 | 33 | -90 | 24 | 5 |
| DEX-CZ10574 | 417768.749 | 9674420.453 | 351.746 | 28 | -90 | 19 | 2 |
| DEX-CZ10575 | 417768.700 | 9674402.293 | 352.038 | 42 | -90 | 13 | 27 |
| DEX-CZ10576 | 417766.367 | 9674380.001 | 350.645 | 30 | -90 | 15 | 13 |
| DEX-CZ10577 | 417765.334 | 9674346.315 | 350.126 | 29 | -90 | 16 | 9 |
| DEX-CZ10578 | 417793.349 | 9674651.944 | 335.087 | 35 | -90 | 21 | 9 |
| DEX-CZ10579 | 417789.331 | 9674623.625 | 330.962 | 10 | -90 | 6 | 1 |
| DEX-CZ10580 | 417795.175 | 9674600.307 | 342.293 | 24 | -90 | 17 | 5 |
| DEX-CZ10581 | 417796.082 | 9674553.398 | 349.500 | 23 | -90 | 19 | 2 |
| DEX-CZ10582 | 417792.018 | 9674526.276 | 351.383 | 18 | -90 | 8 | 2 |
| DEX-CZ10583 | 417795.915 | 9674504.042 | 350.581 | 22 | -90 | 12 | 5 |
| DEX-CZ10584 | 417796.969 | 9674449.436 | 350.013 | 28 | -90 | 16 | 9 |
| DEX-CZ10585 | 417794.754 | 9674426.519 | 348.000 | 40 | -90 | 14 | 24 |
| DEX-CZ10586 | 417793.327 | 9674403.124 | 347.744 | 34 | -90 | 14 | 17 |
| DEX-CZ10587 | 417789.135 | 9674352.327 | 340.000 | 28 | -90 | 19 | 6.8 |
| DEX-CZ10588 | 417814.648 | 9674669.849 | 330.224 | 20 | -90 | 14 | 4 |
| DEX-CZ10589 | 417823.860 | 9674653.000 | 322.989 | 21 | -90 | 4 | 14 |
| DEX-CZ10590 | 417819.675 | 9674623.039 | 331.490 | 12 | -90 | 8 | 3 |
| DEX-CZ10591 | 417821.352 | 9674604.640 | 337.537 | 18 | -90 | 14 | 2 |
| DEX-CZ10592 | 417820.779 | 9674576.644 | 340.241 | 29 | -90 | 10 | 19 |
| DEX-CZ10593 | 417818.318 | 9674548.269 | 347.121 | 15 | -90 | 12 | 1 |
| DEX-CZ10594 | 417817.279 | 9674522.957 | 348.578 | 28 | -90 | 24.5 | 1.5 |
| DEX-CZ10595 | 417818.558 | 9674498.383 | 348.360 | 31 | -90 | 12 | 3 |
| DEX-CZ10596 | 417818.420 | 9674471.212 | 348.665 | 28 | -90 | 15 | 3 |
| DEX-CZ10597 | 417819.205 | 9674446.715 | 348.000 | 22 | -90 | 14 | 3 |
| DEX-CZ10598 | 417815.187 | 9674424.719 | 347.392 | 27 | -90 | 10 | 6 |
| DEX-CZ10599 | 417819.608 | 9674402.743 | 348.026 | 42 | -90 | 23 | 17.55 |
| DEX-CZ10600 | 417822.917 | 9674374.839 | 347.334 | 35 | -90 | 19 | 13.8 |
| DEX-CZ10602 | 417842.526 | 9674649.830 | 315.762 | 18 | -90 | 13 | 2 |
| DEX-CZ10603 | 417844.278 | 9674599.242 | 330.285 | 21 | -90 | 7 | 12 |
| DEX-CZ10604 | 417841.277 | 9674540.899 | 340.601 | 33 | -90 | 7 | 18 |
| DEX-CZ10605 | 417843.517 | 9674499.343 | 342.276 | 28 | -90 | 10 | 13 |
| DEX-CZ10606 | 417842.280 | 9674451.292 | 346.518 | 31 | -90 | 14 | 8 |
| DEX-CZ10607 | 417841.406 | 9674400.155 | 350.574 | 34 | -90 | 14 | 17 |
| DEX-CZ10608 | 417866.726 | 9674667.877 | 309.863 | 20 | -90 | 6 | 9.9 |
| DEX-CZ10609 | 417866.912 | 9674649.365 | 320.629 | 22 | -90 | 11 | 6 |
| DEX-CZ10610 | 417864.587 | 9674622.834 | 324.022 | 42 | -90 | 16 | 23 |
| DEX-CZ10611 | 417868.676 | 9674601.354 | 320.402 | 31 | -90 | 12 | 9 |
| DEX-CZ10612 | 417868.529 | 9674575.643 | 320.882 | 25 | -90 | 4 | 19 |
| DEX-CZ10613 | 417871.097 | 9674549.417 | 325.874 | 20 | -90 | 7 | 11 |
| DEX-CZ10614 | 417870.485 | 9674528.193 | 331.767 | 27 | -90 | 9 | 13.85 |
| DEX-CZ10615 | 417868.725 | 9674498.135 | 333.821 | 30 | -90 | 4 | 12 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB4936 | 415982.382 | 9674597.514 | 419.156 | 32 | -90 | 16.4 | 14.24 |
| DEX-BB4937 | 416000.453 | 9674595.009 | 418.555 | 30 | -90 | 21.63 | 8.49 |
| DEX-BB4938 | 416025.260 | 9674593.847 | 417.323 | 35 | -90 | 16.28 | 17.33 |
| DEX-BB4939 | 416048.600 | 9674590.568 | 416.561 | 40 | -90 | 30.28 | 9 |
| DEX-BB4940 | 416076.147 | 9674593.436 | 414.872 | 28 | -90 | 20 | 6.42 |
| DEX-BB4943 | 415986.011 | 9674567.071 | 422.430 | 30 | -90 | 21.26 | 7 |
| DEX-BB4944 | 415998.081 | 9674567.440 | 421.788 | 27 | -90 | 15.57 | 9.72 |
| DEX-BB4945 | 416025.112 | 9674568.485 | 419.328 | 43 | -90 | 22.03 | 19.67 |
| DEX-BB4946 | 416048.805 | 9674570.112 | 417.557 | 27 | -90 | 16 | 9 |
| DEX-BB4947 | 416077.830 | 9674568.700 | 414.492 | 32 | -90 | 18.4 | 14.29 |
| DEX-BB4948 | 416094.509 | 9674570.317 | 411.596 | 24 | -90 | 17.26 | 5 |
| DEX-BB4952 | 415985.459 | 9674538.238 | 425.299 | 25 | -90 | 17.65 | 6 |
| DEX-BB4953 | 416028.048 | 9674544.208 | 420.701 | 24 | -90 | 20.35 | 2 |
| DEX-BB4954 | 416046.185 | 9674544.587 | 418.208 | 21 | -90 | 15 | 4 |
| DEX-BB4955 | 416072.746 | 9674539.519 | 414.619 | 23 | -90 | 15.62 | 5.27 |
| DEX-BB4956 | 416099.000 | 9674540.958 | 407.088 | 26 | -90 | 15.41 | 9.23 |
| DEX-BB4959 | 415983.147 | 9674516.468 | 426.000 | 36 | -90 | 16.41 | 18.45 |
| DEX-BB4960 | 415999.556 | 9674512.378 | 424.760 | 24 | -90 | 15 | 7 |
| DEX-BB4961 | 416035.144 | 9674514.020 | 419.547 | 34 | -90 | 26.35 | 7 |
| DEX-BB4962 | 416057.054 | 9674512.171 | 415.715 | 24 | -90 | 17.5 | 4.87 |
| DEX-BB4963 | 416079.449 | 9674515.826 | 410.827 | 22 | -90 | 14.25 | 6 |
| DEX-BB4969 | 415982.141 | 9674495.746 | 426.000 | 23 | -90 | 15.23 | 6 |
| DEX-BB4970 | 416028.371 | 9674498.450 | 420.628 | 25 | -90 | 16.42 | 7 |
| DEX-BB4974 | 415653.182 | 9675400.046 | 410.432 | 22 | -90 | 18 | 1 |
| DEX-BB4975 | 415751.907 | 9675406.605 | 403.784 | 30 | -90 | 17 | 11 |
| DEX-BB4976 | 415856.575 | 9675389.783 | 402.094 | 30 | -90 | 16 | 12.57 |
| DEX-BB4977 | 415635.717 | 9675330.249 | 427.472 | 25 | -90 | 11 | 12 |
| DEX-BB4978 | 415710.855 | 9675367.163 | 412.631 | 15 | -90 | 9 | 4 |
| DEX-BB4979 | 415750.254 | 9675352.272 | 409.707 | 22 | -90 | 13 | 6 |
| DEX-BB4980 | 415804.265 | 9675344.695 | 406.805 | 20 | -90 | 11 | 7 |
| DEX-BB4981 | 415854.147 | 9675343.527 | 405.476 | 18 | -90 | 10 | 6 |
| DEX-BB4982 | 415557.901 | 9675288.163 | 427.685 | 30 | -90 | 21 | 6.35 |
| DEX-BB4983 | 415651.535 | 9675286.002 | 441.944 | 7 | -90 | 2 | 3 |
| DEX-BB4984 | 415762.410 | 9675319.820 | 412.710 | 20 | -90 | 12 | 6 |
| DEX-BB4985 | 415858.535 | 9675293.847 | 411.009 | 26 | -90 | 15 | 9 |
| DEX-BB4986 | 415549.578 | 9675236.583 | 435.919 | 30 | -90 | 23 | 5 |
| DEX-BB4987 | 415593.720 | 9675240.299 | 443.437 | 18 | -90 | 12 | 4 |
| DEX-BB4988 | 415651.288 | 9675246.169 | 451.204 | 20 | -90 | 4 | 13.72 |
| DEX-BB4991 | 415546.272 | 9675193.339 | 438.076 | 32 | -90 | 24 | 6 |
| DEX-BB4992 | 415642.620 | 9675196.841 | 453.000 | 21 | -90 | 17 | 2 |
| DEX-BB4993 | 415553.557 | 9675151.917 | 436.837 | 25 | -90 | 18 | 4.8 |
| DEX-BB4994 | 415600.771 | 9675148.923 | 444.784 | 31 | -90 | 19 | 9.8 |
| DEX-BB4995 | 415648.515 | 9675145.525 | 447.818 | 29 | -90 | 25 | 2 |
| DEX-BB4996 | 415698.371 | 9675147.337 | 443.846 | 35 | -90 | 27 | 6 |
| DEX-BB4997 | 415547.461 | 9675102.421 | 429.407 | 26 | -90 | 21 | 3 |
| DEX-BB4998 | 415649.423 | 9675088.263 | 436.817 | 41 | -90 | 26 | 13 |
| DEX-BB4999 | 415753.019 | 9675097.215 | 438.570 | 28 | -90 | 21 | 5 |
| DEX-BB5000 | 415549.089 | 9675046.572 | 416.912 | 18 | -90 | 14 | 2 |
| DEX-BB5001 | 415602.492 | 9675040.517 | 421.097 | 39 | -90 | 33.8 | 3.6 |
| DEX-BB5002 | 415660.161 | 9675046.886 | 430.275 | 25 | -90 | 20 | 3 |
| DEX-BB5003 | 415711.797 | 9675044.581 | 432.973 | 29 | -90 | 19 | 7.77 |
| DEX-BB5004 | 415758.220 | 9675045.238 | 435.126 | 27 | -90 | 23 | 1.75 |
| DEX-BB5005 | 415799.096 | 9675040.600 | 433.579 | 23 | -90 | 18.65 | 2 |
| DEX-BB5007 | 416050.803 | 9675196.665 | 411.084 | 30 | -90 | 13 | 14.36 |
| DEX-BB5008 | 416146.094 | 9675193.278 | 405.968 | 17 | -90 | 8 | 6.83 |
| DEX-BB5009 | 416244.915 | 9675180.126 | 395.679 | 15 | -90 | 12.52 | 0.48 |
| DEX-BB5012 | 416109.521 | 9675162.207 | 414.440 | 24 | -90 | 15 | 7 |
| DEX-BB5013 | 416149.288 | 9675147.653 | 413.064 | 13 | -90 | 8 | 3 |
| DEX-BB5014 | 416204.280 | 9675143.741 | 402.618 | 17 | -90 | 13 | 1.48 |
| DEX-BB5015 | 416249.783 | 9675147.449 | 396.857 | 18 | -90 | 15 | 1 |
| DEX-BB5018 | 416254.563 | 9675094.497 | 403.406 | 10 | -90 | 6 | 2 |
| DEX-BB5025 | 416306.746 | 9675044.148 | 404.303 | 21 | -90 | 9 | 10 |
| DEX-BB5026 | 416350.302 | 9675044.592 | 407.358 | 24 | -90 | 17 | 5 |
| DEX-BB5027 | 416403.258 | 9675042.760 | 420.232 | 26 | -90 | 14 | 10 |
| DEX-BB5028 | 416451.579 | 9675049.999 | 412.286 | 19 | -90 | 13 | 4 |
| DEX-BB5029 | 416513.415 | 9675032.174 | 411.932 | 18 | -90 | 11 | 4.9 |
| DEX-BB5030 | 416546.686 | 9675051.050 | 403.813 | 16 | -90 | 11 | 2.3 |
| DEX-BB5031 | 416448.403 | 9675093.436 | 406.949 | 41 | -90 | 11 | 28 |
| DEX-BB5032 | 416454.213 | 9675145.364 | 397.639 | 18 | -90 | 9 | 7 |
| DEX-BB5037 | 416350.393 | 9674989.928 | 407.000 | 25 | -90 | 19 | 4 |
| DEX-BB5038 | 416449.280 | 9674999.812 | 416.409 | 25 | -90 | 17 | 5.38 |
| DEX-BB5039 | 416549.210 | 9675000.638 | 413.106 | 32 | -90 | 13 | 17 |
| DEX-BB5043 | 416154.559 | 9674929.702 | 419.993 | 24 | -90 | 13.23 | 9 |
| DEX-BB5047 | 416341.141 | 9674955.711 | 411.040 | 52 | -90 | 26.3 | 23.6 |
| DEX-BB5048 | 416397.086 | 9674957.582 | 413.966 | 37 | -90 | 28 | 7 |
| DEX-BB5049 | 416452.639 | 9674946.497 | 422.097 | 19 | -90 | 14 | 3 |
| DEX-BB5050 | 416501.671 | 9674943.793 | 422.945 | 45 | -90 | 28 | 15 |
| DEX-BB5051 | 416553.022 | 9674943.211 | 418.472 | 35 | -90 | 18 | 15 |
| DEX-BB5052 | 416603.761 | 9674945.557 | 411.714 | 40 | -90 | 13 | 25 |
| DEX-BB5053 | 416051.198 | 9674887.431 | 420.461 | 39 | -90 | 17.64 | 21.78 |
| DEX-BB5054 | 416150.053 | 9674891.894 | 415.755 | 24 | -90 | 16.36 | 6 |
| DEX-BB5057 | 416455.474 | 9674888.581 | 432.799 | 41 | -90 | 31 | 8 |
| DEX-BB5058 | 416051.105 | 9674843.903 | 413.148 | 25 | -90 | 14.39 | 9 |
| DEX-BB5059 | 416103.750 | 9674850.665 | 414.732 | 17 | -90 | 12.68 | 2.32 |
| DEX-BB5060 | 416155.485 | 9674849.574 | 410.094 | 21 | -90 | 13.34 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10616 | 417865.684 | 9674470.762 | 338.852 | 29 | -90 | 7 | 12 |
| DEX-CZ10617 | 417870.982 | 9674447.573 | 343.854 | 22 | -90 | 7 | 6 |
| DEX-CZ10618 | 417861.112 | 9674422.525 | 349.972 | 18 | -90 | 7 | 9 |
| DEX-CZ10619 | 417867.450 | 9674402.287 | 352.000 | 22 | -90 | 7 | 8 |
| DEX-CZ10620 | 417885.886 | 9674649.365 | 316.647 | 20 | -90 | 6 | 7 |
| DEX-CZ10621 | 417892.489 | 9674625.640 | 316.191 | 22 | -90 | 10 | 9 |
| DEX-CZ10622 | 417890.940 | 9674597.961 | 313.655 | 31 | -90 | 23 | 3 |
| DEX-CZ10623 | 417892.772 | 9674547.799 | 324.345 | 37 | -90 | 21 | 13 |
| DEX-CZ10624 | 417890.681 | 9674520.355 | 323.391 | 30 | -90 | 6 | 16.51 |
| DEX-CZ10625 | 417892.988 | 9674502.276 | 324.347 | 23 | -90 | 6 | 16 |
| DEX-CZ10626 | 417891.692 | 9674449.246 | 338.786 | 16 | -90 | 8 | 6 |
| DEX-CZ10627 | 417898.321 | 9674424.141 | 344.286 | 12 | -90 | 4 | 4 |
| DEX-CZ10628 | 417912.694 | 9674672.396 | 298.361 | 32 | -90 | 22.85 | 1.9 |
| DEX-CZ10629 | 417927.648 | 9674653.220 | 295.829 | 33 | -90 | 2 | 28.9 |
| DEX-CZ10630 | 417918.820 | 9674623.121 | 309.226 | 18 | -90 | 14 | 2 |
| DEX-CZ10631 | 417919.600 | 9674598.192 | 308.686 | 20 | -90 | 16 | 4 |
| DEX-CZ10632 | 417919.703 | 9674579.094 | 311.680 | 48 | -90 | 33 | 12.75 |
| DEX-CZ10633 | 417917.859 | 9674550.564 | 314.488 | 35 | -90 | 24 | 8 |
| DEX-CZ10634 | 417921.282 | 9674525.351 | 312.800 | 34 | -90 | 17 | 12.8 |
| DEX-CZ10635 | 417915.389 | 9674494.984 | 318.405 | 16 | -90 | 2 | 12 |
| DEX-CZ10636 | 417916.348 | 9674469.170 | 324.613 | 19 | -90 | 2 | 17 |
| DEX-CZ10637 | 417922.726 | 9674452.396 | 326.376 | 15 | -90 | 5 | 3 |
| DEX-CZ10638 | 417920.910 | 9674431.291 | 332.614 | 11 | -90 | 6 | 1.8 |
| DEX-CZ10639 | 417947.614 | 9674646.170 | 296.721 | 28 | -90 | 13.26 | 13 |
| DEX-CZ10640 | 417940.425 | 9674595.032 | 303.381 | 30 | -90 | 17 | 7 |
| DEX-CZ10641 | 417943.509 | 9674552.333 | 305.750 | 22 | -90 | 14 | 5 |
| DEX-CZ10642 | 417934.058 | 9674495.038 | 311.873 | 34 | -90 | 18 | 14 |
| DEX-CZ10643 | 417939.510 | 9674447.182 | 317.370 | 7 | -90 | 1 | 1 |
| DEX-CZ10645 | 417968.307 | 9674652.449 | 292.382 | 23 | -90 | 9 | 4 |
| DEX-CZ10646 | 417966.087 | 9674615.341 | 296.967 | 27 | -90 | 8 | 15 |
| DEX-CZ10647 | 417970.610 | 9674595.509 | 296.070 | 21 | -90 | 9 | 8.75 |
| DEX-CZ10648 | 417969.589 | 9674574.633 | 296.529 | 9 | -90 | 5 | 1 |
| DEX-CZ10649 | 417966.937 | 9674549.801 | 301.232 | 17 | -90 | 3 | 8.8 |
| DEX-CZ10650 | 417970.699 | 9674532.211 | 298.244 | 21 | -90 | 11 | 6 |
| DEX-CZ10654 | 417987.609 | 9674652.285 | 287.935 | 29 | -90 | 1 | 24.72 |
| DEX-CZ10655 | 417990.432 | 9674623.016 | 293.590 | 20 | -90 | 6 | 11 |
| DEX-CZ10656 | 417989.566 | 9674599.409 | 293.687 | 23 | -90 | 11 | 9 |
| DEX-CZ10657 | 417989.618 | 9674550.576 | 292.591 | 24 | -90 | 18 | 3 |
| DEX-CZ10659 | 417521.793 | 9674877.251 | 368.022 | 24 | -90 | 16 | 4 |
| DEX-CZ10660 | 417522.173 | 9674854.477 | 366.477 | 31 | -90 | 18 | 7 |
| DEX-CZ10661 | 417521.809 | 9674830.738 | 364.877 | 19 | -90 | 11 | 1 |
| DEX-CZ10662 | 417518.122 | 9674928.443 | 372.761 | 26 | -90 | 11 | 13 |
| DEX-CZ10663 | 417468.610 | 9674933.929 | 363.236 | 16 | -90 | 9 | 4 |
| DEX-CZ10664 | 417462.423 | 9674956.051 | 364.387 | 23 | -90 | 11 | 9 |
| DEX-CZ10665 | 417468.451 | 9674977.244 | 369.028 | 23 | -90 | 13 | 8 |
| DEX-CZ10666 | 417497.222 | 9674975.963 | 374.708 | 19 | -90 | 10 | 6 |
| DEX-CZ10667 | 417490.676 | 9674956.252 | 370.101 | 28 | -90 | 6 | 19 |
| DEX-CZ10668 | 417519.737 | 9674949.043 | 375.002 | 23 | -90 | 13 | 8 |
| DEX-CZ10669 | 417543.160 | 9674954.970 | 374.456 | 19 | -90 | 13 | 4 |
| DEX-CZ10670 | 417612.245 | 9674926.449 | 367.023 | 11 | -90 | 6 | 0 |
| DEX-CZ10671 | 417472.331 | 9674898.354 | 361.984 | 9 | -90 | 4 | 3 |
| DEX-CZ10672 | 417470.837 | 9674870.798 | 359.588 | 16 | -90 | 10 | 4 |
| DEX-CZ10673 | 417473.727 | 9674850.524 | 359.115 | 25 | -90 | 4 | 19 |
| DEX-CZ10674 | 417496.427 | 9674904.243 | 367.650 | 20 | -90 | 8 | 7 |
| DEX-CZ10675 | 417519.060 | 9674910.665 | 371.161 | 31 | -90 | 6 | 20 |
| DEX-CZ10676 | 417665.525 | 9674898.226 | 369.000 | 41 | -90 | 14 | 25 |
| DEX-CZ10677 | 417688.665 | 9674884.191 | 367.371 | 23 | -90 | 11 | 1 |
| DEX-CZ10678 | 417715.367 | 9674875.726 | 361.961 | 29 | -90 | 15 | 9 |
| DEX-CZ10679 | 417491.605 | 9674856.121 | 361.599 | 28 | -90 | 5 | 17 |
| DEX-CZ10680 | 417692.158 | 9674857.848 | 365.763 | 22 | -90 | 14 | 4 |
| DEX-CZ10681 | 417716.634 | 9674851.255 | 360.134 | 26 | -90 | 9 | 10.85 |
| DEX-CZ10682 | 417734.824 | 9674851.776 | 355.902 | 23 | -90 | 15 | 5 |
| DEX-CZ10683 | 417763.820 | 9674851.459 | 349.969 | 21 | -90 | 8 | 10 |
| DEX-CZ10684 | 417718.914 | 9674825.230 | 358.608 | 19 | -90 | 9 | 6 |
| DEX-CZ10685 | 417745.033 | 9674828.794 | 353.693 | 23 | -90 | 13 | 7 |
| DEX-CZ10686 | 417770.371 | 9674825.310 | 348.313 | 24 | -90 | 15 | 6 |
| DEX-CZ10687 | 417818.205 | 9674821.953 | 331.960 | 21 | -90 | 5 | 10 |
| DEX-CZ10688 | 417517.070 | 9674801.644 | 359.194 | 13 | -90 | 3 | 1 |
| DEX-CZ10689 | 417694.934 | 9674797.277 | 363.688 | 21 | -90 | 13 | 6 |
| DEX-CZ10690 | 417721.218 | 9674803.882 | 354.940 | 23 | -90 | 15 | 1 |
| DEX-CZ10691 | 417740.021 | 9674804.520 | 351.936 | 21 | -90 | 4 | 15 |
| DEX-CZ10692 | 417762.754 | 9674803.924 | 348.918 | 24 | -90 | 7 | 13 |
| DEX-CZ10693 | 417793.291 | 9674806.699 | 342.429 | 25 | -90 | 7 | 11 |
| DEX-CZ10694 | 417818.611 | 9674795.578 | 336.623 | 32 | -90 | 9 | 20 |
| DEX-CZ10695 | 417843.864 | 9674803.586 | 327.924 | 28 | -90 | 4 | 8 |
| DEX-CZ10696 | 417866.653 | 9674801.590 | 321.902 | 17 | -90 | 7 | 8 |
| DEX-CZ10697 | 417894.472 | 9674795.286 | 314.873 | 24 | -90 | 16 | 5 |
| DEX-CZ10698 | 417523.910 | 9674781.776 | 355.236 | 10 | -90 | 4 | 1 |
| DEX-CZ10699 | 417541.109 | 9674754.706 | 355.241 | 23 | -90 | 4 | 10 |
| DEX-CZ10700 | 417490.909 | 9674801.020 | 362.748 | 28 | -90 | 10 | 13 |
| DEX-CZ10701 | 417561.033 | 9674774.328 | 356.878 | 19 | -90 | 3 | 1 |
| DEX-CZ10702 | 417717.927 | 9674776.440 | 357.844 | 27 | -90 | 18 | 6 |
| DEX-CZ10703 | 417765.001 | 9674780.710 | 345.337 | 27 | -90 | 4 | 19 |
| DEX-CZ10704 | 417816.526 | 9674775.385 | 336.112 | 36 | -90 | 6 | 27 |
| DEX-CZ10705 | 417853.261 | 9674766.555 | 324.365 | 20 | -90 | 6 | 9 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5061 | 416192.394 | 9674849.130 | 410.504 | 40 | -90 | 32.25 | 9 |
| DEX-BB5065 | 416405.517 | 9674841.418 | 433.003 | 31 | -90 | 7 | 21.9 |
| DEX-BB5066 | 416448.137 | 9674842.827 | 440.802 | 29 | -90 | 11 | 16 |
| DEX-BB5069 | 416740.507 | 9675181.920 | 395.669 | 21 | -90 | 7 | 12 |
| DEX-BB5073 | 416715.014 | 9675153.505 | 395.294 | 25 | -90 | 12 | 11 |
| DEX-BB5074 | 416757.323 | 9675145.826 | 399.935 | 20 | -90 | 14 | 4 |
| DEX-BB5077 | 416669.061 | 9675049.157 | 410.791 | 27 | -90 | 9 | 16 |
| DEX-BB5078 | 416701.688 | 9675044.010 | 410.693 | 26 | -90 | 9 | 15 |
| DEX-BB5079 | 416752.529 | 9675037.030 | 416.560 | 29 | -90 | 17 | 10 |
| DEX-BB5080 | 416678.911 | 9675012.673 | 413.441 | 20 | -90 | 10 | 8 |
| DEX-BB5081 | 416741.811 | 9674995.394 | 420.433 | 20 | -90 | 12 | 6 |
| DEX-BB5082 | 414051.884 | 9675016.719 | 382.655 | 26 | -90 | 23.11 | 1.55 |
| DEX-BB5083 | 414098.884 | 9675018.367 | 383.469 | 22 | -90 | 19.64 | 1 |
| DEX-BB5084 | 414147.155 | 9675020.854 | 384.000 | 25 | -90 | 18 | 5 |
| DEX-BB5085 | 414203.365 | 9675022.818 | 385.000 | 29 | -90 | 22.27 | 5 |
| DEX-BB5086 | 414250.511 | 9675020.365 | 386.405 | 26 | -90 | 23.54 | 2 |
| DEX-BB5087 | 414050.665 | 9674967.421 | 382.700 | 28 | -90 | 19.59 | 7 |
| DEX-BB5088 | 414151.942 | 9674970.688 | 383.934 | 26 | -90 | 20 | 4 |
| DEX-BB5089 | 414202.176 | 9674970.211 | 384.199 | 29 | -90 | 16.35 | 11.05 |
| DEX-BB5090 | 414250.669 | 9674970.724 | 386.078 | 25 | -90 | 18.27 | 5 |
| DEX-BB5091 | 413880.424 | 9674852.624 | 382.734 | 27 | -90 | 13.36 | 12.32 |
| DEX-BB5092 | 413920.341 | 9674852.392 | 382.696 | 25 | -90 | 12 | 11.28 |
| DEX-BB5093 | 413880.320 | 9674805.643 | 390.226 | 17 | -90 | 7 | 8 |
| DEX-BB5094 | 413929.738 | 9674804.515 | 384.000 | 29 | -90 | 15.37 | 12.18 |
| DEX-BB5095 | 413876.457 | 9674751.200 | 402.246 | 6 | -90 | 2 | 1 |
| DEX-BB5096 | 413928.552 | 9674750.816 | 393.658 | 11 | -90 | 2 | 7 |
| DEX-BB5097 | 414028.138 | 9674750.414 | 388.868 | 44 | -90 | 14.53 | 28 |
| DEX-BB5098 | 414073.316 | 9674754.846 | 389.559 | 29 | -90 | 13 | 14.46 |
| DEX-BB5099 | 414030.361 | 9674697.881 | 398.449 | 19 | -90 | 3 | 13.86 |
| DEX-BB5100 | 414077.707 | 9674701.235 | 396.718 | 23 | -90 | 5 | 15 |
| DEX-BB5101 | 414251.452 | 9674620.165 | 411.615 | 28 | -90 | 15.37 | 11.96 |
| DEX-BB5102 | 414303.174 | 9674622.593 | 407.136 | 37 | -90 | 25.87 | 9.85 |
| DEX-BB5103 | 414350.487 | 9674620.967 | 415.065 | 30 | -90 | 15.82 | 12.86 |
| DEX-BB5104 | 414402.169 | 9674615.020 | 422.806 | 31 | -90 | 16.29 | 13.77 |
| DEX-BB5106 | 414500.308 | 9674618.783 | 451.897 | 12 | -90 | 2 | 8 |
| DEX-BB5107 | 414552.916 | 9674623.635 | 457.477 | 18 | -90 | 3 | 13.31 |
| DEX-BB5108 | 414250.238 | 9674568.273 | 421.534 | 12 | -90 | 1 | 9 |
| DEX-BB5109 | 414300.628 | 9674572.564 | 410.523 | 36 | -90 | 33.19 | 3 |
| DEX-BB5110 | 414345.482 | 9674570.986 | 397.932 | 34 | -90 | 10 | 22 |
| DEX-BB5111 | 414395.263 | 9674565.314 | 401.386 | 31 | -90 | 13 | 16.62 |
| DEX-BB5112 | 414081.334 | 9674284.519 | 377.047 | 23 | -90 | 9 | 12.5 |
| DEX-BB5113 | 414082.911 | 9674236.338 | 379.362 | 23 | -90 | 2 | 19 |
| DEX-BB5114 | 414140.514 | 9674239.461 | 381.402 | 20 | -90 | 4 | 14 |
| DEX-BB5115 | 414239.220 | 9674247.336 | 381.441 | 19 | -90 | 5 | 12.32 |
| DEX-BB5116 | 414004.671 | 9674161.420 | 357.033 | 20 | -90 | 9 | 9 |
| DEX-BB5117 | 414056.755 | 9674101.829 | 356.332 | 35 | -90 | 12 | 21 |
| DEX-BB5118 | 414139.124 | 9673804.801 | 305.484 | 31 | -90 | 19.26 | 10 |
| DEX-BB5119 | 414230.820 | 9673811.232 | 313.021 | 30 | -90 | 19 | 9 |
| DEX-BB5120 | 414733.387 | 9674281.010 | 411.190 | 27 | -90 | 21.99 | 4 |
| DEX-BB5121 | 414693.736 | 9674239.593 | 386.213 | 38 | -90 | 21.66 | 15.38 |
| DEX-BB5122 | 414733.967 | 9674185.569 | 386.774 | 35 | -90 | 18.27 | 15.9 |
| DEX-BB5123 | 414826.022 | 9674207.124 | 398.626 | 24 | -90 | 12 | 9.9 |
| DEX-BB5124 | 414776.631 | 9674235.340 | 409.680 | 25 | -90 | 14 | 9 |
| DEX-BB5125 | 414827.224 | 9674241.444 | 411.374 | 10 | -90 | 5 | 3 |
| DEX-BB5126 | 414875.540 | 9674241.571 | 404.494 | 7 | -90 | 3.62 | 3.38 |
| DEX-BB5127 | 414640.868 | 9674291.102 | 373.494 | 32 | -90 | 14 | 16.15 |
| DEX-BB5128 | 414641.046 | 9674192.211 | 363.352 | 27 | -90 | 17 | 7.5 |
| DEX-BB5129 | 414628.466 | 9674143.568 | 360.797 | 40 | -90 | 29.83 | 11.1 |
| DEX-BB5130 | 414632.602 | 9674096.442 | 359.627 | 38 | -90 | 35.49 | 2 |
| DEX-BB5131 | 414636.422 | 9674048.006 | 361.511 | 37 | -90 | 23.1 | 13.91 |
| DEX-BB5132 | 414693.113 | 9674132.660 | 360.311 | 28 | -90 | 21.59 | 5 |
| DEX-BB5133 | 414729.414 | 9674145.493 | 370.998 | 25 | -90 | 15 | 8 |
| DEX-BB5134 | 413953.685 | 9674104.602 | 340.094 | 11 | -90 | 4 | 5 |
| DEX-BB5135 | 413957.468 | 9674057.495 | 340.286 | 18 | -90 | 6 | 10 |
| DEX-BB5136 | 414002.900 | 9674063.984 | 352.233 | 13 | -90 | 9 | 2 |
| DEX-BB5137 | 414053.322 | 9674056.038 | 352.855 | 26 | -90 | 8 | 16 |
| DEX-BB5138 | 414101.847 | 9674059.458 | 347.851 | 16 | -90 | 8 | 5.77 |
| DEX-BB5139 | 414159.427 | 9674063.200 | 336.569 | 10 | -90 | 4 | 4 |
| DEX-BB5140 | 414056.827 | 9674010.008 | 348.838 | 21 | -90 | 7 | 12 |
| DEX-BB5141 | 414167.274 | 9674007.602 | 325.467 | 10 | -90 | 3 | 5 |
| DEX-BB5142 | 414058.247 | 9673952.189 | 334.544 | 14 | -90 | 1 | 10.78 |
| DEX-BB5143 | 414105.543 | 9673958.134 | 325.311 | 21 | -90 | 5 | 14 |
| DEX-BB5144 | 414159.040 | 9673954.257 | 310.739 | 15 | -90 | 4 | 9 |
| DEX-BB5145 | 414087.522 | 9674329.752 | 365.989 | 13 | -90 | 3 | 8 |
| DEX-BB5146 | 414144.312 | 9674335.019 | 393.255 | 20 | -90 | 3 | 15 |
| DEX-BB5147 | 414185.861 | 9674334.204 | 395.269 | 10 | -90 | 2 | 6 |
| DEX-BB5148 | 414183.416 | 9674287.379 | 382.172 | 25 | -90 | 4 | 19.39 |
| DEX-BB5149 | 414178.914 | 9674234.463 | 369.983 | 23 | -90 | 1 | 19.28 |
| DEX-BB5150 | 414235.176 | 9674183.338 | 374.241 | 16 | -90 | 2 | 12 |
| DEX-BB5151 | 414241.554 | 9674147.128 | 375.645 | 24 | -90 | 2 | 20 |
| DEX-BB5152 | 414288.017 | 9674236.354 | 382.301 | 18 | -90 | 4 | 12.7 |
| DEX-BB5153 | 414335.642 | 9674233.205 | 396.582 | 10 | -90 | 3 | 5 |
| DEX-BB5154 | 414337.054 | 9674188.888 | 396.385 | 26 | -90 | 8 | 16.3 |
| DEX-BB5155 | 414286.967 | 9674146.513 | 376.522 | 32 | -90 | 6 | 25.49 |
| DEX-BB5156 | 414329.889 | 9674143.945 | 393.009 | 19 | -90 | 7 | 10 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10706 | 417872.277 | 9674770.643 | 318.741 | 16 | -90 | 6 | 8 |
| DEX-CZ10707 | 417892.369 | 9674777.786 | 315.009 | 30 | -90 | 20 | 6 |
| DEX-CZ10708 | 417919.384 | 9674770.496 | 307.799 | 17 | -90 | 6 | 5 |
| DEX-CZ10709 | 417940.465 | 9674772.339 | 304.312 | 15 | -90 | 2 | 2 |
| DEX-CZ10710 | 417568.548 | 9674754.145 | 366.050 | 27 | -90 | 4 | 16 |
| DEX-CZ10711 | 417697.732 | 9674752.643 | 362.687 | 30 | -90 | 17 | 11 |
| DEX-CZ10712 | 417722.471 | 9674748.335 | 356.616 | 30 | -90 | 11 | 4 |
| DEX-CZ10713 | 417745.657 | 9674743.919 | 349.205 | 24 | -90 | 7 | 8 |
| DEX-CZ10714 | 417767.401 | 9674758.142 | 342.906 | 18 | -90 | 9 | 6 |
| DEX-CZ10715 | 417790.088 | 9674754.961 | 336.372 | 13 | -90 | 6 | 4 |
| DEX-CZ10716 | 417822.911 | 9674747.065 | 329.781 | 19 | -90 | 6 | 10 |
| DEX-CZ10717 | 417840.229 | 9674755.904 | 326.693 | 28 | -90 | 3 | 19 |
| DEX-CZ10718 | 417863.435 | 9674747.530 | 319.426 | 20 | -90 | 10 | 5 |
| DEX-CZ10719 | 417893.073 | 9674756.565 | 307.952 | 20 | -90 | 4 | 9 |
| DEX-CZ10720 | 417910.891 | 9674748.369 | 302.534 | 12 | -90 | 4 | 0 |
| DEX-CZ10721 | 417938.337 | 9674757.550 | 300.800 | 15 | -90 | 4 | 5 |
| DEX-CZ10722 | 417963.296 | 9674747.611 | 287.568 | 18 | -90 | 7 | 9 |
| DEX-CZ10723 | 417990.452 | 9674745.448 | 301.000 | 34 | -90 | 12 | 3 |
| DEX-CZ10724 | 417568.234 | 9674722.659 | 370.204 | 13 | -90 | 2 | 6 |
| DEX-CZ10725 | 417768.665 | 9674730.939 | 341.114 | 18 | -90 | 14.35 | 1.65 |
| DEX-CZ10726 | 417819.716 | 9674731.062 | 332.914 | 18 | -90 | 11 | 4 |
| DEX-CZ10727 | 417863.682 | 9674725.404 | 325.386 | 24 | -90 | 13 | 7 |
| DEX-CZ10728 | 417895.391 | 9674732.016 | 308.746 | 25 | -90 | 4 | 8 |
| DEX-CZ10729 | 417914.644 | 9674719.701 | 297.084 | 30 | -90 | 13 | 14 |
| DEX-CZ10730 | 417977.505 | 9674721.132 | 299.280 | 28 | -90 | 15 | 10 |
| DEX-CZ10731 | 418017.948 | 9674727.727 | 293.508 | 16 | -90 | 6 | 6 |
| DEX-CZ10732 | 417550.198 | 9674706.425 | 365.949 | 7 | -90 | 3 | 1 |
| DEX-CZ10733 | 417568.467 | 9674695.261 | 369.233 | 30 | -90 | 10 | 15 |
| DEX-CZ10734 | 417745.640 | 9674697.202 | 343.738 | 19 | -90 | 5 | 3 |
| DEX-CZ10735 | 417764.682 | 9674696.293 | 339.358 | 26 | -90 | 7 | 9 |
| DEX-CZ10736 | 417794.430 | 9674704.513 | 334.112 | 28 | -90 | 13 | 6 |
| DEX-CZ10737 | 417818.675 | 9674706.827 | 333.170 | 28 | -90 | 19 | 6 |
| DEX-CZ10738 | 417835.993 | 9674713.624 | 331.254 | 32 | -90 | 20 | 6 |
| DEX-CZ10739 | 417866.836 | 9674703.820 | 314.341 | 20 | -90 | 5 | 10 |
| DEX-CZ10740 | 417894.143 | 9674702.349 | 309.090 | 27 | -90 | 18 | 2 |
| DEX-CZ10741 | 417911.180 | 9674695.985 | 304.285 | 20 | -90 | 13 | 4 |
| DEX-CZ10742 | 417936.799 | 9674692.322 | 296.267 | 23 | -90 | 12 | 6 |
| DEX-CZ10744 | 417992.676 | 9674705.841 | 294.796 | 17 | -90 | 9 | 6 |
| DEX-CZ10745 | 418020.825 | 9674701.170 | 291.723 | 15 | -90 | 7 | 5 |
| DEX-CZ10746 | 418043.398 | 9674697.785 | 290.181 | 12 | -90 | 5 | 1 |
| DEX-CZ10747 | 418066.211 | 9674697.636 | 285.343 | 23 | -90 | 11 | 8 |
| DEX-CZ10748 | 418090.370 | 9674705.515 | 289.925 | 13 | -90 | 2 | 3 |
| DEX-CZ10749 | 417768.310 | 9674687.077 | 337.701 | 31 | -90 | 11 | 17 |
| DEX-CZ10749A | 417769.821 | 9674680.242 | 338.132 | 38 | -90 | 12 | 24 |
| DEX-CZ10750 | 418029.787 | 9674680.943 | 285.570 | 29 | -90 | 12 | 13 |
| DEX-CZ10751 | 418044.188 | 9674679.246 | 287.797 | 21 | -90 | 8 | 0.55 |
| DEX-CZ10752 | 418062.115 | 9674672.584 | 285.320 | 16 | -90 | 3 | 8 |
| DEX-CZ10754 | 417546.121 | 9674635.825 | 358.804 | 26 | -90 | 8 | 5 |
| DEX-CZ10755 | 418017.778 | 9674651.806 | 277.766 | 15 | -90 | 2 | 11 |
| DEX-CZ10756 | 418045.875 | 9674650.639 | 274.783 | 27 | -90 | 19 | 2 |
| DEX-CZ10757 | 417574.543 | 9674628.929 | 361.821 | 23 | -90 | 19 | 2 |
| DEX-CZ10758 | 418021.647 | 9674620.769 | 284.676 | 20 | -90 | 5 | 11 |
| DEX-CZ10759 | 418039.123 | 9674621.461 | 276.928 | 13 | -90 | 2 | 9 |
| DEX-CZ10760 | 417551.020 | 9674605.296 | 350.588 | 24 | -90 | 7 | 11 |
| DEX-CZ10761 | 418018.044 | 9674604.052 | 287.871 | 10 | -90 | 3 | 5 |
| DEX-CZ10762 | 418047.717 | 9674603.735 | 277.085 | 8 | -90 | 3 | 1 |
| DEX-CZ10763 | 418020.897 | 9674575.960 | 286.845 | 13 | -90 | 3 | 2 |
| DEX-CZ10764 | 417528.468 | 9674544.557 | 352.207 | 23 | -90 | 5 | 15 |
| DEX-CZ10765 | 417554.103 | 9674489.367 | 358.247 | 29 | -90 | 21 | 2 |
| DEX-CZ10768 | 417946.676 | 9674421.039 | 317.714 | 6 | -90 | 2 | 2 |
| DEX-CZ10769 | 417965.586 | 9674419.816 | 314.381 | 14 | -90 | 1 | 11 |
| DEX-CZ10772 | 417902.041 | 9674401.256 | 347.739 | 10 | -90 | 3 | 4 |
| DEX-CZ10773 | 417926.918 | 9674396.777 | 338.692 | 14 | -90 | 4 | 9 |
| DEX-CZ10774 | 417948.116 | 9674404.560 | 324.338 | 6 | -90 | 3 | 0 |
| DEX-CZ10775 | 417972.606 | 9674405.638 | 315.590 | 16 | -90 | 2 | 11 |
| DEX-CZ10776 | 417990.602 | 9674395.418 | 312.504 | 12 | -90 | 6 | 3 |
| DEX-CZ10782 | 417878.155 | 9674380.241 | 347.216 | 22 | -90 | 3 | 5 |
| DEX-CZ10783 | 417894.777 | 9674381.053 | 346.362 | 20 | -90 | 2 | 6 |
| DEX-CZ10784 | 417915.391 | 9674379.987 | 340.742 | 18 | -90 | 3 | 6 |
| DEX-CZ10785 | 417944.510 | 9674379.997 | 334.449 | 6 | -90 | 3 | 0 |
| DEX-CZ10786 | 417964.740 | 9674384.384 | 325.295 | 8 | -90 | 2 | 3 |
| DEX-CZ10790 | 417522.944 | 9674351.580 | 369.289 | 15 | -90 | 6 | 4 |
| DEX-CZ10791 | 417840.206 | 9674350.972 | 338.005 | 19 | -90 | 8 | 11 |
| DEX-CZ10792 | 417567.830 | 9674329.996 | 365.829 | 31 | -90 | 21 | 8 |
| DEX-CZ10793 | 417614.681 | 9674331.168 | 360.079 | 28 | -90 | 21 | 5 |
| DEX-CZ10794 | 417665.920 | 9674323.249 | 351.099 | 31 | -90 | 26 | 3 |
| DEX-CZ10795 | 417715.099 | 9674335.730 | 352.703 | 26 | -90 | 16 | 7 |
| DEX-CZ10796 | 418139.197 | 9674679.115 | 279.224 | 21 | -90 | 2 | 19 |
| DEX-CZ10798 | 418165.651 | 9674661.105 | 284.651 | 16 | -90 | 6 | 8 |
| DEX-CZ10799 | 418186.895 | 9674651.296 | 288.437 | 6 | -90 | 3 | 0 |
| DEX-CZ10800 | 418221.062 | 9674657.583 | 282.731 | 14 | -90 | 10 | 2 |
| DEX-CZ10801 | 418179.053 | 9674619.158 | 276.269 | 12 | -90 | 6 | 3 |
| DEX-CZ10802 | 418195.390 | 9674628.073 | 278.824 | 21 | -90 | 12 | 8 |
| DEX-CZ10803 | 418232.960 | 9674625.227 | 280.240 | 13 | -90 | 10 | 0 |
| DEX-CZ10804 | 418242.754 | 9674620.265 | 279.993 | 21 | -90 | 18 | 1 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5157 | 414581.896 | 9674148.204 | 372.235 | 29 | -90 | 9 | 18 |
| DEX-BB5158 | 416140.419 | 9674805.328 | 408.730 | 37 | -90 | 27.66 | 9.3 |
| DEX-BB5163 | 414051.572 | 9674923.777 | 382.907 | 14 | -90 | 9 | 3 |
| DEX-BB5164 | 414150.611 | 9674926.332 | 383.967 | 29 | -90 | 16 | 11.22 |
| DEX-BB5165 | 414198.144 | 9674921.914 | 385.640 | 16 | -90 | 6 | 8 |
| DEX-BB5166 | 414251.137 | 9674926.009 | 387.007 | 13 | -90 | 8 | 3 |
| DEX-BB5167 | 414246.671 | 9674514.015 | 428.497 | 13 | -90 | 5 | 6 |
| DEX-BB5168 | 414296.948 | 9674515.828 | 417.585 | 19 | -90 | 5 | 12 |
| DEX-BB5169 | 414201.455 | 9674513.277 | 433.176 | 27 | -90 | 9 | 16.19 |
| DEX-BB5170 | 414204.287 | 9674466.699 | 439.474 | 22 | -90 | 7 | 13.26 |
| DEX-BB5171 | 414251.479 | 9674470.298 | 437.100 | 14 | -90 | 2 | 10 |
| DEX-BB5172 | 414293.479 | 9674464.494 | 429.529 | 7 | -90 | 3 | 2 |
| DEX-BB5173 | 414182.419 | 9673954.470 | 316.236 | 18 | -90 | 2 | 14 |
| DEX-BB5174 | 414232.622 | 9673961.743 | 334.123 | 16 | -90 | 6 | 8 |
| DEX-BB5175 | 414313.717 | 9673914.415 | 340.199 | 10 | -90 | 5 | 3 |
| DEX-BB5176 | 414335.461 | 9673858.279 | 337.000 | 12 | -90 | 7 | 3 |
| DEX-BB5177 | 414077.511 | 9673811.947 | 287.519 | 12 | -90 | 4 | 6 |
| DEX-BB5550 | 414522.169 | 9675178.898 | 418.628 | 8 | -90 | 3 | 3 |
| DEX-BB5551 | 414551.251 | 9675184.663 | 418.807 | 7 | -90 | 2 | 3 |
| DEX-BB5552 | 414579.424 | 9675183.616 | 421.058 | 9 | -90 | 4 | 2 |
| DEX-BB5553 | 414603.736 | 9675182.182 | 425.649 | 14 | -90 | 9.24 | 3 |
| DEX-BB5554 | 414526.971 | 9675149.249 | 421.243 | 12 | -90 | 8 | 2 |
| DEX-BB5555 | 414574.496 | 9675151.511 | 424.415 | 13 | -90 | 7 | 4 |
| DEX-BB5556 | 414624.284 | 9675155.526 | 423.096 | 16 | -90 | 9 | 5 |
| DEX-BB5557 | 414525.929 | 9675129.599 | 420.197 | 11 | -90 | 6 | 3 |
| DEX-BB5558 | 414548.560 | 9675130.685 | 423.848 | 16 | -90 | 3 | 11 |
| DEX-BB5559 | 414571.325 | 9675132.283 | 424.095 | 19 | -90 | 9 | 8 |
| DEX-BB5560 | 414599.531 | 9675128.139 | 418.484 | 14 | -90 | 6 | 6 |
| DEX-BB5561 | 414623.529 | 9675131.941 | 418.303 | 14 | -90 | 8 | 2.35 |
| DEX-BB5562 | 414644.719 | 9675129.871 | 415.081 | 8 | -90 | 3 | 3 |
| DEX-BB5563 | 414523.562 | 9675103.292 | 417.796 | 12 | -90 | 4 | 6 |
| DEX-BB5564 | 414549.672 | 9675109.174 | 420.502 | 11 | -90 | 7 | 2 |
| DEX-BB5565 | 416026.606 | 9675202.867 | 410.408 | 22 | -90 | 8 | 12 |
| DEX-BB5566 | 416076.856 | 9675203.309 | 408.773 | 29 | -90 | 9 | 18.41 |
| DEX-BB5567 | 416121.155 | 9675200.872 | 405.452 | 18 | -90 | 7 | 9 |
| DEX-BB5568 | 416178.839 | 9675205.133 | 404.302 | 8 | -90 | 3 | 3 |
| DEX-BB5569 | 416199.308 | 9675202.853 | 402.128 | 8 | -90 | 4 | 1 |
| DEX-BB5570 | 415997.837 | 9675230.574 | 406.536 | 18 | -90 | 10.21 | 6 |
| DEX-BB5571 | 416028.447 | 9675225.346 | 406.744 | 25 | -90 | 8 | 15 |
| DEX-BB5572 | 416049.557 | 9675228.500 | 406.580 | 27 | -90 | 16 | 9 |
| DEX-BB5573 | 416066.500 | 9675231.889 | 405.415 | 23 | -90 | 16.2 | 5 |
| DEX-BB5574 | 416102.758 | 9675226.298 | 403.475 | 16 | -90 | 9.19 | 7 |
| DEX-BB5575 | 416118.707 | 9675232.890 | 401.055 | 13 | -90 | 8 | 3 |
| DEX-BB5576 | 416146.561 | 9675230.552 | 400.111 | 20 | -90 | 9 | 9 |
| DEX-BB5577 | 416426.173 | 9675154.716 | 398.746 | 13 | -90 | 7 | 3.6 |
| DEX-BB5578 | 416074.606 | 9675180.992 | 413.446 | 27 | -90 | 16.24 | 8.5 |
| DEX-BB5579 | 416097.136 | 9675178.401 | 411.926 | 18 | -90 | 7 | 9 |
| DEX-BB5580 | 416125.775 | 9675178.035 | 409.559 | 12 | -90 | 8 | 2 |
| DEX-BB5581 | 416175.719 | 9675178.382 | 406.810 | 14 | -90 | 3 | 8.45 |
| DEX-BB5582 | 416225.330 | 9675176.842 | 398.286 | 22 | -90 | 11 | 9 |
| DEX-BB5583 | 416174.209 | 9675152.023 | 407.979 | 20 | -90 | 9 | 9 |
| DEX-BB5584 | 416224.062 | 9675154.616 | 399.370 | 18 | -90 | 11.17 | 5 |
| DEX-BB5585 | 416280.862 | 9675154.278 | 393.326 | 12 | -90 | 9.31 | 1 |
| DEX-BB5586 | 416303.320 | 9675154.679 | 391.965 | 16 | -90 | 12.26 | 2 |
| DEX-BB5587 | 416329.929 | 9675156.969 | 393.443 | 13 | -90 | 7 | 4 |
| DEX-BB5588 | 416351.351 | 9675152.784 | 395.379 | 11 | -90 | 4 | 5 |
| DEX-BB5589 | 416179.359 | 9675125.891 | 407.523 | 19 | -90 | 14 | 3 |
| DEX-BB5590 | 416227.033 | 9675131.127 | 400.459 | 12 | -90 | 8 | 2 |
| DEX-BB5591 | 416278.351 | 9675127.237 | 396.202 | 13 | -90 | 9 | 2 |
| DEX-BB5592 | 416297.529 | 9675127.556 | 394.128 | 15 | -90 | 9.24 | 4 |
| DEX-BB5593 | 416323.483 | 9675128.524 | 395.519 | 14 | -90 | 8 | 4 |
| DEX-BB5594 | 416426.187 | 9675131.640 | 402.984 | 16 | -90 | 7 | 7 |
| DEX-BB5595 | 416229.557 | 9675101.079 | 404.495 | 11 | -90 | 6 | 3 |
| DEX-BB5596 | 416275.167 | 9675103.710 | 399.296 | 10 | -90 | 5 | 3 |
| DEX-BB5597 | 416301.501 | 9675102.802 | 396.000 | 12 | -90 | 8 | 2 |
| DEX-BB5598 | 416325.187 | 9675104.526 | 398.357 | 7 | -90 | 2 | 2 |
| DEX-BB5599 | 416354.040 | 9675103.495 | 401.918 | 16 | -90 | 12.2 | 2 |
| DEX-BB5600 | 416370.981 | 9675100.790 | 405.493 | 20 | -90 | 13.39 | 5 |
| DEX-BB5601 | 416426.097 | 9675108.709 | 408.165 | 19 | -90 | 6 | 11.15 |
| DEX-BB5602 | 416275.082 | 9675081.940 | 402.991 | 16 | -90 | 10 | 4 |
| DEX-BB5603 | 416324.019 | 9675077.336 | 399.307 | 10 | -90 | 6 | 1.23 |
| DEX-BB5604 | 416345.143 | 9675080.290 | 403.177 | 9 | -90 | 7 | 1 |
| DEX-BB5605 | 416374.537 | 9675078.755 | 410.350 | 14 | -90 | 9 | 3 |
| DEX-BB5606 | 416404.385 | 9675078.504 | 415.525 | 17 | -90 | 10.18 | 5.48 |
| DEX-BB5607 | 416427.738 | 9675078.476 | 414.325 | 28 | -90 | 13 | 13 |
| DEX-BB5608 | 416326.356 | 9675055.144 | 401.000 | 19 | -90 | 12.45 | 5 |
| DEX-BB5609 | 416376.218 | 9675057.141 | 414.847 | 21 | -90 | 15.37 | 4 |
| DEX-BB5610 | 416426.819 | 9675054.983 | 418.329 | 28 | -90 | 20.17 | 6 |
| DEX-BB5611 | 416327.964 | 9675031.166 | 402.600 | 17 | -90 | 14.18 | 1 |
| DEX-BB5612 | 416378.949 | 9675031.904 | 416.100 | 18 | -90 | 13.22 | 3 |
| DEX-BB5613 | 416428.217 | 9675030.803 | 420.000 | 16 | -90 | 13 | 1 |
| DEX-BB5614 | 416324.884 | 9675004.703 | 405.795 | 26 | -90 | 17.18 | 7 |
| DEX-BB5615 | 416373.610 | 9675006.124 | 413.082 | 23 | -90 | 14.28 | 7 |
| DEX-BB5616 | 416422.889 | 9675002.326 | 420.000 | 29 | -90 | 22.44 | 5 |
| DEX-BB5618 | 415721.034 | 9675429.224 | 403.000 | 22 | -90 | 12 | 9 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10805 | 418258.270 | 9674619.712 | 283.730 | 11 | -90 | 5 | 2.6 |
| DEX-CZ10806 | 418190.452 | 9674594.248 | 277.000 | 10 | -90 | 4 | 4 |
| DEX-CZ10807 | 418216.157 | 9674603.010 | 277.055 | 13 | -90 | 5 | 4 |
| DEX-CZ5767 | 417587.728 | 9674336.982 | 366.760 | 38 | -90 | 29.5 | 7.5 |
| DEX-CZ5768 | 417686.487 | 9674337.335 | 343.998 | 26 | -90 | 20.58 | 1 |
| DEX-CZ5769 | 417771.838 | 9674328.381 | 348.840 | 17 | -90 | 14.23 | 1 |
| DEX-CZ5773 | 417597.295 | 9674427.174 | 373.267 | 35 | -90 | 25.11 | 8.35 |
| DEX-CZ5774 | 417695.335 | 9674422.446 | 358.113 | 35 | -90 | 26 | 7 |
| DEX-CZ5775 | 417791.912 | 9674427.569 | 348.308 | 35 | -90 | 16.29 | 13 |
| DEX-CZ5776 | 417887.651 | 9674429.106 | 346.316 | 18 | -90 | 6 | 4 |
| DEX-CZ5782 | 417596.434 | 9674534.863 | 356.856 | 28 | -90 | 20.42 | 4 |
| DEX-CZ5783 | 417684.031 | 9674530.673 | 361.456 | 21 | -90 | 11 | 7 |
| DEX-CZ5784 | 417794.606 | 9674532.180 | 351.148 | 13 | -90 | 8.5 | 2.5 |
| DEX-CZ5785 | 417902.506 | 9674526.748 | 320.335 | 21 | -90 | 10 | 9 |
| DEX-CZ5790 | 417606.489 | 9674619.122 | 359.260 | 18 | -90 | 13.22 | 3 |
| DEX-CZ5791 | 417692.194 | 9674642.979 | 352.687 | 23 | -90 | 13.17 | 8 |
| DEX-CZ5792 | 417787.526 | 9674626.751 | 330.000 | 11 | -90 | 5 | 1 |
| DEX-CZ5793 | 417885.734 | 9674631.470 | 319.226 | 23 | -90 | 12.3 | 8 |
| DEX-CZ5794 | 417985.284 | 9674630.564 | 293.485 | 16 | -90 | 8 | 7 |
| DEX-CZ5799 | 417589.217 | 9674734.913 | 373.040 | 28 | -90 | 8 | 12 |
| DEX-CZ5800 | 417689.298 | 9674732.146 | 362.578 | 19 | -90 | 11 | 6 |
| DEX-CZ5801 | 417788.947 | 9674735.210 | 337.023 | 20 | -90 | 9 | 4 |
| DEX-CZ5802 | 417879.742 | 9674714.472 | 318.801 | 37 | -90 | 15.27 | 18 |
| DEX-CZ5803 | 417983.696 | 9674729.987 | 299.937 | 16 | -90 | 9 | 5 |
| DEX-CZ5806 | 417489.276 | 9674831.375 | 362.293 | 26 | -90 | 14.66 | 2 |
| DEX-CZ5807 | 417595.261 | 9674832.778 | 360.422 | 24 | -90 | 9 | 1 |
| DEX-CZ5808 | 417688.544 | 9674835.208 | 365.189 | 26 | -90 | 10 | 9 |
| DEX-CZ5809 | 417786.023 | 9674828.989 | 344.323 | 24 | -90 | 4 | 13 |
| DEX-CZ5812 | 417492.984 | 9674927.135 | 368.664 | 20 | -90 | 6 | 12 |
| DEX-CZ5813 | 417585.872 | 9674936.749 | 367.339 | 27 | -90 | 8 | 15 |
| DEX-CZ141 | 415803.112 | 9674089.917 | 369.740 | 30 | -90 | 13.61 | 14.98 |
| DEX-CZ383 | 415943.927 | 9674300.216 | 415.766 | 25 | -90 | 17.92 | 6.39 |
| DEX-CZ482 | 416402.475 | 9673760.665 | 400.057 | 18 | -90 | 16.51 | 2.28 |
| DEX-CZ1549 | 416751.666 | 9673923.386 | 366.017 | 55 | -90 | 41.2 | 15 |
| BB_STH-1105 | 414389.738 | 9673705.031 | 322.178 | 17 | -90 | 6.56 | 9 |
| DEX-CZ077 | 415193.204 | 9674203.184 | 403.321 | 14 | -90 | 5 | 6.43 |
| BB_STH-1069 | 414617.073 | 9673801.369 | 412.445 | 21 | -90 | 5.4 | 12 |
| DEX-CZ140 | 415799.806 | 9674003.074 | 355.119 | 8 | -90 | 1 | 5 |
| DEX-CZ122 | 415581.323 | 9673911.821 | 367.051 | 12 | -90 | 10.04 | 3.09 |
| DEX-CZ123 | 415581.625 | 9674007.879 | 362.729 | 8 | -90 | 5 | 0 |
| DEX-CZ143 | 415797.476 | 9674302.395 | 396.015 | 27 | -90 | 19.29 | 7.89 |
| DEX-CZ208 | 416489.367 | 9673793.900 | 382.491 | 15 | -90 | 4 | 7 |
| DEX-CZ120 | 415497.591 | 9673888.451 | 356.282 | 26 | -90 | 22.08 | 5 |
| DEX-CZ380 | 416247.745 | 9674286.920 | 393.175 | 24 | -90 | 18.95 | 7 |
| DEX-CZ097 | 415302.184 | 9673899.403 | 342.708 | 28 | -90 | 26.69 | 3.93 |
| DEX-CZ160 | 415809.912 | 9674483.514 | 398.851 | 33 | -90 | 18.43 | 15.14 |
| DEX-CZ484 | 416512.698 | 9673751.832 | 377.316 | 13 | -90 | 5.55 | 5.4 |
| DEX-CZ173 | 415900.629 | 9673685.730 | 355.244 | 10 | -90 | 5 | 3.45 |
| DEX-CZ126 | 415601.753 | 9674302.567 | 405.080 | 15 | -90 | 10 | 4 |
| DEX-CZ723 | 416755.940 | 9673846.279 | 357.246 | 40 | -90 | 24.17 | 19.5 |
| DEX-CZ451 | 416532.560 | 9673895.587 | 355.383 | 13 | -90 | 5.43 | 2 |
| DEX-CZ209 | 416489.361 | 9673694.359 | 378.516 | 29 | -90 | 8.73 | 2 |
| DEX-CZ414 | 416345.519 | 9674105.131 | 391.171 | 40 | -90 | 23.7 | 9.46 |
| DEX-CZ365 | 416263.731 | 9674398.229 | 379.902 | 15 | -90 | 6.63 | 7 |
| DEX-CZ398 | 416151.569 | 9674203.935 | 420.984 | 30 | -90 | 24.3 | 8.54 |
| DEX-CZ729 | 416750.013 | 9673899.532 | 360.356 | 27 | -90 | 28.23 | 1 |
| DEX-CZ1180 | 416446.607 | 9674348.294 | 382.458 | 20 | -90 | 9.93 | 2 |
| DEX-CZ422 | 416102.432 | 9674058.531 | 432.003 | 31 | -90 | 32.37 | 6.3 |
| DEX-CZ152 | 415804.387 | 9673295.663 | 333.389 | 11 | -90 | 4.18 | 4 |
| BB_STH-1076 | 415293.500 | 9673691.715 | 332.616 | 26 | -90 | 5.82 | 19.6 |
| DEX-CZ547 | 416005.220 | 9673347.064 | 321.459 | 24 | -90 | 3 | 11 |
| DEX-CZ054 | 414991.820 | 9674190.447 | 375.923 | 17 | -90 | 5.36 | 9.85 |
| DEX-CZ176 | 415858.241 | 9673400.535 | 343.592 | 15 | -90 | 6.42 | 7.33 |
| DEX-CZ759 | 416651.138 | 9674251.829 | 372.602 | 23 | -90 | 1 | 14.77 |
| NCZ21-10037 | 415896.475 | 9674803.640 | 399.034 | 30 | -90 | 28.07 | 2.49 |
| NCZ21-10038 | 415995.086 | 9674798.001 | 402.289 | 25 | -90 | 20.19 | 6 |
| NCZ21-10073 | 416504.851 | 9674798.561 | 451.851 | 28 | -90 | 26.26 | 5 |
| NCZ21-10077 | 416500.949 | 9674393.749 | 385.444 | 23 | -90 | 18.21 | 4 |
| NCZ21-10078 | 416517.695 | 9674302.293 | 373.237 | 20 | -90 | 7.84 | 10.91 |
| NCZ21-10079 | 416592.397 | 9674295.304 | 365.906 | 31 | -90 | 10.24 | 16.16 |
| NCZ21-10080 | 416596.821 | 9674405.320 | 405.495 | 22 | -90 | 11.39 | 8 |
| NCZ21-10081 | 416610.275 | 9674509.748 | 438.671 | 16 | -90 | 13.71 | 1 |
| NCZ21-10082 | 416596.286 | 9674603.303 | 453.836 | 13 | -90 | 11.31 | 1.4 |
| NCZ21-10083 | 416608.381 | 9674691.768 | 454.885 | 22 | -90 | 14.42 | 4.44 |
| NCZ21-10084 | 416599.685 | 9674812.256 | 441.642 | 32 | -90 | 16.86 | 11.49 |
| NCZ21-10085 | 416601.684 | 9674892.120 | 426.860 | 20 | -90 | 11.04 | 9.05 |
| NCZ21-10098 | 416693.827 | 9674899.331 | 416.509 | 26 | -90 | 14.35 | 10.16 |
| NCZ21-10099 | 416814.983 | 9674895.155 | 415.423 | 21 | -90 | 14 | 3 |
| NCZ21-10100 | 416910.966 | 9674895.749 | 419.100 | 30 | -90 | 11 | 16.29 |
| NCZ21-10101 | 416990.766 | 9674902.204 | 424.112 | 31 | -90 | 11.39 | 13.2 |
| NCZ21-10102 | 417091.148 | 9674906.365 | 412.946 | 22 | -90 | 8 | 12 |
| NCZ21-10103 | 417213.550 | 9674923.014 | 395.181 | 37 | -90 | 11 | 15 |
| NCZ21-10104 | 417183.515 | 9675012.308 | 396.003 | 24 | -90 | 3.3 | 13.95 |
| NCZ21-10105 | 417093.464 | 9675002.323 | 400.252 | 22 | -90 | 10 | 9 |
| NCZ21-10106 | 417202.645 | 9674805.473 | 388.183 | 35 | -90 | 13 | 14.29 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5619 | 415752.232 | 9675420.560 | 402.553 | 30 | -90 | 16 | 14 |
| DEX-BB5620 | 415775.642 | 9675429.689 | 402.611 | 25 | -90 | 14.5 | 9 |
| DEX-BB5621 | 415801.553 | 9675429.747 | 403.863 | 29 | -90 | 10 | 17 |
| DEX-BB5622 | 415823.494 | 9675425.523 | 404.000 | 23 | -90 | 11 | 10.24 |
| DEX-BB5623 | 415851.158 | 9675429.504 | 402.844 | 22 | -90 | 10 | 9 |
| DEX-BB5624 | 415877.038 | 9675426.674 | 401.358 | 24 | -90 | 8 | 13 |
| DEX-BB5625 | 415898.451 | 9675429.022 | 399.715 | 20 | -90 | 11 | 6 |
| DEX-BB5626 | 415631.408 | 9675404.055 | 410.769 | 21 | -90 | 14 | 5 |
| DEX-BB5627 | 415673.782 | 9675395.774 | 410.035 | 15 | -90 | 12.23 | 1 |
| DEX-BB5628 | 415722.349 | 9675406.851 | 405.906 | 24 | -90 | 11 | 10.61 |
| DEX-BB5629 | 415776.579 | 9675405.655 | 403.012 | 24 | -90 | 15 | 9 |
| DEX-BB5630 | 415797.585 | 9675405.724 | 403.792 | 20 | -90 | 14.23 | 6 |
| DEX-BB5631 | 415824.085 | 9675406.837 | 403.804 | 25 | -90 | 16.21 | 6 |
| DEX-BB5632 | 415876.891 | 9675402.508 | 400.883 | 21 | -90 | 14.16 | 4 |
| DEX-BB5633 | 415902.677 | 9675406.075 | 398.044 | 14 | -90 | 9 | 2 |
| DEX-BB5634 | 415675.241 | 9675382.340 | 412.547 | 19 | -90 | 11 | 6 |
| DEX-BB5635 | 415697.224 | 9675378.732 | 411.891 | 20 | -90 | 13.24 | 5 |
| DEX-BB5636 | 415721.497 | 9675383.296 | 409.263 | 20 | -90 | 8 | 10 |
| DEX-BB5637 | 415775.374 | 9675380.379 | 404.735 | 21 | -90 | 15 | 4 |
| DEX-BB5638 | 415826.817 | 9675377.680 | 404.001 | 27 | -90 | 14 | 11.49 |
| DEX-BB5639 | 415875.365 | 9675377.872 | 400.764 | 20 | -90 | 13.41 | 5 |
| DEX-BB5640 | 415899.770 | 9675377.036 | 399.043 | 34 | -90 | 16 | 18 |
| DEX-BB5641 | 415723.590 | 9675353.054 | 413.911 | 16 | -90 | 8 | 6 |
| DEX-BB5642 | 415773.996 | 9675354.894 | 406.878 | 17 | -90 | 11.25 | 4 |
| DEX-BB5643 | 415827.238 | 9675356.696 | 405.412 | 20 | -90 | 11 | 7.21 |
| DEX-BB5644 | 415877.633 | 9675352.542 | 403.078 | 27 | -90 | 21.39 | 3 |
| DEX-BB5645 | 415902.789 | 9675353.816 | 401.625 | 20 | -90 | 15.26 | 3 |
| DEX-BB5646 | 415749.205 | 9675328.800 | 413.531 | 20 | -90 | 10 | 8 |
| DEX-BB5647 | 415773.848 | 9675329.043 | 410.137 | 15 | -90 | 12 | 1 |
| DEX-BB5648 | 415825.910 | 9675328.935 | 407.438 | 19 | -90 | 15.24 | 2 |
| DEX-BB5649 | 415878.858 | 9675328.114 | 406.211 | 22 | -90 | 11.16 | 9 |
| DEX-BB5650 | 415899.224 | 9675323.441 | 406.630 | 28 | -90 | 23.66 | 3 |
| DEX-BB5651 | 415802.394 | 9675303.576 | 409.643 | 20 | -90 | 14.25 | 4 |
| DEX-BB5652 | 415823.635 | 9675304.906 | 409.327 | 36 | -90 | 16 | 18 |
| DEX-BB5653 | 415875.213 | 9675307.650 | 409.240 | 18 | -90 | 12.4 | 4 |
| DEX-BB5654 | 415897.598 | 9675300.271 | 409.517 | 19 | -90 | 12.18 | 5 |
| DEX-BB5655 | 415877.031 | 9675282.127 | 412.766 | 24 | -90 | 8 | 14 |
| DEX-BB5656 | 415899.906 | 9675278.632 | 412.576 | 18 | -90 | 9 | 7 |
| DEX-BB5657 | 415926.302 | 9675524.922 | 395.882 | 10 | -90 | 5 | 0.43 |
| DEX-BB5658 | 415826.130 | 9675482.673 | 400.324 | 15 | -90 | 9.21 | 4 |
| DEX-BB5659 | 415876.203 | 9675477.250 | 399.371 | 17 | -90 | 8 | 7 |
| DEX-BB5660 | 415926.599 | 9675476.882 | 398.417 | 20 | -90 | 7 | 11 |
| DEX-BB5661 | 415974.816 | 9675477.653 | 394.107 | 17 | -90 | 6 | 9 |
| DEX-BB5662 | 415922.826 | 9675433.077 | 398.519 | 15 | -90 | 6 | 6 |
| DEX-BB5663 | 415978.091 | 9675429.659 | 394.000 | 18 | -90 | 9 | 7 |
| DEX-BB5664 | 416026.238 | 9675427.420 | 390.117 | 18 | -90 | 13.25 | 3 |
| DEX-BB5665 | 415927.327 | 9675379.875 | 396.537 | 16 | -90 | 10 | 4 |
| DEX-BB5666 | 415977.646 | 9675380.205 | 393.467 | 10 | -90 | 5 | 3 |
| DEX-BB5667 | 416026.391 | 9675381.545 | 391.671 | 12 | -90 | 8 | 2 |
| DEX-BB5668 | 416076.206 | 9675377.415 | 389.927 | 19 | -90 | 9 | 8 |
| DEX-BB5670 | 414441.888 | 9674772.989 | 445.942 | 23 | -90 | 16 | 4.82 |
| DEX-BB5671 | 414466.787 | 9674764.973 | 445.171 | 15 | -90 | 12 | 1 |
| DEX-BB5672 | 414227.822 | 9674741.753 | 400.670 | 26 | -90 | 19.19 | 5 |
| DEX-BB5673 | 414278.124 | 9674750.544 | 413.328 | 24 | -90 | 10 | 12 |
| DEX-BB5674 | 414296.078 | 9674742.495 | 417.470 | 27 | -90 | 12 | 13 |
| DEX-BB5675 | 414325.440 | 9674742.852 | 425.629 | 20 | -90 | 5 | 14 |
| DEX-BB5676 | 414349.330 | 9674746.994 | 434.482 | 26 | -90 | 14 | 10 |
| DEX-BB5677 | 414379.624 | 9674741.869 | 442.723 | 30 | -90 | 24.3 | 4 |
| DEX-BB5678 | 414421.909 | 9674749.208 | 449.681 | 22 | -90 | 15 | 5 |
| DEX-BB5679 | 414446.657 | 9674746.067 | 450.835 | 28 | -90 | 13 | 11.85 |
| DEX-BB5680 | 414498.669 | 9674739.145 | 452.769 | 25 | -90 | 20 | 3 |
| DEX-BB5681 | 414225.335 | 9674725.171 | 399.786 | 35 | -90 | 20.19 | 13.22 |
| DEX-BB5682 | 414276.969 | 9674724.583 | 410.535 | 27 | -90 | 16 | 10 |
| DEX-BB5683 | 414302.408 | 9674722.837 | 417.884 | 27 | -90 | 16 | 9 |
| DEX-BB5684 | 414325.230 | 9674722.422 | 424.505 | 29 | -90 | 21 | 6 |
| DEX-BB5685 | 414361.490 | 9674715.304 | 437.325 | 37 | -90 | 31.4 | 4 |
| DEX-BB5686 | 414378.399 | 9674713.385 | 442.734 | 25 | -90 | 15 | 8 |
| DEX-BB5687 | 414400.083 | 9674722.696 | 449.037 | 19 | -90 | 13 | 4 |
| DEX-BB5688 | 414445.365 | 9674716.083 | 457.306 | 28 | -90 | 8 | 19 |
| DEX-BB5689 | 414233.953 | 9674693.648 | 400.705 | 41 | -90 | 32.44 | 6.82 |
| DEX-BB5690 | 414252.316 | 9674696.784 | 403.173 | 20 | -90 | 15 | 3 |
| DEX-BB5691 | 414280.957 | 9674694.265 | 408.830 | 17 | -90 | 13 | 2 |
| DEX-BB5692 | 414327.549 | 9674698.741 | 424.251 | 26 | -90 | 20 | 4.23 |
| DEX-BB5693 | 414349.267 | 9674698.978 | 432.480 | 21 | -90 | 16.1 | 3 |
| DEX-BB5694 | 414372.484 | 9674702.448 | 438.827 | 36 | -90 | 21 | 13 |
| DEX-BB5695 | 414421.026 | 9674698.224 | 455.187 | 31 | -90 | 26 | 3 |
| DEX-BB5696 | 414444.255 | 9674695.171 | 459.684 | 38 | -90 | 23 | 13 |
| DEX-BB5697 | 414225.479 | 9674673.027 | 404.103 | 23 | -90 | 17.24 | 3.4 |
| DEX-BB5698 | 414251.383 | 9674670.065 | 402.000 | 31 | -90 | 25 | 4 |
| DEX-BB5699 | 414278.669 | 9674674.568 | 407.219 | 30 | -90 | 22 | 6 |
| DEX-BB5700 | 414303.033 | 9674672.727 | 413.611 | 27 | -90 | 19 | 4.85 |
| DEX-BB5701 | 414327.894 | 9674676.052 | 422.536 | 34 | -90 | 18.6 | 12.2 |
| DEX-BB5702 | 414349.082 | 9674675.115 | 428.004 | 22 | -90 | 11 | 8.85 |
| DEX-BB5703 | 414373.676 | 9674677.002 | 435.844 | 13 | -90 | 6 | 5 |
| DEX-BB5704 | 414401.914 | 9674675.743 | 446.388 | 34 | -90 | 25 | 7 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| NCZ21-10107 | 416996.383 | 9674806.873 | 424.943 | 43 | -90 | 25 | 16 |
| NCZ21-10108 | 416907.023 | 9674794.189 | 421.399 | 41 | -90 | 17 | 21 |
| NCZ21-10109 | 416785.994 | 9674801.601 | 418.469 | 34 | -90 | 19 | 13 |
| NCZ21-10110 | 416696.242 | 9674801.332 | 433.048 | 35 | -90 | 19 | 13 |
| NCZ21-10111 | 416704.781 | 9674692.080 | 441.008 | 25 | -90 | 5 | 17 |
| NCZ21-10112 | 416806.487 | 9674697.272 | 416.108 | 33 | -90 | 16 | 16 |
| NCZ21-10114 | 417198.621 | 9674710.568 | 378.692 | 20 | -90 | 11 | 7 |
| NCZ21-10115 | 417302.277 | 9674697.806 | 373.000 | 27 | -90 | 4 | 19 |
| NCZ21-10116 | 417305.751 | 9674590.964 | 367.500 | 23 | -90 | 12.3 | 8 |
| NCZ21-10117 | 417202.963 | 9674591.589 | 381.011 | 15 | -90 | 6 | 8.8 |
| NCZ21-10118 | 416909.066 | 9674591.533 | 443.712 | 15 | -90 | 2.63 | 10.37 |
| NCZ21-10119 | 416799.131 | 9674601.086 | 416.500 | 29 | -90 | 8.13 | 18 |
| NCZ21-10120 | 416702.276 | 9674601.657 | 443.019 | 19 | -90 | 7 | 10 |
| NCZ21-10121 | 416702.395 | 9674500.911 | 424.125 | 32 | -90 | 15 | 15 |
| NCZ21-10122 | 416794.559 | 9674504.012 | 413.801 | 37 | -90 | 14 | 17 |
| NCZ21-10123 | 416898.032 | 9674499.812 | 431.984 | 21 | -90 | 10 | 8.63 |
| NCZ21-10124 | 417209.278 | 9674501.228 | 388.612 | 18 | -90 | 4 | 11 |
| NCZ21-10126 | 417005.582 | 9674406.249 | 417.154 | 23 | -90 | 12 | 9 |
| NCZ21-10127 | 416902.897 | 9674410.356 | 417.467 | 27 | -90 | 16 | 9 |
| NCZ21-10128 | 416790.417 | 9674398.603 | 398.909 | 23 | -90 | 5 | 16 |
| NCZ21-10129 | 416689.965 | 9674401.756 | 406.335 | 13 | -90 | 2 | 9 |
| NCZ21-10130 | 416803.398 | 9674299.610 | 422.691 | 32 | -90 | 12 | 16 |
| NCZ21-10131 | 416892.833 | 9674300.103 | 421.743 | 16 | -90 | 9 | 4 |
| NCZ21-10132 | 417004.488 | 9674300.188 | 408.924 | 39 | -90 | 34 | 3 |
| NCZ21-10133 | 417099.210 | 9674300.700 | 399.981 | 17 | -90 | 8 | 6.35 |
| NCZ21-10135 | 417391.206 | 9674194.571 | 356.162 | 19 | -90 | 6 | 11 |
| NCZ21-10136 | 417309.128 | 9674198.737 | 359.502 | 8 | -90 | 4 | 2 |
| NCZ21-10137 | 417180.751 | 9674204.357 | 385.118 | 22 | -90 | 15 | 5 |
| NCZ21-10138 | 417095.841 | 9674202.811 | 386.090 | 21 | -90 | 13 | 6 |
| NCZ21-10139 | 417001.119 | 9674201.670 | 401.520 | 29 | -90 | 21 | 6 |
| NCZ21-10140 | 416897.361 | 9674192.908 | 406.523 | 33 | -90 | 16 | 14 |
| NCZ21-10141 | 416818.013 | 9674210.549 | 405.678 | 15 | -90 | 1 | 11 |
| NCZ21-10142 | 416608.329 | 9674099.209 | 369.745 | 14 | -90 | 5 | 7 |
| NCZ21-10143 | 416699.779 | 9674096.577 | 375.912 | 21 | -90 | 10 | 9 |
| NCZ21-10144 | 416799.830 | 9674092.415 | 387.434 | 23 | -90 | 18 | 3 |
| NCZ21-10145 | 416900.151 | 9674094.386 | 397.500 | 13 | -90 | 9 | 2 |
| NCZ21-10146 | 416978.177 | 9674094.827 | 394.500 | 16 | -90 | 6 | 7.91 |
| NCZ21-10147 | 417107.147 | 9674096.806 | 392.500 | 12 | -90 | 9 | 1 |
| NCZ21-10148 | 417202.920 | 9674103.080 | 376.966 | 33 | -90 | 15 | 16 |
| NCZ21-10149 | 416903.412 | 9673996.579 | 391.518 | 31 | -90 | 22 | 6 |
| NCZ21-10150 | 416706.152 | 9674008.619 | 373.425 | 10 | -90 | 7 | 1 |
| NCZ21-10151 | 416614.423 | 9674014.262 | 369.787 | 22 | -90 | 9.93 | 9.35 |
| NCZ21-10152 | 416617.525 | 9673905.881 | 351.643 | 7 | -90 | 3 | 1.48 |
| NCZ21-10153 | 416701.395 | 9673902.950 | 349.516 | 17 | -90 | 12 | 4 |
| NCZ21-10154 | 416810.479 | 9673902.107 | 367.468 | 28 | -90 | 23 | 3 |
| NCZ21-10155 | 416905.850 | 9673895.323 | 375.332 | 31 | -90 | 16 | 8 |
| NCZ21-10156 | 417001.090 | 9673893.149 | 382.433 | 16 | -90 | 10 | 3.75 |
| NCZ21-10157 | 417108.096 | 9673896.990 | 390.178 | 19 | -90 | 4 | 12.7 |
| NCZ21-10158 | 417307.937 | 9673897.867 | 363.016 | 19 | -90 | 9 | 9 |
| NCZ21-10159 | 417400.532 | 9673897.867 | 350.983 | 31 | -90 | 17 | 14 |
| NCZ21-10160 | 417300.459 | 9673800.647 | 347.835 | 39 | -90 | 33 | 3 |
| NCZ21-10161 | 417205.611 | 9673799.312 | 357.925 | 44 | -90 | 30.12 | 11 |
| NCZ21-10162 | 417087.382 | 9673796.959 | 367.411 | 14 | -90 | 9 | 3 |
| NCZ21-10163 | 417000.803 | 9673795.772 | 365.278 | 16 | -90 | 10 | 3 |
| NCZ21-10164 | 416901.363 | 9673804.666 | 363.508 | 42 | -90 | 26 | 15 |
| NCZ21-10165 | 416794.691 | 9673798.827 | 366.145 | 34 | -90 | 19 | 10 |
| NCZ21-10166 | 416699.724 | 9673801.087 | 349.085 | 18 | -90 | 7 | 10 |
| NCZ21-10167 | 416704.344 | 9673708.283 | 352.930 | 10 | -90 | 4 | 3 |
| NCZ21-10168 | 416794.676 | 9673707.435 | 341.701 | 25 | -90 | 10 | 14 |
| NCZ21-10169 | 416898.901 | 9673709.430 | 344.175 | 24 | -90 | 6 | 13 |
| NCZ21-10170 | 417003.163 | 9673703.299 | 357.243 | 33 | -90 | 26 | 6 |
| NCZ21-10171 | 417098.732 | 9673703.363 | 352.859 | 33 | -90 | 27 | 6 |
| NCZ21-10172 | 417196.556 | 9673713.273 | 351.200 | 44 | -90 | 32 | 11 |
| DEX-CZ093 | 415307.688 | 9674311.557 | 440.975 | 26 | -90 | 21.81 | 3 |
| NCZ21-10113 | 416903.267 | 9674704.003 | 423.530 | 22 | -90 | 11.33 | 13.54 |
| DEX-CZ127 | 415598.398 | 9674414.194 | 415.548 | 24 | -90 | 15.71 | 6.3 |
| DEX-CZ762 | 416655.039 | 9674295.651 | 376.298 | 19 | -90 | 4 | 12.62 |
| DEX-CZ072 | 415102.969 | 9674205.412 | 409.459 | 24 | -90 | 25.44 | 1.88 |
| DEX-CZ399 | 416064.552 | 9674205.371 | 422.876 | 31 | -90 | 13.25 | 16.54 |
| DEX-CZ119 | 415489.888 | 9673995.817 | 385.221 | 40 | -90 | 22.08 | 23.48 |
| DEX-CZ146 | 415591.872 | 9673717.910 | 337.108 | 15 | -90 | 8.6 | 6 |
| DEX-CZ185 | 416099.538 | 9674404.136 | 397.191 | 24 | -90 | 17.77 | 6 |
| DEX-CZ487 | 416453.850 | 9673695.142 | 389.756 | 23 | -90 | 16.81 | 7.2 |
| DEX-CZ193 | 416200.506 | 9673998.598 | 426.401 | 38 | -90 | 32.4 | 8.54 |
| DEX-CZ356 | 415952.464 | 9674450.209 | 423.643 | 33 | -90 | 27.06 | 6.77 |
| BB_STH-1075 | 415201.267 | 9673711.496 | 345.360 | 25 | -90 | 10.52 | 14 |
| DEX-CZ132 | 415682.663 | 9674701.264 | 393.418 | 30 | -90 | 6.7 | 22.58 |
| DEX-CZ428 | 416397.149 | 9674047.883 | 390.841 | 14 | -90 | 9.61 | 3.09 |
| DEX-CZ405 | 416145.518 | 9674159.152 | 426.420 | 33 | -90 | 22.42 | 12 |
| BB_STH-1087 | 414898.110 | 9673585.827 | 345.021 | 8 | -90 | 4.12 | 1 |
| DEX-CZ469 | 416542.602 | 9673861.991 | 343.300 | 9 | -90 | 4.13 | 4 |
| DEX-CZ485 | 416549.157 | 9673765.581 | 360.262 | 10 | -90 | 6.21 | 2.15 |
| DEX-CZ727 | 416935.251 | 9673850.792 | 373.647 | 31 | -90 | 14.92 | 5.23 |
| DEX-CZ756 | 416742.018 | 9674182.186 | 384.515 | 24 | -90 | 17.31 | 8.91 |
| DEX-CZ207 | 416498.930 | 9673894.746 | 366.312 | 15 | -90 | 4.3 | 9.28 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5705 | 414431.085 | 9674676.479 | 455.597 | 20 | -90 | 17 | 1 |
| DEX-BB5706 | 414452.492 | 9674674.235 | 459.741 | 30 | -90 | 16 | 12 |
| DEX-BB5707 | 414229.765 | 9674650.190 | 408.519 | 26 | -90 | 22 | 2 |
| DEX-BB5708 | 414246.552 | 9674638.536 | 408.589 | 29 | -90 | 23.15 | 3.5 |
| DEX-BB5709 | 414280.594 | 9674650.030 | 405.582 | 27 | -90 | 18.34 | 7 |
| DEX-BB5710 | 414299.013 | 9674651.151 | 410.357 | 34 | -90 | 17.3 | 15.15 |
| DEX-BB5711 | 414329.592 | 9674651.961 | 417.625 | 26 | -90 | 16.35 | 8 |
| DEX-BB5712 | 414350.974 | 9674648.522 | 421.824 | 17 | -90 | 11.45 | 3.4 |
| DEX-BB5713 | 414372.214 | 9674648.522 | 427.339 | 21 | -90 | 6 | 12.85 |
| DEX-BB5714 | 414397.586 | 9674647.713 | 434.745 | 17 | -90 | 7 | 7.7 |
| DEX-BB5715 | 414429.701 | 9674651.844 | 445.435 | 33 | -90 | 10 | 21 |
| DEX-BB5716 | 414449.832 | 9674643.053 | 448.570 | 7 | -90 | 2 | 3 |
| DEX-BB5717 | 414227.349 | 9674618.698 | 413.764 | 10 | -90 | 3 | 5 |
| DEX-BB5718 | 414274.912 | 9674625.071 | 407.165 | 51 | -90 | 27.58 | 20.8 |
| DEX-BB5719 | 414331.209 | 9674629.502 | 412.454 | 25 | -90 | 13 | 9.85 |
| DEX-BB5720 | 414375.975 | 9674624.042 | 420.584 | 19 | -90 | 8 | 9 |
| DEX-BB5721 | 414422.907 | 9674625.101 | 428.202 | 14 | -90 | 5 | 6.85 |
| DEX-BB5722 | 414473.940 | 9674622.534 | 444.987 | 23 | -90 | 1 | 19.7 |
| DEX-BB5724 | 414253.966 | 9674585.184 | 417.162 | 11 | -90 | 3 | 6 |
| DEX-BB5725 | 414302.665 | 9674594.845 | 406.412 | 34 | -90 | 21.1 | 12 |
| DEX-BB5726 | 414331.827 | 9674607.689 | 406.666 | 29 | -90 | 14 | 13 |
| DEX-BB5727 | 414348.817 | 9674602.522 | 408.577 | 26 | -90 | 15 | 8 |
| DEX-BB5728 | 414375.691 | 9674603.366 | 413.555 | 26 | -90 | 17.3 | 6.9 |
| DEX-BB5729 | 414427.951 | 9674599.334 | 414.324 | 15 | -90 | 2 | 11 |
| DEX-BB5730 | 414449.181 | 9674600.185 | 421.830 | 5 | -90 | 1 | 1 |
| DEX-BB5732 | 414273.082 | 9674575.874 | 414.736 | 26 | -90 | 9 | 15.2 |
| DEX-BB5733 | 414322.427 | 9674565.961 | 405.404 | 40 | -90 | 21.1 | 17.76 |
| DEX-BB5734 | 414375.083 | 9674580.356 | 405.070 | 21 | -90 | 12.85 | 6.3 |
| DEX-BB5735 | 414422.879 | 9674573.145 | 406.444 | 17 | -90 | 1 | 13.7 |
| DEX-BB5736 | 414449.702 | 9674570.412 | 415.025 | 20 | -90 | 8 | 10.05 |
| DEX-BB5737 | 414581.036 | 9674569.585 | 438.077 | 12 | -90 | 5 | 5 |
| DEX-BB5738 | 414595.525 | 9674575.493 | 445.593 | 19 | -90 | 13 | 4 |
| DEX-BB5739 | 414628.194 | 9674572.862 | 433.158 | 15 | -90 | 5 | 8 |
| DEX-BB5740 | 414648.142 | 9674570.908 | 432.085 | 10 | -90 | 3 | 5 |
| DEX-BB5741 | 414277.988 | 9674551.333 | 417.489 | 18 | -90 | 6 | 10 |
| DEX-BB5742 | 414301.070 | 9674540.213 | 411.873 | 29 | -90 | 3 | 24 |
| DEX-BB5743 | 414327.589 | 9674543.815 | 404.607 | 40 | -90 | 36.12 | 3 |
| DEX-BB5744 | 414350.745 | 9674549.762 | 398.517 | 30 | -90 | 24.25 | 3 |
| DEX-BB5745 | 414376.855 | 9674555.551 | 397.729 | 33 | -90 | 28.25 | 2 |
| DEX-BB5746 | 414398.041 | 9674549.801 | 399.171 | 32 | -90 | 22 | 8.26 |
| DEX-BB5747 | 414427.851 | 9674546.733 | 406.471 | 25 | -90 | 19.1 | 4 |
| DEX-BB5748 | 414451.309 | 9674543.786 | 410.948 | 22 | -90 | 17.1 | 3 |
| DEX-BB5749 | 414472.728 | 9674551.853 | 417.448 | 21 | -90 | 10.1 | 9 |
| DEX-BB5750 | 414493.335 | 9674545.506 | 411.411 | 14 | -90 | 3 | 9 |
| DEX-BB5751 | 414528.295 | 9674548.053 | 411.131 | 9 | -90 | 5 | 2 |
| DEX-BB5752 | 414579.674 | 9674545.017 | 429.934 | 21 | -90 | 8 | 11 |
| DEX-BB5753 | 414603.354 | 9674551.182 | 435.936 | 41 | -90 | 20 | 19 |
| DEX-BB5754 | 414627.202 | 9674547.429 | 426.082 | 32 | -90 | 7 | 22 |
| DEX-BB5755 | 414656.955 | 9674551.017 | 429.261 | 14 | -90 | 3 | 9 |
| DEX-BB5756 | 414674.393 | 9674543.421 | 432.295 | 8 | -90 | 2 | 4 |
| DEX-BB5757 | 414333.517 | 9674527.946 | 406.218 | 36 | -90 | 26.56 | 8.18 |
| DEX-BB5758 | 414353.231 | 9674521.706 | 398.887 | 27 | -90 | 21.49 | 4 |
| DEX-BB5759 | 414369.158 | 9674515.433 | 397.780 | 32 | -90 | 19.51 | 11 |
| DEX-BB5760 | 414400.167 | 9674526.137 | 396.735 | 41 | -90 | 16.1 | 23.44 |
| DEX-BB5761 | 414427.334 | 9674520.741 | 398.545 | 25 | -90 | 16.3 | 7 |
| DEX-BB5762 | 414451.229 | 9674526.173 | 405.257 | 43 | -90 | 17 | 23.85 |
| DEX-BB5763 | 414474.649 | 9674520.821 | 407.209 | 30 | -90 | 11.26 | 16.85 |
| DEX-BB5764 | 414500.409 | 9674526.017 | 402.391 | 8 | -90 | 3 | 3 |
| DEX-BB5765 | 414524.224 | 9674526.301 | 404.489 | 9 | -90 | 5 | 2 |
| DEX-BB5766 | 414544.009 | 9674511.322 | 404.537 | 16 | -90 | 3 | 11 |
| DEX-BB5767 | 414582.160 | 9674523.812 | 419.524 | 8 | -90 | 2 | 4 |
| DEX-BB5768 | 414606.468 | 9674524.769 | 418.439 | 17 | -90 | 5 | 10 |
| DEX-BB5769 | 414628.871 | 9674524.781 | 417.152 | 10 | -90 | 5 | 3 |
| DEX-BB5770 | 414651.322 | 9674533.714 | 425.485 | 19 | -90 | 7 | 11 |
| DEX-BB5771 | 414679.190 | 9674521.732 | 427.493 | 17 | -90 | 6 | 9 |
| DEX-BB5772 | 414351.810 | 9674493.627 | 402.572 | 9 | -90 | 2 | 4 |
| DEX-BB5773 | 414373.540 | 9674499.882 | 396.783 | 22 | -90 | 4 | 14 |
| DEX-BB5774 | 414399.384 | 9674501.101 | 395.000 | 29 | -90 | 16.37 | 9.85 |
| DEX-BB5775 | 414427.278 | 9674497.923 | 393.763 | 45 | -90 | 26.77 | 17 |
| DEX-BB5776 | 414447.643 | 9674496.544 | 395.833 | 36 | -90 | 17 | 16.86 |
| DEX-BB5777 | 414470.906 | 9674497.589 | 395.329 | 21 | -90 | 16 | 3 |
| DEX-BB5778 | 414526.650 | 9674495.339 | 396.583 | 22 | -90 | 8 | 12 |
| DEX-BB5779 | 414552.607 | 9674497.144 | 399.671 | 16 | -90 | 6 | 8 |
| DEX-BB5780 | 414584.539 | 9674491.583 | 401.803 | 15 | -90 | 5 | 8 |
| DEX-BB5781 | 414602.916 | 9674495.695 | 406.162 | 17 | -90 | 6 | 10 |
| DEX-BB5782 | 414664.305 | 9674501.502 | 422.319 | 15 | -90 | 5 | 8 |
| DEX-BB5783 | 414679.290 | 9674493.816 | 427.533 | 8 | -90 | 3 | 2 |
| DEX-BB5784 | 414350.824 | 9674472.734 | 409.202 | 6 | -90 | 1 | 2 |
| DEX-BB5785 | 414379.491 | 9674473.658 | 394.790 | 12 | -90 | 2 | 7 |
| DEX-BB5786 | 414403.058 | 9674475.074 | 392.406 | 23 | -90 | 6 | 14.15 |
| DEX-BB5787 | 414427.430 | 9674473.508 | 391.294 | 38 | -90 | 14 | 21 |
| DEX-BB5788 | 414449.523 | 9674471.773 | 390.146 | 29 | -90 | 12 | 14 |
| DEX-BB5789 | 414473.286 | 9674473.645 | 389.811 | 39 | -90 | 17 | 20 |
| DEX-BB5790 | 414496.375 | 9674468.334 | 393.728 | 36 | -90 | 20 | 13.85 |
| DEX-BB5791 | 414522.728 | 9674469.104 | 393.899 | 30 | -90 | 15 | 13 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ569 | 415999.561 | 9673311.558 | 311.946 | 21 | -90 | 5.92 | 14 |
| DEX-CZ745 | 416651.351 | 9674106.689 | 373.869 | 13 | -90 | 4.2 | 7 |
| BB_STH-1079 | 415193.205 | 9673530.415 | 352.796 | 10 | -90 | 0 | 8 |
| DEX-CZ116 | 415507.396 | 9674313.378 | 433.820 | 36 | -90 | 23.7 | 9.75 |
| DEX-CZ125 | 415615.712 | 9674203.104 | 410.534 | 26 | -90 | 21.9 | 3.89 |
| DEX-CZ142 | 415805.842 | 9674192.888 | 363.516 | 11 | -90 | 5.19 | 4 |
| DEX-CZ730 | 416852.457 | 9673898.561 | 373.557 | 27 | -90 | 20.6 | 6.45 |
| DEX-CZ374 | 416261.039 | 9674342.555 | 386.549 | 13 | -90 | 7.29 | 3 |
| DEX-CZ753 | 416597.447 | 9674205.068 | 356.727 | 42 | -90 | 14.7 | 26 |
| DEX-CZ718 | 416850.111 | 9673796.846 | 363.498 | 24 | -90 | 14.05 | 6.9 |
| DEX-CZ049 | 414895.660 | 9674202.469 | 389.382 | 23 | -90 | 10.35 | 11.61 |
| BB_STH-1097 | 414719.287 | 9673374.365 | 326.971 | 24 | -90 | 18.48 | 5 |
| DEX-CZ154 | 415805.291 | 9673503.809 | 357.034 | 28 | -90 | 24.18 | 6.4 |
| DEX-CZ483 | 416455.164 | 9673764.972 | 398.771 | 31 | -90 | 16.06 | 13.42 |
| BB_STH-1082 | 415110.092 | 9673701.110 | 363.443 | 12 | -90 | 3.33 | 8.49 |
| DEX-CZ094 | 415292.734 | 9674198.014 | 382.013 | 12 | -90 | 1 | 8.8 |
| DEX-CZ421 | 416053.343 | 9674059.693 | 430.353 | 26 | -90 | 24.63 | 6.33 |
| DEX-CZ720 | 416602.572 | 9673848.573 | 349.479 | 14 | -90 | 5.49 | 8.9 |
| DEX-CZ121 | 415499.984 | 9673798.032 | 352.798 | 11 | -90 | 7.02 | 3 |
| DEX-CZ149 | 415699.602 | 9673704.985 | 364.238 | 9 | -90 | 4.21 | 3.16 |
| DEX-CZ156 | 415801.973 | 9673691.006 | 371.680 | 12 | -90 | 4.68 | 6.34 |
| DEX-CZ117 | 415495.263 | 9674192.087 | 417.824 | 19 | -90 | 15.5 | 3.12 |
| DEX-CZ118 | 415499.060 | 9674086.711 | 398.295 | 23 | -90 | 20.94 | 2 |
| DEX-CZ736 | 416847.166 | 9673951.587 | 383.556 | 38 | -90 | 35.04 | 5.3 |
| DEX-CZ761 | 416548.680 | 9674304.132 | 370.759 | 20 | -90 | 20.87 | 2 |
| DEX-CZ481 | 416344.707 | 9673752.609 | 402.232 | 18 | -90 | 13.82 | 1 |
| DEX-CZ719 | 416952.050 | 9673801.706 | 363.403 | 24 | -90 | 17.35 | 4.2 |
| DEX-CZ050 | 414896.517 | 9674108.345 | 362.542 | 33 | -90 | 37.47 | 1.24 |
| DEX-CZ076 | 415199.716 | 9674103.572 | 364.900 | 32 | -90 | 27.06 | 6.4 |
| DEX-CZ130 | 415606.244 | 9674704.080 | 417.792 | 37 | -90 | 13.07 | 21.69 |
| DEX-CZ210 | 416484.690 | 9673599.986 | 372.646 | 9 | -90 | 4 | 2.3 |
| BB_STH-1086 | 414907.624 | 9673498.394 | 327.070 | 29 | -90 | 10.57 | 21.23 |
| DEX-CZ051 | 414897.370 | 9674025.411 | 349.038 | 33 | -90 | 24.86 | 12.75 |
| DEX-CZ739 | 416800.523 | 9674005.509 | 385.150 | 30 | -90 | 13.76 | 9.48 |
| DEX-CZ743 | 416756.124 | 9674053.071 | 382.220 | 56 | -90 | 15.88 | 45.7 |
| DEX-CZ760 | 416686.359 | 9674229.796 | 383.049 | 26 | -90 | 13.34 | 9.75 |
| DEX-CZ5111 | 417128.500 | 9674685.000 | 389.663 | 21 | -90 | 3.79 | 15.21 |
| DEX-CZ724 | 416801.325 | 9673851.187 | 366.290 | 40 | -90 | 26.21 | 11.4 |
| DEX-CZ137 | 415695.535 | 9674199.423 | 405.102 | 30 | -90 | 21.38 | 11.48 |
| DEX-CZ164 | 415903.737 | 9674691.318 | 410.893 | 28 | -90 | 13.68 | 15.23 |
| DEX-CZ5291 | 417432.400 | 9673898.000 | 349.312 | 18 | -90 | 15.88 | 1 |
| DEX-CZ728 | 416651.386 | 9673897.841 | 357.857 | 12 | -90 | 8.46 | 3 |
| BB_STH-1067 | 414407.601 | 9673806.931 | 358.791 | 7 | -90 | 2 | 3 |
| BB_STH-1077 | 415312.709 | 9673600.259 | 334.298 | 26 | -90 | 17.33 | 12.6 |
| BB_STH-1090 | 414801.008 | 9673593.330 | 377.320 | 21 | -90 | 0 | 17.2 |
| DEX-CZ441 | 416096.123 | 9673949.833 | 415.611 | 9 | -90 | 6.13 | 1.3 |
| BB_STH-1068 | 414516.939 | 9673791.114 | 405.731 | 28 | -90 | 7.4 | 15 |
| DEX-CZ124 | 415610.165 | 9674099.987 | 398.633 | 24 | -90 | 14.76 | 8 |
| DEX-CZ138 | 415701.186 | 9674101.071 | 398.880 | 44 | -90 | 27.91 | 16.39 |
| DEX-CZ158 | 415796.616 | 9673886.134 | 394.042 | 9 | -90 | 5 | 2.12 |
| DEX-CZ162 | 415809.894 | 9674704.644 | 409.855 | 23 | -90 | 12.53 | 8 |
| DEX-CZ442 | 416157.485 | 9673960.464 | 422.729 | 23 | -90 | 20.49 | 4.21 |
| DEX-CZ4506 | 416951.900 | 9674596.000 | 438.981 | 36 | -90 | 5 | 28.4 |
| DEX-CZ4548 | 417296.900 | 9674802.000 | 381.862 | 23 | -90 | 5.5 | 13.5 |
| DEX-CZ5602 | 415396.900 | 9673243.000 | 335.112 | 29 | -90 | 12.28 | 14 |
| DEX-CZ388 | 416145.217 | 9674252.085 | 414.900 | 31 | -90 | 20.84 | 5.19 |
| DEX-CZ389 | 416203.797 | 9674258.628 | 405.607 | 24 | -90 | 20.29 | 1 |
| DEX-CZ4514 | 416898.600 | 9674649.000 | 429.145 | 47 | -90 | 37.48 | 10 |
| DEX-CZ4515 | 416948.900 | 9674647.000 | 425.596 | 31 | -90 | 13.28 | 16 |
| BB_STH-1085 | 415006.620 | 9673509.782 | 319.254 | 10 | -90 | 7.43 | 1 |
| BB_STH-1096 | 414715.372 | 9673300.333 | 322.546 | 18 | -90 | 13.21 | 3 |
| DEX-CZ098 | 415391.163 | 9673812.634 | 344.804 | 20 | -90 | 17.86 | 3.71 |
| DEX-CZ151 | 415705.700 | 9673505.802 | 338.338 | 26 | -90 | 19.29 | 7 |
| DEX-CZ372 | 416148.640 | 9674347.935 | 402.845 | 35 | -90 | 19.75 | 16.8 |
| DEX-CZ418 | 415951.714 | 9674097.230 | 403.623 | 10 | -90 | 7.4 | 1 |
| DEX-CZ4852 | 417153.500 | 9673878.000 | 376.264 | 42 | -90 | 14.51 | 24.25 |
| DEX-CZ4861 | 417178.300 | 9673902.000 | 379.835 | 24 | -90 | 16.57 | 4 |
| DEX-CZ503 | 416530.974 | 9673676.514 | 356.558 | 16 | -90 | 3 | 10.16 |
| DEX-CZ5732 | 415151.300 | 9673293.000 | 329.085 | 24 | -90 | 15.3 | 6 |
| BB_STH-1093 | 414910.113 | 9673415.712 | 320.688 | 23 | -90 | 14.55 | 7 |
| DEX-CZ150 | 415693.301 | 9673613.134 | 352.921 | 12 | -90 | 8.12 | 3 |
| DEX-CZ369 | 416001.426 | 9674359.986 | 415.903 | 39 | -90 | 29.04 | 12.74 |
| DEX-CZ379 | 416332.900 | 9674293.477 | 372.000 | 9 | -90 | 6 | 0 |
| DEX-CZ4536 | 417100.100 | 9674751.000 | 407.230 | 22 | -90 | 15.87 | 5.8 |
| DEX-CZ4556 | 417208.700 | 9674848.000 | 396.211 | 22 | -90 | 15.8 | 3 |
| DEX-CZ500 | 416412.082 | 9673662.841 | 377.561 | 15 | -90 | 9.78 | 4 |
| DEX-CZ520 | 416454.221 | 9673553.149 | 357.264 | 24 | -90 | 5.25 | 10 |
| DEX-CZ5285 | 417105.600 | 9674681.000 | 389.736 | 16 | -90 | 10 | 4 |
| DEX-CZ722 | 416701.518 | 9673850.122 | 346.450 | 17 | -90 | 6.36 | 7 |
| BB_STH-1073 | 415003.220 | 9673787.423 | 345.800 | 21 | -90 | 5 | 14 |
| DEX-CZ148 | 415710.641 | 9673785.099 | 352.616 | 6 | -90 | 3 | 0 |
| DEX-CZ367 | 415950.402 | 9674403.329 | 416.834 | 30 | -90 | 25.56 | 7 |
| DEX-CZ394 | 416503.101 | 9674254.929 | 360.426 | 7 | -90 | 3 | 1 |
| DEX-CZ4574 | 417000.400 | 9674703.000 | 414.292 | 20 | -90 | 9.38 | 9 |
| DEX-CZ4629 | 417052.400 | 9674355.000 | 401.839 | 32 | -90 | 26.11 | 5 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5792 | 414554.935 | 9674470.772 | 395.163 | 29 | -90 | 14 | 13 |
| DEX-BB5793 | 414579.123 | 9674471.514 | 399.571 | 16 | -90 | 11 | 2 |
| DEX-BB5794 | 414603.386 | 9674476.957 | 405.383 | 11 | -90 | 3 | 7 |
| DEX-BB5795 | 414627.008 | 9674468.064 | 416.920 | 9 | -90 | 4 | 3 |
| DEX-BB5796 | 414639.973 | 9674460.108 | 424.996 | 24 | -90 | 9 | 13 |
| DEX-BB5797 | 414675.335 | 9674463.281 | 441.528 | 28 | -90 | 18 | 8 |
| DEX-BB5798 | 414422.861 | 9674442.756 | 390.000 | 32 | -90 | 9 | 21 |
| DEX-BB5799 | 414447.870 | 9674444.193 | 388.803 | 33 | -90 | 17 | 13 |
| DEX-BB5800 | 414471.068 | 9674447.273 | 388.942 | 33 | -90 | 21 | 10 |
| DEX-BB5801 | 414499.570 | 9674444.958 | 392.125 | 57 | -90 | 19 | 36 |
| DEX-BB5802 | 414523.211 | 9674452.081 | 392.550 | 53 | -90 | 27 | 24 |
| DEX-BB5803 | 414554.412 | 9674446.390 | 395.036 | 32 | -90 | 17 | 13 |
| DEX-BB5805 | 414675.300 | 9674444.492 | 439.535 | 33 | -90 | 19 | 12 |
| DEX-BB5806 | 414425.464 | 9674417.718 | 392.898 | 21 | -90 | 1 | 16.85 |
| DEX-BB5807 | 414444.757 | 9674416.895 | 389.980 | 34 | -90 | 16 | 14.55 |
| DEX-BB5808 | 414474.147 | 9674415.929 | 386.837 | 31 | -90 | 20.25 | 9 |
| DEX-BB5809 | 414502.419 | 9674420.515 | 388.893 | 35 | -90 | 20 | 13 |
| DEX-BB5810 | 414530.164 | 9674421.245 | 387.647 | 25 | -90 | 19 | 4 |
| DEX-BB5811 | 414652.265 | 9674417.627 | 426.882 | 19 | -90 | 14 | 3 |
| DEX-BB5812 | 414674.225 | 9674420.769 | 431.413 | 31 | -90 | 24 | 5 |
| DEX-BB5813 | 414424.202 | 9674387.284 | 406.319 | 10 | -90 | 1 | 6.75 |
| DEX-BB5814 | 414447.756 | 9674390.547 | 396.277 | 11 | -90 | 1 | 7.75 |
| DEX-BB5815 | 414474.003 | 9674389.782 | 387.858 | 27 | -90 | 9 | 16.15 |
| DEX-BB5816 | 414525.688 | 9674394.537 | 383.842 | 27 | -90 | 16 | 9 |
| DEX-BB5817 | 414424.363 | 9674362.946 | 414.115 | 12 | -90 | 2 | 7.7 |
| DEX-BB5818 | 414449.528 | 9674366.483 | 401.650 | 6 | -90 | 1 | 2.85 |
| DEX-BB5819 | 414476.518 | 9674365.757 | 392.272 | 15 | -90 | 2 | 11 |
| DEX-BB5820 | 414498.190 | 9674369.800 | 381.871 | 39 | -90 | 15.55 | 21.25 |
| DEX-BB5821 | 414534.631 | 9674370.314 | 380.276 | 33 | -90 | 16 | 15 |
| DEX-BB5822 | 414551.868 | 9674365.397 | 379.631 | 23 | -90 | 13 | 7.85 |
| DEX-BB5823 | 414732.255 | 9674378.236 | 407.120 | 12 | -90 | 2 | 8 |
| DEX-BB5824 | 414750.762 | 9674373.825 | 405.866 | 6 | -90 | 2 | 2 |
| DEX-BB5825 | 414546.923 | 9674336.641 | 376.590 | 36 | -90 | 19 | 15 |
| DEX-BB5826 | 414575.349 | 9674346.025 | 376.625 | 21 | -90 | 13 | 6 |
| DEX-BB5827 | 414600.624 | 9674347.643 | 375.682 | 7 | -90 | 1 | 3.85 |
| DEX-BB5828 | 414626.216 | 9674347.415 | 380.466 | 15 | -90 | 4 | 7.7 |
| DEX-BB5829 | 414648.671 | 9674348.313 | 391.205 | 10 | -90 | 2 | 6 |
| DEX-BB5830 | 414683.720 | 9674350.597 | 398.414 | 24 | -90 | 11 | 11.24 |
| DEX-BB5831 | 414711.041 | 9674355.704 | 395.990 | 11 | -90 | 6 | 3 |
| DEX-BB5832 | 414725.740 | 9674346.649 | 395.814 | 14 | -90 | 5 | 7 |
| DEX-BB5833 | 414547.171 | 9674312.603 | 377.160 | 38 | -90 | 21 | 15 |
| DEX-BB5834 | 414578.653 | 9674310.259 | 373.480 | 32 | -90 | 20.25 | 9.83 |
| DEX-BB5835 | 414602.378 | 9674314.234 | 372.118 | 26 | -90 | 13 | 11 |
| DEX-BB5836 | 414631.596 | 9674320.922 | 375.176 | 17 | -90 | 3 | 11.7 |
| DEX-BB5837 | 414647.104 | 9674328.924 | 383.577 | 34 | -90 | 2 | 30 |
| DEX-BB5838 | 414675.670 | 9674327.009 | 385.575 | 23 | -90 | 11 | 10 |
| DEX-BB5839 | 414703.717 | 9674323.255 | 389.049 | 19 | -90 | 11 | 7 |
| DEX-BB5840 | 414726.091 | 9674319.045 | 400.282 | 17 | -90 | 3 | 12 |
| DEX-BB5841 | 414748.846 | 9674317.996 | 411.463 | 15 | -90 | 6 | 7 |
| DEX-BB5842 | 414550.210 | 9674293.757 | 375.758 | 37 | -90 | 17 | 18 |
| DEX-BB5843 | 414578.385 | 9674293.474 | 371.576 | 44 | -90 | 16 | 25.7 |
| DEX-BB5844 | 414603.517 | 9674289.379 | 370.354 | 31 | -90 | 15 | 14 |
| DEX-BB5845 | 414670.582 | 9674292.163 | 384.018 | 14 | -90 | 7 | 5 |
| DEX-BB5846 | 414752.082 | 9674289.492 | 417.322 | 32 | -90 | 16 | 14 |
| DEX-BB5847 | 414778.406 | 9674291.409 | 424.784 | 34 | -90 | 18.31 | 14 |
| DEX-BB5848 | 414824.471 | 9674293.998 | 427.912 | 33 | -90 | 22 | 9 |
| DEX-BB5849 | 414851.548 | 9674289.868 | 425.884 | 39 | -90 | 23.31 | 10 |
| DEX-BB5850 | 414902.899 | 9674294.994 | 406.701 | 11 | -90 | 2 | 7 |
| DEX-BB5851 | 414927.694 | 9674286.250 | 390.525 | 14 | -90 | 9 | 3 |
| DEX-BB5852 | 414548.334 | 9674271.928 | 378.253 | 43 | -90 | 25 | 16 |
| DEX-BB5853 | 414576.618 | 9674263.665 | 369.982 | 49 | -90 | 21.27 | 26.26 |
| DEX-BB5854 | 414603.696 | 9674263.911 | 368.796 | 37 | -90 | 18 | 17 |
| DEX-BB5855 | 414622.411 | 9674270.831 | 369.196 | 30 | -90 | 10 | 18 |
| DEX-BB5856 | 414643.086 | 9674271.029 | 375.543 | 17 | -90 | 14 | 1 |
| DEX-BB5857 | 414672.679 | 9674271.456 | 388.429 | 35 | -90 | 18.3 | 16 |
| DEX-BB5858 | 414693.098 | 9674266.701 | 394.648 | 31 | -90 | 16.26 | 12 |
| DEX-BB5859 | 414753.823 | 9674271.190 | 414.805 | 28 | -90 | 15 | 11 |
| DEX-BB5860 | 414777.496 | 9674269.343 | 420.207 | 32 | -90 | 15 | 15 |
| DEX-BB5861 | 414801.663 | 9674272.296 | 423.152 | 27 | -90 | 9 | 15.75 |
| DEX-BB5862 | 414823.525 | 9674261.240 | 418.204 | 18 | -90 | 3 | 12.92 |
| DEX-BB5863 | 414846.597 | 9674270.394 | 418.741 | 26 | -90 | 8 | 16 |
| DEX-BB5864 | 414868.199 | 9674273.583 | 416.011 | 25 | -90 | 7 | 12 |
| DEX-BB5865 | 414892.546 | 9674271.316 | 405.622 | 13 | -90 | 3 | 8 |
| DEX-BB5866 | 414922.524 | 9674264.675 | 385.883 | 14 | -90 | 3 | 9 |
| DEX-BB5867 | 414547.554 | 9674237.272 | 374.468 | 25 | -90 | 9 | 13 |
| DEX-BB5868 | 414572.160 | 9674242.111 | 368.948 | 35 | -90 | 21.28 | 12 |
| DEX-BB5869 | 414600.829 | 9674242.710 | 366.940 | 42 | -90 | 16 | 24.08 |
| DEX-BB5870 | 414623.806 | 9674248.569 | 367.686 | 28 | -90 | 15 | 10.7 |
| DEX-BB5871 | 414650.920 | 9674249.096 | 372.486 | 14 | -90 | 6 | 6 |
| DEX-BB5872 | 414728.262 | 9674245.908 | 400.771 | 18 | -90 | 13 | 3 |
| DEX-BB5873 | 414751.640 | 9674251.980 | 410.033 | 37 | -90 | 14 | 21 |
| DEX-BB5874 | 414796.386 | 9674240.423 | 412.303 | 18 | -90 | 9 | 6.75 |
| DEX-BB5875 | 414553.036 | 9674217.289 | 375.758 | 10 | -90 | 1 | 6 |
| DEX-BB5876 | 414575.589 | 9674221.628 | 369.391 | 43 | -90 | 7 | 33 |
| DEX-BB5877 | 414598.831 | 9674223.120 | 366.000 | 26 | -90 | 18.35 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ749 | 416650.138 | 9674145.687 | 374.281 | 13 | -90 | 10 | 1 |
| DEX-CZ757 | 416550.860 | 9674261.145 | 361.400 | 10 | -90 | 6 | 2 |
| DEX-CZ764 | 416550.881 | 9674346.714 | 377.967 | 44 | -90 | 33.16 | 15.43 |
| NCZ21-10134 | 417286.224 | 9674280.453 | 379.932 | 24 | -90 | 20.37 | 6.43 |
| BB_STH-1065 | 414704.680 | 9673891.414 | 365.178 | 12 | -90 | 3.53 | 5.65 |
| BB_STH-1084 | 414992.454 | 9673581.240 | 342.254 | 7 | -90 | 3 | 2 |
| DEX-CZ192 | 416200.186 | 9673899.983 | 412.585 | 35 | -90 | 36.46 | 0 |
| DEX-CZ373 | 416200.487 | 9674350.105 | 401.045 | 40 | -90 | 24.42 | 15.32 |
| DEX-CZ5177 | 417023.200 | 9674769.000 | 419.679 | 33 | -90 | 20.5 | 10 |
| DEX-CZ5613 | 415606.400 | 9673447.000 | 334.594 | 35 | -90 | 29.15 | 2.55 |
| DEX-CZ711 | 416798.269 | 9673742.690 | 353.987 | 44 | -90 | 21.69 | 22.99 |
| BB_STH-1089 | 414793.883 | 9673696.066 | 393.520 | 18 | -90 | 6 | 10.84 |
| DEX-CZ103 | 415403.447 | 9674299.215 | 449.021 | 37 | -90 | 24.77 | 14.51 |
| DEX-CZ387 | 416091.364 | 9674257.342 | 421.907 | 29 | -90 | 24.61 | 7.59 |
| DEX-CZ404 | 416094.298 | 9674158.775 | 429.964 | 30 | -90 | 28.04 | 3.45 |
| DEX-CZ426 | 416292.439 | 9674056.636 | 411.819 | 6 | -90 | 2 | 1 |
| DEX-CZ4507 | 416997.200 | 9674593.000 | 433.059 | 13 | -90 | 8 | 3 |
| DEX-CZ4516 | 417000.100 | 9674646.000 | 414.794 | 40 | -90 | 19.84 | 15 |
| DEX-CZ4581 | 417101.200 | 9674702.000 | 396.150 | 16 | -90 | 6 | 8 |
| DEX-CZ4837 | 417228.700 | 9673803.000 | 356.046 | 16 | -90 | 14.53 | 0 |
| DEX-CZ4840 | 417156.900 | 9673823.000 | 368.165 | 34 | -90 | 25 | 7 |
| DEX-CZ5609 | 415353.300 | 9673350.000 | 339.552 | 15 | -90 | 6 | 7.75 |
| DEX-CZ748 | 416602.578 | 9674142.553 | 370.831 | 15 | -90 | 6.67 | 4 |
| BB_STH-1081 | 415111.539 | 9673581.550 | 350.924 | 8 | -90 | 4 | 3 |
| BB_STH-1095 | 414795.043 | 9673282.742 | 317.020 | 11 | -90 | 8.12 | 2 |
| DEX-CZ198 | 416302.528 | 9673803.885 | 404.358 | 23 | -90 | 20.91 | 2.35 |
| DEX-CZ377 | 416389.662 | 9674353.380 | 395.416 | 8 | -90 | 5 | 1 |
| DEX-CZ4522 | 417301.700 | 9674653.000 | 372.949 | 19 | -90 | 4.6 | 10.4 |
| DEX-CZ4557 | 417250.600 | 9674852.000 | 393.790 | 42 | -90 | 14 | 10 |
| DEX-CZ4619 | 417000.300 | 9674458.000 | 428.604 | 19 | -90 | 13.32 | 3 |
| DEX-CZ4826 | 417228.200 | 9673752.000 | 351.585 | 31 | -90 | 27.01 | 3 |
| DEX-CZ4839 | 417382.600 | 9673850.000 | 348.285 | 31 | -90 | 26.9 | 4 |
| DEX-CZ4858 | 417383.900 | 9673900.000 | 353.457 | 22 | -90 | 18.28 | 2 |
| DEX-CZ5184 | 417204.400 | 9674770.000 | 384.757 | 20 | -90 | 12.92 | 6 |
| DEX-CZ5265 | 417026.900 | 9674869.000 | 425.706 | 18 | -90 | 13 | 2.4 |
| DEX-CZ5271 | 417178.500 | 9674927.000 | 400.176 | 30 | -90 | 17.96 | 14 |
| DEX-CZ5304 | 417275.400 | 9673824.000 | 352.537 | 27 | -90 | 21.25 | 1 |
| DEX-CZ5605 | 415446.800 | 9673286.000 | 348.023 | 20 | -90 | 10.28 | 7 |
| DEX-CZ717 | 416750.221 | 9673801.416 | 363.214 | 33 | -90 | 15.88 | 14.71 |
| DEX-CZ755 | 416702.789 | 9674197.251 | 381.143 | 31 | -90 | 16.4 | 15.24 |
| DEX-CZ100 | 415394.294 | 9673992.369 | 379.034 | 25 | -90 | 23.88 | 3.9 |
| DEX-CZ407 | 416245.459 | 9674141.683 | 412.876 | 22 | -90 | 19.31 | 4.93 |
| DEX-CZ408 | 416301.674 | 9674153.295 | 398.151 | 21 | -90 | 18.42 | 4.74 |
| DEX-CZ420 | 416014.200 | 9674063.067 | 425.000 | 22 | -90 | 20.75 | 5.5 |
| DEX-CZ4599 | 416897.600 | 9674549.000 | 439.210 | 11 | -90 | 6 | 2 |
| DEX-CZ468 | 416496.422 | 9673876.774 | 369.064 | 30 | -90 | 7.35 | 21.92 |
| DEX-CZ4835 | 417253.400 | 9673824.000 | 355.282 | 37 | -90 | 30.24 | 7 |
| DEX-CZ5106 | 416972.700 | 9674684.000 | 415.586 | 20 | -90 | 10.24 | 7 |
| DEX-CZ5128 | 417130.100 | 9674700.000 | 392.016 | 9 | -90 | 6 | 0.76 |
| DEX-CZ5178 | 417049.900 | 9674770.000 | 417.820 | 32 | -90 | 28.14 | 4.43 |
| DEX-CZ5268 | 417078.700 | 9674948.000 | 409.392 | 25 | -90 | 10.48 | 11 |
| DEX-CZ5603 | 415348.600 | 9673248.000 | 323.221 | 26 | -90 | 22.6 | 1 |
| DEX-CZ725 | 416849.432 | 9673850.715 | 370.373 | 26 | -90 | 18.5 | 4.42 |
| DEX-CZ731 | 416598.381 | 9673945.986 | 352.118 | 12 | -90 | 8 | 2 |
| BB_STH-1102 | 414696.350 | 9673687.422 | 381.020 | 17 | -90 | 13.63 | 4 |
| DEX-CZ102 | 415412.455 | 9674192.090 | 413.317 | 18 | -90 | 9 | 7.91 |
| DEX-CZ424 | 416201.456 | 9674053.893 | 425.520 | 25 | -90 | 22.99 | 4.3 |
| DEX-CZ4527 | 417049.100 | 9674700.000 | 401.169 | 30 | -90 | 7 | 20.18 |
| DEX-CZ4555 | 417144.100 | 9674849.000 | 408.267 | 26 | -90 | 10 | 12 |
| DEX-CZ4563 | 417247.400 | 9674903.000 | 393.670 | 20 | -90 | 9.5 | 8.5 |
| DEX-CZ4709 | 417198.800 | 9674898.000 | 398.525 | 26 | -90 | 13.65 | 9.35 |
| DEX-CZ4843 | 417179.500 | 9673852.000 | 367.637 | 16 | -90 | 12.52 | 2 |
| DEX-CZ4851 | 417130.500 | 9673882.000 | 382.415 | 31 | -90 | 15.3 | 12.7 |
| DEX-CZ488 | 416355.798 | 9673693.413 | 386.309 | 35 | -90 | 16.79 | 18.08 |
| DEX-CZ501 | 416453.287 | 9673666.404 | 383.914 | 26 | -90 | 13.69 | 11 |
| DEX-CZ5015 | 416899.300 | 9674480.000 | 428.714 | 37 | -90 | 18.15 | 20.68 |
| DEX-CZ5198 | 417206.600 | 9674800.000 | 387.594 | 38 | -90 | 7.5 | 22.97 |
| DEX-CZ5307 | 417280.300 | 9673800.000 | 349.935 | 41 | -90 | 35.96 | 2 |
| DEX-CZ5615 | 415697.800 | 9673446.000 | 339.119 | 37 | -90 | 20.2 | 14.55 |
| DEX-CZ5616 | 415650.100 | 9673337.000 | 363.670 | 9 | -90 | 5 | 1.63 |
| DEX-CZ733 | 416697.123 | 9673955.609 | 358.018 | 12 | -90 | 10 | 2 |
| BB_STH-1094 | 414911.837 | 9673292.838 | 299.744 | 16 | -90 | 14.62 | 2 |
| DEX-CZ169 | 415900.605 | 9674094.386 | 385.965 | 11 | -90 | 6 | 3 |
| DEX-CZ402 | 416023.055 | 9674159.922 | 407.520 | 23 | -90 | 13.43 | 10.3 |
| DEX-CZ427 | 416346.953 | 9674060.689 | 398.550 | 17 | -90 | 14.09 | 3 |
| DEX-CZ4535 | 417052.100 | 9674751.000 | 413.673 | 28 | -90 | 20 | 6 |
| DEX-CZ4544 | 417050.100 | 9674801.000 | 423.288 | 30 | -90 | 16 | 7 |
| DEX-CZ4602 | 417049.800 | 9674548.000 | 432.826 | 14 | -90 | 5 | 6.4 |
| DEX-CZ4618 | 416951.500 | 9674457.000 | 427.433 | 29 | -90 | 21.16 | 5.38 |
| DEX-CZ4688 | 417353.600 | 9673800.000 | 345.540 | 49 | -90 | 26.29 | 7 |
| DEX-CZ4691 | 417353.200 | 9673901.000 | 357.509 | 15 | -90 | 12 | 1 |
| DEX-CZ4821 | 417201.800 | 9673724.000 | 352.125 | 39 | -90 | 37.14 | 3 |
| DEX-CZ5123 | 416875.900 | 9674700.000 | 423.512 | 27 | -90 | 18.37 | 7 |
| DEX-CZ5124 | 416900.800 | 9674700.000 | 424.182 | 24 | -90 | 19.49 | 5 |
| DEX-CZ5157 | 416926.700 | 9674750.000 | 422.431 | 41 | -90 | 39.19 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5878 | 414619.466 | 9674219.738 | 365.751 | 34 | -90 | 19 | 13.28 |
| DEX-BB5879 | 414648.431 | 9674220.613 | 365.564 | 31 | -90 | 11 | 17.75 |
| DEX-BB5880 | 414679.714 | 9674227.195 | 376.832 | 17 | -90 | 9 | 5.75 |
| DEX-BB5881 | 414706.896 | 9674223.024 | 386.479 | 25 | -90 | 8 | 15 |
| DEX-BB5882 | 414732.340 | 9674223.113 | 396.391 | 24 | -90 | 16 | 6 |
| DEX-BB5883 | 414755.441 | 9674226.586 | 404.623 | 24 | -90 | 17.29 | 6 |
| DEX-BB5884 | 414802.507 | 9674222.010 | 406.335 | 32 | -90 | 4 | 26.3 |
| DEX-BB5885 | 414826.400 | 9674221.197 | 404.325 | 19 | -90 | 3 | 14 |
| DEX-BB5886 | 414852.928 | 9674223.889 | 401.574 | 31 | -90 | 4 | 22 |
| DEX-BB5887 | 414559.574 | 9674203.056 | 374.295 | 8 | -90 | 1 | 5 |
| DEX-BB5888 | 414573.866 | 9674193.060 | 370.549 | 35 | -90 | 20.2 | 12.23 |
| DEX-BB5889 | 414620.952 | 9674192.377 | 363.412 | 44 | -90 | 15 | 27 |
| DEX-BB5890 | 414678.675 | 9674197.749 | 369.372 | 33 | -90 | 15 | 16 |
| DEX-BB5891 | 414732.675 | 9674192.111 | 388.482 | 28 | -90 | 17 | 9 |
| DEX-BB5892 | 414753.317 | 9674191.389 | 390.167 | 26 | -90 | 21.29 | 3 |
| DEX-BB5893 | 414774.342 | 9674191.269 | 391.204 | 24 | -90 | 13 | 9 |
| DEX-BB5894 | 414794.033 | 9674192.751 | 392.906 | 26 | -90 | 16 | 8 |
| DEX-BB5895 | 414851.937 | 9674186.961 | 391.156 | 21 | -90 | 16.28 | 2.75 |
| DEX-BB5897 | 414577.557 | 9674168.206 | 372.137 | 28 | -90 | 22.24 | 4 |
| DEX-BB5898 | 414593.502 | 9674157.368 | 367.603 | 45 | -90 | 32 | 11 |
| DEX-BB5899 | 414624.071 | 9674164.833 | 362.118 | 39 | -90 | 19.22 | 11 |
| DEX-BB5900 | 414653.205 | 9674170.902 | 361.904 | 27 | -90 | 14 | 10.5 |
| DEX-BB5901 | 414682.592 | 9674173.425 | 367.831 | 16 | -90 | 8 | 6 |
| DEX-BB5902 | 414703.832 | 9674169.462 | 374.553 | 26 | -90 | 10 | 13.85 |
| DEX-BB5903 | 414725.078 | 9674167.082 | 378.772 | 32 | -90 | 22.68 | 8.29 |
| DEX-BB5904 | 414751.036 | 9674166.068 | 378.362 | 34 | -90 | 21.63 | 11 |
| DEX-BB5905 | 414771.146 | 9674169.728 | 379.824 | 26 | -90 | 16 | 8 |
| DEX-BB5906 | 414800.455 | 9674169.186 | 381.243 | 28 | -90 | 18.48 | 8 |
| DEX-BB5907 | 414822.585 | 9674171.602 | 382.532 | 34 | -90 | 27.29 | 5 |
| DEX-BB5910 | 414604.752 | 9674141.195 | 365.215 | 48 | -90 | 40 | 2.92 |
| DEX-BB5911 | 414651.046 | 9674147.860 | 360.785 | 28 | -90 | 17 | 8.5 |
| DEX-BB5912 | 414676.824 | 9674144.449 | 360.675 | 28 | -90 | 14 | 12 |
| DEX-BB5913 | 414697.779 | 9674150.968 | 367.361 | 17 | -90 | 12 | 3 |
| DEX-BB5914 | 414753.708 | 9674149.929 | 372.016 | 34 | -90 | 23.73 | 8.85 |
| DEX-BB5916 | 414575.039 | 9674125.104 | 375.822 | 17 | -90 | 2 | 13 |
| DEX-BB5917 | 414593.870 | 9674116.138 | 368.556 | 20 | -90 | 5 | 13 |
| DEX-BB5918 | 414622.845 | 9674118.875 | 360.883 | 47 | -90 | 31 | 13.8 |
| DEX-BB5919 | 414651.420 | 9674114.987 | 358.742 | 40 | -90 | 37 | 1 |
| DEX-BB5920 | 414679.742 | 9674115.184 | 358.565 | 33 | -90 | 21.32 | 10 |
| DEX-BB5921 | 414700.884 | 9674121.962 | 359.371 | 31 | -90 | 15 | 14 |
| DEX-BB5922 | 414720.154 | 9674120.296 | 360.875 | 31 | -90 | 11 | 18 |
| DEX-BB5923 | 414556.734 | 9674096.388 | 383.831 | 8 | -90 | 2 | 4 |
| DEX-BB5924 | 414571.527 | 9674105.935 | 377.016 | 24 | -90 | 3.3 | 18.7 |
| DEX-BB5925 | 414650.600 | 9674093.426 | 357.518 | 31 | -90 | 26.65 | 2.9 |
| DEX-BB5926 | 414669.739 | 9674093.341 | 357.138 | 36 | -90 | 28 | 6 |
| DEX-BB5927 | 414553.061 | 9674066.348 | 392.373 | 12 | -90 | 4 | 6 |
| DEX-BB5928 | 414572.489 | 9674072.849 | 384.230 | 6 | -90 | 2 | 2 |
| DEX-BB5929 | 414599.989 | 9674073.251 | 373.345 | 27 | -90 | 7 | 18 |
| DEX-BB5930 | 414625.502 | 9674064.438 | 363.870 | 39 | -90 | 23.27 | 13.85 |
| DEX-BB5931 | 414653.643 | 9674069.578 | 357.439 | 34 | -90 | 28.68 | 4 |
| DEX-BB5932 | 414675.590 | 9674070.976 | 355.795 | 39 | -90 | 21 | 16 |
| DEX-BB5933 | 414564.137 | 9674050.754 | 389.406 | 11 | -90 | 1 | 8 |
| DEX-BB5934 | 414581.436 | 9674045.857 | 379.428 | 16 | -90 | 3 | 11 |
| DEX-BB5935 | 414598.409 | 9674039.481 | 372.896 | 27 | -90 | 1 | 24 |
| DEX-BB5936 | 414649.572 | 9674041.712 | 359.148 | 34 | -90 | 19.34 | 13 |
| DEX-BB5937 | 414671.052 | 9674043.169 | 356.997 | 48 | -90 | 34 | 12 |
| DEX-BB5938 | 414580.391 | 9674024.347 | 381.184 | 12 | -90 | 4 | 6 |
| DEX-BB5939 | 414605.303 | 9674022.099 | 367.706 | 12 | -90 | 5 | 5 |
| DEX-BB5940 | 414626.903 | 9674013.736 | 364.503 | 26 | -90 | 8 | 16 |
| DEX-BB5941 | 414650.285 | 9674016.021 | 361.285 | 34 | -90 | 13 | 19 |
| DEX-BB5942 | 414673.665 | 9674019.642 | 356.835 | 50 | -90 | 12 | 35.85 |
| DEX-BB5943 | 414630.769 | 9673992.973 | 367.476 | 31 | -90 | 11 | 18 |
| DEX-BB5944 | 414645.239 | 9673997.032 | 364.337 | 23 | -90 | 7 | 12 |
| DEX-BB5945 | 414674.638 | 9673993.473 | 359.136 | 26 | -90 | 7 | 17 |
| DEX-BB5946 | 414651.733 | 9673963.120 | 365.721 | 16 | -90 | 3 | 11 |
| DEX-BB5947 | 414672.916 | 9673967.426 | 360.982 | 24 | -90 | 5 | 17 |
| DEX-BB5948 | 414647.726 | 9673938.276 | 372.000 | 8 | -90 | 1.6 | 4.15 |
| DEX-BB5949 | 414672.575 | 9673944.734 | 364.705 | 21 | -90 | 5 | 14 |
| DEX-BB5950 | 414648.786 | 9673913.716 | 377.373 | 12 | -90 | 1.5 | 8.4 |
| DEX-BB5951 | 414661.871 | 9673901.242 | 376.783 | 12 | -90 | 1 | 8.8 |
| DEX-BB5952 | 414631.133 | 9673864.952 | 398.898 | 25 | -90 | 4 | 18 |
| DEX-BB5953 | 414649.677 | 9673863.581 | 394.401 | 19 | -90 | 3 | 14 |
| DEX-BB5954 | 414124.678 | 9675050.848 | 385.416 | 22 | -90 | 17 | 3 |
| DEX-BB5955 | 414146.860 | 9675048.786 | 385.444 | 33 | -90 | 21 | 10 |
| DEX-BB5956 | 414179.009 | 9675047.144 | 385.000 | 29 | -90 | 22 | 5 |
| DEX-BB5957 | 414199.424 | 9675043.822 | 385.091 | 30 | -90 | 22.65 | 5.35 |
| DEX-BB5958 | 414220.787 | 9675041.255 | 385.769 | 32 | -90 | 22 | 8 |
| DEX-BB5959 | 413997.159 | 9675023.205 | 381.904 | 24 | -90 | 19 | 2.25 |
| DEX-BB5960 | 414025.814 | 9675016.427 | 382.236 | 21 | -90 | 18.85 | 1 |
| DEX-BB5961 | 414073.725 | 9675020.596 | 383.000 | 23 | -90 | 19.86 | 1.55 |
| DEX-BB5962 | 414127.002 | 9675024.021 | 384.000 | 26 | -90 | 20 | 4 |
| DEX-BB5963 | 414185.804 | 9675024.873 | 384.561 | 28 | -90 | 21 | 4.65 |
| DEX-BB5964 | 414226.836 | 9675022.107 | 385.710 | 24 | -90 | 19 | 3 |
| DEX-BB5965 | 414000.492 | 9674994.790 | 382.000 | 23 | -90 | 19.32 | 1.55 |
| DEX-BB5966 | 414024.486 | 9674991.340 | 382.312 | 25 | -90 | 20.32 | 3.3 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5185 | 417230.100 | 9674770.000 | 384.946 | 42 | -90 | 6.47 | 27.32 |
| DEX-CZ5241 | 417002.500 | 9674870.000 | 425.957 | 45 | -90 | 29.12 | 14.42 |
| DEX-CZ5247 | 417204.100 | 9674881.000 | 398.739 | 40 | -90 | 23.17 | 15 |
| DEX-CZ5248 | 417231.700 | 9674874.000 | 396.203 | 25 | -90 | 9 | 14 |
| DEX-CZ5270 | 417155.700 | 9674934.000 | 402.520 | 38 | -90 | 10 | 17 |
| DEX-CZ5290 | 417433.200 | 9673882.000 | 349.160 | 26 | -90 | 23.88 | 3 |
| DEX-CZ5594 | 415696.800 | 9673253.000 | 371.298 | 22 | -90 | 6 | 14 |
| BB_STH-1071 | 414794.814 | 9673781.267 | 370.834 | 13 | -90 | 1 | 10 |
| BB_STH-1088 | 414886.449 | 9673710.612 | 361.150 | 7 | -90 | 4 | 1 |
| BB_STH-1099 | 414614.686 | 9673501.657 | 311.724 | 8 | -90 | 3 | 3 |
| DEX-BB2096 | 415444.564 | 9674560.324 | 431.955 | 26 | -90 | 14.77 | 9 |
| DEX-BB2240 | 415896.311 | 9674847.461 | 404.136 | 22 | -90 | 10 | 5.25 |
| DEX-BB4150 | 416409.585 | 9674397.168 | 392.603 | 19 | -90 | 13.21 | 5 |
| DEX-BB4238 | 416519.091 | 9674445.967 | 396.701 | 32 | -90 | 24.47 | 3 |
| DEX-CZ1100 | 415806.317 | 9673349.819 | 338.969 | 21 | -90 | 8.32 | 13.02 |
| DEX-CZ1101 | 415752.691 | 9673393.457 | 352.139 | 30 | -90 | 21.56 | 3.7 |
| DEX-CZ1104 | 415748.090 | 9673449.882 | 348.309 | 28 | -90 | 22.76 | 7.42 |
| DEX-CZ1105 | 415799.652 | 9673449.927 | 355.829 | 29 | -90 | 17.17 | 13.26 |
| DEX-CZ1110 | 415749.801 | 9673501.538 | 346.000 | 27 | -90 | 20.37 | 7.23 |
| DEX-CZ1111 | 415853.151 | 9673500.541 | 365.922 | 33 | -90 | 25.74 | 9.21 |
| DEX-CZ1116 | 415749.757 | 9673547.146 | 342.164 | 28 | -90 | 27.54 | 5 |
| DEX-CZ1117 | 415797.229 | 9673554.005 | 354.210 | 21 | -90 | 10.52 | 7 |
| DEX-CZ1118 | 415848.290 | 9673549.215 | 369.647 | 14 | -90 | 7.34 | 4 |
| DEX-CZ1119 | 415897.519 | 9673547.580 | 381.756 | 15 | -90 | 2 | 2 |
| DEX-CZ1123 | 415753.816 | 9673602.048 | 342.865 | 9 | -90 | 5.69 | 1 |
| DEX-CZ1124 | 415851.166 | 9673602.200 | 367.511 | 20 | -90 | 2 | 11 |
| DEX-CZ1125 | 416560.509 | 9673606.039 | 326.000 | 11 | -90 | 1 | 3 |
| DEX-CZ1130 | 415744.798 | 9673652.300 | 359.480 | 14 | -90 | 2 | 10 |
| DEX-CZ1132 | 415852.661 | 9673654.619 | 352.327 | 29 | -90 | 4.5 | 13.4 |
| DEX-CZ1133 | 415902.203 | 9673649.853 | 368.926 | 29 | -90 | 8.3 | 8 |
| DEX-CZ1134 | 415950.644 | 9673651.163 | 377.456 | 27 | -90 | 15.21 | 13.29 |
| DEX-CZ1136 | 415751.295 | 9673696.487 | 369.881 | 23 | -90 | 26.31 | 0.42 |
| DEX-CZ1137 | 415852.008 | 9673698.740 | 371.430 | 15 | -90 | 9.34 | 4.3 |
| DEX-CZ1138 | 415951.322 | 9673705.746 | 369.604 | 33 | -90 | 31.04 | 3.45 |
| DEX-CZ1142 | 415752.409 | 9673750.329 | 368.323 | 34 | -90 | 6.21 | 25.48 |
| DEX-CZ1143 | 415809.070 | 9673746.788 | 375.638 | 18 | -90 | 15.3 | 5 |
| DEX-CZ1144 | 415854.703 | 9673751.754 | 379.787 | 20 | -90 | 4 | 13.45 |
| DEX-CZ1145 | 415897.244 | 9673750.992 | 373.613 | 23 | -90 | 15.24 | 8 |
| DEX-CZ1146 | 415949.731 | 9673746.573 | 363.000 | 23 | -90 | 13.3 | 9 |
| DEX-CZ1147 | 416005.783 | 9673750.119 | 370.676 | 23 | -90 | 22.07 | 0.7 |
| DEX-CZ1150 | 415755.285 | 9673793.978 | 364.560 | 8 | -90 | 4 | 2 |
| DEX-CZ1151 | 415853.224 | 9673798.457 | 374.389 | 16 | -90 | 10.19 | 3.61 |
| DEX-CZ1152 | 415964.426 | 9673800.896 | 383.649 | 20 | -90 | 20.45 | 0 |
| DEX-CZ1155 | 415753.251 | 9673844.155 | 385.488 | 6 | -90 | 1 | 1 |
| DEX-CZ1156 | 415794.266 | 9673839.039 | 385.083 | 8 | -90 | 4 | 0 |
| DEX-CZ1157 | 415849.550 | 9673849.010 | 387.614 | 20 | -90 | 7.41 | 10 |
| DEX-CZ1158 | 415898.224 | 9673847.902 | 383.236 | 16 | -90 | 6 | 7 |
| DEX-CZ1159 | 415745.670 | 9673895.039 | 379.191 | 21 | -90 | 4 | 13 |
| DEX-CZ1170 | 415856.680 | 9674196.525 | 382.044 | 24 | -90 | 4.42 | 4.22 |
| DEX-CZ1171 | 415904.446 | 9674200.112 | 395.481 | 23 | -90 | 9.89 | 9 |
| DEX-CZ1173 | 415855.525 | 9674249.511 | 392.352 | 23 | -90 | 16.32 | 5 |
| DEX-CZ1174 | 415901.138 | 9674256.349 | 410.076 | 21 | -90 | 17.45 | 3.13 |
| DEX-CZ1175 | 415854.556 | 9674309.086 | 404.839 | 38 | -90 | 19.03 | 20.71 |
| DEX-CZ1178 | 415852.327 | 9674351.084 | 412.000 | 30 | -90 | 19 | 8 |
| DEX-CZ1179 | 415895.737 | 9674350.144 | 415.000 | 29 | -90 | 21.76 | 7 |
| DEX-CZ1182 | 415844.639 | 9674398.239 | 411.918 | 33 | -90 | 13 | 6 |
| DEX-CZ1185 | 415801.804 | 9674455.526 | 403.007 | 23 | -90 | 17.72 | 6.25 |
| DEX-CZ1186 | 415854.137 | 9674443.896 | 412.395 | 38 | -90 | 19.11 | 17.9 |
| DEX-CZ1187 | 415895.728 | 9674458.015 | 416.114 | 31 | -90 | 20.49 | 9 |
| DEX-CZ1191 | 415750.992 | 9674498.204 | 379.976 | 37 | -90 | 16.08 | 14 |
| DEX-CZ1195 | 415806.752 | 9674549.564 | 393.215 | 17 | -90 | 10.98 | 3 |
| DEX-CZ1198 | 415950.749 | 9674548.095 | 424.130 | 16 | -90 | 12 | 1 |
| DEX-CZ1201 | 415852.060 | 9674594.838 | 412.343 | 20 | -90 | 16.01 | 2.61 |
| DEX-CZ1202 | 415947.622 | 9674596.393 | 420.518 | 27 | -90 | 15 | 10 |
| DEX-CZ1205 | 415751.582 | 9674650.199 | 382.814 | 27 | -90 | 9.77 | 14 |
| DEX-CZ1206 | 415806.322 | 9674654.532 | 406.482 | 19 | -90 | 4.3 | 5 |
| DEX-CZ1207 | 415848.096 | 9674650.533 | 415.624 | 28 | -90 | 6.59 | 11.51 |
| DEX-CZ1208 | 415898.050 | 9674650.122 | 414.390 | 31 | -90 | 25.65 | 3 |
| DEX-CZ1209 | 415948.169 | 9674649.252 | 414.852 | 28 | -90 | 18.6 | 10.49 |
| DEX-CZ1215 | 415754.794 | 9674696.124 | 399.025 | 21 | -90 | 10.22 | 9.48 |
| DEX-CZ1216 | 415854.014 | 9674702.153 | 411.237 | 25 | -90 | 16.57 | 8 |
| DEX-CZ1217 | 415960.388 | 9674702.919 | 409.771 | 27 | -90 | 13.07 | 13 |
| DEX-CZ1219 | 415754.380 | 9674750.936 | 389.115 | 20 | -90 | 7.5 | 3 |
| DEX-CZ1220 | 415801.351 | 9674747.581 | 393.762 | 15 | -90 | 10.99 | 2 |
| DEX-CZ1221 | 415848.622 | 9674742.897 | 403.969 | 30 | -90 | 20.82 | 10 |
| DEX-CZ1222 | 415898.556 | 9674744.063 | 401.208 | 49 | -90 | 18.26 | 18 |
| DEX-CZ1223 | 415947.440 | 9674747.309 | 398.684 | 24 | -90 | 17.35 | 4.65 |
| DEX-CZ1224 | 416002.790 | 9674746.791 | 398.590 | 16 | -90 | 9.83 | 2 |
| DEX-CZ1276 | 415741.842 | 9673936.086 | 353.883 | 31 | -90 | 3 | 17 |
| DEX-CZ1285 | 415748.538 | 9673995.698 | 365.842 | 14 | -90 | 7.53 | 4.23 |
| DEX-CZ1298 | 415744.119 | 9674049.318 | 389.475 | 43 | -90 | 18.91 | 27.3 |
| DEX-CZ1362 | 415597.783 | 9674549.278 | 410.117 | 19 | -90 | 13.99 | 3 |
| DEX-CZ1363 | 415654.347 | 9674547.474 | 411.000 | 33 | -90 | 20.7 | 12.86 |
| DEX-CZ1364 | 415696.194 | 9674557.774 | 404.270 | 35 | -90 | 12.23 | 16 |
| DEX-CZ1365 | 415739.706 | 9674554.873 | 387.528 | 23 | -90 | 12.7 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB5967 | 414051.915 | 9674996.100 | 382.738 | 22 | -90 | 18 | 2 |
| DEX-BB5968 | 414070.414 | 9675001.701 | 383.000 | 27 | -90 | 21 | 4 |
| DEX-BB5969 | 414101.071 | 9675000.172 | 383.468 | 25 | -90 | 20 | 3 |
| DEX-BB5970 | 414123.902 | 9674995.978 | 383.818 | 26 | -90 | 17 | 6.9 |
| DEX-BB5971 | 414152.329 | 9674999.002 | 384.000 | 32 | -90 | 23 | 7 |
| DEX-BB5972 | 414175.106 | 9675002.437 | 384.298 | 35 | -90 | 21 | 14 |
| DEX-BB5973 | 414200.958 | 9675004.012 | 385.000 | 27 | -90 | 21 | 4 |
| DEX-BB5974 | 414222.284 | 9675003.402 | 385.552 | 22 | -90 | 18 | 2 |
| DEX-BB5975 | 413999.651 | 9674971.710 | 382.009 | 25 | -90 | 19.24 | 3.33 |
| DEX-BB5976 | 414022.608 | 9674966.206 | 382.320 | 25 | -90 | 19.32 | 4.3 |
| DEX-BB5977 | 414079.377 | 9674972.043 | 383.111 | 29 | -90 | 18 | 9 |
| DEX-BB5978 | 414103.949 | 9674972.021 | 383.448 | 30 | -90 | 18 | 9 |
| DEX-BB5979 | 414129.029 | 9674968.206 | 383.681 | 24 | -90 | 18 | 4 |
| DEX-BB5980 | 414179.644 | 9674977.128 | 384.000 | 20 | -90 | 17 | 1 |
| DEX-BB5981 | 414077.345 | 9674953.464 | 383.000 | 19 | -90 | 13 | 4 |
| DEX-BB5982 | 414099.065 | 9674947.097 | 383.216 | 16 | -90 | 12 | 2 |
| DEX-BB5983 | 414126.523 | 9674945.105 | 383.594 | 37 | -90 | 15 | 19 |
| DEX-BB5984 | 414158.907 | 9674945.956 | 384.000 | 30 | -90 | 16 | 12 |
| DEX-BB5985 | 414175.585 | 9674945.149 | 384.000 | 17 | -90 | 12 | 4 |
| DEX-BB5986 | 414198.481 | 9674956.877 | 384.000 | 19 | -90 | 11 | 8 |
| DEX-BB5987 | 413900.781 | 9674923.042 | 380.558 | 24 | -90 | 18 | 4 |
| DEX-BB5988 | 413923.774 | 9674927.446 | 381.000 | 27 | -90 | 20 | 5 |
| DEX-BB5989 | 413948.506 | 9674917.688 | 381.071 | 23 | -90 | 14 | 5.85 |
| DEX-BB5990 | 413968.767 | 9674918.059 | 381.560 | 18 | -90 | 13 | 2.6 |
| DEX-BB5991 | 413996.235 | 9674919.544 | 382.202 | 13 | -90 | 9.8 | 0.55 |
| DEX-BB5992 | 414025.949 | 9674919.569 | 382.765 | 11 | -90 | 4.8 | 4 |
| DEX-BB5993 | 414074.187 | 9674925.365 | 383.352 | 12 | -90 | 8 | 2 |
| DEX-BB5994 | 414108.331 | 9674916.798 | 383.842 | 14 | -90 | 8 | 6 |
| DEX-BB5995 | 414123.584 | 9674922.523 | 383.765 | 14 | -90 | 12 | 1 |
| DEX-BB5996 | 414179.439 | 9674921.126 | 384.818 | 16 | -90 | 7 | 8 |
| DEX-BB5997 | 414227.092 | 9674915.983 | 387.708 | 15 | -90 | 5 | 8 |
| DEX-BB5998 | 414276.329 | 9674918.022 | 388.619 | 17 | -90 | 9 | 5.84 |
| DEX-BB5999 | 414299.364 | 9674919.378 | 389.464 | 16 | -90 | 11 | 3 |
| DEX-BB6000 | 413919.952 | 9674905.716 | 381.000 | 30 | -90 | 15 | 13 |
| DEX-BB6001 | 413950.486 | 9674896.539 | 381.167 | 23 | -90 | 12 | 7.85 |
| DEX-BB6002 | 413976.005 | 9674898.324 | 382.034 | 16 | -90 | 9 | 5 |
| DEX-BB6003 | 413998.652 | 9674904.584 | 382.463 | 14 | -90 | 4 | 8 |
| DEX-BB6004 | 414030.595 | 9674897.762 | 385.272 | 11 | -90 | 5 | 3 |
| DEX-BB6005 | 414049.507 | 9674895.419 | 386.541 | 9 | -90 | 5 | 2 |
| DEX-BB6006 | 414077.861 | 9674897.562 | 386.636 | 17 | -90 | 7 | 8 |
| DEX-BB6007 | 414104.343 | 9674898.506 | 385.987 | 10 | -90 | 5 | 4 |
| DEX-BB6008 | 414126.931 | 9674896.174 | 384.989 | 8 | -90 | 5 | 3 |
| DEX-BB6009 | 414152.629 | 9674895.893 | 384.342 | 21 | -90 | 16 | 3 |
| DEX-BB6010 | 414174.482 | 9674890.741 | 385.283 | 21 | -90 | 17 | 1 |
| DEX-BB6011 | 414196.414 | 9674906.348 | 386.298 | 22 | -90 | 12 | 8.22 |
| DEX-BB6012 | 414229.093 | 9674895.791 | 390.847 | 16 | -90 | 5 | 9 |
| DEX-BB6013 | 414248.258 | 9674891.887 | 394.764 | 10 | -90 | 2 | 6 |
| DEX-BB6014 | 414276.299 | 9674895.534 | 391.613 | 10 | -90 | 5 | 3 |
| DEX-BB6015 | 413847.676 | 9674868.848 | 384.932 | 20 | -90 | 9 | 7.85 |
| DEX-BB6016 | 413877.368 | 9674869.785 | 381.301 | 32 | -90 | 13 | 17 |
| DEX-BB6017 | 413899.295 | 9674868.989 | 381.000 | 30 | -90 | 14 | 13.65 |
| DEX-BB6018 | 413930.145 | 9674870.538 | 381.627 | 22 | -90 | 10 | 9.85 |
| DEX-BB6019 | 413952.125 | 9674872.551 | 381.964 | 20 | -90 | 8 | 9.8 |
| DEX-BB6020 | 413978.331 | 9674869.189 | 384.267 | 17 | -90 | 7 | 8 |
| DEX-BB6021 | 413999.731 | 9674875.587 | 385.818 | 20 | -90 | 5 | 12.81 |
| DEX-BB6022 | 414025.457 | 9674867.507 | 392.461 | 13 | -90 | 2 | 8 |
| DEX-BB6023 | 414050.550 | 9674873.211 | 393.813 | 6 | -90 | 2 | 2 |
| DEX-BB6024 | 414074.954 | 9674872.454 | 392.359 | 10 | -90 | 1 | 5.05 |
| DEX-BB6025 | 414151.946 | 9674872.140 | 386.559 | 21 | -90 | 12 | 6.85 |
| DEX-BB6026 | 414176.021 | 9674867.341 | 386.920 | 31 | -90 | 24 | 4.65 |
| DEX-BB6027 | 414205.703 | 9674874.373 | 390.872 | 28 | -90 | 15.15 | 11.23 |
| DEX-BB6028 | 414223.033 | 9674871.298 | 394.308 | 16 | -90 | 7 | 7 |
| DEX-BB6029 | 414247.162 | 9674872.337 | 398.521 | 9 | -90 | 1 | 6 |
| DEX-BB6030 | 413900.956 | 9674842.969 | 382.110 | 31 | -90 | 16 | 13 |
| DEX-BB6031 | 413952.278 | 9674845.866 | 383.876 | 16 | -90 | 4 | 9.9 |
| DEX-BB6032 | 413979.975 | 9674844.777 | 387.629 | 18 | -90 | 5 | 10.35 |
| DEX-BB6033 | 413999.864 | 9674845.679 | 389.203 | 11 | -90 | 1 | 7.4 |
| DEX-BB6034 | 414018.950 | 9674843.979 | 393.520 | 8 | -90 | 1 | 4 |
| DEX-BB6035 | 414050.541 | 9674847.829 | 401.712 | 6 | -90 | 1 | 2.15 |
| DEX-BB6036 | 414075.504 | 9674841.209 | 402.645 | 5 | -90 | 1 | 1 |
| DEX-BB6037 | 414095.935 | 9674840.531 | 401.397 | 9 | -90 | 1 | 5.5 |
| DEX-BB6038 | 414125.501 | 9674853.488 | 391.753 | 14 | -90 | 4 | 7.85 |
| DEX-BB6039 | 414150.474 | 9674844.383 | 390.608 | 12 | -90 | 8 | 2 |
| DEX-BB6040 | 414171.691 | 9674842.864 | 389.331 | 25 | -90 | 20 | 3 |
| DEX-BB6041 | 414203.516 | 9674853.618 | 393.189 | 31 | -90 | 15.2 | 14 |
| DEX-BB6042 | 414224.249 | 9674845.310 | 398.586 | 22 | -90 | 9 | 11 |
| DEX-BB6043 | 414243.013 | 9674847.344 | 401.626 | 15 | -90 | 4 | 9 |
| DEX-BB6044 | 413878.242 | 9674823.594 | 387.093 | 13 | -90 | 10 | 1 |
| DEX-BB6045 | 413899.465 | 9674818.507 | 384.683 | 27 | -90 | 15 | 9.85 |
| DEX-BB6046 | 413923.960 | 9674817.042 | 383.533 | 26 | -90 | 12 | 12 |
| DEX-BB6047 | 413946.149 | 9674825.830 | 383.804 | 26 | -90 | 8 | 15.9 |
| DEX-BB6048 | 413979.559 | 9674821.591 | 388.480 | 10 | -90 | 2 | 5.57 |
| DEX-BB6049 | 414002.892 | 9674824.436 | 391.298 | 19 | -90 | 11 | 6 |
| DEX-BB6050 | 414024.542 | 9674818.109 | 392.580 | 17 | -90 | 7 | 7.85 |
| DEX-BB6051 | 414044.774 | 9674823.551 | 395.216 | 15 | -90 | 7 | 5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1369 | 415550.644 | 9674602.401 | 420.771 | 21 | -90 | 15.98 | 4.62 |
| DEX-CZ1370 | 415649.266 | 9674587.316 | 406.397 | 29 | -90 | 20.21 | 9 |
| DEX-CZ1371 | 415736.246 | 9674602.408 | 395.767 | 24 | -90 | 9.96 | 1.71 |
| DEX-CZ1384 | 415503.616 | 9674651.305 | 416.077 | 39 | -90 | 32.76 | 6.85 |
| DEX-CZ1385 | 415546.871 | 9674648.132 | 423.000 | 27 | -90 | 16.9 | 11.52 |
| DEX-CZ1386 | 415598.670 | 9674651.918 | 419.517 | 23 | -90 | 13.17 | 8.69 |
| DEX-CZ1387 | 415656.551 | 9674650.158 | 404.358 | 45 | -90 | 15.93 | 20.51 |
| DEX-CZ1388 | 415693.227 | 9674654.893 | 393.236 | 27 | -90 | 18 | 3 |
| DEX-CZ1395 | 415551.095 | 9674696.840 | 420.956 | 43 | -90 | 41.4 | 4.44 |
| DEX-CZ1396 | 415656.882 | 9674699.325 | 403.072 | 42 | -90 | 6.36 | 22.33 |
| DEX-CZ1413 | 415600.170 | 9674750.917 | 414.758 | 36 | -90 | 24.65 | 13.21 |
| DEX-CZ1414 | 415649.296 | 9674747.476 | 410.000 | 24 | -90 | 17.52 | 5.72 |
| DEX-CZ1415 | 415700.744 | 9674750.679 | 397.926 | 11 | -90 | 3.38 | 5.63 |
| DEX-CZ1497 | 416781.896 | 9673705.571 | 343.996 | 15 | -90 | 8.31 | 8 |
| DEX-CZ1498 | 416821.235 | 9673704.334 | 340.808 | 29 | -90 | 13.93 | 13 |
| DEX-CZ1499 | 416875.541 | 9673705.639 | 342.589 | 13 | -90 | 6 | 4.45 |
| DEX-CZ1500 | 416917.463 | 9673707.493 | 348.240 | 36 | -90 | 20.76 | 13 |
| DEX-CZ1501 | 416918.566 | 9673726.647 | 348.146 | 34 | -90 | 8 | 21.36 |
| DEX-CZ1502 | 416896.091 | 9673730.284 | 347.562 | 15 | -90 | 8.22 | 4.9 |
| DEX-CZ1503 | 416876.074 | 9673725.274 | 346.674 | 23 | -90 | 8.91 | 15.41 |
| DEX-CZ1504 | 416848.242 | 9673722.624 | 344.765 | 21 | -90 | 12.45 | 9 |
| DEX-CZ1505 | 416820.889 | 9673722.801 | 344.379 | 29 | -90 | 10.15 | 19 |
| DEX-CZ1511 | 416870.625 | 9673751.357 | 349.145 | 40 | -90 | 12.16 | 20.27 |
| DEX-CZ1512 | 416920.467 | 9673749.912 | 349.799 | 52 | -90 | 31.77 | 7 |
| DEX-CZ1513 | 416916.241 | 9673775.676 | 357.621 | 21 | -90 | 19.19 | 5 |
| DEX-CZ1514 | 416899.503 | 9673776.415 | 359.122 | 17 | -90 | 17.03 | 1 |
| DEX-CZ1515 | 416875.173 | 9673772.567 | 352.506 | 36 | -90 | 17.19 | 21 |
| DEX-CZ1516 | 416849.626 | 9673774.739 | 358.522 | 38 | -90 | 18.17 | 17 |
| DEX-CZ1523 | 416874.479 | 9673804.734 | 358.000 | 22 | -90 | 17 | 3 |
| DEX-CZ1524 | 416922.934 | 9673803.091 | 363.351 | 38 | -90 | 20.62 | 2 |
| DEX-CZ1525 | 416904.350 | 9673824.592 | 367.322 | 43 | -90 | 18.72 | 10 |
| DEX-CZ1526 | 416875.681 | 9673824.351 | 362.284 | 32 | -90 | 22.66 | 8 |
| DEX-CZ1527 | 416848.418 | 9673817.465 | 367.155 | 42 | -90 | 24.5 | 14 |
| DEX-CZ1534 | 416872.861 | 9673852.693 | 370.904 | 18 | -90 | 12.01 | 6 |
| DEX-CZ1536 | 416851.676 | 9673872.569 | 370.453 | 31 | -90 | 10.52 | 4 |
| DEX-CZ1537 | 416828.223 | 9673871.251 | 368.796 | 20 | -90 | 18.27 | 3 |
| DEX-CZ1538 | 416777.590 | 9673871.913 | 360.942 | 12 | -90 | 5 | 4 |
| DEX-CZ1539 | 416797.102 | 9673874.167 | 361.430 | 12 | -90 | 9.96 | 1 |
| DEX-CZ1540 | 416758.726 | 9673874.073 | 358.980 | 12 | -90 | 8.96 | 2 |
| DEX-CZ1541 | 416775.898 | 9673902.424 | 368.338 | 30 | -90 | 23.93 | 5 |
| DEX-CZ1542 | 416829.726 | 9673906.316 | 373.602 | 38 | -90 | 23.9 | 18.73 |
| DEX-CZ1543 | 416870.121 | 9673904.743 | 376.037 | 23 | -90 | 22.66 | 3 |
| DEX-CZ1544 | 416871.902 | 9673924.339 | 379.970 | 25 | -90 | 20.76 | 7.38 |
| DEX-CZ1545 | 416848.419 | 9673922.207 | 377.490 | 24 | -90 | 20.75 | 3 |
| DEX-CZ1546 | 416824.780 | 9673920.918 | 375.536 | 23 | -90 | 13.67 | 9 |
| DEX-CZ1547 | 416809.480 | 9673921.004 | 373.550 | 32 | -90 | 16.07 | 17 |
| DEX-CZ1548 | 416782.335 | 9673924.316 | 370.528 | 30 | -90 | 19.95 | 14.22 |
| DEX-CZ1550 | 416720.215 | 9673930.507 | 353.860 | 17 | -90 | 17.66 | 0 |
| DEX-CZ1551 | 416706.210 | 9673930.707 | 350.552 | 12 | -90 | 10.09 | 1 |
| DEX-CZ1552 | 416726.989 | 9673954.854 | 362.945 | 10 | -90 | 5 | 1.5 |
| DEX-CZ1553 | 416773.020 | 9673952.221 | 373.663 | 35 | -90 | 27.53 | 13 |
| DEX-CZ1554 | 416826.688 | 9673948.194 | 380.759 | 22 | -90 | 24.08 | 1 |
| DEX-CZ1557 | 416845.105 | 9673966.554 | 385.729 | 22 | -90 | 16.45 | 7 |
| DEX-CZ1558 | 416821.019 | 9673973.651 | 381.628 | 24 | -90 | 22.28 | 4 |
| DEX-CZ1559 | 416802.219 | 9673974.695 | 381.733 | 22 | -90 | 16.09 | 6 |
| DEX-CZ1560 | 416775.788 | 9673974.593 | 380.000 | 30 | -90 | 15.51 | 16.19 |
| DEX-CZ1561 | 416755.676 | 9673970.332 | 375.815 | 17 | -90 | 15.36 | 4 |
| DEX-CZ1562 | 416734.892 | 9673977.615 | 372.071 | 8 | -90 | 5 | 0 |
| DEX-CZ1563 | 416702.835 | 9673987.283 | 368.996 | 19 | -90 | 11 | 6 |
| DEX-CZ1564 | 416738.590 | 9674000.648 | 376.914 | 20 | -90 | 14.18 | 5 |
| DEX-CZ1565 | 416777.664 | 9673999.351 | 383.763 | 22 | -90 | 13.84 | 8 |
| DEX-CZ1566 | 416818.038 | 9674005.466 | 387.266 | 31 | -90 | 17.92 | 10.12 |
| DEX-CZ1569 | 416076.398 | 9673553.465 | 381.432 | 14 | -90 | 3 | 8 |
| DEX-CZ1570 | 416121.002 | 9673546.048 | 378.810 | 30 | -90 | 10 | 14 |
| DEX-CZ1571 | 416175.797 | 9673547.174 | 374.890 | 12 | -90 | 8 | 4 |
| DEX-CZ1572 | 416225.087 | 9673551.047 | 357.784 | 10 | -90 | 5 | 1 |
| DEX-CZ1573 | 416268.092 | 9673557.884 | 371.640 | 16 | -90 | 10 | 4 |
| DEX-CZ1574 | 416319.838 | 9673553.342 | 370.123 | 11 | -90 | 8.14 | 1 |
| DEX-CZ1575 | 416370.682 | 9673551.504 | 357.440 | 9 | -90 | 4 | 2 |
| DEX-CZ1576 | 416430.212 | 9673551.697 | 345.772 | 18 | -90 | 4 | 6 |
| DEX-CZ1577 | 416474.796 | 9673555.467 | 358.761 | 6 | -90 | 2 | 0 |
| DEX-CZ1578 | 416050.354 | 9673573.784 | 382.000 | 29 | -90 | 8 | 19 |
| DEX-CZ1579 | 416072.442 | 9673572.250 | 382.000 | 24 | -90 | 6 | 15 |
| DEX-CZ1580 | 416095.234 | 9673573.908 | 381.820 | 31 | -90 | 18 | 13 |
| DEX-CZ1581 | 416118.993 | 9673571.794 | 381.000 | 32 | -90 | 22 | 7 |
| DEX-CZ1582 | 416149.015 | 9673574.265 | 381.587 | 12 | -90 | 6 | 4.74 |
| DEX-CZ1583 | 416175.020 | 9673570.684 | 376.790 | 19 | -90 | 5 | 3 |
| DEX-CZ1584 | 416193.095 | 9673575.890 | 371.670 | 22 | -90 | 6 | 14 |
| DEX-CZ1585 | 416231.102 | 9673577.748 | 366.592 | 21 | -90 | 5 | 14 |
| DEX-CZ1586 | 416249.812 | 9673575.899 | 371.931 | 26 | -90 | 4 | 18 |
| DEX-CZ1587 | 416275.984 | 9673574.880 | 373.786 | 7 | -90 | 5 | 0 |
| DEX-CZ1588 | 416297.686 | 9673576.741 | 373.653 | 16 | -90 | 5.26 | 6 |
| DEX-CZ1589 | 416326.213 | 9673575.979 | 369.756 | 23 | -90 | 5.46 | 10.65 |
| DEX-CZ1590 | 416344.398 | 9673575.610 | 365.716 | 13 | -90 | 10.74 | 0 |
| DEX-CZ1591 | 416370.940 | 9673577.398 | 357.722 | 17 | -90 | 8.35 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6052 | 414081.533 | 9674822.615 | 399.988 | 8 | -90 | 3 | 3 |
| DEX-BB6053 | 414104.386 | 9674825.321 | 400.000 | 10 | -90 | 5 | 2.7 |
| DEX-BB6054 | 414127.399 | 9674819.608 | 397.368 | 18 | -90 | 4 | 10.88 |
| DEX-BB6055 | 414147.507 | 9674821.165 | 395.178 | 20 | -90 | 15 | 4 |
| DEX-BB6056 | 414179.016 | 9674825.221 | 391.558 | 33 | -90 | 17.21 | 14.31 |
| DEX-BB6057 | 414204.763 | 9674825.776 | 396.796 | 28 | -90 | 21.43 | 5 |
| DEX-BB6058 | 414227.349 | 9674818.529 | 402.721 | 16 | -90 | 13 | 1 |
| DEX-BB6059 | 413951.400 | 9674797.000 | 384.000 | 28 | -90 | 14 | 12 |
| DEX-BB6060 | 413976.005 | 9674796.299 | 385.050 | 24 | -90 | 6 | 15.85 |
| DEX-BB6061 | 413999.282 | 9674806.072 | 389.437 | 19 | -90 | 9 | 7.7 |
| DEX-BB6062 | 414020.570 | 9674800.704 | 389.813 | 22 | -90 | 10 | 8.85 |
| DEX-BB6063 | 414051.422 | 9674789.313 | 389.763 | 25 | -90 | 8 | 13.55 |
| DEX-BB6064 | 414078.501 | 9674798.145 | 393.859 | 13 | -90 | 4 | 8 |
| DEX-BB6065 | 414096.676 | 9674795.307 | 397.604 | 14 | -90 | 3 | 8.85 |
| DEX-BB6066 | 414124.962 | 9674799.683 | 400.107 | 9 | -90 | 1 | 5.5 |
| DEX-BB6067 | 414149.916 | 9674793.034 | 399.236 | 21 | -90 | 10 | 8.83 |
| DEX-BB6068 | 414178.389 | 9674797.171 | 395.039 | 27 | -90 | 17.24 | 8.2 |
| DEX-BB6069 | 414207.238 | 9674793.011 | 398.556 | 20 | -90 | 14.21 | 3.3 |
| DEX-BB6070 | 414223.238 | 9674798.020 | 402.126 | 18 | -90 | 13 | 2 |
| DEX-BB6078 | 414073.997 | 9674773.130 | 389.798 | 25 | -90 | 7 | 14.91 |
| DEX-BB6079 | 414095.225 | 9674767.099 | 391.460 | 15 | -90 | 7 | 5 |
| DEX-BB6080 | 414123.511 | 9674767.722 | 395.521 | 9 | -90 | 3 | 2.9 |
| DEX-BB6081 | 414156.086 | 9674768.832 | 399.000 | 19 | -90 | 10 | 7.19 |
| DEX-BB6082 | 414174.255 | 9674769.298 | 398.050 | 17 | -90 | 14 | 1 |
| DEX-BB6083 | 414200.618 | 9674770.566 | 397.411 | 27 | -90 | 13.22 | 12 |
| DEX-BB6084 | 414227.474 | 9674771.231 | 402.696 | 23 | -90 | 16 | 5.18 |
| DEX-BB6087 | 414099.408 | 9674741.186 | 391.565 | 30 | -90 | 11 | 16.62 |
| DEX-BB6088 | 414134.853 | 9674741.172 | 393.522 | 12 | -90 | 3 | 6.46 |
| DEX-BB6089 | 414154.601 | 9674740.845 | 394.728 | 11 | -90 | 6 | 2.6 |
| DEX-BB6090 | 414177.996 | 9674743.207 | 396.601 | 12 | -90 | 8 | 2 |
| DEX-BB6091 | 414202.683 | 9674744.901 | 397.070 | 26 | -90 | 22.25 | 2 |
| DEX-BB6095 | 414099.173 | 9674711.667 | 394.672 | 42 | -90 | 15 | 24.25 |
| DEX-BB6096 | 414127.076 | 9674714.284 | 394.303 | 26 | -90 | 14 | 8.71 |
| DEX-BB6097 | 414150.574 | 9674718.058 | 394.158 | 28 | -90 | 20.45 | 6 |
| DEX-BB6098 | 414174.233 | 9674715.192 | 395.465 | 21 | -90 | 13 | 5.3 |
| DEX-BB6099 | 414200.762 | 9674718.249 | 396.674 | 20 | -90 | 17.26 | 1 |
| DEX-BB6101 | 414095.816 | 9674687.703 | 397.967 | 27 | -90 | 11 | 13 |
| DEX-BB6102 | 414206.895 | 9673957.039 | 325.970 | 13 | -90 | 5 | 6 |
| DEX-BB6103 | 414258.837 | 9673955.343 | 339.476 | 12 | -90 | 2 | 8 |
| DEX-BB6104 | 414152.101 | 9673943.739 | 309.179 | 11 | -90 | 2 | 7 |
| DEX-BB6105 | 414178.434 | 9673931.827 | 314.821 | 24 | -90 | 13 | 9 |
| DEX-BB6106 | 414209.618 | 9673935.615 | 324.363 | 21 | -90 | 8 | 9 |
| DEX-BB6107 | 414231.488 | 9673934.227 | 328.926 | 17 | -90 | 12 | 3 |
| DEX-BB6108 | 414255.458 | 9673933.459 | 334.260 | 19 | -90 | 9 | 7 |
| DEX-BB6109 | 414281.954 | 9673936.547 | 341.802 | 14 | -90 | 11 | 1 |
| DEX-BB6110 | 414308.980 | 9673937.216 | 345.128 | 9 | -90 | 5 | 2 |
| DEX-BB6111 | 414162.318 | 9673914.415 | 306.671 | 16 | -90 | 8 | 8 |
| DEX-BB6111R | 414166.191 | 9673917.840 | 308.701 | 18 | -90 | 6 | 10 |
| DEX-BB6112 | 414254.151 | 9673911.436 | 328.144 | 16 | -90 | 9 | 5 |
| DEX-BB6113 | 414150.199 | 9673887.788 | 301.474 | 11 | -90 | 6 | 2.9 |
| DEX-BB6114 | 414179.730 | 9673887.556 | 304.271 | 13 | -90 | 5 | 5.75 |
| DEX-BB6115 | 414211.088 | 9673876.310 | 315.539 | 26 | -90 | 20 | 3.85 |
| DEX-BB6116 | 414229.932 | 9673881.186 | 320.667 | 19 | -90 | 12 | 5 |
| DEX-BB6117 | 414246.767 | 9673877.103 | 323.772 | 22 | -90 | 11 | 9 |
| DEX-BB6118 | 414280.658 | 9673878.196 | 329.253 | 23 | -90 | 15 | 6 |
| DEX-BB6119 | 414307.072 | 9673880.150 | 337.370 | 28 | -90 | 15 | 11 |
| DEX-BB6120 | 414332.854 | 9673889.561 | 342.619 | 15 | -90 | 12 | 1 |
| DEX-BB6121 | 414357.781 | 9673889.242 | 346.758 | 14 | -90 | 10 | 2 |
| DEX-BB6122 | 414124.073 | 9673859.498 | 296.160 | 11 | -90 | 3 | 6 |
| DEX-BB6123 | 414150.525 | 9673853.995 | 297.773 | 8 | -90 | 3 | 3 |
| DEX-BB6124 | 414176.721 | 9673864.577 | 302.216 | 12 | -90 | 2 | 8 |
| DEX-BB6125 | 414209.479 | 9673859.302 | 312.802 | 21 | -90 | 8 | 9.7 |
| DEX-BB6126 | 414233.440 | 9673858.895 | 318.785 | 35 | -90 | 10 | 22.35 |
| DEX-BB6127 | 414257.106 | 9673856.059 | 324.910 | 21 | -90 | 14 | 5 |
| DEX-BB6128 | 414283.056 | 9673859.148 | 329.903 | 27 | -90 | 22.4 | 2.6 |
| DEX-BB6129 | 414300.167 | 9673858.674 | 331.682 | 27 | -90 | 13 | 11.9 |
| DEX-BB6130 | 414356.122 | 9673851.076 | 335.802 | 12 | -90 | 3 | 6.6 |
| DEX-BB6132 | 414135.304 | 9673835.704 | 296.494 | 10 | -90 | 5 | 3 |
| DEX-BB6133 | 414159.631 | 9673834.949 | 306.348 | 14 | -90 | 9 | 5 |
| DEX-BB6134 | 414180.098 | 9673824.600 | 312.000 | 22 | -90 | 12 | 8 |
| DEX-BB6135 | 414207.030 | 9673830.506 | 315.051 | 21 | -90 | 15 | 4 |
| DEX-BB6136 | 414237.369 | 9673830.765 | 318.623 | 24 | -90 | 17 | 5 |
| DEX-BB6138 | 414282.185 | 9673833.127 | 324.905 | 24 | -90 | 21 | 1 |
| DEX-BB6139 | 414309.444 | 9673840.550 | 326.263 | 19 | -90 | 9 | 8 |
| DEX-BB6140 | 414330.187 | 9673838.924 | 325.095 | 18 | -90 | 5 | 10.7 |
| DEX-BB6141 | 414102.538 | 9673806.164 | 293.464 | 13 | -90 | 6 | 5 |
| DEX-BB6142 | 414156.509 | 9673810.933 | 308.484 | 26 | -90 | 20 | 4 |
| DEX-BB6143 | 414185.856 | 9673806.935 | 311.498 | 23 | -90 | 14 | 7 |
| DEX-BB6144 | 414206.883 | 9673802.727 | 309.467 | 23 | -90 | 11 | 9.9 |
| DEX-BB6145 | 414254.243 | 9673807.171 | 315.098 | 40 | -90 | 10 | 27.65 |
| DEX-BB6146 | 414078.195 | 9673780.003 | 289.676 | 16 | -90 | 8 | 6 |
| DEX-BB6147 | 414100.981 | 9673777.543 | 296.986 | 12 | -90 | 5 | 4.9 |
| DEX-BB6148 | 414124.712 | 9673778.319 | 300.623 | 18 | -90 | 9 | 6.85 |
| DEX-BB6149 | 414149.493 | 9673783.661 | 306.456 | 19 | -90 | 11 | 5.75 |
| DEX-BB6150 | 414172.847 | 9673786.529 | 307.617 | 24 | -90 | 16 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1592 | 416391.943 | 9673582.231 | 346.771 | 14 | -90 | 4 | 4 |
| DEX-CZ1593 | 416420.075 | 9673578.754 | 346.714 | 11 | -90 | 7.22 | 3 |
| DEX-CZ1594 | 416446.945 | 9673575.026 | 359.165 | 10 | -90 | 4 | 3 |
| DEX-CZ1595 | 416462.958 | 9673584.476 | 367.689 | 27 | -90 | 5.6 | 18 |
| DEX-CZ1596 | 415925.953 | 9673597.725 | 384.107 | 21 | -90 | 13.56 | 5.16 |
| DEX-CZ1597 | 415971.641 | 9673600.944 | 385.440 | 19 | -90 | 4 | 8 |
| DEX-CZ1598 | 416026.208 | 9673600.001 | 381.016 | 23 | -90 | 20.12 | 3 |
| DEX-CZ1599 | 416076.610 | 9673596.810 | 382.000 | 22 | -90 | 7 | 2 |
| DEX-CZ1600 | 416124.584 | 9673599.814 | 381.000 | 31 | -90 | 12 | 17 |
| DEX-CZ1601 | 416175.365 | 9673601.625 | 376.743 | 27 | -90 | 12.93 | 14 |
| DEX-CZ1602 | 416222.640 | 9673600.031 | 365.308 | 21 | -90 | 17 | 2 |
| DEX-CZ1603 | 416271.122 | 9673596.381 | 373.193 | 36 | -90 | 7 | 21 |
| DEX-CZ1604 | 416323.160 | 9673600.724 | 369.413 | 50 | -90 | 11.56 | 19.36 |
| DEX-CZ1605 | 416359.570 | 9673596.859 | 361.262 | 21 | -90 | 5.72 | 14 |
| DEX-CZ1606 | 416424.811 | 9673600.065 | 358.104 | 12 | -90 | 4 | 6 |
| DEX-CZ1607 | 416466.874 | 9673600.624 | 373.109 | 23 | -90 | 7.82 | 13.55 |
| DEX-CZ1608 | 415926.061 | 9673621.070 | 380.556 | 27 | -90 | 17.42 | 9 |
| DEX-CZ1609 | 415947.781 | 9673623.307 | 382.970 | 34 | -90 | 20.98 | 13.4 |
| DEX-CZ1610 | 415975.435 | 9673625.250 | 380.916 | 25 | -90 | 12.28 | 11.39 |
| DEX-CZ1611 | 415997.626 | 9673626.067 | 379.116 | 34 | -90 | 11 | 16.7 |
| DEX-CZ1612 | 416022.651 | 9673623.870 | 379.092 | 35 | -90 | 19.98 | 13.8 |
| DEX-CZ1613 | 416050.987 | 9673625.289 | 380.409 | 40 | -90 | 22.36 | 19 |
| DEX-CZ1614 | 416074.463 | 9673621.945 | 380.798 | 21 | -90 | 14.42 | 1 |
| DEX-CZ1615 | 416101.877 | 9673625.142 | 380.999 | 35 | -90 | 31.38 | 4 |
| DEX-CZ1616 | 416125.148 | 9673625.152 | 381.000 | 24 | -90 | 17.7 | 11.07 |
| DEX-CZ1617 | 416155.080 | 9673628.869 | 378.627 | 27 | -90 | 19.75 | 8 |
| DEX-CZ1618 | 416174.371 | 9673622.290 | 377.498 | 29 | -90 | 25.58 | 4 |
| DEX-CZ1619 | 416204.075 | 9673627.174 | 369.000 | 16 | -90 | 9.07 | 6 |
| DEX-CZ1620 | 416225.672 | 9673623.525 | 370.708 | 19 | -90 | 19.02 | 2 |
| DEX-CZ1621 | 416245.047 | 9673626.110 | 374.768 | 27 | -90 | 25.45 | 3 |
| DEX-CZ1622 | 416274.440 | 9673623.169 | 373.840 | 22 | -90 | 17 | 3 |
| DEX-CZ1623 | 416294.063 | 9673616.233 | 370.271 | 31 | -90 | 12 | 17 |
| DEX-CZ1624 | 416314.405 | 9673633.284 | 368.401 | 22 | -90 | 22.12 | 0 |
| DEX-CZ1625 | 416355.868 | 9673628.369 | 358.340 | 28 | -90 | 26.28 | 5.24 |
| DEX-CZ1626 | 416384.991 | 9673628.129 | 356.324 | 12 | -90 | 9.28 | 1 |
| DEX-CZ1627 | 416405.074 | 9673626.482 | 365.208 | 8 | -90 | 3 | 2.4 |
| DEX-CZ1628 | 415922.768 | 9673648.869 | 374.681 | 14 | -90 | 9 | 0 |
| DEX-CZ1629 | 415975.878 | 9673654.065 | 377.000 | 29 | -90 | 13.33 | 13 |
| DEX-CZ1630 | 416025.055 | 9673650.184 | 376.133 | 19 | -90 | 9.95 | 8 |
| DEX-CZ1631 | 416074.880 | 9673650.025 | 379.000 | 28 | -90 | 18.93 | 8.15 |
| DEX-CZ1632 | 416125.108 | 9673649.704 | 380.000 | 32 | -90 | 16 | 12 |
| DEX-CZ1633 | 416175.184 | 9673649.938 | 374.486 | 34 | -90 | 19.3 | 14.6 |
| DEX-CZ1634 | 416224.514 | 9673650.363 | 377.007 | 48 | -90 | 36 | 10 |
| DEX-CZ1635 | 416269.004 | 9673650.198 | 381.796 | 24 | -90 | 20 | 1 |
| DEX-CZ1636 | 416325.879 | 9673645.288 | 371.227 | 22 | -90 | 20.3 | 1.3 |
| DEX-CZ1637 | 416388.758 | 9673649.561 | 362.943 | 28 | -90 | 15.12 | 5.58 |
| DEX-CZ1638 | 415923.636 | 9673672.390 | 368.745 | 25 | -90 | 15.61 | 7 |
| DEX-CZ1639 | 415951.118 | 9673675.322 | 373.128 | 42 | -90 | 24.77 | 11.29 |
| DEX-CZ1640 | 415975.440 | 9673673.020 | 375.261 | 25 | -90 | 20.3 | 6 |
| DEX-CZ1641 | 416000.094 | 9673676.810 | 372.179 | 39 | -90 | 22.56 | 18.38 |
| DEX-CZ1642 | 416023.852 | 9673674.050 | 371.856 | 22 | -90 | 15.65 | 7 |
| DEX-CZ1643 | 416047.584 | 9673676.891 | 375.183 | 35 | -90 | 33.69 | 5 |
| DEX-CZ1644 | 416075.011 | 9673674.951 | 379.262 | 33 | -90 | 22.07 | 13.72 |
| DEX-CZ1645 | 416099.816 | 9673674.804 | 380.000 | 24 | -90 | 18 | 3 |
| DEX-CZ1646 | 416124.793 | 9673675.032 | 379.919 | 18 | -90 | 10 | 1 |
| DEX-CZ1647 | 416150.121 | 9673674.578 | 377.217 | 30 | -90 | 18 | 10 |
| DEX-CZ1648 | 416176.056 | 9673674.963 | 377.939 | 31 | -90 | 27.26 | 3 |
| DEX-CZ1649 | 416199.803 | 9673675.380 | 381.360 | 30 | -90 | 32.21 | 0 |
| DEX-CZ1650 | 416224.858 | 9673674.952 | 383.786 | 33 | -90 | 28.59 | 1.39 |
| DEX-CZ1651 | 416250.232 | 9673675.234 | 384.254 | 21 | -90 | 17.91 | 3 |
| DEX-CZ1652 | 416276.467 | 9673682.863 | 387.984 | 22 | -90 | 17 | 2.44 |
| DEX-CZ1653 | 416299.761 | 9673682.354 | 386.982 | 27 | -90 | 20 | 4.2 |
| DEX-CZ1654 | 416325.052 | 9673667.484 | 379.525 | 29 | -90 | 26.96 | 3 |
| DEX-CZ1655 | 416357.882 | 9673682.696 | 381.799 | 27 | -90 | 16.1 | 8.18 |
| DEX-CZ1656 | 416388.491 | 9673672.239 | 369.739 | 11 | -90 | 9.76 | 0 |
| DEX-CZ1657 | 416400.545 | 9673680.559 | 379.661 | 21 | -90 | 22.77 | 1 |
| DEX-CZ1658 | 416431.138 | 9673675.357 | 385.502 | 12 | -90 | 6.68 | 3.6 |
| DEX-CZ1659 | 416451.633 | 9673680.231 | 386.590 | 23 | -90 | 15.2 | 10 |
| DEX-CZ1660 | 416473.643 | 9673676.182 | 383.160 | 29 | -90 | 17.69 | 10 |
| DEX-CZ1661 | 416500.554 | 9673689.721 | 372.484 | 14 | -90 | 8.8 | 3 |
| DEX-CZ1662 | 416519.964 | 9673674.528 | 362.109 | 40 | -90 | 4 | 18 |
| DEX-CZ1663 | 415925.151 | 9673697.473 | 361.022 | 19 | -90 | 9 | 8 |
| DEX-CZ1664 | 415970.318 | 9673699.425 | 372.104 | 55 | -90 | 21.89 | 12 |
| DEX-CZ1665 | 416027.610 | 9673701.871 | 368.321 | 43 | -90 | 22 | 19 |
| DEX-CZ1666 | 416072.431 | 9673697.678 | 376.883 | 43 | -90 | 18 | 21 |
| DEX-CZ1667 | 416125.337 | 9673699.599 | 380.000 | 26 | -90 | 21 | 1 |
| DEX-CZ1668 | 416175.390 | 9673700.274 | 383.691 | 47 | -90 | 23.29 | 16.72 |
| DEX-CZ1669 | 416224.647 | 9673699.669 | 391.299 | 44 | -90 | 36 | 4 |
| DEX-CZ1670 | 416271.450 | 9673703.903 | 391.506 | 26 | -90 | 21 | 2.64 |
| DEX-CZ1671 | 416324.319 | 9673699.480 | 389.499 | 27 | -90 | 20 | 4.65 |
| DEX-CZ1672 | 416376.657 | 9673707.320 | 384.254 | 23 | -90 | 16.11 | 5 |
| DEX-CZ1673 | 416417.825 | 9673710.409 | 393.511 | 14 | -90 | 10 | 3 |
| DEX-CZ1674 | 416472.923 | 9673705.593 | 387.810 | 15 | -90 | 8.55 | 2.45 |
| DEX-CZ1675 | 416518.985 | 9673700.946 | 364.299 | 28 | -90 | 8.15 | 1 |
| DEX-CZ1676 | 415924.787 | 9673726.010 | 359.965 | 15 | -90 | 7 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6151 | 414203.728 | 9673785.812 | 302.821 | 25 | -90 | 21 | 1.9 |
| DEX-BB6152 | 414086.733 | 9673762.784 | 288.559 | 13 | -90 | 4 | 6.7 |
| DEX-BB6153 | 414110.328 | 9673758.393 | 292.811 | 15 | -90 | 12 | 1 |
| DEX-BB6154 | 414135.875 | 9673753.327 | 291.700 | 16 | -90 | 6 | 8 |
| DEX-BB6155 | 414160.740 | 9673759.429 | 297.466 | 12 | -90 | 7 | 2.75 |
| DEX-BB6156 | 414183.097 | 9673757.244 | 297.671 | 11 | -90 | 5 | 3.9 |
| DEX-BB6157 | 414875.534 | 9675276.098 | 419.568 | 21 | -90 | 13 | 5 |
| DEX-BB6158 | 414897.721 | 9675281.374 | 420.802 | 23 | -90 | 16 | 4 |
| DEX-BB6159 | 414922.948 | 9675289.738 | 421.836 | 21 | -90 | 16 | 3 |
| DEX-BB6160 | 414949.751 | 9675288.465 | 422.182 | 21 | -90 | 16 | 3 |
| DEX-BB6161 | 414975.068 | 9675285.949 | 422.519 | 24 | -90 | 17 | 5 |
| DEX-BB6162 | 414997.881 | 9675287.383 | 418.797 | 23 | -90 | 17 | 4 |
| DEX-BB6163 | 414846.932 | 9675253.153 | 418.000 | 20 | -90 | 12.21 | 7 |
| DEX-BB6164 | 414876.494 | 9675251.883 | 418.835 | 23 | -90 | 15.22 | 6 |
| DEX-BB6165 | 414898.365 | 9675260.062 | 419.774 | 21 | -90 | 15 | 3 |
| DEX-BB6166 | 414925.910 | 9675259.375 | 420.887 | 23 | -90 | 17 | 4 |
| DEX-BB6167 | 414954.234 | 9675259.037 | 421.249 | 29 | -90 | 19 | 8 |
| DEX-BB6168 | 414970.821 | 9675264.116 | 422.000 | 24 | -90 | 16 | 6 |
| DEX-BB6169 | 415000.578 | 9675257.992 | 421.000 | 21 | -90 | 14 | 5 |
| DEX-BB6170 | 414820.831 | 9675226.673 | 417.274 | 19 | -90 | 8 | 9.25 |
| DEX-BB6171 | 414848.417 | 9675230.328 | 417.652 | 18 | -90 | 11 | 5 |
| DEX-BB6172 | 414876.303 | 9675228.384 | 418.167 | 26 | -90 | 17 | 7 |
| DEX-BB6173 | 414902.541 | 9675234.422 | 419.277 | 24 | -90 | 18 | 4 |
| DEX-BB6174 | 414924.496 | 9675228.899 | 420.031 | 26 | -90 | 21 | 3 |
| DEX-BB6175 | 414953.873 | 9675238.968 | 420.471 | 27 | -90 | 17.21 | 7.7 |
| DEX-BB6178 | 415023.407 | 9675234.863 | 421.110 | 18 | -90 | 9 | 7 |
| DEX-BB6179 | 414802.040 | 9675199.117 | 416.558 | 12 | -90 | 7 | 6 |
| DEX-BB6180 | 414822.905 | 9675202.769 | 417.000 | 22 | -90 | 8 | 12.5 |
| DEX-BB6181 | 414846.811 | 9675199.088 | 417.386 | 21 | -90 | 11 | 8 |
| DEX-BB6182 | 414876.834 | 9675207.937 | 418.014 | 22 | -90 | 12 | 8 |
| DEX-BB6183 | 414903.886 | 9675208.912 | 418.799 | 20 | -90 | 17 | 1 |
| DEX-BB6184 | 414923.762 | 9675207.597 | 417.910 | 25 | -90 | 20.23 | 3 |
| DEX-BB6185 | 414945.890 | 9675210.458 | 419.016 | 31 | -90 | 26.19 | 3 |
| DEX-BB6186 | 415049.696 | 9675202.987 | 420.810 | 23 | -90 | 13 | 8 |
| DEX-BB6187 | 415081.677 | 9675198.799 | 422.705 | 21 | -90 | 13 | 6 |
| DEX-BB6188 | 415125.032 | 9675203.980 | 433.011 | 17 | -90 | 11 | 4.27 |
| DEX-BB6189 | 415045.989 | 9675177.191 | 419.743 | 21 | -90 | 16 | 3 |
| DEX-BB6190 | 415074.745 | 9675180.325 | 420.687 | 22 | -90 | 17.28 | 3 |
| DEX-BB6191 | 415097.298 | 9675183.147 | 423.910 | 18 | -90 | 12 | 4 |
| DEX-BB6192 | 415123.357 | 9675181.321 | 427.954 | 13 | -90 | 9 | 2 |
| DEX-BB6193 | 415153.927 | 9675178.699 | 432.078 | 18 | -90 | 5 | 11 |
| DEX-BB6194 | 415175.293 | 9675180.980 | 436.702 | 20 | -90 | 10 | 8 |
| DEX-BB6195 | 415197.260 | 9675174.989 | 437.642 | 24 | -90 | 15 | 7 |
| DEX-BB6196 | 415217.813 | 9675185.473 | 440.767 | 24 | -90 | 4 | 18 |
| DEX-BB6197 | 415248.628 | 9675185.061 | 441.416 | 12 | -90 | 2 | 8 |
| DEX-BB6198 | 415272.654 | 9675182.177 | 439.032 | 22 | -90 | 10 | 9 |
| DEX-BB6199 | 415295.008 | 9675186.731 | 435.116 | 27 | -90 | 5 | 20 |
| DEX-BB6200 | 415028.176 | 9675152.008 | 419.000 | 19 | -90 | 15 | 2 |
| DEX-BB6201 | 415052.028 | 9675154.354 | 419.000 | 32 | -90 | 22 | 8 |
| DEX-BB6202 | 415077.280 | 9675160.056 | 419.468 | 30 | -90 | 17 | 11 |
| DEX-BB6203 | 415098.153 | 9675158.683 | 421.254 | 19 | -90 | 14 | 3 |
| DEX-BB6204 | 415128.426 | 9675156.395 | 425.509 | 16 | -90 | 7 | 7 |
| DEX-BB6205 | 415153.664 | 9675158.394 | 428.869 | 20 | -90 | 6 | 13 |
| DEX-BB6206 | 415175.974 | 9675159.138 | 430.963 | 25 | -90 | 8 | 15 |
| DEX-BB6207 | 415198.944 | 9675151.926 | 431.455 | 15 | -90 | 10 | 3 |
| DEX-BB6208 | 415225.785 | 9675153.460 | 432.168 | 21 | -90 | 11 | 8 |
| DEX-BB6209 | 415249.129 | 9675152.731 | 433.739 | 27 | -90 | 8 | 17 |
| DEX-BB6210 | 415277.665 | 9675157.479 | 434.098 | 17 | -90 | 7 | 8 |
| DEX-BB6211 | 415000.663 | 9675129.785 | 420.653 | 25 | -90 | 14.24 | 9 |
| DEX-BB6212 | 415027.367 | 9675126.747 | 419.000 | 22 | -90 | 13 | 7 |
| DEX-BB6213 | 415053.933 | 9675138.340 | 419.000 | 22 | -90 | 18 | 2 |
| DEX-BB6214 | 415076.328 | 9675130.455 | 419.000 | 41 | -90 | 26.21 | 13 |
| DEX-BB6215 | 415098.789 | 9675130.020 | 419.000 | 23 | -90 | 17.21 | 4 |
| DEX-BB6216 | 415125.590 | 9675126.489 | 420.050 | 20 | -90 | 15 | 3 |
| DEX-BB6217 | 415144.946 | 9675128.471 | 421.910 | 19 | -90 | 12 | 5 |
| DEX-BB6218 | 415174.524 | 9675127.076 | 425.061 | 19 | -90 | 14.22 | 3 |
| DEX-BB6219 | 415000.969 | 9675102.017 | 425.007 | 27 | -90 | 12.15 | 13 |
| DEX-BB6220 | 415029.757 | 9675104.794 | 421.902 | 20 | -90 | 13 | 5 |
| DEX-BB6221 | 415048.559 | 9675103.318 | 419.611 | 15 | -90 | 9 | 4 |
| DEX-BB6225 | 415149.409 | 9675105.790 | 419.010 | 20 | -90 | 16 | 1 |
| DEX-BB6226 | 415174.218 | 9675097.229 | 419.541 | 28 | -90 | 22 | 4 |
| DEX-BB6227 | 415025.971 | 9675080.400 | 427.015 | 12 | -90 | 7 | 3 |
| DEX-BB6228 | 415049.155 | 9675079.048 | 423.726 | 18 | -90 | 11 | 5 |
| DEX-BB6229 | 415080.017 | 9675078.669 | 420.410 | 21 | -90 | 18.81 | 0.4 |
| DEX-BB6230 | 415100.838 | 9675080.391 | 419.889 | 24 | -90 | 16 | 6 |
| DEX-BB6231 | 415122.294 | 9675078.820 | 419.257 | 30 | -90 | 18.18 | 10 |
| DEX-BB6232 | 415146.592 | 9675072.366 | 418.988 | 24 | -90 | 18.19 | 4 |
| DEX-BB6233 | 415174.231 | 9675067.488 | 419.501 | 28 | -90 | 13 | 13.19 |
| DEX-BB6234 | 415219.029 | 9674801.318 | 453.032 | 42 | -90 | 29.19 | 11 |
| DEX-BB6235 | 415248.355 | 9674793.884 | 448.638 | 34 | -90 | 28.17 | 4 |
| DEX-BB6236 | 415270.499 | 9674787.590 | 446.652 | 36 | -90 | 20.2 | 14 |
| DEX-BB6237 | 415196.158 | 9674775.452 | 438.047 | 11 | -90 | 7 | 2 |
| DEX-BB6238 | 415225.641 | 9674776.889 | 446.462 | 32 | -90 | 19 | 11 |
| DEX-BB6239 | 415251.311 | 9674771.692 | 442.617 | 36 | -90 | 21.22 | 13 |
| DEX-BB6240 | 415273.085 | 9674771.334 | 440.321 | 31 | -90 | 17.19 | 12 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1677 | 415949.134 | 9673721.596 | 369.712 | 24 | -90 | 18 | 4 |
| DEX-CZ1678 | 415974.491 | 9673724.192 | 369.619 | 20 | -90 | 10.83 | 8 |
| DEX-CZ1679 | 416000.456 | 9673724.924 | 365.000 | 22 | -90 | 13.77 | 5.21 |
| DEX-CZ1680 | 416024.938 | 9673722.777 | 366.000 | 27 | -90 | 21.86 | 2 |
| DEX-CZ1681 | 416051.410 | 9673725.998 | 367.550 | 31 | -90 | 25.19 | 5 |
| DEX-CZ1682 | 416077.325 | 9673723.687 | 368.000 | 27 | -90 | 16.59 | 6 |
| DEX-CZ1683 | 416099.273 | 9673725.646 | 370.187 | 32 | -90 | 26.7 | 7 |
| DEX-CZ1684 | 416124.753 | 9673725.035 | 373.679 | 22 | -90 | 19.68 | 2 |
| DEX-CZ1685 | 416150.067 | 9673724.956 | 377.982 | 41 | -90 | 22.14 | 21.57 |
| DEX-CZ1686 | 416174.088 | 9673719.104 | 387.049 | 28 | -90 | 28.03 | 3 |
| DEX-CZ1687 | 416198.524 | 9673723.232 | 391.985 | 32 | -90 | 25.47 | 3 |
| DEX-CZ1688 | 416219.919 | 9673731.069 | 395.194 | 30 | -90 | 22 | 1 |
| DEX-CZ1689 | 416245.586 | 9673727.966 | 395.269 | 39 | -90 | 29 | 6 |
| DEX-CZ1690 | 416276.844 | 9673717.992 | 393.875 | 32 | -90 | 27 | 1 |
| DEX-CZ1691 | 416303.355 | 9673726.515 | 396.364 | 32 | -90 | 22 | 7 |
| DEX-CZ1692 | 416317.781 | 9673723.492 | 396.471 | 31 | -90 | 14 | 15 |
| DEX-CZ1693 | 416346.928 | 9673719.027 | 394.513 | 33 | -90 | 18 | 11 |
| DEX-CZ1694 | 416384.815 | 9673722.044 | 386.653 | 30 | -90 | 15.87 | 8 |
| DEX-CZ1695 | 416402.600 | 9673731.397 | 393.074 | 40 | -90 | 17.33 | 18.72 |
| DEX-CZ1696 | 416422.608 | 9673720.962 | 396.309 | 32 | -90 | 15.55 | 14 |
| DEX-CZ1697 | 416442.784 | 9673728.258 | 396.674 | 31 | -90 | 14.83 | 17 |
| DEX-CZ1698 | 416476.215 | 9673725.175 | 390.242 | 14 | -90 | 11.02 | 1 |
| DEX-CZ1699 | 416500.095 | 9673726.739 | 381.343 | 20 | -90 | 7.07 | 11.2 |
| DEX-CZ1700 | 416535.928 | 9673717.362 | 363.054 | 14 | -90 | 4.52 | 6 |
| DEX-CZ1701 | 415928.955 | 9673754.356 | 364.028 | 28 | -90 | 17 | 9 |
| DEX-CZ1702 | 415974.866 | 9673749.920 | 364.572 | 26 | -90 | 18.38 | 1.78 |
| DEX-CZ1703 | 416025.433 | 9673749.963 | 368.327 | 19 | -90 | 9.86 | 7 |
| DEX-CZ1704 | 416074.892 | 9673749.581 | 377.952 | 63 | -90 | 39.66 | 30.62 |
| DEX-CZ1705 | 416123.831 | 9673750.844 | 375.726 | 40 | -90 | 26.71 | 6 |
| DEX-CZ1706 | 416173.549 | 9673743.343 | 385.956 | 24 | -90 | 15.27 | 7 |
| DEX-CZ1707 | 416224.668 | 9673749.369 | 396.241 | 22 | -90 | 17 | 3 |
| DEX-CZ1708 | 416282.594 | 9673751.686 | 401.059 | 36 | -90 | 27 | 6 |
| DEX-CZ1709 | 416421.703 | 9673755.187 | 400.649 | 41 | -90 | 38.79 | 2 |
| DEX-CZ1710 | 416475.279 | 9673758.521 | 393.941 | 25 | -90 | 16.43 | 0 |
| DEX-CZ1711 | 416525.788 | 9673748.871 | 371.725 | 10 | -90 | 4.32 | 4 |
| DEX-CZ1712 | 415921.399 | 9673775.132 | 374.610 | 23 | -90 | 21.33 | 0 |
| DEX-CZ1713 | 415952.684 | 9673774.274 | 369.056 | 22 | -90 | 14.45 | 6 |
| DEX-CZ1714 | 415972.345 | 9673776.692 | 372.901 | 32 | -90 | 24.82 | 7 |
| DEX-CZ1715 | 416000.034 | 9673774.795 | 369.085 | 26 | -90 | 21.89 | 2 |
| DEX-CZ1716 | 416022.974 | 9673775.508 | 373.365 | 27 | -90 | 22.13 | 6.28 |
| DEX-CZ1717 | 416046.724 | 9673779.502 | 374.579 | 12 | -90 | 10.51 | 0 |
| DEX-CZ1718 | 416074.933 | 9673774.995 | 383.755 | 25 | -90 | 22.4 | 2 |
| DEX-CZ1719 | 416099.641 | 9673775.414 | 377.925 | 20 | -90 | 13.68 | 5 |
| DEX-CZ1720 | 416125.228 | 9673776.479 | 376.915 | 52 | -90 | 22 | 1 |
| DEX-CZ1721 | 416154.519 | 9673769.972 | 388.785 | 44 | -90 | 38.41 | 9.67 |
| DEX-CZ1722 | 416172.399 | 9673778.351 | 394.932 | 34 | -90 | 29.3 | 8 |
| DEX-CZ1723 | 416198.687 | 9673776.244 | 396.754 | 30 | -90 | 24.63 | 6.62 |
| DEX-CZ1724 | 416224.722 | 9673778.623 | 396.011 | 28 | -90 | 9 | 9 |
| DEX-CZ1725 | 416248.556 | 9673774.397 | 401.000 | 23 | -90 | 18 | 2.55 |
| DEX-CZ1726 | 416275.996 | 9673777.577 | 403.000 | 47 | -90 | 26 | 10 |
| DEX-CZ1727 | 416421.715 | 9673781.313 | 401.540 | 26 | -90 | 16.53 | 8 |
| DEX-CZ1728 | 416449.696 | 9673777.635 | 399.251 | 19 | -90 | 14.57 | 4 |
| DEX-CZ1729 | 416470.719 | 9673770.797 | 395.562 | 17 | -90 | 9.53 | 5 |
| DEX-CZ1730 | 416499.471 | 9673775.560 | 383.176 | 19 | -90 | 5.25 | 12 |
| DEX-CZ1731 | 416526.351 | 9673775.943 | 371.473 | 8 | -90 | 2 | 2.51 |
| DEX-CZ1732 | 415927.122 | 9673797.048 | 382.742 | 27 | -90 | 23 | 1.66 |
| DEX-CZ1733 | 415967.152 | 9673795.142 | 381.825 | 26 | -90 | 19.08 | 8 |
| DEX-CZ1734 | 416022.427 | 9673807.400 | 373.807 | 21 | -90 | 19.56 | 2 |
| DEX-CZ1735 | 416075.027 | 9673799.431 | 380.881 | 34 | -90 | 23.71 | 8 |
| DEX-CZ1736 | 416127.997 | 9673795.139 | 379.191 | 25 | -90 | 20.45 | 2.37 |
| DEX-CZ1737 | 416182.996 | 9673801.441 | 399.525 | 45 | -90 | 38.14 | 4 |
| DEX-CZ1738 | 416225.970 | 9673795.654 | 399.952 | 46 | -90 | 21 | 15 |
| DEX-CZ1739 | 416276.764 | 9673804.274 | 402.747 | 31 | -90 | 23 | 6 |
| DEX-CZ1740 | 416420.903 | 9673803.765 | 400.659 | 25 | -90 | 20.7 | 4.33 |
| DEX-CZ1741 | 416470.109 | 9673791.045 | 393.445 | 12 | -90 | 5 | 4.41 |
| DEX-CZ1742 | 416535.329 | 9673796.475 | 362.577 | 9 | -90 | 6.39 | 0 |
| DEX-CZ1743 | 416047.588 | 9673523.928 | 371.506 | 26 | -90 | 6 | 13 |
| DEX-CZ1744 | 416083.197 | 9673530.990 | 375.621 | 8 | -90 | 5 | 0 |
| DEX-CZ1745 | 416095.903 | 9673530.679 | 376.136 | 14 | -90 | 8 | 3 |
| DEX-CZ1746 | 416118.861 | 9673525.330 | 374.005 | 17 | -90 | 6 | 8 |
| DEX-CZ1747 | 416147.622 | 9673530.379 | 375.642 | 20 | -90 | 8 | 11 |
| DEX-CZ1748 | 416172.572 | 9673529.724 | 372.153 | 21 | -90 | 5 | 14.23 |
| DEX-CZ1749 | 416196.805 | 9673530.209 | 365.794 | 13 | -90 | 3 | 7 |
| DEX-CZ1750 | 416221.131 | 9673514.149 | 349.909 | 15 | -90 | 5 | 8 |
| DEX-CZ1751 | 416249.787 | 9673527.263 | 352.403 | 26 | -90 | 4 | 19.35 |
| DEX-CZ1752 | 416277.315 | 9673524.829 | 360.297 | 22 | -90 | 4.77 | 5.27 |
| DEX-CZ1753 | 416299.057 | 9673528.642 | 362.393 | 19 | -90 | 5 | 6 |
| DEX-CZ1754 | 416322.570 | 9673531.318 | 364.356 | 17 | -90 | 1 | 3 |
| DEX-CZ1755 | 416347.888 | 9673528.595 | 360.026 | 24 | -90 | 7.95 | 12 |
| DEX-CZ1756 | 416369.840 | 9673534.004 | 355.195 | 14 | -90 | 4 | 6 |
| DEX-CZ1757 | 416386.970 | 9673527.932 | 345.552 | 40 | -90 | 4 | 32 |
| DEX-CZ1758 | 416431.857 | 9673531.989 | 343.819 | 15 | -90 | 4.64 | 6.36 |
| DEX-CZ1759 | 416451.002 | 9673533.682 | 350.735 | 20 | -90 | 4 | 13 |
| DEX-CZ1760 | 416468.606 | 9673532.750 | 351.631 | 10 | -90 | 2 | 5 |
| DEX-CZ1761 | 416073.804 | 9673504.128 | 367.342 | 31 | -90 | 22 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6241 | 415293.557 | 9674775.158 | 442.865 | 36 | -90 | 28 | 6 |
| DEX-BB6242 | 415197.595 | 9674753.159 | 437.803 | 19 | -90 | 14 | 3 |
| DEX-BB6243 | 415217.002 | 9674748.689 | 432.704 | 27 | -90 | 20 | 5 |
| DEX-BB6244 | 415247.754 | 9674748.690 | 438.988 | 35 | -90 | 21.28 | 12 |
| DEX-BB6245 | 415270.047 | 9674746.967 | 429.947 | 25 | -90 | 14.23 | 9 |
| DEX-BB6246 | 415296.013 | 9674747.428 | 432.637 | 30 | -90 | 14 | 14 |
| DEX-BB6247 | 415318.445 | 9674745.500 | 431.923 | 21 | -90 | 17.23 | 2 |
| DEX-BB6248 | 415194.989 | 9674720.720 | 436.432 | 28 | -90 | 20 | 6 |
| DEX-BB6249 | 415221.760 | 9674727.133 | 429.987 | 16 | -90 | 10 | 3.85 |
| DEX-BB6250 | 415239.825 | 9674716.463 | 427.480 | 22 | -90 | 12 | 8 |
| DEX-BB6251 | 415265.976 | 9674711.792 | 424.844 | 23 | -90 | 14 | 7 |
| DEX-BB6252 | 415291.718 | 9674715.902 | 420.976 | 17 | -90 | 6 | 9 |
| DEX-BB6253 | 415322.380 | 9674716.348 | 418.668 | 23 | -90 | 12 | 9 |
| DEX-BB6254 | 415215.245 | 9674691.695 | 434.411 | 20 | -90 | 12 | 6 |
| DEX-BB6255 | 415243.733 | 9674690.398 | 433.049 | 23 | -90 | 15 | 5.85 |
| DEX-BB6256 | 415266.823 | 9674689.060 | 430.489 | 35 | -90 | 31 | 1 |
| DEX-BB6257 | 415321.678 | 9674690.802 | 427.811 | 35 | -90 | 19 | 14 |
| DEX-BB6258 | 415197.706 | 9674663.704 | 446.419 | 29 | -90 | 21 | 6 |
| DEX-BB6259 | 415216.997 | 9674663.260 | 448.051 | 29 | -90 | 22 | 5 |
| DEX-BB6260 | 415238.277 | 9674666.255 | 446.725 | 24 | -90 | 19 | 3 |
| DEX-BB6261 | 415270.335 | 9674662.002 | 445.618 | 30 | -90 | 25 | 3 |
| DEX-BB6262 | 415293.791 | 9674676.111 | 434.648 | 36 | -90 | 17 | 16 |
| DEX-BB6263 | 415314.161 | 9674671.708 | 436.725 | 32 | -90 | 22 | 8 |
| DEX-BB6264 | 415195.754 | 9674645.818 | 451.795 | 39 | -90 | 34 | 3 |
| DEX-BB6265 | 415221.322 | 9674649.124 | 455.269 | 34 | -90 | 21 | 10.85 |
| DEX-BB6266 | 415245.795 | 9674643.530 | 454.964 | 23 | -90 | 15 | 5.85 |
| DEX-BB6267 | 415275.779 | 9674640.623 | 452.844 | 24 | -90 | 18 | 4 |
| DEX-BB6268 | 415298.663 | 9674645.774 | 446.182 | 18 | -90 | 14 | 2 |
| DEX-BB6269 | 415197.591 | 9674609.603 | 460.517 | 17 | -90 | 13 | 2 |
| DEX-BB6270 | 415225.776 | 9674620.276 | 463.894 | 25 | -90 | 20 | 2.89 |
| DEX-BB6271 | 415271.600 | 9674625.453 | 457.330 | 28 | -90 | 14 | 11.87 |
| DEX-BB6272 | 415298.692 | 9674617.492 | 451.451 | 26 | -90 | 19.5 | 4.5 |
| DEX-BB6273 | 415196.214 | 9674596.409 | 463.756 | 23 | -90 | 17 | 3.86 |
| DEX-BB6274 | 415223.846 | 9674598.162 | 464.121 | 20 | -90 | 15 | 3 |
| DEX-BB6275 | 415248.378 | 9674590.803 | 468.023 | 27 | -90 | 20 | 4.85 |
| DEX-BB6276 | 415270.402 | 9674596.089 | 464.239 | 40 | -90 | 34 | 4 |
| DEX-BB6277 | 415199.160 | 9674574.612 | 466.777 | 34 | -90 | 18 | 14 |
| DEX-BB6278 | 415222.512 | 9674570.798 | 465.000 | 23 | -90 | 16 | 5 |
| DEX-BB6279 | 415247.143 | 9674570.651 | 468.573 | 30 | -90 | 24 | 3.86 |
| DEX-BB6280 | 415268.405 | 9674572.894 | 468.244 | 30 | -90 | 18 | 10 |
| DEX-BB6281 | 415289.158 | 9674572.811 | 461.828 | 23 | -90 | 12 | 8 |
| DEX-BB6282 | 415191.397 | 9674543.888 | 467.000 | 36 | -90 | 23 | 11 |
| DEX-BB6283 | 415219.581 | 9674545.663 | 466.187 | 44 | -90 | 37 | 5 |
| DEX-BB6284 | 415248.433 | 9674547.125 | 468.056 | 32 | -90 | 26 | 4 |
| DEX-BB6285 | 415267.967 | 9674548.254 | 471.000 | 32 | -90 | 22 | 8 |
| DEX-BB6286 | 415173.030 | 9674522.633 | 465.260 | 46 | -90 | 31 | 13 |
| DEX-BB6287 | 415193.325 | 9674524.799 | 466.369 | 31 | -90 | 19 | 10 |
| DEX-BB6288 | 415218.217 | 9674523.226 | 467.479 | 53 | -90 | 22.2 | 29 |
| DEX-BB6289 | 415244.973 | 9674519.650 | 468.618 | 37 | -90 | 18 | 17 |
| DEX-BB6290 | 415268.208 | 9674517.278 | 471.647 | 47 | -90 | 24 | 21 |
| DEX-BB6291 | 415171.258 | 9674497.636 | 462.002 | 25 | -90 | 18 | 5 |
| DEX-BB6292 | 415217.882 | 9674489.922 | 468.263 | 24 | -90 | 20 | 2 |
| DEX-BB6293 | 415241.396 | 9674494.354 | 469.620 | 35 | -90 | 30 | 3 |
| DEX-BB6294 | 415268.971 | 9674497.227 | 472.058 | 51 | -90 | 40.52 | 9 |
| DEX-BB6295 | 415196.328 | 9674472.099 | 462.976 | 25 | -90 | 18 | 5 |
| DEX-BB6296 | 415220.697 | 9674471.530 | 467.069 | 21 | -90 | 18 | 1 |
| DEX-BB6297 | 415244.523 | 9674473.791 | 469.462 | 44 | -90 | 21 | 21 |
| DEX-BB6298 | 415272.355 | 9674469.881 | 470.063 | 29 | -90 | 18 | 9 |
| DEX-BB6299 | 415296.169 | 9674474.363 | 472.612 | 37 | -90 | 27 | 8 |
| DEX-BB6300 | 415196.637 | 9674443.485 | 457.945 | 23 | -90 | 14 | 7 |
| DEX-BB6301 | 415216.359 | 9674446.971 | 464.244 | 35 | -90 | 14 | 19 |
| DEX-BB6302 | 415246.724 | 9674449.041 | 463.019 | 23 | -90 | 12 | 9 |
| DEX-BB6303 | 415273.496 | 9674445.415 | 468.894 | 37 | -90 | 29 | 6 |
| DEX-BB6304 | 415292.501 | 9674450.519 | 470.867 | 41 | -90 | 32 | 7 |
| DEX-BB6305 | 415320.370 | 9674453.016 | 470.769 | 50 | -90 | 35 | 13 |
| DEX-BB6306 | 415220.072 | 9674422.326 | 454.473 | 26 | -90 | 11 | 13 |
| DEX-BB6307 | 415250.524 | 9674422.890 | 465.557 | 32 | -90 | 15 | 15 |
| DEX-BB6308 | 415274.556 | 9674421.208 | 469.000 | 44 | -90 | 26.3 | 16 |
| DEX-BB6309 | 415320.275 | 9674423.869 | 468.168 | 25 | -90 | 17 | 5.7 |
| DEX-BB6310 | 415350.970 | 9674423.398 | 465.158 | 28 | -90 | 21 | 5 |
| DEX-BB6311 | 415173.712 | 9674391.483 | 452.338 | 24 | -90 | 10 | 12 |
| DEX-BB6312 | 415230.791 | 9674393.648 | 461.985 | 49 | -90 | 22 | 25 |
| DEX-BB6313 | 415249.931 | 9674386.659 | 464.878 | 36 | -90 | 29 | 5 |
| DEX-BB6314 | 415276.180 | 9674397.399 | 466.526 | 36 | -90 | 21 | 13 |
| DEX-BB6315 | 415295.357 | 9674398.834 | 466.824 | 29 | -90 | 18 | 9 |
| DEX-BB6316 | 415321.633 | 9674401.066 | 466.722 | 30 | -90 | 25 | 3 |
| DEX-BB6317 | 415342.966 | 9674402.810 | 464.746 | 35 | -90 | 17 | 15.75 |
| DEX-BB6318 | 415152.192 | 9674370.905 | 442.079 | 26 | -90 | 6 | 18 |
| DEX-BB6319 | 415179.878 | 9674365.899 | 450.229 | 15 | -90 | 8 | 5 |
| DEX-BB6320 | 415198.275 | 9674366.136 | 457.211 | 40 | -90 | 18 | 20 |
| DEX-BB6321 | 415225.459 | 9674367.778 | 461.241 | 42 | -90 | 31.75 | 8.25 |
| DEX-BB6322 | 415244.630 | 9674371.284 | 462.540 | 48 | -90 | 16 | 29.58 |
| DEX-BB6323 | 415279.793 | 9674366.655 | 456.012 | 23 | -90 | 18 | 3 |
| DEX-BB6324 | 415293.412 | 9674373.568 | 459.674 | 19 | -90 | 15 | 2 |
| DEX-BB6325 | 415327.778 | 9674380.147 | 463.949 | 30 | -90 | 19 | 9 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1762 | 416121.215 | 9673501.995 | 368.422 | 17 | -90 | 12 | 3 |
| DEX-CZ1763 | 416172.538 | 9673496.955 | 361.930 | 26 | -90 | 8 | 17 |
| DEX-CZ1764 | 416224.066 | 9673496.478 | 344.317 | 10 | -90 | 1 | 7 |
| DEX-CZ1765 | 416273.622 | 9673501.984 | 349.541 | 15 | -90 | 3.25 | 9.21 |
| DEX-CZ1766 | 416327.377 | 9673502.802 | 352.763 | 18 | -90 | 8.59 | 5.36 |
| DEX-CZ1767 | 416373.355 | 9673497.716 | 343.114 | 20 | -90 | 3 | 9 |
| DEX-CZ1768 | 416432.266 | 9673502.969 | 338.437 | 14 | -90 | 5.15 | 7.39 |
| DEX-CZ1770 | 416049.971 | 9673474.263 | 357.790 | 26 | -90 | 16 | 3 |
| DEX-CZ1771 | 416072.628 | 9673479.131 | 361.534 | 21 | -90 | 13 | 3 |
| DEX-CZ1772 | 416099.729 | 9673475.391 | 362.334 | 14 | -90 | 10.65 | 0.35 |
| DEX-CZ1773 | 416120.946 | 9673474.707 | 361.436 | 30 | -90 | 5 | 10 |
| DEX-CZ1774 | 416152.798 | 9673477.932 | 358.961 | 11 | -90 | 5 | 1 |
| DEX-CZ1775 | 416178.553 | 9673472.934 | 349.850 | 10 | -90 | 2 | 5 |
| DEX-CZ1776 | 416195.601 | 9673483.350 | 351.813 | 14 | -90 | 3 | 7 |
| DEX-CZ1778 | 416247.886 | 9673476.336 | 330.356 | 8 | -90 | 4 | 1 |
| DEX-CZ1779 | 416273.570 | 9673474.416 | 336.493 | 8 | -90 | 2 | 4 |
| DEX-CZ1780 | 416297.591 | 9673477.817 | 340.372 | 21 | -90 | 3 | 8 |
| DEX-CZ1781 | 416325.639 | 9673478.291 | 342.980 | 22 | -90 | 3 | 11.82 |
| DEX-CZ1782 | 416344.427 | 9673477.433 | 341.701 | 21 | -90 | 4.26 | 13.3 |
| DEX-CZ1783 | 416372.133 | 9673478.829 | 335.464 | 14 | -90 | 3 | 5 |
| DEX-CZ1784 | 416405.394 | 9673466.634 | 321.980 | 7 | -90 | 2 | 1 |
| DEX-CZ1785 | 416420.065 | 9673474.261 | 324.140 | 5 | -90 | 2 | 0 |
| DEX-CZ1786 | 416442.196 | 9673483.030 | 334.928 | 13 | -90 | 1 | 8 |
| DEX-CZ1787 | 416076.158 | 9673452.957 | 356.781 | 24 | -90 | 10 | 11 |
| DEX-CZ1788 | 416124.023 | 9673446.867 | 351.035 | 22 | -90 | 8 | 11 |
| DEX-CZ1789 | 416170.084 | 9673449.308 | 341.574 | 21 | -90 | 2 | 15 |
| DEX-CZ1790 | 416228.257 | 9673454.830 | 323.572 | 17 | -90 | 2 | 13 |
| DEX-CZ1792 | 416325.817 | 9673452.032 | 330.075 | 12 | -90 | 1.3 | 5.7 |
| DEX-CZ1793 | 416380.398 | 9673451.926 | 324.263 | 27 | -90 | 3 | 18 |
| DEX-CZ1794 | 416053.433 | 9673425.262 | 342.678 | 24 | -90 | 13 | 8 |
| DEX-CZ1795 | 416072.449 | 9673431.138 | 348.380 | 8 | -90 | 3 | 2 |
| DEX-CZ1800 | 416206.254 | 9673432.195 | 322.114 | 15 | -90 | 2 | 6.23 |
| DEX-CZ1801 | 416226.020 | 9673427.519 | 317.830 | 11 | -90 | 7 | 1 |
| DEX-CZ1802 | 416244.930 | 9673427.743 | 319.142 | 6 | -90 | 2 | 1 |
| DEX-CZ1803 | 416276.901 | 9673429.322 | 320.112 | 15 | -90 | 7 | 4 |
| DEX-CZ1804 | 416304.716 | 9673427.548 | 320.540 | 12 | -90 | 5 | 3 |
| DEX-CZ1805 | 416321.594 | 9673435.675 | 322.151 | 7 | -90 | 4 | 0.6 |
| DEX-CZ1806 | 416204.867 | 9673821.422 | 406.516 | 31 | -90 | 27.38 | 5 |
| DEX-CZ1807 | 416222.226 | 9673825.484 | 406.258 | 32 | -90 | 25.64 | 7.2 |
| DEX-CZ1808 | 416247.025 | 9673824.224 | 403.440 | 27 | -90 | 25.77 | 1 |
| DEX-CZ1809 | 416273.747 | 9673824.295 | 401.562 | 53 | -90 | 28.92 | 3 |
| DEX-CZ1810 | 416299.481 | 9673820.538 | 403.038 | 43 | -90 | 20.42 | 17.25 |
| DEX-CZ1811 | 416325.801 | 9673819.600 | 403.668 | 36 | -90 | 30.04 | 8.21 |
| DEX-CZ1812 | 416351.356 | 9673820.083 | 403.819 | 29 | -90 | 17.99 | 8 |
| DEX-CZ1813 | 416373.257 | 9673822.818 | 402.617 | 39 | -90 | 21.06 | 11 |
| DEX-CZ1814 | 416224.538 | 9673850.613 | 407.910 | 25 | -90 | 21.46 | 2 |
| DEX-CZ1815 | 416273.186 | 9673851.863 | 405.484 | 28 | -90 | 21.29 | 6 |
| DEX-CZ1816 | 416322.338 | 9673847.074 | 400.224 | 39 | -90 | 29.39 | 1 |
| DEX-CZ1817 | 416373.237 | 9673847.606 | 399.221 | 23 | -90 | 18.21 | 1 |
| DEX-CZ1818 | 416175.253 | 9673874.881 | 404.621 | 22 | -90 | 16.41 | 5 |
| DEX-CZ1819 | 416199.534 | 9673874.316 | 405.000 | 15 | -90 | 7 | 5 |
| DEX-CZ1820 | 416227.559 | 9673874.521 | 412.070 | 31 | -90 | 30.52 | 2.21 |
| DEX-CZ1821 | 416248.402 | 9673870.877 | 411.202 | 35 | -90 | 27.82 | 5 |
| DEX-CZ1822 | 416274.524 | 9673871.237 | 408.665 | 28 | -90 | 26.42 | 5 |
| DEX-CZ1823 | 416298.481 | 9673871.033 | 405.593 | 25 | -90 | 22.43 | 0 |
| DEX-CZ1824 | 416323.513 | 9673871.881 | 400.835 | 48 | -90 | 29.54 | 1.3 |
| DEX-CZ1825 | 416349.147 | 9673872.855 | 391.785 | 47 | -90 | 16.32 | 26.68 |
| DEX-CZ1826 | 416374.347 | 9673871.200 | 392.115 | 30 | -90 | 12 | 12 |
| DEX-CZ1827 | 416124.508 | 9673894.037 | 401.494 | 27 | -90 | 11.28 | 3 |
| DEX-CZ1828 | 416176.597 | 9673896.750 | 405.475 | 25 | -90 | 14.2 | 7.24 |
| DEX-CZ1829 | 416225.765 | 9673900.296 | 416.060 | 27 | -90 | 27.02 | 1.35 |
| DEX-CZ1830 | 416274.655 | 9673896.902 | 412.712 | 24 | -90 | 22.16 | 1 |
| DEX-CZ1831 | 416127.085 | 9673919.018 | 409.316 | 43 | -90 | 17.19 | 14.21 |
| DEX-CZ1832 | 416150.317 | 9673921.725 | 410.688 | 31 | -90 | 25.34 | 3 |
| DEX-CZ1833 | 416172.250 | 9673924.001 | 409.524 | 32 | -90 | 18.26 | 11.49 |
| DEX-CZ1834 | 416200.365 | 9673925.080 | 418.973 | 33 | -90 | 28.69 | 5.2 |
| DEX-CZ1835 | 416226.074 | 9673926.623 | 418.841 | 33 | -90 | 28.3 | 7 |
| DEX-CZ1836 | 416252.936 | 9673925.481 | 416.097 | 22 | -90 | 18.57 | 0.5 |
| DEX-CZ1837 | 416276.261 | 9673924.264 | 413.043 | 22 | -90 | 22.89 | 0 |
| DEX-CZ1838 | 416302.156 | 9673921.362 | 409.491 | 33 | -90 | 14.19 | 14 |
| DEX-CZ1839 | 416326.073 | 9673926.459 | 404.893 | 20 | -90 | 14.97 | 1.59 |
| DEX-CZ1840 | 416450.346 | 9673924.409 | 368.193 | 28 | -90 | 7 | 5 |
| DEX-CZ1841 | 416477.196 | 9673926.826 | 361.032 | 23 | -90 | 6 | 15 |
| DEX-CZ1842 | 416121.675 | 9673944.023 | 415.991 | 25 | -90 | 22.63 | 1 |
| DEX-CZ1843 | 416174.015 | 9673952.846 | 423.377 | 21 | -90 | 15 | 4 |
| DEX-CZ1844 | 416226.873 | 9673948.719 | 420.689 | 48 | -90 | 35.56 | 14.88 |
| DEX-CZ1845 | 416276.086 | 9673948.115 | 415.471 | 25 | -90 | 22.08 | 3 |
| DEX-CZ1846 | 416327.860 | 9673951.208 | 405.624 | 18 | -90 | 15 | 1 |
| DEX-CZ1847 | 416477.523 | 9673951.061 | 359.397 | 14 | -90 | 2 | 6 |
| DEX-CZ1848 | 416124.968 | 9673972.444 | 425.870 | 24 | -90 | 14.92 | 6.19 |
| DEX-CZ1849 | 416151.471 | 9673975.019 | 426.089 | 24 | -90 | 20.18 | 5 |
| DEX-CZ1850 | 416174.969 | 9673976.203 | 426.186 | 31 | -90 | 25.73 | 4.66 |
| DEX-CZ1851 | 416199.978 | 9673974.604 | 425.075 | 36 | -90 | 19.1 | 17.97 |
| DEX-CZ1852 | 416224.927 | 9673975.493 | 422.847 | 22 | -90 | 15 | 6 |
| DEX-CZ1853 | 416249.437 | 9673972.990 | 420.034 | 30 | -90 | 16.52 | 9 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6326 | 415122.162 | 9674338.599 | 439.179 | 31 | -90 | 10 | 18.6 |
| DEX-BB6327 | 415170.491 | 9674343.957 | 453.553 | 34 | -90 | 13 | 19 |
| DEX-BB6328 | 415196.626 | 9674343.398 | 455.696 | 49 | -90 | 22 | 25 |
| DEX-BB6329 | 415223.677 | 9674345.903 | 457.672 | 43 | -90 | 20 | 21 |
| DEX-BB6330 | 415248.819 | 9674344.449 | 455.982 | 43 | -90 | 20 | 21 |
| DEX-BB6331 | 415266.584 | 9674350.271 | 452.701 | 60 | -90 | 25 | 35 |
| DEX-BB6332 | 415290.693 | 9674354.954 | 450.732 | 20 | -90 | 11 | 7 |
| DEX-BB6333 | 415315.883 | 9674345.694 | 455.686 | 30 | -90 | 19.21 | 9.46 |
| DEX-BB6334 | 415147.558 | 9674320.933 | 449.063 | 30 | -90 | 12 | 15.8 |
| DEX-BB6335 | 415172.089 | 9674322.067 | 452.387 | 38 | -90 | 16 | 20 |
| DEX-BB6336 | 415196.772 | 9674323.633 | 451.753 | 37 | -90 | 11.6 | 23.4 |
| DEX-BB6337 | 415226.371 | 9674327.645 | 453.148 | 17 | -90 | 14 | 1 |
| DEX-BB6338 | 415243.055 | 9674324.687 | 452.651 | 40 | -90 | 16 | 22 |
| DEX-BB6339 | 415276.637 | 9674316.481 | 437.857 | 6 | -90 | 2 | 2 |
| DEX-BB6340 | 415295.877 | 9674318.120 | 439.151 | 8 | -90 | 3 | 3 |
| DEX-BB6341 | 415170.543 | 9674299.621 | 449.055 | 16 | -90 | 7 | 7 |
| DEX-BB6342 | 415220.465 | 9674300.173 | 443.144 | 20 | -90 | 8 | 10 |
| DEX-BB6343 | 415243.871 | 9674304.004 | 446.957 | 28 | -90 | 12 | 14 |
| DEX-BB6344 | 415266.664 | 9674291.079 | 438.315 | 24 | -90 | 9 | 13.66 |
| DEX-CZ045 | 414898.680 | 9674601.967 | 434.916 | 21 | -90 | 16.87 | 3.9 |
| DEX-CZ1188 | 416366.762 | 9674450.232 | 395.000 | 24 | -90 | 16.99 | 7 |
| DEX-CZ1203 | 416047.874 | 9674607.706 | 415.264 | 28 | -90 | 21.03 | 6 |
| DEX-CZ1204 | 416149.798 | 9674602.194 | 400.207 | 23 | -90 | 14.73 | 8.2 |
| DEX-CZ1210 | 415999.499 | 9674649.589 | 413.633 | 25 | -90 | 15 | 8 |
| DEX-CZ1211 | 416046.136 | 9674650.994 | 411.271 | 18 | -90 | 15.29 | 2 |
| DEX-CZ1212 | 416102.857 | 9674647.939 | 409.995 | 32 | -90 | 14.25 | 16.69 |
| DEX-CZ1213 | 416146.668 | 9674640.264 | 404.420 | 25 | -90 | 16.22 | 8.29 |
| DEX-CZ1214 | 416200.731 | 9674651.472 | 402.847 | 33 | -90 | 30.18 | 3 |
| DEX-CZ1218 | 416050.703 | 9674691.887 | 405.523 | 21 | -90 | 8.51 | 11 |
| DEX-CZ1225 | 416051.011 | 9674744.614 | 403.471 | 22 | -90 | 14.81 | 7.47 |
| DEX-CZ1412 | 415551.196 | 9674752.300 | 410.448 | 36 | -90 | 12.52 | 24.34 |
| DEX-CZ2100 | 416124.417 | 9674424.482 | 395.310 | 15 | -90 | 11.47 | 3 |
| DEX-CZ2207 | 415573.882 | 9674523.169 | 414.317 | 45 | -90 | 22.53 | 22 |
| DEX-CZ2208 | 415548.639 | 9674524.940 | 417.856 | 43 | -90 | 18 | 23 |
| DEX-CZ2209 | 415524.168 | 9674524.080 | 421.740 | 41 | -90 | 14.8 | 24.73 |
| DEX-CZ2210 | 415500.218 | 9674523.579 | 426.871 | 37 | -90 | 19 | 17.57 |
| DEX-CZ2211 | 415475.295 | 9674523.158 | 433.037 | 27 | -90 | 12.64 | 13.26 |
| DEX-CZ2221 | 415473.564 | 9674548.913 | 429.127 | 33 | -90 | 22.86 | 11.05 |
| DEX-CZ2318 | 415575.490 | 9674772.694 | 411.578 | 33 | -90 | 13.24 | 18.99 |
| DEX-CZ2471 | 416549.885 | 9674900.698 | 428.802 | 27 | -90 | 20.87 | 6 |
| DEX-CZ267 | 415538.132 | 9674510.992 | 419.948 | 34 | -90 | 25.44 | 9.44 |
| DEX-CZ282 | 415512.441 | 9674455.124 | 425.202 | 38 | -90 | 35.54 | 4 |
| DEX-CZ2870 | 416451.517 | 9674775.764 | 444.905 | 17 | -90 | 2 | 9 |
| DEX-CZ3957 | 413980.985 | 9673808.945 | 293.241 | 16 | -90 | 4 | 10 |
| DEX-CZ3958 | 414098.971 | 9673796.204 | 294.313 | 18 | -90 | 6 | 10 |
| DEX-CZ3959 | 414177.493 | 9673797.923 | 310.689 | 19 | -90 | 13.03 | 3.45 |
| DEX-CZ3969 | 414003.404 | 9673902.759 | 317.517 | 19 | -90 | 3 | 14 |
| DEX-CZ3970 | 414100.718 | 9673903.956 | 307.096 | 21 | -90 | 2 | 17 |
| DEX-CZ3971 | 414211.252 | 9673909.615 | 318.587 | 12 | -90 | 8.52 | 1.48 |
| DEX-CZ4053 | 415030.989 | 9674304.649 | 414.275 | 12 | -90 | 3 | 6.5 |
| DEX-CZ635 | 416096.848 | 9674499.566 | 402.013 | 25 | -90 | 13.97 | 11.36 |
| DEX-CZ9761 | 414240.520 | 9673863.141 | 320.778 | 32 | -90 | 9 | 21 |
| DEX-CZ9762 | 414235.181 | 9673915.601 | 325.074 | 26 | -90 | 10.31 | 13.25 |
| DEX-CZ9763 | 414186.717 | 9673908.601 | 312.741 | 25 | -90 | 14.53 | 9.45 |
| DX00132 | 414653.705 | 9675253.012 | 432.923 | 19 | -90 | 1.8 | 17.49 |
| BB_STH-1015 | 414275.391 | 9674600.368 | 410.431 | 29 | -90 | 26.41 | 4.72 |
| BB_STH-1044 | 414020.925 | 9674098.513 | 356.010 | 26 | -90 | 14.14 | 11.88 |
| BB_STH-1063 | 414503.240 | 9673895.924 | 381.386 | 7 | -90 | 3 | 4 |
| DEX-BB6076 | 414028.800 | 9674769.000 | 387.266 | 24 | -90 | 14 | 7.55 |
| DEX-BB6100 | 414049.700 | 9674699.000 | 398.129 | 12 | -90 | 6 | 4 |
| DEX-BB6137 | 414263.796 | 9673828.267 | 322.018 | 36 | -90 | 12 | 21.8 |
| DEX-CZ032 | 414811.204 | 9674406.401 | 434.407 | 32 | -90 | 15.97 | 23.44 |
| DX00171 | 414848.706 | 9675499.171 | 438.595 | 11 | -90 | 2 | 6 |
| BB_STH-1002 | 413912.115 | 9674495.344 | 355.674 | 6 | -90 | 1 | 3 |
| BB_STH-1028 | 414204.909 | 9674310.684 | 386.513 | 15 | -90 | 2 | 11.48 |
| DX00170 | 414849.243 | 9675459.753 | 441.053 | 13 | -90 | 5 | 7 |
| BB_STH-1003 | 413998.249 | 9674495.911 | 383.253 | 9 | -90 | 7.29 | 1.54 |
| BB_STH-1013 | 413905.901 | 9674797.929 | 387.370 | 21 | -90 | 17.5 | 5 |
| DEX-BB6086 | 414045.400 | 9674747.000 | 389.849 | 27 | -90 | 17 | 7.7 |
| DEX-CZ010 | 414493.934 | 9674494.555 | 395.391 | 25 | -90 | 8.77 | 16.13 |
| DEX-CZ183 | 416001.888 | 9674702.960 | 406.783 | 23 | -90 | 14.93 | 8 |
| BB_STH-1011 | 413826.729 | 9674703.100 | 389.396 | 13 | -90 | 6.54 | 5.34 |
| DEX-BB6092 | 414029.300 | 9674724.000 | 394.355 | 19 | -90 | 14 | 4 |
| DEX-CZ351 | 416149.550 | 9674551.589 | 402.615 | 18 | -90 | 10.27 | 7.2 |
| BB_STH-1057 | 413923.675 | 9674015.201 | 331.000 | 15 | -90 | 3 | 10 |
| DEX-BB6072 | 413921.200 | 9674768.000 | 390.181 | 10 | -90 | 5 | 3 |
| DEX-CZ025 | 414702.651 | 9674506.155 | 434.528 | 15 | -90 | 10.58 | 5.05 |
| DEX-CZ1193 | 416261.595 | 9674500.640 | 400.070 | 34 | -90 | 9.6 | 25.77 |
| DX00174 | 414902.394 | 9675408.678 | 425.530 | 32 | -90 | 9.36 | 22.86 |
| BB_STH-1053 | 414377.439 | 9673995.364 | 378.689 | 12 | -90 | 1 | 9 |
| DX00168 | 414847.839 | 9675349.733 | 422.296 | 20 | -90 | 10.31 | 12.27 |
| BB_STH-1043 | 413926.636 | 9674098.650 | 329.010 | 10 | -90 | 3 | 5 |
| DEX-CZ037 | 414800.377 | 9674897.516 | 425.496 | 22 | -90 | 2 | 18.72 |
| BB_STH-1007 | 414110.511 | 9674601.890 | 421.483 | 11 | -90 | 1 | 9 |
| DEX-CZ031 | 414800.438 | 9674305.086 | 430.530 | 30 | -90 | 14.46 | 23.59 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1854 | 416274.291 | 9673974.407 | 417.714 | 34 | -90 | 14.25 | 20 |
| DEX-CZ1855 | 416301.828 | 9673972.344 | 414.009 | 34 | -90 | 17.47 | 15 |
| DEX-CZ1856 | 416326.405 | 9673972.941 | 407.131 | 33 | -90 | 6 | 4 |
| DEX-CZ1857 | 416399.713 | 9673974.264 | 388.005 | 21 | -90 | 16 | 3 |
| DEX-CZ1858 | 416422.659 | 9673973.022 | 381.113 | 40 | -90 | 19.32 | 15 |
| DEX-CZ1859 | 416449.380 | 9673974.955 | 372.755 | 29 | -90 | 11.25 | 16 |
| DEX-CZ1860 | 416474.806 | 9673974.152 | 363.494 | 38 | -90 | 4 | 8 |
| DEX-CZ1861 | 416502.315 | 9673975.565 | 357.762 | 19 | -90 | 2 | 10 |
| DEX-CZ1862 | 416551.536 | 9673975.252 | 344.602 | 23 | -90 | 16.37 | 6 |
| DEX-CZ1863 | 416126.546 | 9673997.346 | 429.715 | 39 | -90 | 29.9 | 7.64 |
| DEX-CZ1864 | 416176.285 | 9673996.702 | 427.546 | 29 | -90 | 25.27 | 3 |
| DEX-CZ1865 | 416225.202 | 9674000.066 | 424.451 | 30 | -90 | 18 | 5.75 |
| DEX-CZ1866 | 416275.219 | 9673999.163 | 417.772 | 30 | -90 | 16.1 | 6 |
| DEX-CZ1867 | 416423.492 | 9673992.784 | 384.707 | 17 | -90 | 13.62 | 0 |
| DEX-CZ1868 | 416475.376 | 9674002.823 | 370.238 | 22 | -90 | 7 | 13 |
| DEX-CZ1869 | 416527.085 | 9674001.486 | 349.478 | 32 | -90 | 6.44 | 12.47 |
| DEX-CZ1870 | 416579.487 | 9674000.155 | 356.123 | 13 | -90 | 4 | 7 |
| DEX-CZ1872 | 416222.030 | 9674024.634 | 425.026 | 31 | -90 | 15.02 | 14 |
| DEX-CZ1873 | 416249.666 | 9674025.707 | 421.571 | 28 | -90 | 16 | 8 |
| DEX-CZ1874 | 416275.479 | 9674024.114 | 417.977 | 52 | -90 | 34.24 | 4 |
| DEX-CZ1875 | 416398.551 | 9674020.711 | 391.231 | 25 | -90 | 15.7 | 8.68 |
| DEX-CZ1876 | 416430.529 | 9674025.093 | 385.727 | 28 | -90 | 24.58 | 4.48 |
| DEX-CZ1877 | 416452.940 | 9674026.068 | 381.138 | 35 | -90 | 18.74 | 6.2 |
| DEX-CZ1878 | 416476.697 | 9674025.469 | 374.111 | 30 | -90 | 15.73 | 12 |
| DEX-CZ1879 | 416500.365 | 9674024.306 | 364.271 | 11 | -90 | 6 | 2 |
| DEX-CZ1880 | 416524.144 | 9674025.993 | 353.828 | 26 | -90 | 9 | 14.56 |
| DEX-CZ1881 | 416551.469 | 9674025.404 | 345.739 | 25 | -90 | 16 | 6 |
| DEX-CZ1882 | 416576.337 | 9674022.221 | 346.792 | 31 | -90 | 4.2 | 24 |
| DEX-CZ1884 | 416224.069 | 9674047.658 | 424.004 | 23 | -90 | 16.13 | 5 |
| DEX-CZ1885 | 416275.186 | 9674050.193 | 415.555 | 24 | -90 | 16.89 | 3 |
| DEX-CZ1886 | 416475.625 | 9674048.297 | 376.725 | 17 | -90 | 7 | 8 |
| DEX-CZ1887 | 416527.065 | 9674050.792 | 356.677 | 40 | -90 | 12 | 28 |
| DEX-CZ1888 | 416577.897 | 9674050.284 | 347.443 | 14 | -90 | 7.42 | 4 |
| DEX-CZ1889 | 416225.758 | 9674076.796 | 420.863 | 32 | -90 | 24.33 | 6 |
| DEX-CZ1890 | 416249.257 | 9674075.785 | 418.634 | 20 | -90 | 16 | 2 |
| DEX-CZ1891 | 416273.077 | 9674074.351 | 413.960 | 27 | -90 | 8.52 | 9 |
| DEX-CZ1892 | 416297.608 | 9674077.364 | 407.077 | 40 | -90 | 5 | 13 |
| DEX-CZ1893 | 416323.131 | 9674075.809 | 400.389 | 40 | -90 | 18 | 6 |
| DEX-CZ1894 | 416348.328 | 9674074.055 | 395.130 | 35 | -90 | 14 | 5 |
| DEX-CZ1895 | 416375.156 | 9674072.611 | 387.591 | 32 | -90 | 14 | 14 |
| DEX-CZ1896 | 416400.496 | 9674074.975 | 386.647 | 16 | -90 | 12 | 0.8 |
| DEX-CZ1897 | 416501.882 | 9674076.476 | 365.465 | 31 | -90 | 1 | 11 |
| DEX-CZ1898 | 416524.587 | 9674071.505 | 355.083 | 26 | -90 | 9 | 14 |
| DEX-CZ1899 | 416550.847 | 9674073.803 | 347.000 | 9 | -90 | 2.4 | 3.35 |
| DEX-CZ1900 | 416577.743 | 9674075.952 | 352.086 | 12 | -90 | 6 | 4 |
| DEX-CZ1901 | 416600.443 | 9674075.000 | 363.587 | 12 | -90 | 3 | 4 |
| DEX-CZ1902 | 416224.293 | 9674098.916 | 420.520 | 22 | -90 | 18.66 | 4 |
| DEX-CZ1903 | 416278.170 | 9674099.105 | 408.843 | 35 | -90 | 9 | 21 |
| DEX-CZ1904 | 416325.729 | 9674096.896 | 397.753 | 22 | -90 | 16 | 1 |
| DEX-CZ1905 | 416378.518 | 9674099.277 | 380.531 | 36 | -90 | 11 | 16 |
| DEX-CZ1906 | 416423.971 | 9674097.818 | 380.288 | 18 | -90 | 5 | 7.28 |
| DEX-CZ1907 | 416551.133 | 9674100.026 | 351.792 | 14 | -90 | 6 | 6 |
| DEX-CZ1908 | 416577.533 | 9674100.412 | 359.537 | 12 | -90 | 6 | 4 |
| DEX-CZ1909 | 416275.167 | 9674125.214 | 407.108 | 25 | -90 | 11.58 | 11.18 |
| DEX-CZ1910 | 416300.974 | 9674127.323 | 398.533 | 26 | -90 | 20 | 4 |
| DEX-CZ1911 | 416326.852 | 9674125.672 | 391.895 | 13 | -90 | 10 | 0 |
| DEX-CZ1912 | 416352.649 | 9674122.495 | 387.410 | 35 | -90 | 19 | 2 |
| DEX-CZ1913 | 416377.622 | 9674123.282 | 379.796 | 36 | -90 | 11 | 25 |
| DEX-CZ1914 | 416403.208 | 9674123.941 | 372.000 | 40 | -90 | 22 | 7 |
| DEX-CZ1915 | 416426.606 | 9674122.935 | 371.260 | 37 | -90 | 7 | 23 |
| DEX-CZ1916 | 416448.851 | 9674124.603 | 366.128 | 28 | -90 | 6 | 15 |
| DEX-CZ1917 | 416477.517 | 9674124.501 | 359.489 | 19 | -90 | 5 | 11 |
| DEX-CZ1918 | 416500.403 | 9674129.034 | 354.039 | 18 | -90 | 8 | 3 |
| DEX-CZ1919 | 416525.070 | 9674124.726 | 350.438 | 21 | -90 | 17 | 1.43 |
| DEX-CZ1920 | 416550.847 | 9674124.476 | 350.013 | 28 | -90 | 4 | 17 |
| DEX-CZ1921 | 416576.080 | 9674124.168 | 360.010 | 11 | -90 | 4 | 5 |
| DEX-CZ1922 | 416602.228 | 9674124.590 | 370.554 | 43 | -90 | 25 | 14 |
| DEX-CZ1923 | 416275.602 | 9674148.622 | 404.924 | 15 | -90 | 11.35 | 2.57 |
| DEX-CZ1924 | 416324.708 | 9674150.037 | 392.049 | 26 | -90 | 18 | 5 |
| DEX-CZ1925 | 416351.148 | 9674148.731 | 386.505 | 34 | -90 | 23 | 11 |
| DEX-CZ1926 | 416374.906 | 9674150.096 | 381.909 | 39 | -90 | 24 | 11 |
| DEX-CZ1927 | 416399.953 | 9674150.643 | 376.189 | 23 | -90 | 19 | 2 |
| DEX-CZ1928 | 416427.865 | 9674150.110 | 372.315 | 32 | -90 | 18 | 12 |
| DEX-CZ1929 | 416450.289 | 9674150.760 | 368.321 | 20 | -90 | 13 | 4 |
| DEX-CZ1930 | 416528.914 | 9674149.133 | 350.898 | 23 | -90 | 20 | 1 |
| DEX-CZ1931 | 416550.966 | 9674150.922 | 350.838 | 24 | -90 | 9 | 9 |
| DEX-CZ1932 | 416576.168 | 9674149.688 | 362.815 | 27 | -90 | 4 | 17 |
| DEX-CZ1933 | 416627.282 | 9674150.678 | 372.892 | 36 | -90 | 10 | 18 |
| DEX-CZ1934 | 416275.333 | 9674173.174 | 403.697 | 31 | -90 | 18.76 | 13.88 |
| DEX-CZ1935 | 416303.122 | 9674174.181 | 394.802 | 27 | -90 | 22.42 | 6 |
| DEX-CZ1936 | 416325.404 | 9674172.032 | 388.433 | 38 | -90 | 21 | 13 |
| DEX-CZ1937 | 416352.865 | 9674173.440 | 388.000 | 22 | -90 | 17 | 3 |
| DEX-CZ1938 | 416376.199 | 9674175.391 | 387.060 | 20 | -90 | 10 | 6 |
| DEX-CZ1939 | 416401.627 | 9674175.621 | 383.634 | 29 | -90 | 12 | 16 |
| DEX-CZ1940 | 416428.027 | 9674173.032 | 379.731 | 19 | -90 | 16 | 1 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| BB_STH-1036 | 414102.095 | 9674208.709 | 374.218 | 15 | -90 | 4.23 | 10.44 |
| BB_STH-1046 | 414206.883 | 9674084.345 | 355.200 | 14 | -90 | 4 | 8.6 |
| DEX-CZ059 | 414989.908 | 9674702.853 | 476.559 | 30 | -90 | 24.24 | 7.85 |
| DX00178 | 414952.826 | 9675499.760 | 429.985 | 7 | -90 | 4 | 1.38 |
| BB_STH-1025 | 413937.485 | 9674286.428 | 349.466 | 12 | -90 | 3.18 | 7.19 |
| BB_STH-1033 | 414398.969 | 9674201.954 | 412.272 | 11 | -90 | 4 | 5 |
| DEX-BB6085 | 413999.300 | 9674749.000 | 390.446 | 49 | -90 | 35 | 11.85 |
| DEX-CZ108 | 415398.801 | 9674799.488 | 427.983 | 22 | -90 | 18.01 | 5.33 |
| BB_STH-1064 | 414597.673 | 9673894.477 | 401.924 | 10 | -90 | 1 | 7 |
| BB_STH-1029 | 414300.403 | 9674305.949 | 400.228 | 7 | -90 | 2 | 3 |
| DEX-CZ009 | 414499.519 | 9674640.614 | 463.046 | 18 | -90 | 15.01 | 3.57 |
| DEX-CZ078 | 415196.005 | 9674301.736 | 448.001 | 18 | -90 | 11.36 | 6 |
| DX00175 | 414894.980 | 9675346.974 | 422.790 | 19 | -90 | 11.74 | 9.35 |
| BB_STH-1004 | 414135.413 | 9674528.402 | 436.207 | 4 | -90 | 1 | 1 |
| BB_STH-1038 | 413901.967 | 9674192.531 | 332.200 | 8 | -90 | 2 | 4 |
| BB_STH-1054 | 414307.811 | 9673986.576 | 360.509 | 8 | -90 | 1 | 5 |
| DEX-BB4728 | 414732.266 | 9674475.752 | 453.000 | 27 | -90 | 24.57 | 0.5 |
| BB_STH-1047 | 414289.677 | 9674092.097 | 376.484 | 15 | -90 | 4 | 10.54 |
| DEX-CZ048 | 414877.484 | 9674305.238 | 424.602 | 15 | -90 | 13.23 | 1.79 |
| DEX-CZ104 | 415391.235 | 9674405.940 | 457.894 | 32 | -90 | 35.03 | 2.29 |
| DEX-CZ092 | 415288.570 | 9674414.595 | 468.932 | 31 | -90 | 32.27 | 2 |
| DEX-CZ079 | 415198.478 | 9674407.190 | 450.406 | 15 | -90 | 9.49 | 5.63 |
| DEX-CZ023 | 414682.923 | 9674693.454 | 468.298 | 38 | -90 | 19.38 | 23.55 |
| BB_STH-1040 | 413732.751 | 9674201.196 | 346.868 | 14 | -90 | 1 | 11 |
| BB_STH-1018 | 414196.283 | 9674415.606 | 436.888 | 7 | -90 | 1 | 4 |
| BB_STH-1052 | 414493.906 | 9674000.331 | 422.259 | 11 | -90 | 1 | 8 |
| DEX-CZ068 | 415088.595 | 9674599.956 | 454.224 | 30 | -90 | 27 | 10.29 |
| BB_STH-1037 | 414006.618 | 9674209.451 | 365.021 | 27 | -90 | 9.76 | 16.6 |
| DEX-CZ033 | 414801.715 | 9674499.980 | 453.276 | 27 | -90 | 17.4 | 11.01 |
| BB_STH-1021 | 413824.658 | 9674414.850 | 322.370 | 8 | -90 | 2 | 4.27 |
| DEX-CZ1189 | 416407.680 | 9674448.579 | 396.199 | 29 | -90 | 16.75 | 13 |
| BB_STH-1008 | 413989.367 | 9674643.148 | 419.435 | 4 | -90 | 1 | 1 |
| DEX-CZ091 | 415299.419 | 9674493.394 | 474.275 | 33 | -90 | 21.26 | 16.15 |
| BB_STH-1055 | 414200.697 | 9673996.107 | 330.074 | 7 | -90 | 2 | 3.38 |
| DEX-CZ020 | 414692.975 | 9675002.931 | 419.427 | 26 | -90 | 3.35 | 23.16 |
| DEX-CZ008 | 414499.582 | 9674701.603 | 463.387 | 26 | -90 | 16.08 | 11.66 |
| BB_STH-1010 | 413899.408 | 9674704.188 | 411.711 | 6 | -90 | 1 | 3 |
| DEX-CZ110 | 415502.668 | 9674902.626 | 402.279 | 8 | -90 | 6 | 0.45 |
| DEX-CZ1194 | 416359.228 | 9674490.772 | 392.900 | 23 | -90 | 19.11 | 5.07 |
| DX00163 | 414795.099 | 9675352.783 | 426.253 | 13 | -90 | 9.41 | 5.61 |
| DEX-CZ021 | 414704.439 | 9674899.578 | 406.569 | 11 | -90 | 3 | 6.26 |
| BB_STH-1030 | 414405.886 | 9674306.615 | 432.610 | 5 | -90 | 1 | 1 |
| DX00105 | 414800.683 | 9675406.392 | 437.239 | 7 | -90 | 2 | 3.27 |
| BB_STH-1009 | 413917.230 | 9674600.087 | 383.775 | 9 | -90 | 5 | 2 |
| DEX-CZ007 | 414495.447 | 9674793.708 | 429.312 | 9 | -90 | 2 | 5 |
| DX00179 | 415006.464 | 9675453.273 | 427.874 | 5 | -90 | 2 | 1 |
| DEX-CZ044 | 414890.270 | 9674695.257 | 456.130 | 31 | -90 | 24.82 | 9.15 |
| DEX-CZ060 | 414997.440 | 9674802.474 | 469.295 | 22 | -90 | 17.81 | 4.9 |
| DEX-CZ043 | 414898.709 | 9674810.483 | 457.262 | 26 | -90 | 1 | 24.42 |
| DEX-CZ114 | 415493.155 | 9674487.917 | 432.537 | 20 | -90 | 10.38 | 9.51 |
| DEX-CZ070 | 415096.399 | 9674413.426 | 436.665 | 18 | -90 | 4.53 | 13.35 |
| BB_STH-1017 | 414295.852 | 9674409.965 | 430.887 | 13 | -90 | 4.83 | 8.64 |
| DEX-MIA074 | 411600.430 | 9675812.810 | 361.820 | 9 | -90 | 2 | 3 |
| DEX-MIA028 | 411596.970 | 9676023.030 | 344.180 | 24 | -90 | 27.36 | 1.35 |
| DEX-MIA108 | 411701.790 | 9675726.200 | 346.260 | 12 | -90 | 8.35 | 3.1 |
| DEX-MIA154 | 411802.210 | 9675418.390 | 345.360 | 6 | -90 | 3 | 1 |
| DEX-MIA066 | 411693.030 | 9675922.270 | 339.910 | 19 | -90 | 10.86 | 8.77 |
| DEX-MIA145 | 411708.150 | 9675515.660 | 366.750 | 6 | -90 | 1 | 3 |
| DEX-MIA067 | 411604.610 | 9675923.470 | 349.930 | 12 | -90 | 9.34 | 2 |
| DEX-MIA107 | 411803.120 | 9675720.070 | 336.360 | 20 | -90 | 17.57 | 3.23 |
| DEX-MIA064 | 411902.630 | 9675921.300 | 331.810 | 5 | -90 | 2 | 0 |
| DEX-MIA121 | 412213.920 | 9675620.550 | 334.220 | 11 | -90 | 5 | 2 |
| DEX-MIA106 | 411903.000 | 9675714.020 | 330.780 | 6 | -90 | 3 | 1 |
| DEX-MIA029 | 411697.750 | 9676021.680 | 337.330 | 20 | -90 | 20.09 | 1.5 |
| DEX-MIA020 | 411704.950 | 9676120.100 | 340.080 | 13 | -90 | 8.25 | 4 |
| DEX-MIA143 | 411904.470 | 9675520.520 | 340.970 | 7 | -90 | 2 | 1 |
| DEX-MIA075 | 411801.620 | 9675824.470 | 332.470 | 17 | -90 | 12.77 | 3 |
| DEX-MIA126 | 412790.060 | 9675635.080 | 348.530 | 5 | -90 | 2 | 0 |
| DEX-MIA155 | 411899.560 | 9675415.560 | 370.920 | 16 | -90 | 1 | 10 |
| DEX-MIA014 | 412306.570 | 9676115.460 | 330.480 | 17 | -90 | 6 | 7.47 |
| DEX-MIA033 | 412192.920 | 9676026.160 | 347.450 | 21 | -90 | 5 | 15.53 |
| DEX-MIA103 | 412216.290 | 9675724.630 | 353.700 | 16 | -90 | 2 | 12.77 |
| DEX-MIA030 | 411806.940 | 9676019.910 | 334.540 | 16 | -90 | 3.25 | 3 |
| DEX-MIA142 | 412100.100 | 9675518.900 | 325.460 | 9 | -90 | 4.25 | 0 |
| DEX-MIA153 | 411711.220 | 9675429.100 | 349.800 | 6 | -90 | 2 | 1 |
| DEX-MIA118 | 411801.460 | 9675630.140 | 337.800 | 13 | -90 | 10.87 | 1 |
| DEX-MIA102 | 412303.280 | 9675730.050 | 347.900 | 14 | -90 | 6.41 | 6.34 |
| DEX-MIA156 | 411999.500 | 9675417.170 | 343.570 | 9 | -90 | 6.17 | 1 |
| DEX-MIA034 | 412306.080 | 9676020.440 | 337.530 | 24 | -90 | 10.34 | 11.73 |
| DEX-MIA019 | 411811.410 | 9676124.790 | 334.820 | 10 | -90 | 2 | 4.34 |
| DEX-MIA012 | 412499.090 | 9676122.730 | 346.910 | 13 | -90 | 5 | 6 |
| DEX-MIA035 | 412402.280 | 9676023.440 | 335.850 | 13 | -90 | 6 | 5.13 |
| DEX-MIA016 | 412097.400 | 9676120.000 | 352.830 | 11 | -90 | 1 | 6 |
| DEX-MIA036 | 412500.880 | 9676031.990 | 340.490 | 9 | -90 | 7 | 0 |
| DEX-MIA157 | 412089.300 | 9675416.560 | 327.950 | 9 | -90 | 6.15 | 1 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ1941 | 416448.413 | 9674175.929 | 374.401 | 20 | -90 | 12 | 2 |
| DEX-CZ1942 | 416475.259 | 9674175.115 | 367.164 | 18 | -90 | 2 | 13 |
| DEX-CZ1943 | 416501.161 | 9674174.098 | 355.074 | 10 | -90 | 7 | 1 |
| DEX-CZ1944 | 416525.682 | 9674177.185 | 351.247 | 18 | -90 | 14 | 0 |
| DEX-CZ1945 | 416549.158 | 9674172.358 | 352.253 | 8 | -90 | 3 | 2 |
| DEX-CZ1946 | 416577.727 | 9674173.256 | 363.003 | 19 | -90 | 6 | 6 |
| DEX-CZ1947 | 416602.679 | 9674173.864 | 366.198 | 44 | -90 | 13 | 25 |
| DEX-CZ1948 | 416625.663 | 9674173.868 | 367.314 | 41 | -90 | 15.48 | 14.52 |
| DEX-CZ1949 | 416274.832 | 9674200.658 | 399.547 | 16 | -90 | 13.49 | 4.35 |
| DEX-CZ1950 | 416324.333 | 9674198.720 | 387.534 | 40 | -90 | 15.67 | 27.62 |
| DEX-CZ1951 | 416375.568 | 9674201.962 | 385.917 | 19 | -90 | 11 | 5 |
| DEX-CZ1952 | 416426.737 | 9674199.277 | 378.392 | 17 | -90 | 8 | 7 |
| DEX-CZ1953 | 416447.135 | 9674200.777 | 371.457 | 17 | -90 | 9 | 6 |
| DEX-CZ1954 | 416526.960 | 9674199.343 | 352.315 | 8 | -90 | 4 | 1 |
| DEX-CZ1955 | 416575.214 | 9674201.583 | 354.676 | 18 | -90 | 5 | 5 |
| DEX-CZ1956 | 416625.986 | 9674200.769 | 362.575 | 37 | -90 | 6.73 | 25.27 |
| DEX-CZ1957 | 416273.604 | 9674226.066 | 395.203 | 13 | -90 | 10.23 | 1.34 |
| DEX-CZ1958 | 416298.831 | 9674226.180 | 389.874 | 24 | -90 | 12.04 | 10 |
| DEX-CZ1959 | 416323.478 | 9674226.374 | 384.690 | 27 | -90 | 22.54 | 6 |
| DEX-CZ1960 | 416351.332 | 9674225.835 | 377.303 | 14 | -90 | 8 | 2 |
| DEX-CZ1961 | 416376.006 | 9674223.982 | 380.773 | 16 | -90 | 5 | 8 |
| DEX-CZ1962 | 416401.707 | 9674221.718 | 377.013 | 12 | -90 | 7 | 1 |
| DEX-CZ1963 | 416426.976 | 9674222.962 | 371.345 | 19 | -90 | 8 | 9 |
| DEX-CZ1964 | 416452.240 | 9674224.108 | 365.318 | 14 | -90 | 6 | 4 |
| DEX-CZ1965 | 416477.883 | 9674225.894 | 357.322 | 25 | -90 | 3 | 20 |
| DEX-CZ1966 | 416502.695 | 9674225.945 | 355.043 | 13 | -90 | 2.68 | 3.32 |
| DEX-CZ1967 | 416576.250 | 9674225.473 | 353.788 | 24 | -90 | 12 | 4 |
| DEX-CZ1968 | 416601.661 | 9674224.987 | 357.661 | 49 | -90 | 15 | 17 |
| DEX-CZ1969 | 416626.447 | 9674224.883 | 362.798 | 13 | -90 | 3 | 8 |
| DEX-CZ1970 | 416249.830 | 9674225.232 | 401.686 | 29 | -90 | 25.76 | 3 |
| DEX-CZ1971 | 416225.356 | 9674223.646 | 407.471 | 37 | -90 | 29.82 | 8 |
| DEX-CZ1972 | 416201.242 | 9674226.807 | 408.874 | 26 | -90 | 23.47 | 1 |
| DEX-CZ1974 | 416127.603 | 9674224.082 | 421.836 | 23 | -90 | 20.74 | 1.6 |
| DEX-CZ1975 | 416100.309 | 9674224.552 | 424.000 | 32 | -90 | 32.66 | 2 |
| DEX-CZ1976 | 416074.940 | 9674226.906 | 423.066 | 34 | -90 | 18.07 | 9.52 |
| DEX-CZ1977 | 416050.294 | 9674224.129 | 420.800 | 24 | -90 | 16 | 4 |
| DEX-CZ1978 | 416028.098 | 9674224.200 | 417.131 | 38 | -90 | 26 | 9 |
| DEX-CZ1979 | 416000.056 | 9674232.324 | 409.771 | 25 | -90 | 24.34 | 1 |
| DEX-CZ1980 | 415974.557 | 9674227.032 | 400.562 | 20 | -90 | 11.17 | 6 |
| DEX-CZ1981 | 415948.925 | 9674225.656 | 402.421 | 23 | -90 | 17.84 | 5 |
| DEX-CZ1982 | 415921.524 | 9674226.189 | 403.449 | 43 | -90 | 11.32 | 24 |
| DEX-CZ1983 | 416174.756 | 9674198.485 | 417.773 | 34 | -90 | 30.69 | 3 |
| DEX-CZ1984 | 416125.418 | 9674201.179 | 425.586 | 36 | -90 | 21.24 | 16.22 |
| DEX-CZ1985 | 416082.079 | 9674197.363 | 425.560 | 27 | -90 | 20 | 5 |
| DEX-CZ1986 | 416025.820 | 9674199.943 | 414.845 | 20 | -90 | 14.93 | 3 |
| DEX-CZ1987 | 415925.846 | 9674203.424 | 394.562 | 25 | -90 | 10.17 | 11.25 |
| DEX-CZ1988 | 415980.825 | 9674199.141 | 397.599 | 37 | -90 | 19.22 | 4 |
| DEX-CZ1989 | 416175.810 | 9674173.393 | 422.840 | 44 | -90 | 42.07 | 4 |
| DEX-CZ1990 | 416149.872 | 9674179.787 | 424.555 | 25 | -90 | 21.53 | 2 |
| DEX-CZ1991 | 416124.450 | 9674175.228 | 428.860 | 32 | -90 | 33.04 | 1 |
| DEX-CZ1992 | 416000.405 | 9674174.776 | 403.001 | 39 | -90 | 33.35 | 2 |
| DEX-CZ1993 | 415976.556 | 9674175.990 | 392.305 | 38 | -90 | 20.15 | 5 |
| DEX-CZ1994 | 415923.711 | 9674176.869 | 386.128 | 41 | -90 | 12.87 | 23 |
| DEX-CZ1995 | 416175.118 | 9674152.973 | 425.042 | 31 | -90 | 23.29 | 7 |
| DEX-CZ1996 | 416125.374 | 9674146.178 | 430.484 | 26 | -90 | 21 | 2 |
| DEX-CZ1997 | 416076.494 | 9674100.197 | 428.577 | 25 | -90 | 19 | 3.52 |
| DEX-CZ1998 | 416124.728 | 9674076.848 | 433.000 | 28 | -90 | 22 | 4 |
| DEX-CZ1999 | 416100.655 | 9674073.046 | 432.481 | 32 | -90 | 25 | 5 |
| DEX-CZ2000 | 416025.935 | 9674074.148 | 425.421 | 20 | -90 | 16 | 1 |
| DEX-CZ2001 | 415999.999 | 9674074.762 | 421.422 | 30 | -90 | 21.8 | 6.2 |
| DEX-CZ2002 | 415924.794 | 9674074.271 | 401.345 | 26 | -90 | 20 | 1 |
| DEX-CZ2003 | 415898.070 | 9674075.509 | 389.780 | 21 | -90 | 4 | 11 |
| DEX-CZ2004 | 416123.990 | 9674049.541 | 432.830 | 24 | -90 | 19 | 3 |
| DEX-CZ2005 | 415925.461 | 9674049.737 | 404.604 | 14 | -90 | 10.29 | 0 |
| DEX-CZ2006 | 416123.405 | 9674027.103 | 432.110 | 23 | -90 | 18 | 3 |
| DEX-CZ2007 | 416100.391 | 9674029.049 | 431.762 | 38 | -90 | 27 | 9 |
| DEX-CZ2008 | 416023.166 | 9674025.393 | 430.338 | 19 | -90 | 15 | 1 |
| DEX-CZ2009 | 415999.010 | 9674023.782 | 427.780 | 26 | -90 | 18 | 6 |
| DEX-CZ2011 | 415925.476 | 9674027.933 | 405.970 | 13 | -90 | 5.36 | 5 |
| DEX-CZ2012 | 415900.095 | 9674024.958 | 393.701 | 6 | -90 | 2 | 0 |
| DEX-CZ2013 | 415876.020 | 9674025.149 | 387.085 | 17 | -90 | 5 | 9 |
| DEX-CZ2014 | 416025.709 | 9674000.430 | 430.335 | 25 | -90 | 16.17 | 6 |
| DEX-CZ2015 | 415972.859 | 9673999.558 | 425.684 | 19 | -90 | 11 | 3.39 |
| DEX-CZ2016 | 415925.110 | 9673998.966 | 409.345 | 12 | -90 | 6.37 | 3 |
| DEX-CZ2017 | 415876.255 | 9673996.527 | 395.838 | 12 | -90 | 4.34 | 5 |
| DEX-CZ2018 | 416024.597 | 9673975.004 | 429.209 | 31 | -90 | 16 | 12.28 |
| DEX-CZ2019 | 416002.449 | 9673975.065 | 430.000 | 36 | -90 | 15.92 | 19.05 |
| DEX-CZ2020 | 415977.112 | 9673971.873 | 429.295 | 12 | -90 | 8.2 | 0.35 |
| DEX-CZ2021 | 415952.094 | 9673978.404 | 423.463 | 27 | -90 | 13 | 13 |
| DEX-CZ2022 | 415925.491 | 9673974.988 | 415.615 | 10 | -90 | 6.29 | 2 |
| DEX-CZ2023 | 415900.553 | 9673974.533 | 408.116 | 20 | -90 | 5.3 | 11 |
| DEX-CZ2024 | 415877.550 | 9673975.421 | 398.845 | 10 | -90 | 2 | 5 |
| DEX-CZ2025 | 416027.501 | 9673948.936 | 425.895 | 28 | -90 | 25.2 | 1 |
| DEX-CZ2026 | 415974.730 | 9673948.989 | 426.219 | 16 | -90 | 6.51 | 7.49 |
| DEX-CZ2027 | 415924.465 | 9673950.391 | 415.552 | 18 | -90 | 3 | 4.3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-MIA104 | 412103.850 | 9675717.060 | 337.370 | 14 | -90 | 5.37 | 4 |
| DEX-MIA015 | 412202.550 | 9676119.520 | 346.900 | 21 | -90 | 14.87 | 7 |
| DEX-MIA021 | 411605.800 | 9676129.800 | 342.890 | 23 | -90 | 4.82 | 23.03 |
| DEX-MIA032 | 412092.680 | 9676023.620 | 340.160 | 28 | -90 | 11.09 | 16 |
| DEX-MIA119 | 411910.863 | 9675623.867 | 332.060 | 5 | -90 | 2 | 0 |
| DEX-MIA065 | 411802.990 | 9675932.970 | 334.410 | 17 | -90 | 11 | 4 |
| DEX-MIA105 | 412002.320 | 9675714.220 | 335.180 | 7 | -90 | 3 | 2 |
| DEX-BB6714 | 412003.210 | 9675880.535 | 332.000 | 23 | -90 | 17 | 4 |
| DEX-MIA018 | 411901.320 | 9676122.260 | 336.680 | 31 | -90 | 27.95 | 2.89 |
| DEX-BB6345 | 411656.850 | 9675334.480 | 360.880 | 11 | -90 | 1 | 4 |
| DEX-BB6346 | 411756.210 | 9675322.640 | 361.510 | 5 | -90 | 2 | 0 |
| DEX-BB6347 | 411861.690 | 9675339.920 | 373.680 | 6 | -90 | 2 | 1 |
| DEX-BB6348 | 412152.500 | 9675339.380 | 326.500 | 14 | -90 | 7 | 6 |
| DEX-BB6349 | 412253.590 | 9675335.860 | 330.390 | 11 | -90 | 7 | 1 |
| DEX-BB6350 | 412345.100 | 9675337.540 | 326.010 | 23 | -90 | 14 | 6 |
| DEX-BB6351 | 411948.390 | 9675227.070 | 338.370 | 6 | -90 | 4 | 0 |
| DEX-BB6352 | 411507.159 | 9675979.822 | 357.747 | 16 | -90 | 4 | 10 |
| DEX-BB6353 | 411854.370 | 9675230.950 | 356.570 | 10 | -90 | 1 | 9 |
| DEX-BB6354 | 411602.050 | 9675785.440 | 372.560 | 9 | -90 | 2 | 3 |
| DEX-BB6355 | 411502.930 | 9675773.060 | 392.090 | 9 | -90 | 3 | 2.45 |
| DEX-BB6356 | 411405.280 | 9675780.400 | 402.390 | 11 | -90 | 2 | 0 |
| DEX-BB6357 | 411306.690 | 9675773.640 | 372.360 | 10 | -90 | 6 | 1 |
| DEX-BB6358 | 411611.950 | 9675682.670 | 372.100 | 10 | -90 | 2 | 2 |
| DEX-BB6359 | 411505.080 | 9675673.450 | 405.540 | 6 | -90 | 3 | 0 |
| DEX-BB6360 | 411405.310 | 9675687.190 | 396.160 | 12 | -90 | 1 | 9 |
| DEX-BB6361 | 411307.900 | 9675681.740 | 384.740 | 15 | -90 | 9 | 3 |
| DEX-BB6362 | 411754.770 | 9675229.700 | 380.820 | 5 | -90 | 2 | 0 |
| DEX-BB6363 | 411613.590 | 9675579.780 | 373.210 | 12 | -90 | 2 | 2 |
| DEX-BB6364 | 411504.520 | 9675580.540 | 406.000 | 18 | -90 | 2.35 | 2.65 |
| DEX-BB6365 | 411405.050 | 9675583.460 | 410.330 | 40 | -90 | 31 | 2 |
| DEX-BB6366 | 411306.370 | 9675583.090 | 391.430 | 30 | -90 | 13 | 13.25 |
| DEX-BB6367 | 411602.290 | 9675474.860 | 393.390 | 14 | -90 | 1 | 4 |
| DEX-BB6368 | 411506.320 | 9675480.100 | 387.510 | 21 | -90 | 10 | 7 |
| DEX-BB6369 | 411403.910 | 9675480.310 | 389.620 | 50 | -90 | 25 | 10 |
| DEX-BB6370 | 411303.620 | 9675480.520 | 397.340 | 20 | -90 | 8 | 2 |
| DEX-BB6371 | 411658.490 | 9675228.410 | 365.540 | 10 | -90 | 1 | 4 |
| DEX-BB6372 | 412054.690 | 9675237.060 | 333.750 | 16 | -90 | 10 | 3 |
| DEX-BB6373 | 412151.550 | 9675228.300 | 327.150 | 11 | -90 | 6 | 2 |
| DEX-BB6374 | 412254.420 | 9675229.020 | 320.780 | 12 | -90 | 5 | 2 |
| DEX-BB6375 | 412359.250 | 9675244.640 | 313.680 | 9 | -90 | 4 | 0 |
| DEX-BB6376 | 411757.970 | 9675129.040 | 362.010 | 12 | -90 | 12 | 0 |
| DEX-BB6377 | 411854.841 | 9675127.629 | 354.481 | 10 | -90 | 1 | 0 |
| DEX-BB6378 | 411963.431 | 9675125.863 | 367.228 | 5 | -90 | 1 | 1 |
| DEX-BB6379 | 412052.975 | 9675133.286 | 342.345 | 11 | -90 | 2 | 1 |
| DEX-BB6380 | 412167.911 | 9675127.725 | 330.081 | 11 | -90 | 8 | 0.4 |
| DEX-BB6381 | 412250.340 | 9675141.980 | 318.980 | 12 | -90 | 3 | 1 |
| DEX-BB6382 | 412346.340 | 9675133.490 | 311.610 | 7 | -90 | 3 | 0 |
| DEX-BB6383 | 412458.200 | 9675127.020 | 332.480 | 21 | -90 | 12 | 6 |
| DEX-BB6384 | 412550.480 | 9675128.650 | 342.430 | 17 | -90 | 14 | 0.4 |
| DEX-BB6385 | 411754.179 | 9675026.196 | 353.165 | 17 | -90 | 8 | 6 |
| DEX-BB6386 | 411854.223 | 9675030.196 | 368.090 | 11 | -90 | 9 | 2 |
| DEX-BB6387 | 411960.875 | 9675027.686 | 372.286 | 6 | -90 | 1 | 1 |
| DEX-BB6388 | 412054.363 | 9675033.382 | 345.383 | 12 | -90 | 8 | 1.52 |
| DEX-BB6389 | 412155.807 | 9675029.502 | 328.414 | 9 | -90 | 2 | 3 |
| DEX-BB6390 | 412254.600 | 9675026.640 | 345.710 | 13 | -90 | 12 | 0 |
| DEX-BB6391 | 412358.550 | 9675031.600 | 330.920 | 12 | -90 | 8.4 | 0 |
| DEX-BB6392 | 412469.410 | 9675040.900 | 309.680 | 8 | -90 | 4 | 1.35 |
| DEX-BB6393 | 412555.330 | 9675035.930 | 333.060 | 16 | -90 | 7 | 6.5 |
| DEX-BB6394 | 411749.116 | 9674931.528 | 344.873 | 14 | -90 | 11 | 0 |
| DEX-BB6395 | 411852.544 | 9674922.447 | 365.743 | 11 | -90 | 2 | 4 |
| DEX-BB6396 | 411954.456 | 9674921.984 | 372.193 | 13 | -90 | 3 | 4 |
| DEX-BB6397 | 412054.539 | 9674918.409 | 346.760 | 24 | -90 | 13 | 6.57 |
| DEX-BB6398 | 412155.408 | 9674926.230 | 336.122 | 14 | -90 | 10 | 0 |
| DEX-BB6399 | 412267.970 | 9674942.840 | 356.180 | 8 | -90 | 4 | 4 |
| DEX-BB6400 | 412360.164 | 9674931.773 | 329.132 | 13 | -90 | 12 | 0 |
| DEX-BB6401 | 412445.104 | 9674933.702 | 318.084 | 13 | -90 | 5 | 2.7 |
| DEX-BB6402 | 411848.042 | 9674831.952 | 364.790 | 10 | -90 | 4 | 0 |
| DEX-BB6403 | 411950.763 | 9674825.044 | 382.319 | 14 | -90 | 2 | 4 |
| DEX-BB6404 | 412058.222 | 9674826.988 | 348.467 | 23 | -90 | 8 | 5 |
| DEX-BB6405 | 412157.645 | 9674827.058 | 341.748 | 14 | -90 | 8 | 2 |
| DEX-BB6406 | 412255.185 | 9674832.098 | 354.101 | 8 | -90 | 1 | 0 |
| DEX-BB6407 | 412358.795 | 9674827.858 | 332.416 | 12 | -90 | 6 | 1 |
| DEX-BB6408 | 412465.030 | 9674829.100 | 328.098 | 18 | -90 | 10 | 6 |
| DEX-BB6411 | 412251.462 | 9674719.852 | 366.509 | 8 | -90 | 3 | 0 |
| DEX-BB6412 | 412341.575 | 9674720.545 | 344.294 | 14 | -90 | 4 | 5 |
| DEX-BB6413 | 412453.262 | 9674743.609 | 331.148 | 20 | -90 | 4 | 12 |
| DEX-BB6415 | 412261.882 | 9674633.781 | 342.822 | 7 | -90 | 2 | 1 |
| DEX-BB6416 | 412346.269 | 9674620.463 | 326.338 | 17 | -90 | 10 | 4 |
| DEX-BB6417 | 412444.183 | 9674643.228 | 315.094 | 24 | -90 | 12 | 5 |
| DEX-BB6418 | 411652.173 | 9676126.430 | 346.017 | 11 | -90 | 1 | 0 |
| DEX-BB6419 | 411757.243 | 9676131.254 | 336.000 | 12 | -90 | 4 | 0 |
| DEX-BB6420 | 411855.852 | 9676130.266 | 335.379 | 27 | -90 | 9 | 15 |
| DEX-BB6421 | 411953.680 | 9676130.170 | 338.630 | 22 | -90 | 5 | 14 |
| DEX-BB6422 | 412056.253 | 9676123.930 | 351.697 | 16 | -90 | 3 | 6 |
| DEX-BB6423 | 412099.714 | 9676131.948 | 352.855 | 13 | -90 | 2 | 7 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2028 | 415876.996 | 9673947.517 | 403.295 | 27 | -90 | 8.65 | 17 |
| DEX-CZ2029 | 416024.450 | 9673924.529 | 419.040 | 21 | -90 | 6.63 | 12.37 |
| DEX-CZ2030 | 415999.368 | 9673925.360 | 422.353 | 6 | -90 | 1 | 3 |
| DEX-CZ2031 | 415974.304 | 9673927.523 | 420.248 | 15 | -90 | 4 | 2 |
| DEX-CZ2032 | 415949.539 | 9673924.697 | 412.442 | 23 | -90 | 9.15 | 7.21 |
| DEX-CZ2033 | 415928.415 | 9673924.527 | 406.939 | 26 | -90 | 2 | 22 |
| DEX-CZ2034 | 415894.008 | 9673930.604 | 408.870 | 15 | -90 | 13.74 | 1 |
| DEX-CZ2035 | 415970.747 | 9673901.029 | 409.504 | 13 | -90 | 8.24 | 1.71 |
| DEX-CZ2036 | 415926.108 | 9673901.811 | 397.939 | 17 | -90 | 7.37 | 7.23 |
| DEX-CZ2037 | 416223.002 | 9674299.935 | 396.433 | 20 | -90 | 18.2 | 3 |
| DEX-CZ2038 | 416075.985 | 9674300.156 | 415.237 | 44 | -90 | 27.1 | 11 |
| DEX-CZ2039 | 416226.806 | 9674348.940 | 392.474 | 23 | -90 | 15.64 | 8.2 |
| DEX-CZ2040 | 416175.850 | 9674348.651 | 401.929 | 28 | -90 | 17.12 | 5 |
| DEX-CZ2041 | 416122.725 | 9674350.486 | 403.644 | 56 | -90 | 29.54 | 17.25 |
| DEX-CZ2042 | 416073.246 | 9674351.163 | 404.275 | 33 | -90 | 24.8 | 2 |
| DEX-CZ2043 | 416019.838 | 9674349.170 | 415.182 | 30 | -90 | 23.2 | 4.3 |
| DEX-CZ2044 | 415976.799 | 9674350.437 | 417.972 | 38 | -90 | 22 | 5 |
| DEX-CZ2045 | 415927.619 | 9674274.744 | 414.226 | 27 | -90 | 19.03 | 6.77 |
| DEX-CZ2046 | 415950.537 | 9674274.845 | 413.500 | 22 | -90 | 14.76 | 5 |
| DEX-CZ2047 | 415974.565 | 9674275.270 | 416.053 | 41 | -90 | 15.94 | 5.2 |
| DEX-CZ2048 | 415996.836 | 9674275.172 | 417.000 | 43 | -90 | 18.15 | 17 |
| DEX-CZ2049 | 416025.209 | 9674274.497 | 417.638 | 46 | -90 | 20 | 6 |
| DEX-CZ2050 | 416049.288 | 9674273.453 | 419.165 | 34 | -90 | 26.93 | 3 |
| DEX-CZ2051 | 416073.950 | 9674274.408 | 419.336 | 38 | -90 | 23.52 | 11.29 |
| DEX-CZ2052 | 416101.327 | 9674274.495 | 419.136 | 45 | -90 | 35.23 | 11 |
| DEX-CZ2053 | 416124.201 | 9674274.284 | 415.722 | 39 | -90 | 22.87 | 18 |
| DEX-CZ2054 | 416149.452 | 9674275.118 | 411.466 | 35 | -90 | 28.49 | 5 |
| DEX-CZ2055 | 416174.058 | 9674273.985 | 408.534 | 35 | -90 | 25.67 | 7.85 |
| DEX-CZ2056 | 416201.490 | 9674276.720 | 403.185 | 39 | -90 | 22.88 | 9 |
| DEX-CZ2057 | 416176.040 | 9674249.159 | 411.872 | 34 | -90 | 14.26 | 10 |
| DEX-CZ2058 | 416225.142 | 9674249.839 | 402.571 | 21 | -90 | 20.25 | 0 |
| DEX-CZ2061 | 416027.517 | 9674250.599 | 417.583 | 29 | -90 | 23.38 | 5 |
| DEX-CZ2064 | 416123.632 | 9674248.951 | 419.986 | 50 | -90 | 35.33 | 16 |
| DEX-CZ2065 | 416076.193 | 9674250.394 | 421.882 | 34 | -90 | 33.98 | 2 |
| DEX-CZ2067 | 415976.265 | 9674250.588 | 410.792 | 20 | -90 | 17.52 | 1 |
| DEX-CZ2068 | 415921.718 | 9674251.045 | 409.668 | 35 | -90 | 19.19 | 14 |
| DEX-CZ2069 | 416249.406 | 9674324.493 | 390.445 | 19 | -90 | 17.28 | 2 |
| DEX-CZ2070 | 416222.984 | 9674327.202 | 389.486 | 23 | -90 | 24 | 2 |
| DEX-CZ2071 | 416202.078 | 9674323.539 | 395.000 | 35 | -90 | 29.45 | 7.99 |
| DEX-CZ2072 | 416175.055 | 9674322.147 | 401.247 | 35 | -90 | 23.48 | 8 |
| DEX-CZ2073 | 416149.108 | 9674324.535 | 405.328 | 53 | -90 | 34.98 | 16.01 |
| DEX-CZ2074 | 416098.479 | 9674322.683 | 410.010 | 31 | -90 | 25.87 | 6 |
| DEX-CZ2075 | 416074.775 | 9674324.508 | 411.056 | 43 | -90 | 23.26 | 5 |
| DEX-CZ2076 | 416049.300 | 9674322.010 | 412.667 | 30 | -90 | 15.84 | 9 |
| DEX-CZ2077 | 416024.470 | 9674325.393 | 413.829 | 36 | -90 | 16.27 | 1 |
| DEX-CZ2078 | 416001.396 | 9674326.396 | 418.000 | 35 | -90 | 28.83 | 4 |
| DEX-CZ2079 | 416223.113 | 9674374.168 | 398.117 | 19 | -90 | 16.72 | 2 |
| DEX-CZ2080 | 416199.351 | 9674376.828 | 402.172 | 41 | -90 | 18.51 | 14.59 |
| DEX-CZ2081 | 416171.503 | 9674375.177 | 403.000 | 26 | -90 | 14.43 | 7 |
| DEX-CZ2082 | 416146.676 | 9674375.483 | 403.000 | 21 | -90 | 16.92 | 3.18 |
| DEX-CZ2083 | 416125.651 | 9674376.613 | 400.891 | 29 | -90 | 18.47 | 6 |
| DEX-CZ2084 | 416075.431 | 9674373.010 | 402.700 | 29 | -90 | 24 | 1 |
| DEX-CZ2085 | 416049.822 | 9674373.951 | 406.564 | 40 | -90 | 22.61 | 5 |
| DEX-CZ2086 | 416025.550 | 9674374.852 | 410.225 | 33 | -90 | 16 | 14 |
| DEX-CZ2087 | 416000.135 | 9674374.818 | 414.000 | 33 | -90 | 20.84 | 10 |
| DEX-CZ2088 | 415975.742 | 9674375.860 | 416.000 | 45 | -90 | 30.12 | 6.25 |
| DEX-CZ2089 | 416224.214 | 9674401.345 | 395.425 | 27 | -90 | 9.96 | 8.92 |
| DEX-CZ2090 | 416171.556 | 9674401.193 | 402.937 | 30 | -90 | 27.54 | 6.21 |
| DEX-CZ2091 | 416123.031 | 9674400.385 | 399.474 | 35 | -90 | 20.11 | 10.31 |
| DEX-CZ2092 | 416024.661 | 9674399.994 | 413.753 | 33 | -90 | 33.05 | 1 |
| DEX-CZ2093 | 415974.328 | 9674400.432 | 416.796 | 20 | -90 | 17.74 | 2 |
| DEX-CZ2094 | 415974.500 | 9674423.410 | 419.335 | 26 | -90 | 21.99 | 3.22 |
| DEX-CZ2095 | 415999.659 | 9674426.277 | 418.821 | 28 | -90 | 17.47 | 4 |
| DEX-CZ2096 | 416026.048 | 9674425.604 | 414.832 | 34 | -90 | 29.82 | 2 |
| DEX-CZ2097 | 416051.086 | 9674425.056 | 410.401 | 33 | -90 | 15 | 11 |
| DEX-CZ2098 | 416075.168 | 9674424.841 | 404.644 | 28 | -90 | 17.49 | 12 |
| DEX-CZ2099 | 416100.839 | 9674425.769 | 401.754 | 26 | -90 | 21.71 | 4 |
| DEX-CZ2101 | 416148.717 | 9674425.280 | 398.511 | 32 | -90 | 5.58 | 22.4 |
| DEX-CZ2102 | 416172.707 | 9674421.539 | 400.950 | 17 | -90 | 13.76 | 1 |
| DEX-CZ2103 | 416196.970 | 9674424.207 | 396.874 | 22 | -90 | 5 | 14 |
| DEX-CZ2106 | 416002.800 | 9673874.110 | 402.025 | 23 | -90 | 11 | 4 |
| DEX-CZ2107 | 415976.186 | 9673874.934 | 402.627 | 22 | -90 | 15.98 | 5 |
| DEX-CZ2108 | 415951.222 | 9673870.417 | 397.486 | 15 | -90 | 11.63 | 2 |
| DEX-CZ2109 | 415974.128 | 9673853.186 | 397.535 | 23 | -90 | 17.25 | 5 |
| DEX-CZ2110 | 416224.331 | 9674274.747 | 399.955 | 23 | -90 | 20.85 | 3 |
| DEX-CZ2111 | 416247.234 | 9674265.476 | 397.154 | 30 | -90 | 11.28 | 12 |
| DEX-CZ2112 | 416248.532 | 9674298.361 | 394.306 | 32 | -90 | 17.61 | 15 |
| DEX-CZ2113 | 415974.976 | 9674024.298 | 423.457 | 22 | -90 | 14 | 6 |
| DEX-CZ2114 | 415976.500 | 9674047.285 | 420.949 | 35 | -90 | 21 | 12 |
| DEX-CZ2115 | 415973.724 | 9674073.114 | 415.906 | 34 | -90 | 24 | 5 |
| DEX-CZ2116 | 415951.027 | 9674075.989 | 409.293 | 26 | -90 | 20 | 2 |
| DEX-CZ2117 | 416074.718 | 9674050.729 | 432.000 | 24 | -90 | 18 | 3.52 |
| DEX-CZ2118 | 416070.449 | 9674076.479 | 429.892 | 30 | -90 | 24 | 4 |
| DEX-CZ2119 | 416022.418 | 9674098.704 | 420.691 | 33 | -90 | 18 | 15 |
| DEX-CZ2120 | 415975.295 | 9674099.083 | 411.244 | 22 | -90 | 13 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6424 | 412161.180 | 9676125.220 | 347.960 | 26 | -90 | 11 | 12 |
| DEX-BB6425 | 412249.300 | 9676128.830 | 339.420 | 20 | -90 | 10 | 2 |
| DEX-BB6426 | 411609.604 | 9676079.343 | 344.000 | 26 | -90 | 9 | 7 |
| DEX-BB6427 | 411655.194 | 9676079.245 | 342.571 | 16 | -90 | 5 | 5 |
| DEX-BB6428 | 411854.300 | 9675581.060 | 334.000 | 15 | -90 | 6 | 3 |
| DEX-BB6429 | 411858.160 | 9675473.370 | 343.280 | 13 | -90 | 9 | 2 |
| DEX-BB6430 | 411997.150 | 9675472.440 | 342.390 | 11 | -90 | 3 | 3 |
| DEX-BB6432 | 411956.340 | 9675429.060 | 357.650 | 6 | -90 | 3 | 0 |
| DEX-BB6433 | 411856.380 | 9675382.310 | 376.860 | 7 | -90 | 2 | 1 |
| DEX-BB6434 | 411707.293 | 9676079.136 | 338.706 | 26 | -90 | 21 | 3 |
| DEX-BB6435 | 411904.070 | 9675380.340 | 374.910 | 7 | -90 | 3 | 1 |
| DEX-BB6436 | 411954.800 | 9675388.310 | 357.290 | 9 | -90 | 3 | 3 |
| DEX-BB6437 | 412007.769 | 9675386.988 | 341.440 | 15 | -90 | 10 | 1 |
| DEX-BB6438 | 412055.350 | 9675377.760 | 333.360 | 17 | -90 | 13 | 2 |
| DEX-BB6439 | 412100.300 | 9675371.930 | 328.100 | 13 | -90 | 8 | 1 |
| DEX-BB6440 | 412171.550 | 9675375.960 | 321.000 | 15 | -90 | 3 | 5 |
| DEX-BB6441 | 411957.080 | 9675342.540 | 349.800 | 9 | -90 | 2.7 | 0 |
| DEX-BB6442 | 412006.600 | 9675333.120 | 338.960 | 18 | -90 | 11 | 5 |
| DEX-BB6443 | 412050.900 | 9675331.120 | 333.390 | 17 | -90 | 13 | 1 |
| DEX-BB6444 | 412107.630 | 9675334.350 | 328.970 | 17 | -90 | 8 | 4 |
| DEX-BB6445 | 411763.392 | 9676080.793 | 336.239 | 15 | -90 | 4 | 0 |
| DEX-BB6446 | 411805.011 | 9676078.233 | 335.025 | 15 | -90 | 2 | 10.55 |
| DEX-BB6447 | 411850.972 | 9676082.136 | 334.214 | 21 | -90 | 16.25 | 1 |
| DEX-BB6448 | 411906.530 | 9676081.790 | 334.130 | 27 | -90 | 13 | 11 |
| DEX-BB6449 | 411956.180 | 9676085.260 | 335.940 | 23 | -90 | 16.32 | 5 |
| DEX-BB6450 | 412011.721 | 9676075.977 | 338.326 | 22 | -90 | 10 | 10 |
| DEX-BB6451 | 412056.352 | 9676078.868 | 344.410 | 18 | -90 | 10 | 2 |
| DEX-BB6452 | 412110.627 | 9676080.813 | 350.004 | 22 | -90 | 10 | 9 |
| DEX-BB6453 | 412160.110 | 9676080.640 | 349.000 | 34 | -90 | 26 | 6 |
| DEX-BB6454 | 412204.330 | 9676079.340 | 349.000 | 24 | -90 | 10 | 10 |
| DEX-BB6456 | 412296.670 | 9676076.820 | 336.550 | 24 | -90 | 11 | 5 |
| DEX-BB6457 | 411654.607 | 9676029.653 | 339.943 | 25 | -90 | 19.23 | 3 |
| DEX-BB6459 | 411864.860 | 9676019.620 | 333.820 | 20 | -90 | 14 | 2 |
| DEX-BB6460 | 411957.272 | 9676028.652 | 334.374 | 19 | -90 | 13 | 3 |
| DEX-BB6461 | 412005.883 | 9676029.980 | 336.000 | 33 | -90 | 22 | 8 |
| DEX-BB6462 | 412055.499 | 9676030.125 | 338.554 | 34 | -90 | 19 | 12 |
| DEX-BB6463 | 412152.610 | 9676037.950 | 346.750 | 33 | -90 | 20 | 5 |
| DEX-BB6464 | 412252.140 | 9676029.690 | 345.490 | 23 | -90 | 6 | 7 |
| DEX-BB6465 | 411610.427 | 9675982.626 | 346.484 | 23 | -90 | 11 | 9 |
| DEX-BB6466 | 411657.945 | 9675979.646 | 341.840 | 20 | -90 | 15 | 1 |
| DEX-BB6467 | 411707.307 | 9675980.731 | 337.469 | 30 | -90 | 15 | 4 |
| DEX-BB6468 | 411755.150 | 9675979.510 | 335.760 | 25 | -90 | 10 | 7 |
| DEX-BB6469 | 411806.730 | 9675979.750 | 334.690 | 20 | -90 | 3 | 10 |
| DEX-BB6470 | 412005.844 | 9675979.314 | 335.131 | 30 | -90 | 12 | 14 |
| DEX-BB6471 | 412047.459 | 9675980.873 | 335.523 | 32 | -90 | 20.3 | 9 |
| DEX-BB6472 | 412101.476 | 9675979.040 | 338.187 | 33 | -90 | 15 | 12 |
| DEX-BB6473 | 412154.022 | 9675977.700 | 342.006 | 41 | -90 | 13 | 12.3 |
| DEX-BB6474 | 412202.430 | 9675980.690 | 348.970 | 28 | -90 | 10 | 11 |
| DEX-BB6475 | 412257.170 | 9675978.340 | 347.260 | 13 | -90 | 2 | 6 |
| DEX-BB6477 | 411657.961 | 9675934.723 | 343.565 | 23 | -90 | 12 | 4 |
| DEX-BB6478 | 411761.610 | 9675931.130 | 335.000 | 18 | -90 | 11 | 4 |
| DEX-BB6479 | 412055.444 | 9675930.105 | 334.230 | 27 | -90 | 12 | 12 |
| DEX-BB6480 | 412099.515 | 9675928.712 | 335.752 | 30 | -90 | 13 | 10 |
| DEX-BB6481 | 412306.980 | 9675931.710 | 346.990 | 10 | -90 | 6 | 0 |
| DEX-BB6482 | 411658.528 | 9675881.528 | 345.148 | 20 | -90 | 7 | 1.45 |
| DEX-BB6483 | 411706.119 | 9675882.862 | 340.278 | 18 | -90 | 11 | 1 |
| DEX-BB6484 | 411758.926 | 9675878.162 | 335.344 | 18 | -90 | 13 | 2 |
| DEX-BB6485 | 411802.230 | 9675879.220 | 333.490 | 20 | -90 | 14 | 2 |
| DEX-BB6486 | 411855.680 | 9675879.370 | 332.800 | 18 | -90 | 12 | 1 |
| DEX-BB6487 | 411752.797 | 9675832.418 | 337.963 | 21 | -90 | 11 | 5 |
| DEX-BB6488 | 411858.060 | 9675835.520 | 332.260 | 21 | -90 | 17 | 1 |
| DEX-BB6489 | 411652.860 | 9675779.400 | 358.070 | 12 | -90 | 4 | 8 |
| DEX-BB6491 | 412307.090 | 9675777.640 | 355.850 | 20 | -90 | 12 | 4 |
| DEX-BB6492 | 412351.600 | 9675788.750 | 348.880 | 17 | -90 | 10 | 4 |
| DEX-BB6493 | 411650.390 | 9675728.780 | 359.750 | 10 | -90 | 3 | 2 |
| DEX-BB6494 | 411758.830 | 9675728.080 | 339.570 | 19 | -90 | 10 | 4 |
| DEX-BB6495 | 411654.510 | 9675680.000 | 355.890 | 12 | -90 | 6 | 2 |
| DEX-BB6496 | 411706.650 | 9675679.190 | 347.090 | 15 | -90 | 9 | 1 |
| DEX-BB6497 | 411758.240 | 9675680.320 | 342.000 | 18 | -90 | 11 | 1 |
| DEX-BB6498 | 412055.120 | 9675683.710 | 334.200 | 15 | -90 | 11 | 1.5 |
| DEX-BB6499 | 412106.640 | 9675679.270 | 334.600 | 9 | -90 | 4 | 1 |
| DEX-BB6501 | 412358.200 | 9675677.930 | 342.420 | 17 | -90 | 6 | 8 |
| DEX-BB6503 | 411756.530 | 9675630.170 | 343.000 | 17 | -90 | 9 | 5 |
| DEX-BB6504 | 411854.830 | 9675631.730 | 333.460 | 18 | -90 | 13 | 2 |
| DEX-BB6505 | 412253.840 | 9675630.060 | 335.710 | 13 | -90 | 3 | 2 |
| DEX-BB6507 | 411656.330 | 9675580.080 | 363.780 | 14 | -90 | 1 | 3 |
| DEX-BB6508 | 411701.110 | 9675576.460 | 354.240 | 10 | -90 | 5 | 0 |
| DEX-BB6509 | 411755.480 | 9675581.970 | 346.820 | 12 | -90 | 5 | 4 |
| DEX-BB6510 | 411807.880 | 9675577.070 | 340.000 | 16 | -90 | 6 | 0 |
| DEX-BB6511 | 411584.404 | 9676124.578 | 342.901 | 27 | -90 | 13 | 11 |
| DEX-BB6512 | 411828.798 | 9676128.433 | 335.051 | 17 | -90 | 11 | 3 |
| DEX-BB6513 | 411879.938 | 9676135.751 | 336.745 | 25 | -90 | 14 | 7 |
| DEX-BB6514 | 411927.679 | 9676130.668 | 338.418 | 24 | -90 | 11 | 8 |
| DEX-BB6515 | 411982.351 | 9676126.948 | 340.751 | 29 | -90 | 21 | 6 |
| DEX-BB6516 | 412028.120 | 9676125.914 | 347.382 | 16 | -90 | 3 | 9 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2121 | 416074.687 | 9674028.934 | 432.000 | 25 | -90 | 20 | 1.35 |
| DEX-CZ2122 | 416123.109 | 9674099.459 | 433.000 | 21 | -90 | 17 | 2 |
| DEX-CZ2123 | 416102.934 | 9674125.987 | 432.535 | 25 | -90 | 20 | 3 |
| DEX-CZ2124 | 416125.319 | 9674129.148 | 432.407 | 25 | -90 | 16 | 9 |
| DEX-CZ2125 | 416152.406 | 9674126.521 | 430.021 | 22 | -90 | 17 | 5 |
| DEX-CZ2126 | 416174.567 | 9674124.684 | 428.332 | 26 | -90 | 20 | 4 |
| DEX-CZ2127 | 415878.589 | 9674049.392 | 384.347 | 21 | -90 | 5.71 | 13 |
| DEX-CZ2128 | 416101.806 | 9674172.851 | 429.133 | 36 | -90 | 21 | 14 |
| DEX-CZ2129 | 416075.871 | 9674122.336 | 429.370 | 25 | -90 | 19 | 4 |
| DEX-CZ2130 | 416024.599 | 9674051.333 | 428.435 | 19 | -90 | 16 | 0 |
| DEX-CZ2131 | 416076.777 | 9674148.579 | 427.938 | 20 | -90 | 13 | 3 |
| DEX-CZ2132 | 416076.331 | 9674175.816 | 426.380 | 47 | -90 | 37 | 8 |
| DEX-CZ2133 | 416049.945 | 9674180.280 | 421.376 | 50 | -90 | 43 | 5 |
| DEX-CZ2134 | 416026.382 | 9674176.025 | 413.001 | 22 | -90 | 18.06 | 1 |
| DEX-CZ2135 | 415922.721 | 9673874.604 | 390.776 | 13 | -90 | 7.3 | 3.29 |
| DEX-CZ2136 | 415878.343 | 9674069.854 | 378.551 | 15 | -90 | 7 | 3 |
| DEX-CZ2137 | 416071.580 | 9674400.444 | 403.134 | 35 | -90 | 22.84 | 11 |
| DEX-CZ2138 | 416098.052 | 9674372.080 | 400.486 | 32 | -90 | 22.9 | 2 |
| DEX-CZ2139 | 416124.650 | 9674324.512 | 407.041 | 25 | -90 | 22.94 | 2 |
| DEX-CZ2140 | 415978.566 | 9674328.222 | 418.000 | 30 | -90 | 24.08 | 4 |
| DEX-CZ2141 | 415875.316 | 9673927.242 | 405.020 | 20 | -90 | 12.75 | 7.37 |
| DEX-CZ2142 | 415976.034 | 9674300.083 | 417.775 | 27 | -90 | 16.02 | 7 |
| DEX-CZ2143 | 416022.971 | 9674299.927 | 415.271 | 46 | -90 | 26.18 | 15 |
| DEX-CZ2144 | 416126.900 | 9674299.755 | 411.190 | 34 | -90 | 19.68 | 10 |
| DEX-CZ2145 | 416175.875 | 9674298.515 | 403.735 | 40 | -90 | 24.14 | 9 |
| DEX-CZ2146 | 416174.907 | 9674223.668 | 415.765 | 17 | -90 | 14.35 | 1 |
| DEX-CZ2148 | 415875.755 | 9674301.041 | 403.288 | 28 | -90 | 21.84 | 5 |
| DEX-CZ2149 | 415825.528 | 9674296.426 | 390.633 | 18 | -90 | 10.22 | 5 |
| DEX-CZ2150 | 415769.639 | 9674297.599 | 382.799 | 14 | -90 | 9.25 | 5 |
| DEX-CZ2151 | 415924.043 | 9674350.426 | 416.177 | 39 | -90 | 22 | 14 |
| DEX-CZ2152 | 415873.242 | 9674351.359 | 413.278 | 25 | -90 | 15.54 | 4 |
| DEX-CZ2153 | 415826.665 | 9674348.934 | 408.313 | 34 | -90 | 23.74 | 10 |
| DEX-CZ2154 | 415875.753 | 9674254.381 | 403.142 | 28 | -90 | 23.46 | 3 |
| DEX-CZ2155 | 415823.695 | 9674250.532 | 376.467 | 16 | -90 | 2 | 11 |
| DEX-CZ2158 | 415924.487 | 9674327.719 | 416.070 | 26 | -90 | 17.76 | 4 |
| DEX-CZ2159 | 415900.660 | 9674324.224 | 411.971 | 35 | -90 | 19.72 | 12 |
| DEX-CZ2160 | 415875.029 | 9674326.364 | 411.140 | 30 | -90 | 22.94 | 5.24 |
| DEX-CZ2161 | 415850.941 | 9674329.014 | 408.610 | 26 | -90 | 20.5 | 4 |
| DEX-CZ2162 | 415821.997 | 9674328.304 | 404.442 | 28 | -90 | 13.5 | 8 |
| DEX-CZ2163 | 415800.895 | 9674327.608 | 402.283 | 28 | -90 | 24.21 | 3 |
| DEX-CZ2164 | 415781.315 | 9674327.342 | 397.125 | 22 | -90 | 11.28 | 12.2 |
| DEX-CZ2165 | 415924.309 | 9674376.028 | 417.000 | 44 | -90 | 23.71 | 15 |
| DEX-CZ2166 | 415900.151 | 9674374.627 | 416.000 | 24 | -90 | 14.44 | 8.2 |
| DEX-CZ2167 | 415874.989 | 9674375.156 | 414.885 | 33 | -90 | 14 | 17 |
| DEX-CZ2168 | 415849.085 | 9674374.114 | 413.213 | 26 | -90 | 13.27 | 8 |
| DEX-CZ2169 | 415823.978 | 9674374.619 | 409.943 | 31 | -90 | 26.65 | 4 |
| DEX-CZ2170 | 415800.852 | 9674375.586 | 405.025 | 29 | -90 | 20.81 | 7 |
| DEX-CZ2171 | 415874.053 | 9674400.727 | 415.125 | 38 | -90 | 15.77 | 15 |
| DEX-CZ2172 | 415825.428 | 9674400.143 | 409.406 | 23 | -90 | 14.78 | 2 |
| DEX-CZ2173 | 415777.440 | 9674400.913 | 397.188 | 22 | -90 | 16.7 | 4 |
| DEX-CZ2174 | 415875.211 | 9674427.701 | 414.265 | 31 | -90 | 16 | 8 |
| DEX-CZ2175 | 415824.941 | 9674422.497 | 408.118 | 37 | -90 | 15.07 | 17 |
| DEX-CZ2176 | 415802.513 | 9674423.842 | 405.620 | 34 | -90 | 17.1 | 14 |
| DEX-CZ2177 | 415776.192 | 9674419.610 | 397.586 | 27 | -90 | 20.04 | 5.26 |
| DEX-CZ2178 | 415749.773 | 9674424.644 | 387.519 | 7 | -90 | 4 | 0 |
| DEX-CZ2179 | 415723.929 | 9674427.461 | 378.430 | 18 | -90 | 8 | 7.56 |
| DEX-CZ2180 | 415871.965 | 9674448.573 | 412.279 | 38 | -90 | 19.76 | 17 |
| DEX-CZ2181 | 415824.213 | 9674449.791 | 408.090 | 31 | -90 | 17.66 | 12 |
| DEX-CZ2182 | 415773.902 | 9674451.660 | 396.061 | 36 | -90 | 26.57 | 5 |
| DEX-CZ2183 | 415724.188 | 9674450.319 | 379.693 | 16 | -90 | 2.57 | 11.43 |
| DEX-CZ2184 | 415875.454 | 9674477.103 | 412.403 | 37 | -90 | 18.87 | 10 |
| DEX-CZ2185 | 415826.066 | 9674475.157 | 405.741 | 48 | -90 | 25.4 | 22.54 |
| DEX-CZ2187 | 415748.600 | 9674477.195 | 381.324 | 13 | -90 | 6 | 3 |
| DEX-CZ2188 | 415723.747 | 9674472.889 | 385.511 | 29 | -90 | 5 | 14 |
| DEX-CZ2189 | 415701.769 | 9674473.634 | 393.902 | 22 | -90 | 8 | 12 |
| DEX-CZ2190 | 415876.836 | 9674500.427 | 412.040 | 22 | -90 | 14.28 | 3.7 |
| DEX-CZ2191 | 415823.666 | 9674501.844 | 396.000 | 22 | -90 | 15.38 | 5 |
| DEX-CZ2192 | 415776.556 | 9674502.220 | 389.085 | 29 | -90 | 22.74 | 5 |
| DEX-CZ2193 | 415721.848 | 9674501.292 | 389.968 | 23 | -90 | 10.25 | 6 |
| DEX-CZ2194 | 415672.626 | 9674502.845 | 403.236 | 53 | -90 | 25.69 | 8 |
| DEX-CZ2195 | 415948.832 | 9674526.418 | 425.116 | 27 | -90 | 15 | 9 |
| DEX-CZ2196 | 415926.088 | 9674524.781 | 422.598 | 30 | -90 | 25.85 | 3 |
| DEX-CZ2197 | 415899.164 | 9674523.748 | 418.838 | 24 | -90 | 18.03 | 5 |
| DEX-CZ2198 | 415874.310 | 9674525.561 | 414.787 | 41 | -90 | 16 | 20 |
| DEX-CZ2199 | 415849.373 | 9674524.336 | 409.013 | 47 | -90 | 25.26 | 3 |
| DEX-CZ2200 | 415774.500 | 9674525.904 | 387.609 | 16 | -90 | 13.19 | 0.64 |
| DEX-CZ2201 | 415751.342 | 9674526.449 | 379.687 | 22 | -90 | 14.82 | 6 |
| DEX-CZ2202 | 415675.484 | 9674524.607 | 406.400 | 27 | -90 | 11.2 | 4 |
| DEX-CZ2203 | 415700.156 | 9674524.228 | 400.680 | 40 | -90 | 10.76 | 3 |
| DEX-CZ2204 | 415723.887 | 9674524.312 | 392.163 | 25 | -90 | 13.7 | 10 |
| DEX-CZ2205 | 415650.358 | 9674524.673 | 410.603 | 46 | -90 | 11.21 | 24.27 |
| DEX-CZ2206 | 415625.005 | 9674523.869 | 411.000 | 46 | -90 | 15.57 | 16.32 |
| DEX-CZ2212 | 415925.095 | 9674549.864 | 421.974 | 23 | -90 | 21 | 0 |
| DEX-CZ2213 | 415874.116 | 9674550.503 | 414.444 | 36 | -90 | 24.67 | 8 |
| DEX-CZ2214 | 415824.318 | 9674550.745 | 399.965 | 30 | -90 | 9.6 | 11 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6517 | 412077.446 | 9676128.131 | 353.572 | 12 | -90 | 2 | 7 |
| DEX-BB6518 | 412130.661 | 9676126.258 | 350.421 | 16 | -90 | 3 | 10 |
| DEX-BB6519 | 412181.748 | 9676131.093 | 346.530 | 16 | -90 | 8 | 5 |
| DEX-BB6520 | 411605.075 | 9676104.185 | 343.849 | 31 | -90 | 9 | 9 |
| DEX-BB6521 | 411582.486 | 9676105.781 | 343.383 | 36 | -90 | 15 | 14 |
| DEX-BB6522 | 411855.650 | 9676113.156 | 334.735 | 19 | -90 | 14 | 2 |
| DEX-BB6523 | 411882.458 | 9676106.180 | 334.653 | 18 | -90 | 12 | 1 |
| DEX-BB6524 | 411901.730 | 9676103.463 | 335.462 | 21 | -90 | 13 | 6 |
| DEX-BB6525 | 411929.020 | 9676104.056 | 336.169 | 21 | -90 | 15 | 5 |
| DEX-BB6526 | 411956.343 | 9676105.219 | 336.881 | 25 | -90 | 15 | 6 |
| DEX-BB6527 | 411978.393 | 9676103.545 | 338.391 | 26 | -90 | 15 | 9 |
| DEX-BB6528 | 412005.980 | 9676103.268 | 340.975 | 18 | -90 | 9 | 4 |
| DEX-BB6529 | 412031.635 | 9676105.836 | 344.642 | 16 | -90 | 4 | 8 |
| DEX-BB6530 | 412058.265 | 9676106.947 | 349.623 | 16 | -90 | 3 | 8.6 |
| DEX-BB6531 | 412075.355 | 9676106.055 | 351.267 | 16 | -90 | 6 | 5 |
| DEX-BB6532 | 412103.945 | 9676105.739 | 352.318 | 11 | -90 | 2 | 5 |
| DEX-BB6533 | 412129.147 | 9676104.947 | 351.506 | 16 | -90 | 2 | 7 |
| DEX-BB6534 | 412153.831 | 9676102.990 | 350.121 | 23 | -90 | 9 | 5 |
| DEX-BB6535 | 412183.837 | 9676109.380 | 348.040 | 18 | -90 | 7 | 9 |
| DEX-BB6536 | 412205.709 | 9676104.884 | 347.695 | 23 | -90 | 16 | 5 |
| DEX-BB6537 | 411631.987 | 9676076.217 | 343.872 | 23 | -90 | 6 | 12 |
| DEX-BB6538 | 411580.611 | 9676080.298 | 344.129 | 30 | -90 | 15 | 13 |
| DEX-BB6539 | 411679.668 | 9676077.110 | 340.446 | 25 | -90 | 9 | 11 |
| DEX-BB6540 | 411881.067 | 9676079.535 | 334.000 | 24 | -90 | 16 | 3 |
| DEX-BB6541 | 411928.576 | 9676080.087 | 334.677 | 35 | -90 | 14 | 1 |
| DEX-BB6542 | 411977.346 | 9676080.065 | 336.694 | 25 | -90 | 15 | 9 |
| DEX-BB6543 | 412033.388 | 9676078.934 | 340.952 | 21 | -90 | 13 | 6 |
| DEX-BB6544 | 412076.662 | 9676078.371 | 346.582 | 23 | -90 | 15 | 4 |
| DEX-BB6545 | 412129.161 | 9676081.334 | 350.233 | 22 | -90 | 9 | 5 |
| DEX-BB6546 | 412179.829 | 9676079.706 | 349.000 | 25 | -90 | 12 | 9 |
| DEX-BB6547 | 412231.030 | 9676079.508 | 347.136 | 16 | -90 | 8 | 1 |
| DEX-BB6548 | 411604.450 | 9676058.421 | 343.598 | 21 | -90 | 11 | 3 |
| DEX-BB6549 | 411581.680 | 9676053.224 | 344.553 | 25 | -90 | 13 | 9 |
| DEX-BB6550 | 411956.692 | 9676055.505 | 334.518 | 18 | -90 | 12 | 3 |
| DEX-BB6551 | 411982.341 | 9676056.244 | 335.460 | 26 | -90 | 19 | 3 |
| DEX-BB6552 | 412002.896 | 9676054.746 | 335.879 | 32 | -90 | 21 | 4 |
| DEX-BB6553 | 412030.926 | 9676054.716 | 338.098 | 30 | -90 | 21 | 6.4 |
| DEX-BB6554 | 412053.609 | 9676052.711 | 339.870 | 31 | -90 | 24 | 5 |
| DEX-BB6555 | 412082.339 | 9676057.292 | 343.117 | 34 | -90 | 24 | 7 |
| DEX-BB6556 | 412108.852 | 9676055.994 | 346.241 | 19 | -90 | 7 | 9 |
| DEX-BB6557 | 412132.454 | 9676053.805 | 346.798 | 18 | -90 | 5 | 9 |
| DEX-BB6558 | 412156.661 | 9676053.110 | 348.000 | 26 | -90 | 17 | 6 |
| DEX-BB6559 | 412179.157 | 9676055.035 | 348.451 | 25 | -90 | 15 | 6 |
| DEX-BB6560 | 412204.797 | 9676057.735 | 348.688 | 35 | -90 | 22 | 7 |
| DEX-BB6561 | 412232.146 | 9676057.136 | 348.506 | 18 | -90 | 6 | 8 |
| DEX-BB6562 | 412254.094 | 9676054.009 | 344.751 | 21 | -90 | 6 | 4 |
| DEX-BB6563 | 412278.107 | 9676054.974 | 341.685 | 17 | -90 | 6 | 9 |
| DEX-BB6564 | 412305.965 | 9676054.203 | 336.919 | 25 | -90 | 9 | 2 |
| DEX-BB6565 | 412331.214 | 9676055.687 | 333.808 | 20 | -90 | 9 | 6 |
| DEX-BB6566 | 412380.079 | 9676055.178 | 331.262 | 30 | -90 | 19 | 3 |
| DEX-BB6567 | 412405.741 | 9676054.204 | 332.511 | 12 | -90 | 4 | 5 |
| DEX-BB6568 | 412430.963 | 9676054.416 | 333.294 | 13 | -90 | 3 | 8 |
| DEX-BB6569 | 411735.094 | 9676029.914 | 336.802 | 22 | -90 | 15 | 1 |
| DEX-BB6570 | 411981.751 | 9676028.661 | 335.275 | 28 | -90 | 21 | 4 |
| DEX-BB6571 | 412031.320 | 9676030.596 | 336.890 | 31 | -90 | 24 | 1.51 |
| DEX-BB6572 | 412131.667 | 9676028.953 | 344.235 | 31 | -90 | 11 | 16 |
| DEX-BB6573 | 412226.357 | 9676031.526 | 348.639 | 24 | -90 | 14 | 6 |
| DEX-BB6574 | 412278.540 | 9676025.952 | 341.220 | 24 | -90 | 15 | 7 |
| DEX-BB6575 | 412330.886 | 9676037.010 | 334.960 | 20 | -90 | 5 | 8 |
| DEX-BB6576 | 412355.972 | 9676032.273 | 333.751 | 20 | -90 | 1 | 9 |
| DEX-BB6577 | 412379.318 | 9676030.392 | 333.818 | 11 | -90 | 1 | 7 |
| DEX-BB6578 | 412428.091 | 9676026.792 | 332.000 | 10 | -90 | 3 | 3.78 |
| DEX-BB6579 | 411657.542 | 9676006.948 | 340.205 | 23 | -90 | 18 | 2 |
| DEX-BB6580 | 411629.247 | 9676006.331 | 342.851 | 25 | -90 | 17 | 6 |
| DEX-BB6581 | 411533.086 | 9676011.635 | 349.711 | 13 | -90 | 2 | 8 |
| DEX-BB6582 | 411511.944 | 9676012.677 | 351.279 | 11 | -90 | 4 | 3 |
| DEX-BB6583 | 411487.081 | 9676003.765 | 351.910 | 13 | -90 | 8.25 | 0 |
| DEX-BB6584 | 411707.943 | 9676003.655 | 337.276 | 24 | -90 | 16 | 2 |
| DEX-BB6585 | 411956.875 | 9676004.927 | 334.730 | 14 | -90 | 10 | 1 |
| DEX-BB6586 | 411980.670 | 9676005.695 | 335.159 | 19 | -90 | 15 | 0 |
| DEX-BB6587 | 412003.558 | 9676006.195 | 335.543 | 22 | -90 | 16 | 4 |
| DEX-BB6588 | 412032.034 | 9676003.787 | 335.928 | 26 | -90 | 17 | 5 |
| DEX-BB6589 | 412054.675 | 9676005.052 | 337.000 | 27 | -90 | 21 | 3 |
| DEX-BB6590 | 412078.255 | 9676005.984 | 337.983 | 35 | -90 | 16 | 19 |
| DEX-BB6591 | 412102.391 | 9676002.523 | 340.000 | 26 | -90 | 19 | 2 |
| DEX-BB6592 | 412132.755 | 9676005.212 | 342.733 | 25 | -90 | 8 | 12 |
| DEX-BB6593 | 412156.494 | 9676001.805 | 343.630 | 25 | -90 | 13 | 8 |
| DEX-BB6594 | 412184.313 | 9675997.212 | 346.565 | 20 | -90 | 12 | 2 |
| DEX-BB6595 | 412209.209 | 9676005.611 | 349.382 | 20 | -90 | 8 | 7 |
| DEX-BB6596 | 412227.211 | 9676007.618 | 350.000 | 20 | -90 | 5 | 9 |
| DEX-BB6597 | 412255.129 | 9676007.763 | 344.440 | 13 | -90 | 4 | 5 |
| DEX-BB6598 | 412280.457 | 9676004.598 | 341.678 | 18 | -90 | 11 | 4 |
| DEX-BB6599 | 412305.571 | 9676003.810 | 339.210 | 22 | -90 | 10 | 3 |
| DEX-BB6600 | 412381.027 | 9676006.843 | 335.994 | 14 | -90 | 8 | 3 |
| DEX-BB6601 | 412401.710 | 9676004.857 | 335.983 | 13 | -90 | 8 | 3 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2215 | 415773.906 | 9674551.644 | 381.694 | 20 | -90 | 2 | 1 |
| DEX-CZ2216 | 415724.611 | 9674553.737 | 393.151 | 16 | -90 | 6 | 7.65 |
| DEX-CZ2217 | 415673.815 | 9674550.966 | 408.358 | 31 | -90 | 18.37 | 4 |
| DEX-CZ2218 | 415627.982 | 9674549.981 | 411.000 | 34 | -90 | 11.67 | 4 |
| DEX-CZ2219 | 415573.002 | 9674550.425 | 414.756 | 30 | -90 | 18.17 | 6 |
| DEX-CZ2220 | 415525.176 | 9674550.663 | 422.012 | 41 | -90 | 17.27 | 15.71 |
| DEX-CZ2222 | 415950.450 | 9674573.453 | 422.445 | 29 | -90 | 18 | 9 |
| DEX-CZ2223 | 415925.612 | 9674575.170 | 420.977 | 41 | -90 | 19 | 16 |
| DEX-CZ2224 | 415899.241 | 9674575.418 | 418.186 | 27 | -90 | 23 | 2 |
| DEX-CZ2225 | 415875.390 | 9674573.599 | 413.924 | 41 | -90 | 30.33 | 6.48 |
| DEX-CZ2226 | 415851.239 | 9674576.930 | 409.012 | 35 | -90 | 19.84 | 14 |
| DEX-CZ2227 | 415824.413 | 9674578.244 | 405.181 | 23 | -90 | 8 | 6 |
| DEX-CZ2228 | 415801.268 | 9674575.730 | 397.695 | 15 | -90 | 6.19 | 5 |
| DEX-CZ2229 | 415748.591 | 9674575.728 | 386.920 | 23 | -90 | 16.18 | 4 |
| DEX-CZ2230 | 415723.686 | 9674576.019 | 394.889 | 28 | -90 | 12.24 | 14 |
| DEX-CZ2231 | 415698.704 | 9674576.136 | 403.956 | 37 | -90 | 19.76 | 9 |
| DEX-CZ2232 | 415672.909 | 9674575.209 | 408.173 | 28 | -90 | 24.35 | 1.43 |
| DEX-CZ2233 | 415648.813 | 9674574.491 | 409.606 | 26 | -90 | 13.1 | 10.47 |
| DEX-CZ2234 | 415626.452 | 9674575.176 | 407.199 | 34 | -90 | 16.45 | 6 |
| DEX-CZ2235 | 415597.519 | 9674576.151 | 409.422 | 28 | -90 | 26.59 | 0.29 |
| DEX-CZ2236 | 415575.105 | 9674578.050 | 413.937 | 29 | -90 | 19.04 | 6.3 |
| DEX-CZ2237 | 415549.549 | 9674576.820 | 419.206 | 25 | -90 | 21.4 | 3 |
| DEX-CZ2238 | 415525.834 | 9674575.204 | 421.378 | 45 | -90 | 26.75 | 5.36 |
| DEX-CZ2239 | 415498.707 | 9674573.969 | 422.433 | 41 | -90 | 20.15 | 20.19 |
| DEX-CZ2240 | 415475.124 | 9674574.874 | 424.589 | 39 | -90 | 24.49 | 11.27 |
| DEX-CZ2241 | 415924.810 | 9674599.900 | 419.688 | 27 | -90 | 17 | 7 |
| DEX-CZ2242 | 415876.728 | 9674598.937 | 413.401 | 27 | -90 | 11 | 14 |
| DEX-CZ2243 | 415826.545 | 9674599.547 | 407.799 | 29 | -90 | 20.69 | 8.22 |
| DEX-CZ2244 | 415717.417 | 9674597.854 | 399.517 | 32 | -90 | 11.43 | 19 |
| DEX-CZ2245 | 415674.557 | 9674601.285 | 403.783 | 46 | -90 | 8.47 | 35 |
| DEX-CZ2246 | 415625.598 | 9674599.528 | 407.890 | 31 | -90 | 20.48 | 9 |
| DEX-CZ2247 | 415571.470 | 9674600.103 | 419.309 | 30 | -90 | 19.1 | 9.55 |
| DEX-CZ2248 | 415525.440 | 9674599.451 | 419.957 | 32 | -90 | 31.41 | 0 |
| DEX-CZ2249 | 415475.311 | 9674599.105 | 422.595 | 30 | -90 | 29.06 | 1 |
| DEX-CZ2250 | 415874.830 | 9674624.121 | 415.590 | 23 | -90 | 12 | 9 |
| DEX-CZ2251 | 415849.497 | 9674625.818 | 415.740 | 40 | -90 | 14 | 24 |
| DEX-CZ2252 | 415826.864 | 9674624.987 | 411.070 | 32 | -90 | 13 | 17 |
| DEX-CZ2253 | 415801.593 | 9674626.130 | 399.576 | 24 | -90 | 8 | 8 |
| DEX-CZ2254 | 415769.197 | 9674625.967 | 382.000 | 12 | -90 | 9 | 0 |
| DEX-CZ2255 | 415751.025 | 9674624.755 | 388.949 | 12 | -90 | 7.57 | 2 |
| DEX-CZ2256 | 415724.535 | 9674625.182 | 396.379 | 25 | -90 | 19.91 | 3 |
| DEX-CZ2257 | 415702.809 | 9674625.342 | 397.736 | 35 | -90 | 14 | 15 |
| DEX-CZ2258 | 415676.035 | 9674625.977 | 395.000 | 26 | -90 | 14.63 | 8 |
| DEX-CZ2259 | 415648.414 | 9674625.534 | 406.311 | 23 | -90 | 10.53 | 10 |
| DEX-CZ2260 | 415623.664 | 9674625.538 | 413.318 | 16 | -90 | 12.72 | 2 |
| DEX-CZ2261 | 415601.559 | 9674625.545 | 417.428 | 26 | -90 | 19.94 | 5 |
| DEX-CZ2262 | 415575.838 | 9674625.182 | 420.689 | 25 | -90 | 16.2 | 7 |
| DEX-CZ2263 | 415524.612 | 9674624.455 | 420.891 | 28 | -90 | 20.7 | 6.22 |
| DEX-CZ2264 | 415500.546 | 9674625.902 | 417.197 | 30 | -90 | 21.38 | 8.39 |
| DEX-CZ2265 | 415475.803 | 9674622.498 | 421.964 | 29 | -90 | 21.74 | 7 |
| DEX-CZ2266 | 415825.906 | 9674650.383 | 412.781 | 28 | -90 | 6 | 14 |
| DEX-CZ2267 | 415777.622 | 9674652.574 | 391.887 | 37 | -90 | 2 | 9 |
| DEX-CZ2268 | 415726.969 | 9674649.195 | 386.706 | 30 | -90 | 9 | 18 |
| DEX-CZ2269 | 415676.556 | 9674650.101 | 398.372 | 34 | -90 | 13.21 | 20 |
| DEX-CZ2270 | 415624.045 | 9674649.736 | 412.734 | 20 | -90 | 10.26 | 7 |
| DEX-CZ2271 | 415927.376 | 9674676.759 | 410.994 | 19 | -90 | 11.41 | 5 |
| DEX-CZ2272 | 415898.530 | 9674674.935 | 412.867 | 29 | -90 | 16 | 11.44 |
| DEX-CZ2273 | 415875.438 | 9674677.897 | 413.797 | 33 | -90 | 7 | 18 |
| DEX-CZ2274 | 415849.128 | 9674675.218 | 414.158 | 25 | -90 | 14.52 | 9.4 |
| DEX-CZ2275 | 415826.163 | 9674674.090 | 413.250 | 24 | -90 | 9.62 | 12.38 |
| DEX-CZ2276 | 415801.286 | 9674676.423 | 409.989 | 23 | -90 | 9.64 | 7.36 |
| DEX-CZ2277 | 415775.842 | 9674676.568 | 401.030 | 15 | -90 | 8 | 1 |
| DEX-CZ2278 | 415750.388 | 9674674.881 | 390.211 | 13 | -90 | 8 | 2.45 |
| DEX-CZ2279 | 415725.789 | 9674674.481 | 385.457 | 31 | -90 | 11.59 | 19 |
| DEX-CZ2280 | 415699.400 | 9674673.630 | 387.475 | 16 | -90 | 10.65 | 5 |
| DEX-CZ2281 | 415674.315 | 9674673.651 | 394.312 | 18 | -90 | 14.48 | 0.52 |
| DEX-CZ2282 | 415601.305 | 9674675.475 | 417.436 | 34 | -90 | 12.56 | 17 |
| DEX-CZ2283 | 415573.612 | 9674675.721 | 421.823 | 20 | -90 | 15.08 | 4 |
| DEX-CZ2284 | 415550.458 | 9674675.179 | 422.301 | 34 | -90 | 17.82 | 15.51 |
| DEX-CZ2285 | 415523.931 | 9674674.879 | 419.601 | 23 | -90 | 11.24 | 10.27 |
| DEX-CZ2286 | 415926.062 | 9674700.372 | 407.534 | 27 | -90 | 20.89 | 4 |
| DEX-CZ2287 | 415875.012 | 9674699.197 | 411.292 | 29 | -90 | 17.32 | 9.68 |
| DEX-CZ2288 | 415825.116 | 9674700.792 | 411.284 | 22 | -90 | 15.23 | 4 |
| DEX-CZ2289 | 415775.098 | 9674700.102 | 405.169 | 20 | -90 | 14 | 4 |
| DEX-CZ2290 | 415727.804 | 9674697.493 | 388.730 | 23 | -90 | 10 | 10.72 |
| DEX-CZ2291 | 415667.292 | 9674699.955 | 399.687 | 25 | -90 | 7 | 14 |
| DEX-CZ2292 | 415625.341 | 9674700.207 | 413.743 | 21 | -90 | 12.23 | 7 |
| DEX-CZ2293 | 415575.036 | 9674700.308 | 420.000 | 20 | -90 | 12.59 | 5 |
| DEX-CZ2294 | 415926.024 | 9674724.468 | 403.000 | 19 | -90 | 12.65 | 3.6 |
| DEX-CZ2295 | 415900.743 | 9674725.252 | 405.610 | 28 | -90 | 19.89 | 8 |
| DEX-CZ2296 | 415877.101 | 9674725.223 | 406.884 | 27 | -90 | 19.5 | 7.34 |
| DEX-CZ2297 | 415849.127 | 9674724.863 | 407.362 | 26 | -90 | 11.51 | 12.49 |
| DEX-CZ2298 | 415826.035 | 9674723.174 | 407.075 | 23 | -90 | 18.5 | 2 |
| DEX-CZ2299 | 415801.525 | 9674719.767 | 404.669 | 29 | -90 | 18 | 10 |
| DEX-CZ2300 | 415776.883 | 9674722.906 | 398.123 | 24 | -90 | 9 | 13 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-BB6602 | 412427.577 | 9676008.219 | 336.265 | 10 | -90 | 4 | 4 |
| DEX-BB6603 | 411630.343 | 9675980.292 | 344.668 | 30 | -90 | 11 | 15 |
| DEX-BB6604 | 411581.613 | 9675980.111 | 349.406 | 10 | -90 | 6 | 2 |
| DEX-BB6605 | 411558.569 | 9675978.760 | 352.248 | 13 | -90 | 9 | 1 |
| DEX-BB6606 | 411533.164 | 9675980.235 | 355.254 | 11 | -90 | 7 | 1 |
| DEX-BB6607 | 411477.915 | 9675984.244 | 356.398 | 10 | -90 | 3 | 4.5 |
| DEX-BB6608 | 411680.085 | 9675980.766 | 339.672 | 21 | -90 | 16 | 1 |
| DEX-BB6609 | 411730.608 | 9675978.763 | 336.000 | 21 | -90 | 15 | 3 |
| DEX-BB6610 | 411954.534 | 9675981.709 | 334.152 | 22 | -90 | 12 | 0 |
| DEX-BB6611 | 411980.357 | 9675978.523 | 335.000 | 15 | -90 | 12 | 0 |
| DEX-BB6612 | 412031.928 | 9675979.702 | 335.397 | 28 | -90 | 12 | 13 |
| DEX-BB6613 | 412080.427 | 9675979.694 | 336.685 | 31 | -90 | 15 | 16 |
| DEX-BB6614 | 412130.399 | 9675980.010 | 340.718 | 32 | -90 | 14 | 12 |
| DEX-BB6615 | 412180.714 | 9675979.990 | 344.981 | 24 | -90 | 10 | 9 |
| DEX-BB6616 | 412228.684 | 9675983.679 | 351.522 | 19 | -90 | 8 | 2 |
| DEX-BB6617 | 412283.935 | 9675981.913 | 341.955 | 18 | -90 | 11 | 5 |
| DEX-BB6618 | 412402.643 | 9675986.267 | 338.349 | 15 | -90 | 7 | 6 |
| DEX-BB6619 | 411609.380 | 9675956.355 | 348.247 | 20 | -90 | 11 | 1 |
| DEX-BB6620 | 411527.751 | 9675960.378 | 357.699 | 19 | -90 | 8 | 8 |
| DEX-BB6621 | 411507.277 | 9675955.835 | 362.837 | 11 | -90 | 5 | 4 |
| DEX-BB6622 | 411485.634 | 9675956.439 | 364.454 | 9 | -90 | 5.65 | 0 |
| DEX-BB6623 | 411734.032 | 9675953.836 | 336.000 | 20 | -90 | 14 | 4 |
| DEX-BB6624 | 411983.854 | 9675953.478 | 334.300 | 20 | -90 | 15 | 1 |
| DEX-BB6625 | 412007.763 | 9675957.804 | 334.773 | 28 | -90 | 18 | 7 |
| DEX-BB6626 | 412031.721 | 9675954.277 | 334.734 | 14 | -90 | 10 | 2 |
| DEX-BB6627 | 412055.261 | 9675956.995 | 335.000 | 29 | -90 | 18 | 9 |
| DEX-BB6628 | 412080.819 | 9675955.742 | 335.609 | 22 | -90 | 8 | 12 |
| DEX-BB6629 | 412108.245 | 9675955.826 | 337.412 | 26 | -90 | 17 | 7 |
| DEX-BB6630 | 412130.989 | 9675958.382 | 339.278 | 31 | -90 | 26 | 0 |
| DEX-BB6631 | 412154.501 | 9675955.004 | 341.003 | 30 | -90 | 23 | 2 |
| DEX-BB6632 | 412180.167 | 9675956.136 | 343.298 | 27 | -90 | 7 | 10 |
| DEX-BB6633 | 412205.482 | 9675955.750 | 347.687 | 22 | -90 | 4 | 15 |
| DEX-BB6634 | 412229.018 | 9675955.464 | 351.549 | 20 | -90 | 3 | 8 |
| DEX-BB6635 | 412255.851 | 9675954.702 | 347.919 | 13 | -90 | 2 | 9 |
| DEX-BB6636 | 411605.225 | 9675926.979 | 350.414 | 15 | -90 | 8 | 1 |
| DEX-BB6637 | 411980.910 | 9675928.683 | 332.795 | 21 | -90 | 16 | 3 |
| DEX-BB6638 | 412007.175 | 9675930.393 | 333.000 | 27 | -90 | 17 | 6 |
| DEX-BB6639 | 412031.739 | 9675930.156 | 333.611 | 25 | -90 | 13 | 9 |
| DEX-BB6640 | 412078.786 | 9675928.932 | 335.207 | 25 | -90 | 13 | 9 |
| DEX-BB6641 | 412131.658 | 9675928.157 | 337.765 | 24 | -90 | 14 | 8 |
| DEX-BB6642 | 412156.104 | 9675932.518 | 340.415 | 27 | -90 | 23 | 1 |
| DEX-BB6643 | 411603.277 | 9675903.963 | 351.510 | 13 | -90 | 7 | 2 |
| DEX-BB6644 | 412033.504 | 9675907.994 | 333.000 | 25 | -90 | 14 | 10 |
| DEX-BB6645 | 412058.368 | 9675904.153 | 333.222 | 26 | -90 | 13 | 6 |
| DEX-BB6646 | 412079.970 | 9675906.513 | 334.344 | 26 | -90 | 11 | 13 |
| DEX-BB6647 | 412107.354 | 9675905.750 | 335.046 | 26 | -90 | 11 | 11 |
| DEX-BB6648 | 412131.116 | 9675903.658 | 337.169 | 19 | -90 | 8 | 4 |
| DEX-BB6649 | 411781.335 | 9675872.374 | 333.835 | 21 | -90 | 15 | 3 |
| DEX-BB6650 | 411733.357 | 9675854.366 | 338.333 | 16 | -90 | 8 | 2 |
| DEX-BB6651 | 411755.890 | 9675853.880 | 336.325 | 21 | -90 | 11 | 5 |
| DEX-BB6652 | 411786.080 | 9675852.023 | 333.671 | 19 | -90 | 13.5 | 1.5 |
| DEX-BB6708 | 411849.221 | 9675980.721 | 333.563 | 22 | -90 | 2 | 6 |
| DEX-BB6709 | 411908.853 | 9675981.704 | 333.000 | 23 | -90 | 15 | 6 |
| DEX-BB6710 | 411853.746 | 9675928.026 | 333.497 | 21 | -90 | 3 | 7 |
| DEX-BB6711 | 411955.514 | 9675930.432 | 332.360 | 13 | -90 | 10 | 0 |
| DEX-BB6712 | 411909.290 | 9675882.599 | 332.000 | 24 | -90 | 2 | 12 |
| DEX-BB6713 | 411957.920 | 9675880.499 | 332.000 | 20 | -90 | 10 | 2 |
| DEX-BB6715 | 412056.084 | 9675883.722 | 332.919 | 24 | -90 | 14 | 5 |
| DEX-BB6716 | 411953.584 | 9675835.263 | 331.930 | 19 | -90 | 10 | 4 |
| DEX-BB6717 | 411603.504 | 9676158.255 | 342.000 | 27 | -90 | 12 | 6.5 |
| DEX-BB6718 | 411652.520 | 9676160.068 | 349.521 | 14 | -90 | 2 | 2 |
| DEX-BB6719 | 411706.624 | 9676161.126 | 340.751 | 15 | -90 | 6 | 7 |
| DEX-BB6720 | 411758.794 | 9676157.430 | 336.000 | 13 | -90 | 3 | 2.35 |
| DEX-BB6721 | 411806.978 | 9676152.334 | 335.789 | 15 | -90 | 3 | 8 |
| DEX-BB6722 | 411853.548 | 9676159.462 | 337.977 | 18 | -90 | 11 | 5 |
| DEX-BB6723 | 411905.189 | 9676154.630 | 339.431 | 23 | -90 | 7.45 | 15.55 |
| DEX-BB6724 | 411931.304 | 9676158.461 | 340.904 | 27 | -90 | 18 | 3.65 |
| DEX-BB6725 | 411953.362 | 9676158.021 | 341.413 | 19 | -90 | 8 | 5.35 |
| DEX-BB6726 | 411980.437 | 9676155.705 | 343.746 | 30 | -90 | 20.56 | 6.44 |
| DEX-BB6727 | 412005.149 | 9676154.301 | 346.781 | 18 | -90 | 10 | 5 |
| DEX-BB6728 | 412032.008 | 9676155.424 | 351.802 | 13 | -90 | 3 | 8 |
| DEX-BB6729 | 412056.177 | 9676156.550 | 353.906 | 7 | -90 | 2 | 3 |
| DEX-BB6730 | 412080.288 | 9676156.644 | 349.991 | 10 | -90 | 3 | 3 |
| DEX-BB6731 | 412101.568 | 9676156.529 | 347.283 | 12 | -90 | 4.45 | 4.55 |
| DEX-BB6732 | 412129.850 | 9676156.718 | 345.111 | 17 | -90 | 13 | 1 |
| DEX-BB6733 | 412155.938 | 9676155.605 | 344.025 | 12 | -90 | 9 | 1 |
| DEX-BB6734 | 412182.260 | 9676152.385 | 344.019 | 23 | -90 | 12 | 7 |
| DEX-BB6735 | 412203.968 | 9676156.373 | 342.913 | 17 | -90 | 3 | 8 |
| DEX-BB6431 | 411853.360 | 9675429.460 | 356.890 | 6 | -90 | 2 | 1 |
| DEX-BB6455 | 412257.880 | 9676080.680 | 343.330 | 12 | -90 | 5 | 4 |
| DEX-BB6458 | 411759.870 | 9676032.320 | 336.290 | 24 | -90 | 15 | 6 |
| DEX-BB6476 | 412302.730 | 9675984.940 | 340.480 | 20 | -90 | 6 | 6 |
| DEX-BB6502 | 411656.080 | 9675626.040 | 355.110 | 8 | -90 | 2.45 | 0.55 |
| DEX-MIA117 | 411705.880 | 9675622.500 | 350.120 | 15 | -90 | 10.19 | 4 |
| DEX-MIA120 | 412110.380 | 9675626.310 | 330.220 | 10 | -90 | 6.17 | 1.13 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2301 | 415751.745 | 9674723.137 | 390.063 | 16 | -90 | 5 | 5 |
| DEX-CZ2302 | 415702.056 | 9674723.028 | 393.749 | 21 | -90 | 11.25 | 6 |
| DEX-CZ2303 | 415674.601 | 9674726.710 | 401.916 | 24 | -90 | 18.45 | 3 |
| DEX-CZ2304 | 415626.138 | 9674725.849 | 414.263 | 21 | -90 | 14.02 | 6 |
| DEX-CZ2305 | 415599.807 | 9674724.571 | 417.327 | 24 | -90 | 15.76 | 6.23 |
| DEX-CZ2306 | 415574.484 | 9674724.689 | 418.637 | 27 | -90 | 22.5 | 3.27 |
| DEX-CZ2307 | 415924.906 | 9674749.703 | 397.460 | 20 | -90 | 12 | 6 |
| DEX-CZ2308 | 415873.495 | 9674748.770 | 399.947 | 29 | -90 | 12.01 | 17 |
| DEX-CZ2309 | 415824.042 | 9674748.516 | 399.331 | 19 | -90 | 13 | 1 |
| DEX-CZ2310 | 415624.907 | 9674749.525 | 412.928 | 31 | -90 | 13.64 | 16 |
| DEX-CZ2311 | 415574.779 | 9674749.160 | 415.695 | 30 | -90 | 22.85 | 6 |
| DEX-CZ2312 | 415927.336 | 9674776.098 | 394.809 | 16 | -90 | 11.41 | 3 |
| DEX-CZ2313 | 415898.857 | 9674775.729 | 392.431 | 20 | -90 | 9 | 8 |
| DEX-CZ2314 | 415877.807 | 9674775.122 | 391.000 | 25 | -90 | 20.92 | 3 |
| DEX-CZ2315 | 415847.211 | 9674779.088 | 389.399 | 19 | -90 | 14 | 2 |
| DEX-CZ2316 | 415824.581 | 9674774.960 | 388.558 | 22 | -90 | 4 | 15 |
| DEX-CZ2317 | 415599.221 | 9674774.564 | 411.789 | 24 | -90 | 15.18 | 8.68 |
| DEX-CZ2319 | 415924.119 | 9674801.001 | 400.934 | 23 | -90 | 17.42 | 5 |
| DEX-CZ2320 | 415874.263 | 9674799.261 | 396.189 | 20 | -90 | 12 | 6 |
| DEX-CZ2321 | 415899.945 | 9674825.068 | 404.486 | 30 | -90 | 12.64 | 4.36 |
| DEX-CZ2322 | 415925.719 | 9674821.110 | 405.807 | 23 | -90 | 16 | 4 |
| DEX-CZ2323 | 415674.259 | 9674476.000 | 401.291 | 51 | -90 | 23.12 | 22 |
| DEX-CZ2324 | 415852.711 | 9674472.168 | 407.298 | 26 | -90 | 12 | 12 |
| DEX-CZ2325 | 415725.550 | 9674723.580 | 386.711 | 12 | -90 | 4 | 4 |
| DEX-CZ2326 | 415874.711 | 9674275.525 | 400.097 | 26 | -90 | 18.44 | 5 |
| DEX-CZ2327 | 415825.575 | 9674270.541 | 385.555 | 10 | -90 | 7 | 1 |
| DEX-CZ2328 | 415775.821 | 9674275.760 | 380.999 | 10 | -90 | 4 | 4 |
| DEX-CZ2329 | 415796.715 | 9674283.241 | 388.380 | 30 | -90 | 12.54 | 17 |
| DEX-CZ2330 | 415849.120 | 9674273.837 | 390.246 | 21 | -90 | 10 | 9 |
| DEX-CZ2331 | 415849.447 | 9674422.049 | 411.000 | 30 | -90 | 16.18 | 10 |
| DEX-CZ2332 | 415775.484 | 9674375.298 | 396.447 | 21 | -90 | 16.74 | 3 |
| DEX-CZ2333 | 415776.619 | 9674595.938 | 382.310 | 9 | -90 | 3 | 3 |
| DEX-CZ2334 | 415773.842 | 9674574.817 | 382.205 | 12 | -90 | 6.21 | 4 |
| DEX-CZ2335 | 415798.252 | 9674472.291 | 402.039 | 30 | -90 | 21 | 5 |
| DEX-CZ2336 | 415822.055 | 9674522.322 | 402.922 | 27 | -90 | 19.22 | 4 |
| DEX-CZ2337 | 415801.479 | 9674523.657 | 395.754 | 28 | -90 | 15.68 | 4 |
| DEX-CZ2338 | 415622.842 | 9674672.652 | 409.789 | 31 | -90 | 28.03 | 1 |
| DEX-CZ2339 | 415648.822 | 9674674.421 | 400.037 | 24 | -90 | 5 | 16.2 |
| DEX-CZ2340 | 415646.116 | 9674725.895 | 410.102 | 20 | -90 | 16.53 | 1 |
| DEX-CZ2341 | 415625.384 | 9674774.498 | 410.096 | 26 | -90 | 17.95 | 7.27 |
| DEX-CZ2342 | 415872.713 | 9674823.424 | 400.899 | 12 | -90 | 7 | 1 |
| DEX-CZ2343 | 415450.335 | 9673799.858 | 349.609 | 6 | -90 | 4 | 0 |
| DEX-CZ2344 | 415345.936 | 9673803.139 | 341.265 | 13 | -90 | 7.26 | 3 |
| DEX-CZ2346 | 415397.626 | 9673850.488 | 348.000 | 33 | -90 | 19.03 | 12 |
| DEX-CZ2347 | 415450.892 | 9673847.715 | 350.320 | 20 | -90 | 17.43 | 3 |
| DEX-CZ2348 | 415506.936 | 9673850.423 | 362.434 | 16 | -90 | 9.86 | 4.01 |
| DEX-CZ2350 | 415350.264 | 9673895.114 | 346.948 | 35 | -90 | 28.4 | 4 |
| DEX-CZ2351 | 415449.737 | 9673899.555 | 360.212 | 19 | -90 | 7.74 | 11.15 |
| DEX-CZ2353 | 415298.061 | 9673948.469 | 349.382 | 28 | -90 | 26.43 | 0 |
| DEX-CZ2354 | 415345.896 | 9673949.287 | 359.021 | 35 | -90 | 31.54 | 5 |
| DEX-CZ2359 | 415649.499 | 9673956.225 | 347.690 | 18 | -90 | 7.2 | 8 |
| DEX-CZ2360 | 415696.281 | 9673957.868 | 345.607 | 18 | -90 | 3 | 1 |
| DEX-CZ2361 | 415700.796 | 9674050.916 | 388.455 | 21 | -90 | 14.19 | 4 |
| DEX-CZ2364 | 415698.338 | 9674347.712 | 382.821 | 20 | -90 | 8.28 | 10 |
| DEX-CZ2365 | 415145.774 | 9674003.365 | 344.512 | 26 | -90 | 23 | 1 |
| DEX-CZ2366 | 415250.720 | 9674000.501 | 347.773 | 19 | -90 | 15.94 | 2 |
| DEX-CZ2367 | 415352.181 | 9673996.341 | 371.793 | 35 | -90 | 29.49 | 6 |
| DEX-CZ2369 | 415451.500 | 9674049.420 | 394.999 | 27 | -90 | 23.6 | 3 |
| DEX-CZ2370 | 415450.361 | 9674100.259 | 402.459 | 25 | -90 | 18.88 | 3 |
| DEX-CZ2371 | 415451.232 | 9674152.112 | 410.672 | 22 | -90 | 17.36 | 3 |
| DEX-CZ2372 | 415450.736 | 9674202.402 | 420.652 | 25 | -90 | 6 | 12 |
| DEX-CZ2373 | 415448.230 | 9674247.422 | 431.569 | 44 | -90 | 17.97 | 19 |
| DEX-CZ2374 | 415454.388 | 9674303.697 | 440.637 | 33 | -90 | 18.14 | 10 |
| DEX-CZ2375 | 415449.929 | 9674346.984 | 449.500 | 26 | -90 | 18.81 | 6 |
| DEX-CZ2377 | 415553.896 | 9674047.892 | 379.790 | 10 | -90 | 2 | 6 |
| DEX-CZ2378 | 415554.467 | 9674101.243 | 391.000 | 25 | -90 | 11.89 | 8 |
| DEX-CZ2379 | 415546.433 | 9674147.312 | 400.107 | 13 | -90 | 5 | 4 |
| DEX-CZ2380 | 415552.835 | 9674251.888 | 417.710 | 34 | -90 | 16.41 | 13 |
| DEX-CZ2381 | 415551.893 | 9674299.400 | 418.104 | 21 | -90 | 13.12 | 3.9 |
| DEX-CZ2382 | 415552.216 | 9674353.533 | 429.873 | 29 | -90 | 21.66 | 6 |
| DEX-CZ2383 | 415650.752 | 9674001.755 | 360.750 | 31 | -90 | 7.3 | 15.03 |
| DEX-CZ2384 | 415651.620 | 9674048.870 | 374.925 | 29 | -90 | 12.17 | 13.99 |
| DEX-CZ2385 | 415649.789 | 9674099.644 | 392.998 | 24 | -90 | 17.98 | 7.46 |
| DEX-CZ2386 | 415650.278 | 9674148.411 | 406.027 | 14 | -90 | 6 | 6.2 |
| DEX-CZ2387 | 415647.998 | 9674200.324 | 407.903 | 34 | -90 | 18.28 | 15.22 |
| DEX-CZ2388 | 415650.053 | 9674248.130 | 406.991 | 33 | -90 | 21.02 | 9.8 |
| DEX-CZ2389 | 415650.931 | 9674300.322 | 393.432 | 8 | -90 | 3 | 3 |
| DEX-CZ2390 | 415646.954 | 9674351.019 | 400.164 | 21 | -90 | 1 | 17 |
| DEX-CZ2391 | 415052.208 | 9674051.239 | 364.187 | 33 | -90 | 26.28 | 6 |
| DEX-CZ2392 | 415099.280 | 9674049.092 | 361.442 | 30 | -90 | 17.82 | 11.12 |
| DEX-CZ2393 | 415148.294 | 9674056.515 | 358.198 | 25 | -90 | 22.42 | 2 |
| DEX-CZ2394 | 415200.476 | 9674045.558 | 350.835 | 28 | -90 | 27.29 | 0 |
| DEX-CZ2395 | 415248.774 | 9674048.294 | 351.339 | 29 | -90 | 25.43 | 1 |
| DEX-CZ2396 | 415302.006 | 9674050.750 | 361.559 | 19 | -90 | 14 | 3 |
| DEX-CZ2398 | 415345.921 | 9674053.394 | 374.696 | 15 | -90 | 12 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-MIA013 | 412412.070 | 9676120.670 | 342.120 | 12 | -90 | 6 | 4.23 |
| DEX-MIA017 | 411999.370 | 9676120.160 | 342.540 | 26 | -90 | 10.27 | 9 |
| DEX-MIA123 | 412508.383 | 9675626.693 | 346.366 | 7 | -90 | 2 | 0 |
| DEX-CZ538 | 416348.194 | 9673410.745 | 317.790 | 24 | -90 | 4 | 6.56 |
| CZ210135 | 417547.861 | 9673348.597 | 407.684 | 9 | -90 | 3 | 4.99 |
| CZ210137 | 417655.392 | 9673351.361 | 381.029 | 29 | -90 | 15.73 | 12.65 |
| CZ210016 | 418048.841 | 9673260.328 | 431.313 | 18 | -90 | 1 | 9.68 |
| CZ210034 | 418401.630 | 9673449.651 | 418.317 | 36 | -90 | 32.57 | 8.51 |
| CZ210168 | 418795.441 | 9673705.450 | 408.335 | 32 | -90 | 11.53 | 18.95 |
| CZ210043 | 418199.817 | 9673446.806 | 406.533 | 29 | -90 | 8.35 | 4 |
| DEX-CZ584 | 416389.158 | 9673407.154 | 326.897 | 11 | -90 | 2 | 5 |
| CZ210076 | 418152.077 | 9673504.932 | 415.238 | 17 | -90 | 1 | 12.3 |
| CZ210173 | 418752.399 | 9673647.949 | 435.049 | 26 | -90 | 10.09 | 5.33 |
| CZ210056 | 418003.188 | 9673655.525 | 374.425 | 16 | -90 | 5.41 | 7.26 |
| CZ210119 | 417752.684 | 9673211.238 | 389.984 | 20 | -90 | 17.77 | 3.6 |
| DEX-CZ200 | 416308.684 | 9673383.655 | 323.600 | 11 | -90 | 3 | 3 |
| CZ210124 | 417649.408 | 9673254.753 | 401.263 | 17 | -90 | 5.77 | 8.22 |
| CZ210083 | 418248.032 | 9673497.512 | 398.071 | 24 | -90 | 7.51 | 14.86 |
| CZ210167 | 418750.715 | 9673697.132 | 412.357 | 29 | -90 | 12.14 | 11.35 |
| CZ210202 | 418234.531 | 9673300.688 | 427.075 | 35 | -90 | 19.66 | 10.66 |
| CZ210250 | 418022.775 | 9673449.748 | 423.204 | 31 | -90 | 14.59 | 17.33 |
| CZ210185 | 418747.214 | 9673554.850 | 464.301 | 26 | -90 | 14.56 | 9.58 |
| CZ210153 | 417649.784 | 9673496.697 | 359.038 | 30 | -90 | 24.5 | 7 |
| CZ210075 | 418150.696 | 9673540.672 | 406.051 | 18 | -90 | 4.36 | 4.64 |
| DEX-CZ201 | 416298.183 | 9673308.544 | 357.836 | 14 | -90 | 7.75 | 2 |
| CZ210037 | 418287.846 | 9673543.270 | 409.606 | 20 | -90 | 10.26 | 5.28 |
| CZ210172 | 418698.176 | 9673650.407 | 435.596 | 7 | -90 | 1 | 4 |
| CZ210195 | 418303.655 | 9673421.601 | 422.168 | 36 | -90 | 18.19 | 6.92 |
| CZ210132 | 417650.803 | 9673306.159 | 391.319 | 13 | -90 | 7.41 | 5.41 |
| CZ210209 | 418379.047 | 9673448.139 | 421.755 | 38 | -90 | 32.41 | 12.2 |
| CZ210175 | 418497.411 | 9673602.926 | 418.394 | 34 | -90 | 26.53 | 10.78 |
| CZ210121 | 417847.320 | 9673212.899 | 386.618 | 49 | -90 | 20.27 | 31.89 |
| CZ210154 | 417600.787 | 9673500.022 | 362.698 | 21 | -90 | 18.19 | 3.26 |
| CZ210231 | 418276.576 | 9673442.525 | 417.420 | 10 | -90 | 5.69 | 3 |
| CZ210126 | 417746.847 | 9673257.968 | 382.185 | 18 | -90 | 14.91 | 2 |
| DEX-CZ1107 | 416446.432 | 9673445.232 | 320.500 | 7 | -90 | 1 | 1 |
| CZ210198 | 418321.381 | 9673343.333 | 428.093 | 33 | -90 | 26.2 | 0 |
| DEX-CZ189 | 416207.533 | 9673196.381 | 351.940 | 31 | -90 | 23.44 | 6 |
| CZ210133 | 417749.122 | 9673298.012 | 374.972 | 29 | -90 | 24.15 | 7.57 |
| CZ210292 | 418129.129 | 9673321.863 | 430.420 | 27 | -90 | 14.14 | 15.53 |
| CZ210210 | 418381.237 | 9673425.241 | 424.319 | 36 | -90 | 15.17 | 8.28 |
| CZ210125 | 417694.006 | 9673262.095 | 388.491 | 25 | -90 | 10.64 | 15.75 |
| CZ210169 | 418547.676 | 9673649.234 | 413.567 | 22 | -90 | 12.71 | 7.18 |
| CZ210205 | 418329.576 | 9673424.154 | 422.678 | 17 | -90 | 15.39 | 3 |
| CZ210223 | 418450.490 | 9673426.817 | 429.711 | 31 | -90 | 23.98 | 6.63 |
| CZ210062 | 418051.438 | 9673614.323 | 390.824 | 14 | -90 | 3.43 | 4.57 |
| CZ210138 | 417698.748 | 9673351.195 | 371.067 | 33 | -90 | 25.81 | 8.94 |
| CZ210146 | 417684.849 | 9673447.187 | 362.610 | 20 | -90 | 16.06 | 4.29 |
| CZ210166 | 418699.607 | 9673697.944 | 415.983 | 12 | -90 | 8.35 | 3 |
| CZ210100 | 418050.322 | 9673342.908 | 412.017 | 27 | -90 | 16.14 | 12.01 |
| CZ210120 | 417805.010 | 9673210.507 | 390.095 | 17 | -90 | 6.41 | 9 |
| CZ210123 | 417601.868 | 9673252.944 | 415.105 | 12 | -90 | 2 | 3.43 |
| CZ210232 | 418321.637 | 9673301.389 | 430.573 | 32 | -90 | 18.6 | 14.8 |
| CZ210131 | 417600.808 | 9673304.836 | 406.799 | 10 | -90 | 3.85 | 4.21 |
| CZ210159 | 418401.728 | 9673495.436 | 417.865 | 35 | -90 | 21.62 | 17.28 |
| CZ210160 | 418696.790 | 9673747.383 | 399.885 | 25 | -90 | 9.22 | 15.14 |
| CZ210068 | 418099.982 | 9673644.684 | 374.208 | 40 | -90 | 13.78 | 21.56 |
| CZ210117 | 417652.142 | 9673203.994 | 407.135 | 37 | -90 | 25.7 | 8.68 |
| CZ210176 | 418549.643 | 9673597.672 | 425.941 | 44 | -90 | 22.38 | 19.98 |
| CZ210228 | 418499.792 | 9673428.351 | 434.741 | 36 | -90 | 25.24 | 7 |
| CZ210296 | 418172.988 | 9673276.670 | 435.284 | 27 | -90 | 10.98 | 12.35 |
| CZ210233 | 418320.893 | 9673321.422 | 429.540 | 27 | -90 | 19.74 | 5.9 |
| CZ210156 | 418291.455 | 9673593.996 | 386.703 | 12 | -90 | 5 | 2 |
| CZ210207 | 418356.632 | 9673423.789 | 423.189 | 25 | -90 | 15.92 | 5.07 |
| CZ210070 | 418105.459 | 9673448.114 | 433.005 | 12 | -90 | 8.26 | 2.18 |
| CZ210184 | 418702.940 | 9673551.790 | 460.459 | 24 | -90 | 23.83 | 2 |
| CZ210162 | 418798.638 | 9673753.795 | 396.346 | 27 | -90 | 14.13 | 10.97 |
| CZ210279 | 418457.700 | 9673518.758 | 422.283 | 41 | -90 | 22.3 | 16.65 |
| CZ210155 | 417547.119 | 9673499.888 | 367.017 | 19 | -90 | 17.26 | 2.61 |
| CZ210262 | 418024.157 | 9673426.599 | 422.970 | 34 | -90 | 20.62 | 17.2 |
| CZ210254 | 417970.840 | 9673450.219 | 417.800 | 25 | -90 | 5.51 | 20.35 |
| CZ210287 | 418496.849 | 9673600.638 | 418.968 | 37 | -90 | 24.26 | 11.93 |
| CZ210061 | 418049.579 | 9673652.868 | 373.263 | 29 | -90 | 11.11 | 14.5 |
| CZ210093 | 418449.656 | 9673750.310 | 385.089 | 29 | -90 | 27.2 | 0 |
| CZ210094 | 418448.275 | 9673700.059 | 398.297 | 28 | -90 | 10.18 | 17.9 |
| CZ210136 | 417600.108 | 9673349.730 | 397.525 | 17 | -90 | 12.92 | 3.7 |
| CZ210219 | 418226.149 | 9673373.429 | 427.379 | 48 | -90 | 23.15 | 31.77 |
| CZ210212 | 418341.646 | 9673397.008 | 425.588 | 14 | -90 | 12.55 | 4 |
| CZ210213 | 418274.123 | 9673423.816 | 421.177 | 22 | -90 | 7.73 | 9.95 |
| CZ210145 | 417632.170 | 9673453.288 | 368.021 | 25 | -90 | 20.2 | 6.23 |
| CZ210216 | 418381.490 | 9673398.928 | 427.775 | 26 | -90 | 16.55 | 1 |
| CZ210217 | 418226.705 | 9673345.932 | 428.401 | 28 | -90 | 20.33 | 5.2 |
| CZ210118 | 417699.850 | 9673211.219 | 398.718 | 15 | -90 | 6 | 7.67 |
| CZ210204 | 418273.216 | 9673375.383 | 423.085 | 38 | -90 | 24.33 | 12.58 |
| DEX-CZ4782 | 417799.125 | 9673908.084 | 341.381 | 26 | -90 | 19.74 | 4.25 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2399 | 415347.072 | 9674101.677 | 368.094 | 20 | -90 | 18.58 | 0 |
| DEX-CZ2400 | 415352.752 | 9674152.462 | 376.767 | 25 | -90 | 18.23 | 5 |
| DEX-CZ2401 | 415340.013 | 9674198.883 | 387.332 | 16 | -90 | 7.19 | 8 |
| DEX-CZ2402 | 415346.285 | 9674260.190 | 427.463 | 14 | -90 | 2 | 8.83 |
| DEX-CZ2403 | 415349.696 | 9674294.060 | 440.297 | 20 | -90 | 14.63 | 3 |
| DEX-CZ2405 | 415405.827 | 9674145.243 | 400.190 | 21 | -90 | 7.37 | 11.2 |
| DEX-CZ2406 | 415392.117 | 9674254.332 | 434.459 | 26 | -90 | 7.21 | 13.66 |
| DEX-CZ2407 | 415500.666 | 9674047.347 | 392.620 | 30 | -90 | 26.77 | 2 |
| DEX-CZ2408 | 415499.001 | 9674152.322 | 411.954 | 24 | -90 | 20.45 | 3 |
| DEX-CZ2409 | 415498.400 | 9674251.516 | 424.592 | 29 | -90 | 20.1 | 6 |
| DEX-CZ2410 | 415499.370 | 9674349.076 | 439.528 | 24 | -90 | 19.58 | 3 |
| DEX-CZ2411 | 415798.803 | 9674050.552 | 367.797 | 15 | -90 | 8.17 | 4.56 |
| DEX-CZ2412 | 415044.065 | 9674096.009 | 373.200 | 22 | -90 | 18.92 | 2 |
| DEX-CZ2413 | 415146.555 | 9674100.014 | 372.542 | 22 | -90 | 18 | 2 |
| DEX-CZ2414 | 415248.672 | 9674096.699 | 359.117 | 33 | -90 | 23.61 | 9 |
| DEX-CZ2415 | 415048.824 | 9674146.694 | 385.002 | 31 | -90 | 22.68 | 9 |
| DEX-CZ2416 | 415099.570 | 9674146.750 | 389.259 | 29 | -90 | 16.38 | 10 |
| DEX-CZ2417 | 415145.752 | 9674150.682 | 390.441 | 21 | -90 | 15.24 | 5 |
| DEX-CZ2418 | 415198.797 | 9674142.210 | 379.268 | 24 | -90 | 19.2 | 2 |
| DEX-CZ2419 | 415247.974 | 9674146.966 | 368.399 | 26 | -90 | 11.73 | 12 |
| DEX-CZ2420 | 415299.737 | 9674148.939 | 366.611 | 17 | -90 | 8.51 | 5 |
| DEX-CZ2421 | 415048.013 | 9674192.558 | 395.927 | 26 | -90 | 15.9 | 11.19 |
| DEX-CZ2422 | 415142.895 | 9674205.234 | 412.505 | 19 | -90 | 4 | 12.5 |
| DEX-CZ2423 | 415243.578 | 9674196.137 | 384.803 | 10 | -90 | 5 | 3 |
| DEX-CZ2424 | 415255.034 | 9674243.867 | 413.617 | 9 | -90 | 5 | 1 |
| DEX-CZ2425 | 415306.781 | 9674263.664 | 419.007 | 5 | -90 | 2 | 1 |
| DEX-CZ2426 | 415550.650 | 9673748.433 | 329.578 | 11 | -90 | 1.53 | 7.47 |
| DEX-CZ2427 | 415504.415 | 9673746.181 | 335.486 | 16 | -90 | 8.07 | 5.25 |
| DEX-CZ2428 | 415447.727 | 9673744.072 | 334.895 | 28 | -90 | 16.4 | 9.6 |
| DEX-CZ2429 | 415397.181 | 9673751.572 | 335.379 | 21 | -90 | 7.37 | 10.63 |
| DEX-CZ2430 | 415348.599 | 9673745.154 | 331.832 | 27 | -90 | 12 | 11 |
| DEX-CZ2431 | 415349.208 | 9673848.399 | 343.534 | 37 | -90 | 9.49 | 26 |
| DEX-CZ2432 | 415249.315 | 9673949.835 | 343.197 | 26 | -90 | 19.87 | 3.98 |
| DEX-CZ2433 | 415199.159 | 9673955.012 | 342.000 | 34 | -90 | 32.61 | 3 |
| DEX-CZ2434 | 415146.414 | 9673959.105 | 339.581 | 27 | -90 | 23.36 | 3 |
| DEX-CZ2435 | 415101.645 | 9674249.398 | 426.155 | 7 | -90 | 4 | 1 |
| DEX-CZ2436 | 415157.368 | 9674257.654 | 438.860 | 17 | -90 | 7.24 | 8 |
| DEX-CZ2437 | 415048.464 | 9674248.070 | 409.816 | 34 | -90 | 11.47 | 21.52 |
| DEX-CZ2438 | 416648.543 | 9674500.396 | 436.327 | 20 | -90 | 9.77 | 4.77 |
| DEX-CZ2439 | 416750.014 | 9674499.845 | 411.781 | 22 | -90 | 15.47 | 4 |
| DEX-CZ2440 | 416825.067 | 9674498.440 | 417.281 | 47 | -90 | 10.68 | 28.41 |
| DEX-CZ2441 | 416646.016 | 9674545.723 | 446.676 | 18 | -90 | 6.13 | 9.21 |
| DEX-CZ2442 | 416694.572 | 9674547.538 | 437.339 | 35 | -90 | 8.27 | 22.6 |
| DEX-CZ2443 | 416749.098 | 9674550.429 | 419.893 | 42 | -90 | 11.69 | 27.87 |
| DEX-CZ2444 | 416798.683 | 9674551.885 | 416.268 | 35 | -90 | 14.97 | 16 |
| DEX-CZ2445 | 416650.307 | 9674602.582 | 459.813 | 12 | -90 | 4.17 | 6 |
| DEX-CZ2446 | 416750.861 | 9674598.744 | 424.168 | 24 | -90 | 16 | 5.2 |
| DEX-CZ2447 | 416646.771 | 9674645.803 | 458.384 | 18 | -90 | 7.01 | 10.29 |
| DEX-CZ2448 | 416697.301 | 9674648.558 | 444.779 | 40 | -90 | 4 | 29 |
| DEX-CZ2449 | 416751.533 | 9674649.157 | 427.868 | 22 | -90 | 7 | 11 |
| DEX-CZ2450 | 416782.003 | 9674648.458 | 420.391 | 34 | -90 | 18.62 | 14 |
| DEX-CZ2451 | 416648.336 | 9674701.980 | 454.676 | 11 | -90 | 2 | 1 |
| DEX-CZ2452 | 416749.606 | 9674698.847 | 429.285 | 47 | -90 | 6 | 30 |
| DEX-CZ2453 | 416499.738 | 9674752.831 | 452.803 | 28 | -90 | 4.34 | 18.42 |
| DEX-CZ2454 | 416543.369 | 9674746.019 | 454.000 | 47 | -90 | 16.59 | 24 |
| DEX-CZ2455 | 416594.630 | 9674749.178 | 449.214 | 31 | -90 | 12.33 | 17.12 |
| DEX-CZ2456 | 416644.964 | 9674745.663 | 447.591 | 35 | -90 | 9.43 | 15 |
| DEX-CZ2457 | 416699.149 | 9674749.829 | 439.465 | 33 | -90 | 14.29 | 12.64 |
| DEX-CZ2458 | 416751.503 | 9674751.021 | 428.040 | 24 | -90 | 19.15 | 2 |
| DEX-CZ2459 | 416777.846 | 9674750.669 | 421.446 | 30 | -90 | 16.09 | 11 |
| DEX-CZ2460 | 416451.480 | 9674801.753 | 445.522 | 23 | -90 | 1 | 5 |
| DEX-CZ2461 | 416548.493 | 9674799.978 | 450.651 | 35 | -90 | 21.45 | 12 |
| DEX-CZ2462 | 416649.063 | 9674799.178 | 432.795 | 49 | -90 | 22.6 | 20 |
| DEX-CZ2463 | 416749.888 | 9674803.267 | 424.802 | 33 | -90 | 13 | 18 |
| DEX-CZ2464 | 416499.544 | 9674849.643 | 443.401 | 21 | -90 | 11 | 8 |
| DEX-CZ2465 | 416548.820 | 9674848.388 | 443.823 | 16 | -90 | 11.6 | 2 |
| DEX-CZ2466 | 416595.268 | 9674852.831 | 435.524 | 16 | -90 | 3 | 10.76 |
| DEX-CZ2467 | 416653.214 | 9674846.336 | 422.347 | 14 | -90 | 8.52 | 4 |
| DEX-CZ2468 | 416704.890 | 9674847.733 | 425.522 | 11 | -90 | 7.18 | 1 |
| DEX-CZ2469 | 416745.946 | 9674852.840 | 424.032 | 20 | -90 | 12.41 | 1 |
| DEX-CZ2470 | 416774.352 | 9674849.141 | 420.357 | 17 | -90 | 12.19 | 4 |
| DEX-CZ2472 | 416651.301 | 9674902.433 | 414.909 | 30 | -90 | 9.52 | 20.6 |
| DEX-CZ2473 | 416746.160 | 9674884.184 | 422.559 | 18 | -90 | 14.35 | 0.74 |
| DEX-CZ2474 | 416800.955 | 9674250.355 | 418.968 | 7 | -90 | 2 | 2.58 |
| DEX-CZ2475 | 416850.455 | 9674250.183 | 418.834 | 26 | -90 | 8.31 | 13.91 |
| DEX-CZ2476 | 416848.586 | 9674299.106 | 423.140 | 28 | -90 | 15.34 | 10.6 |
| DEX-CZ2477 | 416799.231 | 9674350.477 | 413.461 | 24 | -90 | 6.61 | 14 |
| DEX-CZ2478 | 416849.398 | 9674349.873 | 413.897 | 25 | -90 | 16 | 5 |
| DEX-CZ2479 | 416650.232 | 9674402.491 | 412.799 | 10 | -90 | 3 | 4.66 |
| DEX-CZ2480 | 416751.675 | 9674402.360 | 405.469 | 32 | -90 | 7.37 | 19.69 |
| DEX-CZ2481 | 416850.098 | 9674398.813 | 411.112 | 16 | -90 | 5.15 | 7.49 |
| DEX-CZ2482 | 416598.602 | 9674451.162 | 420.571 | 18 | -90 | 8.22 | 7.46 |
| DEX-CZ2483 | 416650.003 | 9674451.035 | 426.275 | 22 | -90 | 7.17 | 12.18 |
| DEX-CZ2484 | 416700.609 | 9674449.661 | 422.963 | 16 | -90 | 13.49 | 2 |
| DEX-CZ2485 | 416750.844 | 9674450.451 | 412.854 | 21 | -90 | 6.48 | 13 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| CZ210165 | 418652.098 | 9673703.646 | 412.922 | 16 | -90 | 5.3 | 5.5 |
| CZ210208 | 418329.348 | 9673445.167 | 420.083 | 32 | -90 | 13.49 | 17.29 |
| CZ210268 | 418072.809 | 9673265.838 | 433.475 | 17 | -90 | 3 | 9 |
| CZ210300 | 418172.510 | 9673322.250 | 432.175 | 24 | -90 | 20.34 | 4.18 |
| DEX-CZ188 | 416111.291 | 9673193.928 | 347.341 | 9 | -90 | 5.97 | 2 |
| CZ210025 | 418499.743 | 9673698.020 | 402.487 | 23 | -90 | 12.54 | 11.26 |
| CZ210181 | 418553.842 | 9673549.564 | 433.411 | 51 | -90 | 16.84 | 36.47 |
| CZ210147 | 417742.176 | 9673443.493 | 373.731 | 20 | -90 | 16.1 | 3 |
| CZ210199 | 418292.845 | 9673319.181 | 426.561 | 40 | -90 | 27.13 | 16.3 |
| CZ210200 | 418254.995 | 9673324.219 | 425.388 | 43 | -90 | 20.02 | 26.17 |
| CZ210252 | 418051.007 | 9673426.702 | 425.059 | 28 | -90 | 13.76 | 14 |
| CZ210215 | 418357.634 | 9673374.935 | 428.164 | 46 | -90 | 21.41 | 9.78 |
| CZ210218 | 418229.982 | 9673322.116 | 427.475 | 48 | -90 | 20.79 | 22.95 |
| CZ210122 | 417552.303 | 9673255.568 | 420.392 | 9 | -90 | 4 | 2 |
| CZ210144 | 417588.938 | 9673449.929 | 376.442 | 18 | -90 | 9.58 | 9 |
| CZ210182 | 418595.467 | 9673554.485 | 439.919 | 29 | -90 | 10.17 | 11.55 |
| CZ210222 | 418176.858 | 9673351.127 | 427.788 | 27 | -90 | 19.08 | 10.64 |
| CZ210090 | 418347.525 | 9673500.041 | 418.870 | 28 | -90 | 30.64 | 5.41 |
| CZ210149 | 417841.347 | 9673449.608 | 395.004 | 26 | -90 | 11.55 | 13.03 |
| CZ210214 | 418329.622 | 9673374.211 | 426.774 | 43 | -90 | 21.32 | 15.53 |
| DEX-CZ191 | 416228.002 | 9673398.425 | 315.641 | 10 | -90 | 6 | 2 |
| CZ210024 | 418497.268 | 9673750.547 | 384.911 | 21 | -90 | 19.51 | 3.27 |
| CZ210036 | 418300.376 | 9673654.582 | 396.684 | 18 | -90 | 4 | 4 |
| CZ210045 | 418451.892 | 9673800.702 | 375.608 | 29 | -90 | 23.88 | 4.39 |
| CZ210148 | 417794.258 | 9673448.696 | 384.491 | 33 | -90 | 9.34 | 7.45 |
| CZ210170 | 418597.964 | 9673652.269 | 417.834 | 24 | -90 | 18.72 | 5.49 |
| CZ210191 | 418248.494 | 9673379.081 | 425.710 | 24 | -90 | 19.34 | 10.35 |
| DEX-CZ177 | 415927.451 | 9673202.704 | 325.992 | 12 | -90 | 4 | 5.93 |
| CZ210063 | 418047.937 | 9673549.214 | 427.925 | 13 | -90 | 4.34 | 7 |
| CZ210174 | 418799.065 | 9673651.852 | 427.829 | 21 | -90 | 12.74 | 6.92 |
| CZ210029 | 418498.592 | 9673348.192 | 446.042 | 33 | -90 | 10.03 | 21.88 |
| CZ210127 | 417795.437 | 9673257.227 | 379.260 | 25 | -90 | 16.36 | 1 |
| CZ210142 | 417844.275 | 9673395.098 | 395.626 | 21 | -90 | 7.03 | 12.43 |
| CZ210283 | 418499.939 | 9673474.822 | 430.323 | 26 | -90 | 15.74 | 4 |
| DEX-CZ4747 | 418604.800 | 9674101.000 | 350.492 | 23 | -90 | 18.56 | 3 |
| CZ210049 | 417945.629 | 9673654.338 | 390.578 | 6 | -90 | 2 | 0 |
| CZ210058 | 418002.846 | 9673448.951 | 421.982 | 32 | -90 | 20.57 | 15.57 |
| CZ210096 | 418451.147 | 9673549.940 | 419.759 | 26 | -90 | 22.2 | 8 |
| CZ210234 | 418298.496 | 9673280.336 | 429.522 | 47 | -90 | 27.76 | 22.19 |
| DEX-CZ703 | 417000.266 | 9673645.868 | 345.482 | 15 | -90 | 6.17 | 8.8 |
| CZ210157 | 418397.919 | 9673599.241 | 414.928 | 27 | -90 | 7.64 | 17.01 |
| CZ210236 | 418231.382 | 9673277.225 | 428.070 | 49 | -90 | 21.31 | 21.24 |
| DEX-CZ4741 | 417792.700 | 9674109.000 | 351.504 | 36 | -90 | 20.31 | 13 |
| CZ210113 | 417901.267 | 9673647.415 | 390.562 | 11 | -90 | 2 | 5.09 |
| CZ210197 | 418270.633 | 9673344.859 | 425.458 | 40 | -90 | 26.97 | 8.81 |
| CZ210298 | 418199.038 | 9673277.239 | 432.442 | 28 | -90 | 23.56 | 3 |
| DEX-CZ7049 | 417356.419 | 9673623.863 | 347.943 | 38 | -90 | 31.26 | 6 |
| CZ210054 | 417954.464 | 9673398.819 | 418.330 | 18 | -90 | 9.28 | 5 |
| CZ210089 | 418359.811 | 9673548.983 | 411.123 | 24 | -90 | 8.1 | 10.36 |
| CZ210130 | 417553.234 | 9673303.247 | 421.319 | 5 | -90 | 2 | 0 |
| CZ210164 | 418599.706 | 9673697.882 | 408.011 | 30 | -90 | 10.28 | 8.03 |
| CZ210203 | 418278.433 | 9673299.098 | 426.495 | 43 | -90 | 38.24 | 8.3 |
| CZ210288 | 418100.133 | 9673279.316 | 433.577 | 36 | -90 | 10.19 | 20.28 |
| CZ210293 | 418126.711 | 9673298.082 | 433.844 | 27 | -90 | 11.64 | 15.19 |
| CZ210022 | 418354.054 | 9673264.449 | 437.203 | 25 | -90 | 8.49 | 15.7 |
| CZ210143 | 417542.649 | 9673445.973 | 385.086 | 6 | -90 | 3 | 1 |
| CZ210150 | 417853.369 | 9673499.697 | 385.839 | 16 | -90 | 9.03 | 6.18 |
| CZ210180 | 418749.458 | 9673612.278 | 447.990 | 24 | -90 | 9.02 | 15.94 |
| CZ210194 | 418271.313 | 9673400.887 | 422.960 | 40 | -90 | 19.17 | 19.96 |
| DEX-CZ4739 | 417599.200 | 9674101.000 | 357.949 | 27 | -90 | 8 | 8 |
| CZ210085 | 418250.267 | 9673400.639 | 423.751 | 38 | -90 | 24.94 | 8.78 |
| CZ210256 | 417977.286 | 9673524.614 | 408.578 | 23 | -90 | 17.03 | 7 |
| DEX-CZ4758 | 418697.600 | 9674205.000 | 342.989 | 13 | -90 | 6 | 5 |
| CZ210066 | 418057.684 | 9673404.759 | 424.346 | 23 | -90 | 18.16 | 3.8 |
| CZ210080 | 418254.015 | 9673656.187 | 385.661 | 34 | -90 | 15.96 | 8.7 |
| CZ210183 | 418648.803 | 9673552.726 | 449.345 | 21 | -90 | 11.43 | 0 |
| CZ210225 | 418473.811 | 9673451.723 | 428.693 | 46 | -90 | 21.32 | 17.77 |
| DEX-CZ4740 | 417707.200 | 9674101.000 | 366.223 | 10 | -90 | 4 | 3 |
| CZ210027 | 418496.369 | 9673548.854 | 424.504 | 33 | -90 | 28.42 | 6.5 |
| CZ210104 | 418251.566 | 9673349.060 | 426.990 | 44 | -90 | 35.28 | 13.01 |
| CZ210255 | 417972.704 | 9673469.007 | 416.735 | 16 | -90 | 5.54 | 3 |
| CZ210050 | 417951.985 | 9673594.624 | 400.874 | 23 | -90 | 9.66 | 13.74 |
| CZ210052 | 417948.954 | 9673499.642 | 404.622 | 33 | -90 | 18.94 | 15.2 |
| CZ210306 | 418473.698 | 9673550.744 | 421.709 | 26 | -90 | 16.79 | 8 |
| DEX-CZ10000 | 416694.422 | 9672373.137 | 391.447 | 31 | -90 | 14 | 12 |
| DEX-CZ10001 | 416717.514 | 9672372.781 | 396.753 | 31 | -90 | 7.26 | 19 |
| DEX-CZ10002 | 416741.054 | 9672373.489 | 400.121 | 20 | -90 | 12 | 6 |
| DEX-CZ10003 | 416770.454 | 9672374.227 | 404.405 | 20 | -90 | 11.13 | 7 |
| DEX-CZ10004 | 416795.253 | 9672371.576 | 406.607 | 22 | -90 | 15.35 | 1 |
| DEX-CZ10005 | 416819.668 | 9672370.847 | 408.836 | 13 | -90 | 4 | 4 |
| DEX-CZ10006 | 416843.984 | 9672375.656 | 410.163 | 17 | -90 | 7 | 6.21 |
| DEX-CZ10007 | 416872.508 | 9672370.881 | 416.486 | 9 | -90 | 4 | 2 |
| DEX-CZ10008 | 416890.501 | 9672373.886 | 419.152 | 16 | -90 | 4 | 10 |
| DEX-CZ10009 | 416927.198 | 9672373.657 | 420.841 | 15 | -90 | 6 | 7 |
| DEX-CZ10010 | 416945.048 | 9672377.463 | 420.759 | 39 | -90 | 15.42 | 20.2 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2486 | 416800.476 | 9674451.764 | 408.865 | 30 | -90 | 9.16 | 18.52 |
| DEX-CZ2487 | 416846.695 | 9674449.520 | 416.926 | 40 | -90 | 16.54 | 22.05 |
| DEX-CZ2488 | 415498.693 | 9673499.025 | 329.844 | 22 | -90 | 14 | 5 |
| DEX-CZ2489 | 415649.817 | 9673500.150 | 335.174 | 40 | -90 | 31.54 | 5.8 |
| DEX-CZ2490 | 415599.602 | 9673500.377 | 333.790 | 16 | -90 | 10.22 | 4 |
| DEX-CZ2491 | 415549.684 | 9673499.531 | 336.411 | 17 | -90 | 13 | 2 |
| DEX-CZ2492 | 415599.909 | 9673548.625 | 345.482 | 25 | -90 | 16.79 | 7 |
| DEX-CZ2493 | 415499.651 | 9673550.739 | 330.779 | 18 | -90 | 13.62 | 2 |
| DEX-CZ2494 | 415646.362 | 9673548.632 | 341.525 | 20 | -90 | 14.35 | 3 |
| DEX-CZ2495 | 415700.715 | 9673549.120 | 337.411 | 31 | -90 | 28.95 | 0.45 |
| DEX-CZ2496 | 415548.730 | 9673549.522 | 340.446 | 30 | -90 | 19.91 | 6 |
| DEX-CZ2497 | 415698.242 | 9673599.139 | 348.500 | 27 | -90 | 13.79 | 12 |
| DEX-CZ2498 | 415648.464 | 9673598.691 | 352.725 | 14 | -90 | 8.26 | 4 |
| DEX-CZ2499 | 415549.542 | 9673600.438 | 337.572 | 41 | -90 | 9.27 | 29.54 |
| DEX-CZ2500 | 415500.519 | 9673600.488 | 329.488 | 41 | -90 | 23 | 15.51 |
| DEX-CZ2501 | 415695.789 | 9673649.055 | 358.650 | 22 | -90 | 9.24 | 11.37 |
| DEX-CZ2502 | 415498.672 | 9673650.692 | 330.407 | 20 | -90 | 15 | 3 |
| DEX-CZ2503 | 415549.729 | 9673651.170 | 332.391 | 16 | -90 | 8 | 6 |
| DEX-CZ2504 | 415647.622 | 9673650.401 | 363.000 | 16 | -90 | 6.21 | 7.57 |
| DEX-CZ2505 | 415599.407 | 9673651.617 | 352.716 | 4 | -90 | 1 | 0 |
| DEX-CZ2506 | 415796.216 | 9673652.944 | 355.124 | 15 | -90 | 2 | 9 |
| DEX-CZ2507 | 415495.864 | 9673701.807 | 326.334 | 14 | -90 | 4.29 | 7.71 |
| DEX-CZ2508 | 415549.300 | 9673700.687 | 332.610 | 22 | -90 | 14.67 | 6 |
| DEX-CZ2509 | 415599.489 | 9673699.493 | 341.845 | 15 | -90 | 3 | 10 |
| DEX-CZ2510 | 415651.603 | 9673700.943 | 359.869 | 13 | -90 | 5.7 | 5.3 |
| DEX-CZ2512 | 415800.685 | 9673749.551 | 375.059 | 9 | -90 | 5 | 1 |
| DEX-CZ2513 | 415599.810 | 9673749.261 | 335.308 | 17 | -90 | 13 | 2 |
| DEX-CZ2514 | 415700.985 | 9673748.384 | 357.374 | 10 | -90 | 6 | 2 |
| DEX-CZ2515 | 415651.551 | 9673748.620 | 346.441 | 6 | -90 | 3 | 1 |
| DEX-CZ2516 | 415798.169 | 9673800.431 | 368.831 | 15 | -90 | 6.24 | 7 |
| DEX-CZ2518 | 415650.921 | 9673799.278 | 341.604 | 15 | -90 | 9 | 3 |
| DEX-CZ2519 | 415750.507 | 9673801.751 | 366.320 | 7 | -90 | 2 | 1 |
| DEX-CZ2520 | 415698.319 | 9673801.396 | 350.389 | 17 | -90 | 2.6 | 4.4 |
| DEX-CZ2521 | 415699.971 | 9673849.723 | 367.564 | 5 | -90 | 1 | 0.62 |
| DEX-CZ2522 | 415649.334 | 9673851.242 | 347.678 | 9 | -90 | 1 | 6 |
| DEX-CZ2524 | 415652.044 | 9673900.334 | 349.120 | 6 | -90 | 2 | 0 |
| DEX-CZ265 | 415500.195 | 9674553.230 | 424.256 | 42 | -90 | 24 | 16 |
| DEX-CZ266 | 415548.647 | 9674553.863 | 419.798 | 33 | -90 | 20.2 | 12.53 |
| DEX-CZ2827 | 416624.546 | 9674921.552 | 415.519 | 40 | -90 | 13.42 | 24.2 |
| DEX-CZ2828 | 416649.363 | 9674920.093 | 412.225 | 27 | -90 | 11.25 | 13.01 |
| DEX-CZ2829 | 416676.765 | 9674907.788 | 412.974 | 22 | -90 | 17 | 3.24 |
| DEX-CZ2830 | 416697.013 | 9674915.659 | 415.101 | 33 | -90 | 30.5 | 2 |
| DEX-CZ2831 | 416725.058 | 9674914.963 | 419.250 | 41 | -90 | 29.79 | 11 |
| DEX-CZ2832 | 416747.002 | 9674913.872 | 419.426 | 45 | -90 | 30.23 | 15.3 |
| DEX-CZ2833 | 416624.774 | 9674897.110 | 421.411 | 13 | -90 | 10.23 | 0.77 |
| DEX-CZ2834 | 416675.863 | 9674899.310 | 414.091 | 27 | -90 | 12 | 12 |
| DEX-CZ2835 | 416723.520 | 9674900.780 | 421.653 | 33 | -90 | 28.22 | 3.5 |
| DEX-CZ2836 | 416626.294 | 9674882.210 | 422.050 | 11 | -90 | 6.2 | 3 |
| DEX-CZ2836R | 416623.792 | 9674866.769 | 425.862 | 11 | -90 | 4 | 4.64 |
| DEX-CZ2837 | 416648.899 | 9674875.012 | 418.786 | 9 | -90 | 5.44 | 0.56 |
| DEX-CZ2838 | 416674.166 | 9674875.816 | 417.000 | 21 | -90 | 11 | 6 |
| DEX-CZ2839 | 416698.851 | 9674881.441 | 420.164 | 22 | -90 | 11.3 | 8.33 |
| DEX-CZ2840 | 416727.924 | 9674878.831 | 423.789 | 24 | -90 | 19.17 | 4 |
| DEX-CZ2841 | 416751.059 | 9674876.667 | 422.611 | 26 | -90 | 20.45 | 1 |
| DEX-CZ2842 | 416524.255 | 9674846.852 | 445.045 | 23 | -90 | 15.49 | 6 |
| DEX-CZ2843 | 416574.387 | 9674848.313 | 441.025 | 12 | -90 | 7.23 | 2 |
| DEX-CZ2844 | 416625.431 | 9674848.704 | 427.784 | 12 | -90 | 3 | 5 |
| DEX-CZ2845 | 416674.441 | 9674845.656 | 422.195 | 16 | -90 | 5 | 1 |
| DEX-CZ2846 | 416722.365 | 9674847.422 | 426.459 | 28 | -90 | 13.23 | 9 |
| DEX-CZ2848 | 416450.714 | 9674823.829 | 443.335 | 15 | -90 | 7 | 4.23 |
| DEX-CZ2849 | 416475.654 | 9674825.856 | 446.933 | 24 | -90 | 19.66 | 3 |
| DEX-CZ2850 | 416499.405 | 9674825.294 | 448.218 | 29 | -90 | 17.49 | 6 |
| DEX-CZ2851 | 416524.272 | 9674825.066 | 448.400 | 37 | -90 | 15.25 | 15.41 |
| DEX-CZ2852 | 416549.412 | 9674823.734 | 448.167 | 31 | -90 | 23.65 | 6 |
| DEX-CZ2853 | 416575.435 | 9674823.350 | 446.025 | 25 | -90 | 20 | 1 |
| DEX-CZ2854 | 416601.938 | 9674822.687 | 441.150 | 16 | -90 | 9.58 | 1.42 |
| DEX-CZ2855 | 416623.527 | 9674821.044 | 435.367 | 50 | -90 | 16.6 | 29.4 |
| DEX-CZ2856 | 416647.938 | 9674823.330 | 426.863 | 43 | -90 | 34.47 | 4.78 |
| DEX-CZ2857 | 416674.636 | 9674821.520 | 427.951 | 28 | -90 | 10.23 | 15 |
| DEX-CZ2858 | 416699.498 | 9674819.394 | 430.530 | 41 | -90 | 19.63 | 16.5 |
| DEX-CZ2859 | 416721.991 | 9674820.333 | 429.764 | 36 | -90 | 19.53 | 14 |
| DEX-CZ2860 | 416746.794 | 9674821.459 | 426.072 | 38 | -90 | 22.47 | 15 |
| DEX-CZ2861 | 416776.321 | 9674821.171 | 421.209 | 57 | -90 | 19.12 | 37 |
| DEX-CZ2863 | 416474.526 | 9674800.466 | 451.262 | 9 | -90 | 2 | 2 |
| DEX-CZ2864 | 416525.704 | 9674800.433 | 452.480 | 31 | -90 | 18 | 11.22 |
| DEX-CZ2865 | 416574.296 | 9674797.633 | 446.078 | 36 | -90 | 25.3 | 8.59 |
| DEX-CZ2866 | 416627.643 | 9674799.577 | 433.389 | 46 | -90 | 26.05 | 19.45 |
| DEX-CZ2867 | 416673.348 | 9674802.291 | 433.277 | 19 | -90 | 11.25 | 5.35 |
| DEX-CZ2868 | 416723.304 | 9674799.262 | 429.682 | 41 | -90 | 26.25 | 14 |
| DEX-CZ2869 | 416776.736 | 9674800.155 | 420.130 | 46 | -90 | 27.7 | 18 |
| DEX-CZ2871 | 416474.640 | 9674776.598 | 451.277 | 22 | -90 | 1 | 10 |
| DEX-CZ2872 | 416500.082 | 9674774.721 | 453.220 | 13 | -90 | 5.2 | 5 |
| DEX-CZ2873 | 416524.901 | 9674776.588 | 453.881 | 25 | -90 | 10.29 | 11 |
| DEX-CZ2874 | 416549.908 | 9674774.986 | 452.838 | 35 | -90 | 7.7 | 13.3 |
| DEX-CZ2875 | 416576.581 | 9674774.301 | 449.330 | 36 | -90 | 24.73 | 7.6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10011 | 416972.307 | 9672375.439 | 424.232 | 32 | -90 | 20.48 | 9.27 |
| DEX-CZ10012 | 416996.247 | 9672379.666 | 427.766 | 38 | -90 | 12.55 | 21.53 |
| DEX-CZ10013 | 417018.944 | 9672371.398 | 431.753 | 30 | -90 | 17 | 7.33 |
| DEX-CZ10014 | 417043.116 | 9672369.491 | 434.191 | 30 | -90 | 20 | 6 |
| DEX-CZ10015 | 416668.848 | 9672300.045 | 377.000 | 15 | -90 | 4.75 | 0 |
| DEX-CZ10016 | 416718.771 | 9672299.260 | 394.126 | 30 | -90 | 12.26 | 7.55 |
| DEX-CZ10017 | 416769.145 | 9672299.668 | 402.882 | 37 | -90 | 15 | 18 |
| DEX-CZ10019 | 416844.319 | 9672299.730 | 409.462 | 35 | -90 | 22.21 | 10.31 |
| DEX-CZ10020 | 416870.722 | 9672297.680 | 415.120 | 22 | -90 | 11.81 | 8.24 |
| DEX-CZ10021 | 416918.490 | 9672304.996 | 424.230 | 26 | -90 | 10.23 | 13 |
| DEX-CZ10022 | 416967.487 | 9672297.186 | 433.992 | 19 | -90 | 10.93 | 5.25 |
| DEX-CZ10023 | 417019.207 | 9672297.919 | 440.656 | 21 | -90 | 8 | 6 |
| DEX-CZ10024 | 416668.138 | 9672269.744 | 387.661 | 34 | -90 | 10 | 16.22 |
| DEX-CZ10025 | 416691.920 | 9672270.715 | 380.000 | 12 | -90 | 3 | 6 |
| DEX-CZ10026 | 416725.222 | 9672278.759 | 393.371 | 46 | -90 | 14 | 23.28 |
| DEX-CZ10027 | 416746.949 | 9672272.317 | 397.533 | 25 | -90 | 10 | 13 |
| DEX-CZ10028 | 416764.560 | 9672274.226 | 401.484 | 20 | -90 | 12 | 5 |
| DEX-CZ10031 | 416841.291 | 9672276.899 | 408.368 | 30 | -90 | 20.54 | 7.36 |
| DEX-CZ10032 | 416870.381 | 9672277.089 | 416.565 | 19 | -90 | 13.67 | 3 |
| DEX-CZ10033 | 416897.262 | 9672272.513 | 424.553 | 18 | -90 | 10 | 1 |
| DEX-CZ10034 | 416919.404 | 9672276.094 | 429.021 | 18 | -90 | 15 | 1 |
| DEX-CZ10035 | 416943.162 | 9672277.795 | 433.726 | 15 | -90 | 5 | 6 |
| DEX-CZ10036 | 416968.228 | 9672272.487 | 438.141 | 17 | -90 | 6 | 2 |
| DEX-CZ10037 | 416992.619 | 9672279.605 | 440.047 | 29 | -90 | 20 | 5 |
| DEX-CZ10038 | 417020.379 | 9672279.104 | 442.890 | 19 | -90 | 11 | 6 |
| DEX-CZ10039 | 417050.221 | 9672276.355 | 445.253 | 17 | -90 | 6 | 6.45 |
| DEX-CZ10040 | 417068.992 | 9672277.764 | 445.126 | 13 | -90 | 4.42 | 1.58 |
| DEX-CZ10041 | 417098.712 | 9672276.449 | 443.172 | 20 | -90 | 10 | 4.72 |
| DEX-CZ10042 | 416667.168 | 9672324.470 | 380.180 | 23 | -90 | 5 | 12.75 |
| DEX-CZ10043 | 416693.013 | 9672319.794 | 389.654 | 14 | -90 | 8 | 4 |
| DEX-CZ10044 | 416722.930 | 9672323.698 | 397.250 | 23 | -90 | 15 | 4 |
| DEX-CZ10045 | 416744.940 | 9672326.458 | 401.413 | 28 | -90 | 14 | 9 |
| DEX-CZ10046 | 416767.205 | 9672328.845 | 403.899 | 27 | -90 | 19.31 | 6 |
| DEX-CZ10047 | 416792.095 | 9672325.121 | 406.656 | 37 | -90 | 17.87 | 15 |
| DEX-CZ10048 | 416817.094 | 9672324.248 | 409.410 | 34 | -90 | 17.15 | 12.86 |
| DEX-CZ10049 | 416843.601 | 9672331.391 | 413.632 | 17 | -90 | 13.65 | 1 |
| DEX-CZ10050 | 416871.852 | 9672321.988 | 414.000 | 31 | -90 | 12.88 | 16.82 |
| DEX-CZ10051 | 416899.864 | 9672312.733 | 418.943 | 18 | -90 | 10.63 | 4 |
| DEX-CZ10052 | 416915.898 | 9672327.608 | 419.584 | 17 | -90 | 9.85 | 0.58 |
| DEX-CZ10053 | 416947.634 | 9672321.138 | 426.834 | 18 | -90 | 11.27 | 2 |
| DEX-CZ10054 | 416969.690 | 9672323.284 | 430.800 | 25 | -90 | 15.54 | 3 |
| DEX-CZ10055 | 416997.350 | 9672327.801 | 434.135 | 30 | -90 | 19.75 | 7.48 |
| DEX-CZ10056 | 417024.805 | 9672326.972 | 438.472 | 30 | -90 | 19.79 | 3.38 |
| DEX-CZ10057 | 417043.682 | 9672318.394 | 441.194 | 19 | -90 | 8 | 4 |
| DEX-CZ10058 | 416722.403 | 9672351.863 | 397.911 | 23 | -90 | 14.68 | 6 |
| DEX-CZ10059 | 416768.023 | 9672351.833 | 405.468 | 31 | -90 | 17.24 | 12 |
| DEX-CZ10060 | 416795.003 | 9672352.135 | 408.485 | 40 | -90 | 23.1 | 3 |
| DEX-CZ10061 | 416819.848 | 9672348.933 | 411.604 | 30 | -90 | 17.72 | 8.85 |
| DEX-CZ10062 | 416864.217 | 9672352.552 | 416.069 | 11 | -90 | 4 | 3 |
| DEX-CZ10063 | 416917.943 | 9672345.926 | 419.028 | 24 | -90 | 3 | 5 |
| DEX-CZ10064 | 416971.943 | 9672348.406 | 427.004 | 30 | -90 | 18.33 | 4 |
| DEX-CZ10065 | 417015.976 | 9672352.947 | 434.207 | 35 | -90 | 28.43 | 3 |
| DEX-CZ10066 | 416671.332 | 9672243.492 | 394.848 | 27 | -90 | 21.58 | 3.5 |
| DEX-CZ10067 | 416721.427 | 9672241.747 | 384.542 | 33 | -90 | 12.35 | 19.44 |
| DEX-CZ10071 | 416847.190 | 9672250.388 | 411.366 | 25 | -90 | 14.3 | 6 |
| DEX-CZ10072 | 416865.625 | 9672251.835 | 416.101 | 18 | -90 | 13.35 | 1.38 |
| DEX-CZ10073 | 416894.322 | 9672251.470 | 423.781 | 21 | -90 | 15.34 | 1.4 |
| DEX-CZ10074 | 416920.329 | 9672253.279 | 430.304 | 20 | -90 | 12 | 2 |
| DEX-CZ10075 | 416967.837 | 9672255.705 | 439.923 | 15 | -90 | 8 | 2 |
| DEX-CZ10076 | 417018.266 | 9672248.089 | 445.180 | 32 | -90 | 27 | 2 |
| DEX-CZ10077 | 417064.721 | 9672250.806 | 447.000 | 24 | -90 | 10 | 1 |
| DEX-CZ10078 | 416645.233 | 9672200.280 | 405.114 | 45 | -90 | 12 | 24 |
| DEX-CZ10079 | 416667.150 | 9672200.220 | 402.437 | 46 | -90 | 15.23 | 20.26 |
| DEX-CZ10081 | 416718.992 | 9672195.674 | 402.719 | 34 | -90 | 23.65 | 6 |
| DEX-CZ10086 | 416845.096 | 9672200.192 | 402.621 | 11 | -90 | 8 | 0 |
| DEX-CZ10087 | 416919.683 | 9672205.883 | 424.993 | 21 | -90 | 7 | 11 |
| DEX-CZ10088 | 416971.980 | 9672205.828 | 436.244 | 46 | -90 | 21 | 22 |
| DEX-CZ10089 | 417025.416 | 9672198.830 | 441.220 | 28 | -90 | 24 | 2.35 |
| DEX-CZ10090 | 417070.326 | 9672199.076 | 443.026 | 43 | -90 | 40.67 | 1 |
| DEX-CZ10091 | 417116.396 | 9672200.011 | 439.464 | 32 | -90 | 18.31 | 9 |
| DEX-CZ10092 | 417171.569 | 9672200.544 | 436.904 | 26 | -90 | 17.35 | 3 |
| DEX-CZ10093 | 417218.756 | 9672200.900 | 431.813 | 29 | -90 | 23.66 | 4 |
| DEX-CZ10094 | 417272.087 | 9672195.040 | 419.664 | 29 | -90 | 9 | 8 |
| DEX-CZ10095 | 417294.858 | 9672190.996 | 413.737 | 35 | -90 | 9 | 23 |
| DEX-CZ10096 | 417319.229 | 9672204.716 | 401.000 | 34 | -90 | 6 | 21 |
| DEX-CZ10097 | 416620.743 | 9672170.471 | 410.032 | 19 | -90 | 14.65 | 2 |
| DEX-CZ10098 | 416641.996 | 9672175.655 | 408.136 | 29 | -90 | 8.24 | 12 |
| DEX-CZ10099 | 416681.828 | 9672169.700 | 404.529 | 26 | -90 | 9 | 12.23 |
| DEX-CZ10100 | 416701.312 | 9672173.127 | 406.654 | 30 | -90 | 25.74 | 3 |
| DEX-CZ10101 | 416723.024 | 9672172.961 | 407.137 | 26 | -90 | 21.03 | 2 |
| DEX-CZ10102 | 416744.091 | 9672169.626 | 408.411 | 32 | -90 | 27.01 | 1 |
| DEX-CZ10103 | 416771.036 | 9672169.498 | 410.378 | 19 | -90 | 15 | 2 |
| DEX-CZ10104 | 416794.524 | 9672170.959 | 409.465 | 33 | -90 | 19.76 | 11.34 |
| DEX-CZ10105 | 416814.676 | 9672167.937 | 411.813 | 24 | -90 | 16.93 | 6 |
| DEX-CZ10106 | 416841.833 | 9672172.110 | 412.041 | 21 | -90 | 14.68 | 5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2876 | 416599.637 | 9674774.495 | 444.314 | 28 | -90 | 20.43 | 3 |
| DEX-CZ2877 | 416622.355 | 9674777.169 | 440.090 | 37 | -90 | 27.2 | 8.6 |
| DEX-CZ2878 | 416647.144 | 9674774.868 | 441.662 | 48 | -90 | 21.4 | 25.37 |
| DEX-CZ2879 | 416673.254 | 9674773.203 | 440.142 | 42 | -90 | 33.62 | 8 |
| DEX-CZ2880 | 416699.118 | 9674774.907 | 437.483 | 45 | -90 | 21 | 19 |
| DEX-CZ2881 | 416723.320 | 9674774.382 | 432.504 | 36 | -90 | 16.55 | 18.28 |
| DEX-CZ2882 | 416750.833 | 9674774.050 | 425.863 | 51 | -90 | 26.95 | 24.25 |
| DEX-CZ2883 | 416775.021 | 9674772.589 | 421.129 | 55 | -90 | 33.51 | 22 |
| DEX-CZ2884 | 416791.139 | 9674773.122 | 418.215 | 46 | -90 | 37.95 | 9.78 |
| DEX-CZ2885 | 416475.098 | 9674750.624 | 448.961 | 30 | -90 | 4 | 24 |
| DEX-CZ2886 | 416524.972 | 9674750.482 | 454.000 | 38 | -90 | 14.48 | 21 |
| DEX-CZ2887 | 416575.061 | 9674750.542 | 451.735 | 42 | -90 | 17.31 | 21.49 |
| DEX-CZ2888 | 416623.180 | 9674750.277 | 447.298 | 31 | -90 | 14.63 | 8 |
| DEX-CZ2889 | 416674.605 | 9674748.876 | 444.931 | 41 | -90 | 19.25 | 19 |
| DEX-CZ2890 | 416725.265 | 9674749.055 | 433.850 | 25 | -90 | 12.46 | 9.3 |
| DEX-CZ2892 | 416575.339 | 9674724.825 | 453.448 | 33 | -90 | 19.72 | 11.32 |
| DEX-CZ2893 | 416600.685 | 9674724.898 | 452.586 | 31 | -90 | 24.05 | 4 |
| DEX-CZ2894 | 416622.103 | 9674724.972 | 452.814 | 25 | -90 | 12.24 | 8 |
| DEX-CZ2895 | 416648.794 | 9674724.788 | 451.491 | 24 | -90 | 10.49 | 10.24 |
| DEX-CZ2896 | 416674.795 | 9674724.944 | 447.022 | 17 | -90 | 2 | 10 |
| DEX-CZ2897 | 416700.795 | 9674725.994 | 440.459 | 21 | -90 | 12.49 | 6.68 |
| DEX-CZ2898 | 416725.206 | 9674726.172 | 433.305 | 27 | -90 | 15.12 | 9.7 |
| DEX-CZ2899 | 416748.142 | 9674724.374 | 427.940 | 37 | -90 | 15 | 19 |
| DEX-CZ2900 | 416773.546 | 9674722.640 | 423.202 | 22 | -90 | 17.32 | 4 |
| DEX-CZ2901 | 416798.800 | 9674724.565 | 418.155 | 27 | -90 | 11 | 13 |
| DEX-CZ2902 | 416674.930 | 9674700.727 | 449.257 | 10 | -90 | 2 | 6 |
| DEX-CZ2903 | 416724.034 | 9674697.941 | 436.231 | 19 | -90 | 11.29 | 5 |
| DEX-CZ2904 | 416773.506 | 9674699.651 | 422.698 | 28 | -90 | 10.51 | 15 |
| DEX-CZ2905 | 416626.831 | 9674677.366 | 455.424 | 48 | -90 | 14.48 | 5 |
| DEX-CZ2906 | 416649.539 | 9674675.192 | 452.720 | 50 | -90 | 19.93 | 28 |
| DEX-CZ2907 | 416673.798 | 9674675.341 | 448.090 | 47 | -90 | 22.72 | 9 |
| DEX-CZ2908 | 416697.344 | 9674678.434 | 441.303 | 31 | -90 | 18.95 | 1 |
| DEX-CZ2909 | 416723.633 | 9674674.085 | 433.881 | 21 | -90 | 13.54 | 6 |
| DEX-CZ2910 | 416749.026 | 9674674.662 | 427.899 | 24 | -90 | 13.68 | 9.24 |
| DEX-CZ2911 | 416774.408 | 9674675.682 | 422.374 | 45 | -90 | 18.18 | 26 |
| DEX-CZ2912 | 416799.589 | 9674674.056 | 418.727 | 22 | -90 | 9.26 | 9 |
| DEX-CZ2913 | 416623.694 | 9674651.691 | 457.371 | 36 | -90 | 17 | 15 |
| DEX-CZ2914 | 416674.467 | 9674648.731 | 452.227 | 51 | -90 | 16.68 | 19 |
| DEX-CZ2915 | 416725.308 | 9674650.829 | 435.190 | 34 | -90 | 8.53 | 21.7 |
| DEX-CZ2916 | 416774.529 | 9674652.554 | 422.075 | 40 | -90 | 18 | 21 |
| DEX-CZ2917 | 416624.102 | 9674625.101 | 461.650 | 16 | -90 | 5.84 | 5.42 |
| DEX-CZ2918 | 416649.464 | 9674625.007 | 461.242 | 26 | -90 | 2 | 12 |
| DEX-CZ2919 | 416674.414 | 9674626.225 | 454.491 | 45 | -90 | 3 | 5 |
| DEX-CZ2920 | 416699.462 | 9674624.925 | 445.057 | 23 | -90 | 3 | 17.27 |
| DEX-CZ2921 | 416724.131 | 9674624.377 | 436.052 | 30 | -90 | 4 | 23.27 |
| DEX-CZ2922 | 416751.538 | 9674626.731 | 427.531 | 29 | -90 | 13.85 | 10 |
| DEX-CZ2923 | 416774.947 | 9674626.122 | 419.163 | 41 | -90 | 16.87 | 23 |
| DEX-CZ2924 | 416799.935 | 9674622.975 | 417.645 | 14 | -90 | 5 | 7 |
| DEX-CZ2925 | 416726.612 | 9674601.126 | 433.351 | 25 | -90 | 8.42 | 6.95 |
| DEX-CZ2926 | 416776.119 | 9674601.060 | 418.051 | 52 | -90 | 35.14 | 19 |
| DEX-CZ2927 | 416651.312 | 9674574.626 | 453.193 | 22 | -90 | 5.56 | 14 |
| DEX-CZ2928 | 416674.584 | 9674575.700 | 449.496 | 24 | -90 | 10.43 | 12.54 |
| DEX-CZ2929 | 416699.819 | 9674574.872 | 442.632 | 25 | -90 | 5 | 18 |
| DEX-CZ2930 | 416723.200 | 9674576.378 | 434.697 | 21 | -90 | 5 | 13 |
| DEX-CZ2931 | 416751.007 | 9674572.358 | 422.337 | 42 | -90 | 11 | 23 |
| DEX-CZ2932 | 416774.067 | 9674574.482 | 415.569 | 40 | -90 | 17.51 | 17.5 |
| DEX-CZ2933 | 416802.074 | 9674576.951 | 417.291 | 44 | -90 | 15.74 | 27 |
| DEX-CZ2934 | 416673.246 | 9674552.131 | 444.384 | 15 | -90 | 5 | 8.34 |
| DEX-CZ2935 | 416724.185 | 9674549.995 | 429.177 | 45 | -90 | 6 | 29 |
| DEX-CZ2936 | 416775.033 | 9674548.557 | 412.653 | 43 | -90 | 19.87 | 22.75 |
| DEX-CZ2937 | 416649.637 | 9674524.529 | 441.359 | 20 | -90 | 9.29 | 10.16 |
| DEX-CZ2938 | 416674.362 | 9674525.235 | 436.280 | 33 | -90 | 5 | 21 |
| DEX-CZ2939 | 416699.021 | 9674527.454 | 429.689 | 38 | -90 | 9.73 | 16.62 |
| DEX-CZ2940 | 416724.459 | 9674525.805 | 422.183 | 42 | -90 | 13.74 | 18 |
| DEX-CZ2941 | 416750.349 | 9674526.604 | 415.310 | 40 | -90 | 22.08 | 12.34 |
| DEX-CZ2942 | 416776.093 | 9674523.457 | 411.000 | 55 | -90 | 24 | 28 |
| DEX-CZ2943 | 416803.019 | 9674528.158 | 416.670 | 28 | -90 | 14.95 | 6 |
| DEX-CZ2944 | 416823.461 | 9674524.659 | 419.921 | 29 | -90 | 17.42 | 5.5 |
| DEX-CZ2945 | 416675.177 | 9674499.571 | 432.207 | 60 | -90 | 9 | 6 |
| DEX-CZ2946 | 416724.962 | 9674499.974 | 417.546 | 49 | -90 | 19.03 | 26 |
| DEX-CZ2947 | 416774.800 | 9674500.191 | 409.495 | 22 | -90 | 5.55 | 13.45 |
| DEX-CZ2949 | 416624.945 | 9674475.160 | 432.292 | 22 | -90 | 14.51 | 6 |
| DEX-CZ2950 | 416650.063 | 9674476.030 | 431.551 | 14 | -90 | 5 | 7.67 |
| DEX-CZ2951 | 416674.593 | 9674475.283 | 429.123 | 14 | -90 | 6.44 | 6 |
| DEX-CZ2952 | 416700.099 | 9674475.256 | 424.656 | 14 | -90 | 10 | 0.7 |
| DEX-CZ2953 | 416724.418 | 9674480.205 | 419.106 | 47 | -90 | 13.88 | 25 |
| DEX-CZ2954 | 416750.318 | 9674475.168 | 412.116 | 52 | -90 | 12.28 | 36 |
| DEX-CZ2955 | 416774.182 | 9674473.582 | 406.894 | 35 | -90 | 4 | 28 |
| DEX-CZ2956 | 416800.555 | 9674474.905 | 411.042 | 10 | -90 | 6 | 1 |
| DEX-CZ2957 | 416825.553 | 9674475.848 | 415.995 | 60 | -90 | 24.56 | 31.5 |
| DEX-CZ2958 | 416847.121 | 9674472.127 | 419.677 | 39 | -90 | 30.15 | 9 |
| DEX-CZ2959 | 416624.442 | 9674450.389 | 425.487 | 13 | -90 | 9.64 | 1.36 |
| DEX-CZ2960 | 416675.905 | 9674450.023 | 425.452 | 19 | -90 | 9.83 | 2 |
| DEX-CZ2961 | 416725.313 | 9674452.338 | 418.499 | 37 | -90 | 14 | 14 |
| DEX-CZ2962 | 416776.799 | 9674451.120 | 404.093 | 12 | -90 | 3.58 | 6.42 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10107 | 416924.973 | 9672172.765 | 422.503 | 22 | -90 | 11 | 3 |
| DEX-CZ10108 | 416946.644 | 9672171.234 | 425.048 | 27 | -90 | 15 | 9 |
| DEX-CZ10109 | 416969.491 | 9672175.236 | 430.116 | 30 | -90 | 9 | 16.8 |
| DEX-CZ10110 | 416995.810 | 9672174.259 | 434.185 | 33 | -90 | 29.24 | 1 |
| DEX-CZ10111 | 417018.177 | 9672175.499 | 436.318 | 36 | -90 | 26.65 | 5 |
| DEX-CZ10112 | 417043.873 | 9672171.972 | 437.600 | 35 | -90 | 24.73 | 4 |
| DEX-CZ10113 | 417065.573 | 9672168.485 | 438.398 | 23 | -90 | 18 | 2 |
| DEX-CZ10114 | 417095.016 | 9672170.191 | 439.000 | 44 | -90 | 31.28 | 8 |
| DEX-CZ10115 | 417123.887 | 9672176.786 | 438.537 | 28 | -90 | 18 | 6.41 |
| DEX-CZ10116 | 417146.359 | 9672176.842 | 438.324 | 27 | -90 | 20.3 | 5 |
| DEX-CZ10117 | 417167.608 | 9672172.897 | 438.372 | 21 | -90 | 15 | 4 |
| DEX-CZ10118 | 417194.379 | 9672174.729 | 437.027 | 18 | -90 | 13.74 | 3 |
| DEX-CZ10119 | 417220.370 | 9672178.119 | 433.377 | 23 | -90 | 12 | 8 |
| DEX-CZ10120 | 417245.097 | 9672174.710 | 429.680 | 21 | -90 | 14.53 | 4 |
| DEX-CZ10121 | 417270.188 | 9672175.838 | 425.890 | 29 | -90 | 17.53 | 6 |
| DEX-CZ10122 | 417294.325 | 9672168.452 | 419.527 | 11 | -90 | 5 | 1 |
| DEX-CZ10123 | 417314.306 | 9672163.326 | 411.912 | 18 | -90 | 5 | 5 |
| DEX-CZ10124 | 416621.993 | 9672148.209 | 412.136 | 49 | -90 | 18.61 | 25.65 |
| DEX-CZ10125 | 416596.771 | 9672125.250 | 414.566 | 46 | -90 | 19.81 | 23.55 |
| DEX-CZ10126 | 416593.694 | 9672095.612 | 417.376 | 36 | -90 | 18.87 | 7 |
| DEX-CZ10127 | 416619.411 | 9672097.951 | 418.720 | 18 | -90 | 14.66 | 1 |
| DEX-CZ10128 | 416618.384 | 9672122.060 | 414.981 | 22 | -90 | 11 | 8 |
| DEX-CZ10129 | 416647.364 | 9672123.192 | 416.054 | 17 | -90 | 12 | 1 |
| DEX-CZ10130 | 416671.898 | 9672120.227 | 418.057 | 21 | -90 | 6 | 6 |
| DEX-CZ10131 | 416698.098 | 9672123.967 | 418.705 | 23 | -90 | 13.34 | 7 |
| DEX-CZ10132 | 416769.600 | 9672112.651 | 418.358 | 25 | -90 | 13 | 7 |
| DEX-CZ10133 | 416772.414 | 9672092.977 | 419.000 | 25 | -90 | 13.55 | 7.75 |
| DEX-CZ10134 | 416820.910 | 9672102.117 | 419.363 | 29 | -90 | 12.25 | 7 |
| DEX-CZ10135 | 416847.857 | 9672097.503 | 421.199 | 30 | -90 | 17.93 | 8 |
| DEX-CZ10136 | 416872.610 | 9672100.758 | 422.542 | 29 | -90 | 19.97 | 1 |
| DEX-CZ10137 | 416893.763 | 9672102.102 | 423.635 | 20 | -90 | 10 | 6.89 |
| DEX-CZ10138 | 416917.979 | 9672101.065 | 424.762 | 34 | -90 | 13 | 7 |
| DEX-CZ10139 | 416944.708 | 9672101.547 | 426.626 | 24 | -90 | 9 | 11 |
| DEX-CZ10140 | 416968.979 | 9672103.945 | 428.723 | 24 | -90 | 12 | 10 |
| DEX-CZ10141 | 417020.661 | 9672100.963 | 430.259 | 28 | -90 | 12 | 11.27 |
| DEX-CZ10142 | 417038.232 | 9672105.851 | 432.240 | 23 | -90 | 13.37 | 4 |
| DEX-CZ10143 | 417069.490 | 9672099.164 | 435.258 | 23 | -90 | 20.59 | 1 |
| DEX-CZ10144 | 417115.394 | 9672100.951 | 440.039 | 20 | -90 | 14.33 | 2 |
| DEX-CZ10145 | 417147.024 | 9672103.200 | 441.000 | 26 | -90 | 21.22 | 1 |
| DEX-CZ10146 | 417167.944 | 9672101.022 | 441.000 | 27 | -90 | 21 | 2 |
| DEX-CZ10147 | 417222.413 | 9672101.718 | 432.742 | 22 | -90 | 9 | 3 |
| DEX-CZ10148 | 416799.853 | 9672120.392 | 417.674 | 24 | -90 | 12.29 | 6.73 |
| DEX-CZ10149 | 416818.278 | 9672124.170 | 417.706 | 30 | -90 | 9 | 9.26 |
| DEX-CZ10150 | 416842.918 | 9672127.073 | 418.221 | 23 | -90 | 11.38 | 9 |
| DEX-CZ10151 | 416869.138 | 9672126.581 | 419.571 | 31 | -90 | 16.6 | 11 |
| DEX-CZ10152 | 416894.975 | 9672127.726 | 421.966 | 28 | -90 | 16.77 | 8 |
| DEX-CZ10153 | 416920.430 | 9672122.917 | 425.133 | 34 | -90 | 20.59 | 9.33 |
| DEX-CZ10154 | 416942.853 | 9672122.359 | 427.294 | 29 | -90 | 16.41 | 9 |
| DEX-CZ10155 | 416966.480 | 9672122.687 | 429.309 | 22 | -90 | 13.2 | 4 |
| DEX-CZ10156 | 416993.908 | 9672124.225 | 431.000 | 28 | -90 | 21.48 | 1 |
| DEX-CZ10157 | 417017.562 | 9672124.754 | 432.096 | 38 | -90 | 21.54 | 11.85 |
| DEX-CZ10158 | 417043.378 | 9672128.997 | 434.482 | 34 | -90 | 18 | 7 |
| DEX-CZ10159 | 417069.104 | 9672127.396 | 436.794 | 20 | -90 | 13.24 | 4 |
| DEX-CZ10160 | 417093.251 | 9672126.845 | 439.132 | 15 | -90 | 9 | 1 |
| DEX-CZ10161 | 417116.798 | 9672121.859 | 440.361 | 22 | -90 | 16.51 | 3 |
| DEX-CZ10162 | 417147.198 | 9672122.802 | 441.000 | 24 | -90 | 19.23 | 2 |
| DEX-CZ10163 | 417170.314 | 9672122.930 | 440.315 | 28 | -90 | 19 | 5.92 |
| DEX-CZ10164 | 417194.710 | 9672128.555 | 439.458 | 28 | -90 | 24.63 | 2 |
| DEX-CZ10165 | 417220.720 | 9672120.981 | 436.108 | 26 | -90 | 22.18 | 2 |
| DEX-CZ10166 | 417241.698 | 9672123.313 | 430.653 | 17 | -90 | 13 | 1 |
| DEX-CZ10167 | 417270.251 | 9672122.429 | 418.125 | 11 | -90 | 6 | 2.25 |
| DEX-CZ10168 | 417287.268 | 9672126.898 | 410.594 | 14 | -90 | 10 | 1 |
| DEX-CZ10170 | 416672.133 | 9672148.620 | 411.032 | 33 | -90 | 14 | 7 |
| DEX-CZ10171 | 416695.266 | 9672149.078 | 412.153 | 16 | -90 | 9 | 2 |
| DEX-CZ10172 | 416771.611 | 9672141.515 | 415.927 | 20 | -90 | 16.91 | 1 |
| DEX-CZ10173 | 416792.362 | 9672146.094 | 415.474 | 17 | -90 | 11.37 | 3.25 |
| DEX-CZ10174 | 416816.990 | 9672146.941 | 415.184 | 22 | -90 | 11 | 8.47 |
| DEX-CZ10175 | 416843.637 | 9672149.988 | 415.793 | 18 | -90 | 10.71 | 4 |
| DEX-CZ10176 | 416869.307 | 9672146.705 | 418.644 | 19 | -90 | 12 | 2 |
| DEX-CZ10177 | 416894.928 | 9672149.581 | 420.700 | 17 | -90 | 7 | 6 |
| DEX-CZ10178 | 416920.904 | 9672149.659 | 422.822 | 22 | -90 | 5 | 13 |
| DEX-CZ10179 | 416969.261 | 9672150.743 | 427.907 | 28 | -90 | 21 | 1.69 |
| DEX-CZ10180 | 417016.165 | 9672146.705 | 433.299 | 39 | -90 | 23 | 4 |
| DEX-CZ10181 | 417067.199 | 9672147.317 | 436.567 | 34 | -90 | 28.14 | 4 |
| DEX-CZ10182 | 417117.278 | 9672143.339 | 439.697 | 19 | -90 | 9 | 5.75 |
| DEX-CZ10183 | 417165.412 | 9672149.635 | 439.000 | 25 | -90 | 19 | 3 |
| DEX-CZ10184 | 417224.718 | 9672150.420 | 436.037 | 33 | -90 | 28.49 | 2.8 |
| DEX-CZ10186 | 417309.510 | 9672140.838 | 410.674 | 27 | -90 | 5 | 19.86 |
| DEX-CZ10187 | 416616.649 | 9673615.686 | 349.370 | 20 | -90 | 4 | 4 |
| DEX-CZ10189 | 416617.320 | 9673596.114 | 354.324 | 16 | -90 | 4 | 7 |
| DEX-CZ10190 | 416648.673 | 9673591.641 | 358.557 | 10 | -90 | 6 | 2 |
| DEX-CZ10194 | 416624.008 | 9673566.575 | 358.370 | 8 | -90 | 3 | 2 |
| DEX-CZ10195 | 416646.915 | 9673567.104 | 363.732 | 18 | -90 | 6 | 9 |
| DEX-CZ10196 | 416669.299 | 9673565.165 | 362.876 | 14 | -90 | 9 | 2 |
| DEX-CZ10198 | 416627.572 | 9673542.934 | 360.418 | 11 | -90 | 4 | 4 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2963 | 416824.925 | 9674452.130 | 413.771 | 48 | -90 | 26.78 | 17 |
| DEX-CZ2964 | 416624.530 | 9674424.233 | 417.076 | 22 | -90 | 13.03 | 5.75 |
| DEX-CZ2965 | 416649.843 | 9674424.326 | 419.283 | 25 | -90 | 20.04 | 5.7 |
| DEX-CZ2966 | 416673.199 | 9674423.805 | 417.650 | 39 | -90 | 6 | 25.64 |
| DEX-CZ2967 | 416701.141 | 9674424.821 | 418.602 | 14 | -90 | 3.65 | 4.2 |
| DEX-CZ2968 | 416724.995 | 9674425.642 | 416.454 | 14 | -90 | 6 | 6 |
| DEX-CZ2969 | 416750.671 | 9674425.734 | 410.224 | 18 | -90 | 4 | 10 |
| DEX-CZ2970 | 416774.871 | 9674425.754 | 402.798 | 19 | -90 | 2 | 15 |
| DEX-CZ2971 | 416803.749 | 9674425.388 | 405.593 | 14 | -90 | 7.31 | 3 |
| DEX-CZ2972 | 416824.429 | 9674425.514 | 409.026 | 41 | -90 | 17.28 | 12.98 |
| DEX-CZ2973 | 416851.746 | 9674426.939 | 413.461 | 32 | -90 | 28.51 | 4 |
| DEX-CZ2974 | 416676.865 | 9674401.638 | 407.912 | 14 | -90 | 4.76 | 3.64 |
| DEX-CZ2975 | 416723.997 | 9674401.557 | 408.856 | 5 | -90 | 2 | 0 |
| DEX-CZ2976 | 416776.105 | 9674399.094 | 399.130 | 18 | -90 | 8.23 | 8.11 |
| DEX-CZ2977 | 416825.311 | 9674400.201 | 405.928 | 11 | -90 | 8.3 | 0 |
| DEX-CZ2978 | 416799.495 | 9674374.117 | 405.289 | 27 | -90 | 6 | 19 |
| DEX-CZ2979 | 416774.852 | 9674374.694 | 402.496 | 14 | -90 | 4 | 5 |
| DEX-CZ2980 | 416825.845 | 9674375.621 | 407.540 | 40 | -90 | 14.96 | 21 |
| DEX-CZ2981 | 416852.116 | 9674375.521 | 411.313 | 23 | -90 | 5.6 | 10.4 |
| DEX-CZ2982 | 416775.781 | 9674349.657 | 411.526 | 23 | -90 | 5 | 13.51 |
| DEX-CZ2983 | 416825.770 | 9674345.329 | 415.724 | 17 | -90 | 12.61 | 3 |
| DEX-CZ2984 | 416774.570 | 9674326.538 | 417.618 | 15 | -90 | 4 | 6.66 |
| DEX-CZ2985 | 416800.793 | 9674325.834 | 419.506 | 10 | -90 | 4 | 3.51 |
| DEX-CZ2986 | 416827.073 | 9674325.829 | 421.085 | 10 | -90 | 6 | 1 |
| DEX-CZ2987 | 416848.557 | 9674324.740 | 420.124 | 32 | -90 | 16.66 | 13 |
| DEX-CZ2988 | 416775.099 | 9674300.801 | 421.083 | 17 | -90 | 7 | 7 |
| DEX-CZ2989 | 416824.771 | 9674298.584 | 423.768 | 19 | -90 | 14.67 | 2.55 |
| DEX-CZ2990 | 416775.526 | 9674274.283 | 419.680 | 15 | -90 | 6 | 7 |
| DEX-CZ2991 | 416799.224 | 9674275.082 | 422.787 | 32 | -90 | 12.72 | 17.38 |
| DEX-CZ2992 | 416826.364 | 9674276.677 | 423.459 | 24 | -90 | 9 | 7.34 |
| DEX-CZ2993 | 416851.004 | 9674276.196 | 422.676 | 35 | -90 | 13.33 | 20 |
| DEX-CZ2994 | 416775.648 | 9674248.309 | 414.394 | 24 | -90 | 5 | 9 |
| DEX-CZ2995 | 416823.839 | 9674251.533 | 419.499 | 24 | -90 | 5 | 16 |
| DEX-CZ2996 | 415525.602 | 9674374.640 | 434.639 | 30 | -90 | 23.3 | 3 |
| DEX-CZ2997 | 415524.076 | 9674350.327 | 434.206 | 31 | -90 | 22.6 | 6 |
| DEX-CZ2998 | 415678.107 | 9674347.881 | 389.343 | 15 | -90 | 12.67 | 1 |
| DEX-CZ2999 | 415734.283 | 9674344.450 | 375.333 | 17 | -90 | 10 | 5 |
| DEX-CZ3000 | 415552.654 | 9674374.525 | 429.573 | 40 | -90 | 17.28 | 18 |
| DEX-CZ3001 | 415375.206 | 9674328.429 | 456.126 | 24 | -90 | 15.33 | 7 |
| DEX-CZ3002 | 415398.937 | 9674326.832 | 454.555 | 32 | -90 | 14 | 12 |
| DEX-CZ3003 | 415425.507 | 9674323.710 | 450.440 | 34 | -90 | 19 | 13 |
| DEX-CZ3004 | 415575.584 | 9674374.051 | 420.835 | 28 | -90 | 18.99 | 8 |
| DEX-CZ3005 | 415574.449 | 9674352.118 | 424.075 | 35 | -90 | 18.71 | 15.33 |
| DEX-CZ3006 | 415500.031 | 9674324.198 | 437.152 | 35 | -90 | 18.8 | 11 |
| DEX-CZ3007 | 415524.893 | 9674324.572 | 432.284 | 35 | -90 | 24.85 | 9 |
| DEX-CZ3008 | 415550.167 | 9674323.933 | 426.710 | 29 | -90 | 21.11 | 7 |
| DEX-CZ3009 | 415652.541 | 9674322.933 | 395.539 | 15 | -90 | 12.69 | 1 |
| DEX-CZ3010 | 415673.500 | 9674327.676 | 386.554 | 16 | -90 | 7.16 | 7 |
| DEX-CZ3011 | 415699.674 | 9674324.966 | 377.958 | 10 | -90 | 6 | 2 |
| DEX-CZ3012 | 415725.638 | 9674319.092 | 374.087 | 14 | -90 | 7 | 4 |
| DEX-CZ3013 | 415373.034 | 9674304.521 | 449.440 | 17 | -90 | 10.3 | 4 |
| DEX-CZ3014 | 415426.549 | 9674300.229 | 445.672 | 20 | -90 | 15.56 | 3.24 |
| DEX-CZ3015 | 415571.931 | 9674326.760 | 422.570 | 33 | -90 | 17 | 13 |
| DEX-CZ3016 | 415523.795 | 9674300.485 | 426.776 | 30 | -90 | 25.81 | 3 |
| DEX-CZ3017 | 415665.500 | 9674304.314 | 388.053 | 13 | -90 | 5 | 6 |
| DEX-CZ3018 | 415716.851 | 9674296.657 | 374.056 | 15 | -90 | 6 | 5 |
| DEX-CZ3019 | 415577.125 | 9674267.834 | 416.699 | 33 | -90 | 18 | 11 |
| DEX-CZ3020 | 415378.461 | 9674276.425 | 441.231 | 26 | -90 | 15 | 8 |
| DEX-CZ3021 | 415401.033 | 9674275.013 | 442.358 | 14 | -90 | 5 | 7 |
| DEX-CZ3022 | 415423.843 | 9674275.351 | 440.105 | 21 | -90 | 9.37 | 8 |
| DEX-CZ3023 | 415450.341 | 9674276.065 | 436.223 | 38 | -90 | 20.41 | 15 |
| DEX-CZ3024 | 415478.847 | 9674275.813 | 431.643 | 44 | -90 | 16.58 | 22 |
| DEX-CZ3025 | 415499.692 | 9674275.044 | 428.233 | 33 | -90 | 19.34 | 12 |
| DEX-CZ3026 | 415524.133 | 9674274.906 | 425.241 | 34 | -90 | 17 | 15 |
| DEX-CZ3027 | 415550.320 | 9674275.583 | 420.413 | 39 | -90 | 31.18 | 7.5 |
| DEX-CZ3028 | 415649.114 | 9674271.801 | 404.660 | 23 | -90 | 17.49 | 6 |
| DEX-CZ3029 | 415667.729 | 9674279.281 | 397.620 | 23 | -90 | 20.57 | 2 |
| DEX-CZ3030 | 415701.932 | 9674271.670 | 384.627 | 8 | -90 | 4 | 1 |
| DEX-CZ3031 | 415721.147 | 9674276.632 | 376.732 | 9 | -90 | 6 | 0 |
| DEX-CZ3032 | 415070.746 | 9674248.076 | 416.369 | 18 | -90 | 4 | 12 |
| DEX-CZ3033 | 415124.863 | 9674252.466 | 431.680 | 12 | -90 | 3 | 6.57 |
| DEX-CZ3034 | 415576.062 | 9674249.928 | 415.610 | 37 | -90 | 18.37 | 13 |
| DEX-CZ3035 | 415575.836 | 9674226.097 | 412.987 | 24 | -90 | 13.3 | 9 |
| DEX-CZ3036 | 415376.682 | 9674258.118 | 434.013 | 21 | -90 | 6.27 | 8 |
| DEX-CZ3037 | 415424.581 | 9674251.696 | 434.580 | 25 | -90 | 16.5 | 6 |
| DEX-CZ3038 | 415475.981 | 9674255.792 | 429.279 | 17 | -90 | 14 | 0.6 |
| DEX-CZ3039 | 415524.217 | 9674249.880 | 420.952 | 30 | -90 | 15.38 | 12.62 |
| DEX-CZ3040 | 415673.091 | 9674251.178 | 402.428 | 21 | -90 | 17.9 | 2 |
| DEX-CZ3041 | 415725.235 | 9674248.435 | 387.601 | 23 | -90 | 11 | 10 |
| DEX-CZ3042 | 415057.478 | 9674225.511 | 406.644 | 17 | -90 | 5 | 9 |
| DEX-CZ3043 | 415076.579 | 9674226.989 | 411.847 | 20 | -90 | 15.48 | 3 |
| DEX-CZ3044 | 415101.193 | 9674229.858 | 419.142 | 27 | -90 | 10.2 | 17 |
| DEX-CZ3045 | 415126.260 | 9674229.738 | 422.859 | 21 | -90 | 4 | 14 |
| DEX-CZ3046 | 415626.218 | 9674225.059 | 411.147 | 32 | -90 | 24.48 | 6 |
| DEX-CZ3047 | 415622.273 | 9674202.408 | 410.447 | 34 | -90 | 21.24 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10199 | 416670.866 | 9673540.927 | 369.339 | 22 | -90 | 11 | 11 |
| DEX-CZ10201 | 416621.183 | 9673517.761 | 359.698 | 14 | -90 | 10 | 1 |
| DEX-CZ10202 | 416647.436 | 9673518.705 | 369.148 | 17 | -90 | 10.44 | 4 |
| DEX-CZ10203 | 416671.663 | 9673516.744 | 372.295 | 22 | -90 | 16.91 | 5 |
| DEX-CZ10206 | 416623.309 | 9673491.657 | 360.058 | 22 | -90 | 18.58 | 1 |
| DEX-CZ10207 | 416650.374 | 9673489.529 | 369.320 | 20 | -90 | 17.67 | 0 |
| DEX-CZ10208 | 416673.456 | 9673492.587 | 373.908 | 20 | -90 | 15.3 | 3 |
| DEX-CZ10209 | 416696.987 | 9673492.794 | 374.827 | 19 | -90 | 16.28 | 0 |
| DEX-CZ10210 | 416572.966 | 9673456.940 | 354.807 | 25 | -90 | 20.3 | 1 |
| DEX-CZ10211 | 416599.226 | 9673464.442 | 359.942 | 28 | -90 | 21.31 | 4.25 |
| DEX-CZ10212 | 416624.107 | 9673466.288 | 366.075 | 19 | -90 | 16.28 | 1 |
| DEX-CZ10213 | 416649.801 | 9673463.152 | 370.467 | 22 | -90 | 17.2 | 2 |
| DEX-CZ10214 | 416668.568 | 9673467.769 | 373.934 | 25 | -90 | 20.75 | 0.56 |
| DEX-CZ10215 | 416695.664 | 9673468.260 | 376.000 | 33 | -90 | 28 | 1 |
| DEX-CZ10216 | 416719.319 | 9673469.556 | 375.630 | 22 | -90 | 18.3 | 2 |
| DEX-CZ10217 | 416749.228 | 9673465.697 | 372.269 | 19 | -90 | 16.3 | 0.35 |
| DEX-CZ10218 | 416770.950 | 9673464.285 | 368.237 | 29 | -90 | 23.66 | 6 |
| DEX-CZ10219 | 416575.076 | 9673441.236 | 359.097 | 22 | -90 | 18.28 | 2.85 |
| DEX-CZ10220 | 416624.268 | 9673441.011 | 372.742 | 34 | -90 | 22.21 | 11.57 |
| DEX-CZ10221 | 416668.240 | 9673438.312 | 375.835 | 20 | -90 | 17 | 1 |
| DEX-CZ10222 | 416721.865 | 9673443.521 | 375.294 | 23 | -90 | 16 | 5 |
| DEX-CZ10224 | 416772.525 | 9673441.719 | 367.025 | 36 | -90 | 21 | 10 |
| DEX-CZ10225 | 416571.952 | 9673411.540 | 367.384 | 25 | -90 | 20.27 | 2 |
| DEX-CZ10226 | 416600.602 | 9673426.541 | 371.885 | 32 | -90 | 26.23 | 3 |
| DEX-CZ10227 | 416620.319 | 9673417.292 | 376.910 | 28 | -90 | 24.54 | 1 |
| DEX-CZ10228 | 416645.566 | 9673420.073 | 379.076 | 31 | -90 | 26 | 2 |
| DEX-CZ10229 | 416673.002 | 9673413.833 | 379.790 | 28 | -90 | 24 | 0 |
| DEX-CZ10230 | 416694.491 | 9673417.573 | 376.185 | 29 | -90 | 22.68 | 4 |
| DEX-CZ10231 | 416723.329 | 9673421.403 | 373.353 | 20 | -90 | 15.27 | 3 |
| DEX-CZ10232 | 416748.809 | 9673419.496 | 369.537 | 28 | -90 | 18.68 | 1 |
| DEX-CZ10233 | 416123.340 | 9673287.084 | 336.869 | 17 | -90 | 4 | 11 |
| DEX-CZ10234 | 416074.222 | 9673287.482 | 321.938 | 16 | -90 | 8 | 6 |
| DEX-CZ10235 | 416120.509 | 9673268.063 | 343.574 | 12 | -90 | 3 | 3 |
| DEX-CZ10236 | 416100.014 | 9673270.028 | 337.058 | 10 | -90 | 4 | 3 |
| DEX-CZ10237 | 416068.016 | 9673270.135 | 327.057 | 14 | -90 | 7 | 4.4 |
| DEX-CZ10238 | 416047.113 | 9673271.733 | 320.990 | 32 | -90 | 6 | 23 |
| DEX-CZ10239 | 416171.967 | 9673271.768 | 352.382 | 14 | -90 | 3 | 7 |
| DEX-CZ10240 | 416024.162 | 9673247.001 | 323.716 | 30 | -90 | 11 | 13 |
| DEX-CZ10241 | 416047.388 | 9673235.693 | 331.696 | 25 | -90 | 9 | 10.23 |
| DEX-CZ10242 | 416081.184 | 9673236.986 | 341.098 | 9 | -90 | 4 | 2 |
| DEX-CZ10243 | 416123.293 | 9673242.145 | 350.855 | 16 | -90 | 7 | 9 |
| DEX-CZ10244 | 416147.057 | 9673243.764 | 355.884 | 23 | -90 | 10 | 11 |
| DEX-CZ10245 | 416174.511 | 9673243.586 | 361.000 | 17 | -90 | 9 | 7 |
| DEX-CZ10246 | 416348.568 | 9673335.386 | 354.707 | 16 | -90 | 8 | 5 |
| DEX-CZ10247 | 416349.750 | 9673308.587 | 361.535 | 18 | -90 | 12 | 4 |
| DEX-CZ10248 | 416322.663 | 9673314.034 | 356.929 | 20 | -90 | 15 | 3 |
| DEX-CZ10249 | 416372.479 | 9673315.891 | 362.535 | 22 | -90 | 19.3 | 0 |
| DEX-CZ10250 | 416396.450 | 9673319.050 | 364.566 | 22 | -90 | 17 | 3 |
| DEX-CZ10251 | 416324.016 | 9673291.137 | 360.685 | 17 | -90 | 14 | 1 |
| DEX-CZ10252 | 416273.210 | 9673292.600 | 361.792 | 25 | -90 | 13.26 | 10 |
| DEX-CZ10253 | 416346.907 | 9673291.730 | 360.609 | 29 | -90 | 19 | 10 |
| DEX-CZ10254 | 416370.992 | 9673293.637 | 362.611 | 38 | -90 | 29.25 | 7 |
| DEX-CZ10255 | 416273.777 | 9673266.631 | 360.096 | 32 | -90 | 22 | 8 |
| DEX-CZ10256 | 416298.305 | 9673266.268 | 358.080 | 27 | -90 | 22.31 | 3 |
| DEX-CZ10257 | 416325.382 | 9673262.805 | 354.960 | 24 | -90 | 21.7 | 1 |
| DEX-CZ10258 | 416350.124 | 9673263.286 | 354.889 | 30 | -90 | 26.62 | 2 |
| DEX-CZ10259 | 416370.702 | 9673268.636 | 355.951 | 36 | -90 | 35.03 | 0 |
| DEX-CZ10260 | 416397.689 | 9673265.269 | 356.513 | 24 | -90 | 20.43 | 2 |
| DEX-CZ10261 | 416422.726 | 9673271.937 | 360.466 | 30 | -90 | 28.2 | 0 |
| DEX-CZ10262 | 416444.199 | 9673277.064 | 362.294 | 31 | -90 | 25.27 | 4 |
| DEX-CZ10263 | 416473.038 | 9673267.832 | 360.476 | 39 | -90 | 34 | 4 |
| DEX-CZ10264 | 416499.417 | 9673267.570 | 361.323 | 27 | -90 | 22 | 2 |
| DEX-CZ10265 | 416271.676 | 9673244.038 | 355.756 | 40 | -90 | 17.21 | 20 |
| DEX-CZ10266 | 416323.965 | 9673240.552 | 350.820 | 38 | -90 | 34 | 3.85 |
| DEX-CZ10267 | 416372.325 | 9673246.003 | 352.288 | 26 | -90 | 23.35 | 1 |
| DEX-CZ10268 | 416424.190 | 9673242.489 | 355.000 | 45 | -90 | 34.65 | 9 |
| DEX-CZ10269 | 416473.801 | 9673242.546 | 358.905 | 45 | -90 | 42 | 1 |
| DEX-CZ10270 | 416498.160 | 9673317.189 | 370.950 | 20 | -90 | 14 | 2 |
| DEX-CZ10271 | 416524.028 | 9673320.456 | 372.191 | 28 | -90 | 19 | 7 |
| DEX-CZ10272 | 416547.315 | 9673318.137 | 373.155 | 39 | -90 | 30.35 | 8 |
| DEX-CZ10273 | 416580.390 | 9673315.424 | 375.486 | 26 | -90 | 22.38 | 1 |
| DEX-CZ10274 | 416493.862 | 9673293.683 | 366.916 | 25 | -90 | 21 | 1 |
| DEX-CZ10275 | 416521.644 | 9673293.725 | 367.929 | 33 | -90 | 30 | 1 |
| DEX-CZ10276 | 416578.143 | 9673292.406 | 369.971 | 27 | -90 | 24 | 1 |
| DEX-CZ10277 | 416522.329 | 9673269.083 | 363.000 | 28 | -90 | 24 | 2 |
| DEX-CZ10278 | 416546.599 | 9673267.005 | 365.000 | 41 | -90 | 29 | 9 |
| DEX-CZ10279 | 416623.778 | 9673365.562 | 382.036 | 32 | -90 | 28.91 | 1.09 |
| DEX-CZ10280 | 416648.909 | 9673370.242 | 382.928 | 34 | -90 | 31.21 | 0 |
| DEX-CZ10281 | 416670.444 | 9673364.624 | 381.905 | 39 | -90 | 35.29 | 1 |
| DEX-CZ10282 | 416621.912 | 9673339.492 | 381.319 | 42 | -90 | 37.45 | 1 |
| DEX-CZ10283 | 416671.634 | 9673340.012 | 379.950 | 27 | -90 | 18 | 5 |
| DEX-CZ10284 | 416669.662 | 9673320.754 | 380.958 | 26 | -90 | 22 | 2 |
| DEX-CZ10285 | 416697.107 | 9673321.363 | 383.867 | 34 | -90 | 30.56 | 2 |
| DEX-CZ10286 | 416695.328 | 9673291.765 | 389.872 | 26 | -90 | 21 | 2.37 |
| DEX-CZ10287 | 416720.659 | 9673290.599 | 392.192 | 27 | -90 | 20 | 5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3052 | 415371.174 | 9674226.333 | 413.449 | 12 | -90 | 5 | 4 |
| DEX-CZ3053 | 415402.611 | 9674223.698 | 423.839 | 15 | -90 | 2 | 8 |
| DEX-CZ3054 | 415425.045 | 9674224.077 | 425.961 | 19 | -90 | 9 | 8 |
| DEX-CZ3055 | 415448.721 | 9674223.185 | 425.621 | 18 | -90 | 11 | 5 |
| DEX-CZ3056 | 415473.550 | 9674225.371 | 424.177 | 13 | -90 | 5 | 6 |
| DEX-CZ3057 | 415499.005 | 9674226.495 | 420.566 | 20 | -90 | 10 | 8 |
| DEX-CZ3058 | 415525.674 | 9674225.844 | 417.698 | 26 | -90 | 13 | 9 |
| DEX-CZ3059 | 415550.512 | 9674222.766 | 414.434 | 34 | -90 | 24.44 | 8 |
| DEX-CZ3060 | 415650.280 | 9674223.159 | 408.423 | 31 | -90 | 17 | 13 |
| DEX-CZ3061 | 415672.769 | 9674224.982 | 404.486 | 28 | -90 | 22.64 | 5.77 |
| DEX-CZ3062 | 415699.181 | 9674222.438 | 401.817 | 45 | -90 | 19.51 | 14 |
| DEX-CZ3063 | 415725.153 | 9674224.289 | 393.869 | 31 | -90 | 10 | 19 |
| DEX-CZ3064 | 415068.302 | 9674198.227 | 403.190 | 35 | -90 | 24.18 | 10 |
| DEX-CZ3065 | 415125.592 | 9674203.446 | 411.181 | 10 | -90 | 5 | 3 |
| DEX-CZ3066 | 415276.301 | 9674194.103 | 382.660 | 10 | -90 | 3 | 5 |
| DEX-CZ3067 | 415328.049 | 9674196.702 | 381.841 | 17 | -90 | 9 | 6 |
| DEX-CZ3068 | 415371.506 | 9674199.045 | 402.811 | 20 | -90 | 8 | 10 |
| DEX-CZ3069 | 415425.264 | 9674199.610 | 417.777 | 22 | -90 | 7 | 12 |
| DEX-CZ3070 | 415471.098 | 9674206.638 | 421.418 | 21 | -90 | 6 | 13 |
| DEX-CZ3071 | 415674.768 | 9674201.003 | 405.935 | 21 | -90 | 16.27 | 3 |
| DEX-CZ3072 | 415725.256 | 9674200.865 | 397.066 | 31 | -90 | 9.3 | 21.2 |
| DEX-CZ3073 | 415052.280 | 9674177.407 | 393.714 | 34 | -90 | 25.03 | 9.24 |
| DEX-CZ3074 | 415076.075 | 9674179.785 | 397.692 | 37 | -90 | 24.12 | 8 |
| DEX-CZ3075 | 415096.409 | 9674175.139 | 397.755 | 36 | -90 | 25.68 | 10 |
| DEX-CZ3076 | 415125.385 | 9674178.546 | 401.025 | 19 | -90 | 12.43 | 5 |
| DEX-CZ3078 | 415248.550 | 9674176.257 | 378.288 | 24 | -90 | 12.21 | 10 |
| DEX-CZ3079 | 415271.376 | 9674171.227 | 375.782 | 20 | -90 | 10 | 8 |
| DEX-CZ3080 | 415299.946 | 9674173.695 | 370.959 | 17 | -90 | 7 | 8 |
| DEX-CZ3081 | 415324.823 | 9674172.424 | 374.368 | 16 | -90 | 3 | 10 |
| DEX-CZ3082 | 415352.276 | 9674177.066 | 388.156 | 24 | -90 | 13.47 | 8 |
| DEX-CZ3084 | 415404.257 | 9674175.179 | 405.204 | 25 | -90 | 20 | 3 |
| DEX-CZ3085 | 415424.837 | 9674176.092 | 410.317 | 26 | -90 | 12.23 | 12 |
| DEX-CZ3086 | 415451.337 | 9674175.303 | 415.498 | 25 | -90 | 10 | 13 |
| DEX-CZ3087 | 415471.426 | 9674179.940 | 416.703 | 35 | -90 | 12 | 20 |
| DEX-CZ3088 | 415500.080 | 9674174.432 | 415.803 | 27 | -90 | 18.62 | 6.13 |
| DEX-CZ3089 | 415525.893 | 9674174.640 | 411.579 | 19 | -90 | 9.72 | 8 |
| DEX-CZ3090 | 415551.336 | 9674175.301 | 405.643 | 33 | -90 | 3 | 27.7 |
| DEX-CZ3091 | 415651.717 | 9674175.760 | 407.000 | 42 | -90 | 34.6 | 8 |
| DEX-CZ3092 | 415675.538 | 9674173.660 | 406.353 | 48 | -90 | 17 | 24 |
| DEX-CZ3093 | 415697.063 | 9674177.879 | 404.049 | 39 | -90 | 21.48 | 3 |
| DEX-CZ3094 | 415726.021 | 9674174.348 | 394.796 | 32 | -90 | 3.6 | 16.4 |
| DEX-CZ3095 | 415749.923 | 9674173.141 | 383.471 | 11 | -90 | 1 | 5 |
| DEX-CZ3096 | 415774.514 | 9674176.232 | 371.740 | 15 | -90 | 5 | 8.33 |
| DEX-CZ3097 | 415799.543 | 9674175.217 | 363.208 | 24 | -90 | 10 | 12.39 |
| DEX-CZ3098 | 415825.671 | 9674176.464 | 365.774 | 20 | -90 | 12.56 | 4.76 |
| DEX-CZ3099 | 415849.887 | 9674175.047 | 374.111 | 12 | -90 | 2 | 6.24 |
| DEX-CZ3100 | 415875.620 | 9674175.847 | 383.425 | 16 | -90 | 5.3 | 8.38 |
| DEX-CZ3101 | 415898.688 | 9674181.263 | 387.743 | 20 | -90 | 9.32 | 7.36 |
| DEX-CZ3104 | 415168.873 | 9674153.585 | 387.643 | 25 | -90 | 20.67 | 2.53 |
| DEX-CZ3105 | 415221.745 | 9674149.193 | 378.078 | 26 | -90 | 15.54 | 10 |
| DEX-CZ3106 | 415272.012 | 9674153.567 | 368.841 | 31 | -90 | 3 | 26.56 |
| DEX-CZ3107 | 415321.077 | 9674150.631 | 367.844 | 13 | -90 | 9 | 0 |
| DEX-CZ3109 | 415424.793 | 9674149.249 | 405.041 | 14 | -90 | 7 | 3 |
| DEX-CZ3110 | 415476.164 | 9674151.162 | 412.583 | 18 | -90 | 10.48 | 2.52 |
| DEX-CZ3111 | 415524.437 | 9674149.302 | 409.791 | 13 | -90 | 5 | 0 |
| DEX-CZ3112 | 415624.475 | 9674176.016 | 409.411 | 39 | -90 | 23.76 | 1 |
| DEX-CZ3113 | 415723.918 | 9674149.610 | 390.925 | 30 | -90 | 5.27 | 18 |
| DEX-CZ3114 | 415776.658 | 9674149.073 | 372.926 | 37 | -90 | 3 | 29 |
| DEX-CZ3115 | 415825.689 | 9674149.707 | 362.000 | 10 | -90 | 6.25 | 2 |
| DEX-CZ3116 | 415871.309 | 9674151.378 | 374.313 | 20 | -90 | 4.47 | 13.53 |
| DEX-CZ3121 | 415576.851 | 9674121.551 | 403.046 | 27 | -90 | 17 | 6 |
| DEX-CZ3122 | 415172.787 | 9674124.565 | 376.304 | 25 | -90 | 19.96 | 3 |
| DEX-CZ3123 | 415199.032 | 9674129.028 | 374.356 | 39 | -90 | 20.01 | 15.66 |
| DEX-CZ3124 | 415222.369 | 9674126.637 | 370.961 | 29 | -90 | 28.11 | 2 |
| DEX-CZ3125 | 415247.534 | 9674126.759 | 364.691 | 24 | -90 | 13.94 | 10.87 |
| DEX-CZ3126 | 415278.471 | 9674126.724 | 362.335 | 30 | -90 | 25.28 | 2 |
| DEX-CZ3127 | 415304.486 | 9674126.208 | 363.865 | 30 | -90 | 26.23 | 3 |
| DEX-CZ3128 | 415326.107 | 9674126.188 | 365.562 | 36 | -90 | 32.99 | 3 |
| DEX-CZ3129 | 415348.027 | 9674124.494 | 369.816 | 27 | -90 | 18.85 | 9 |
| DEX-CZ3131 | 415402.800 | 9674129.115 | 394.452 | 32 | -90 | 11 | 18 |
| DEX-CZ3132 | 415422.913 | 9674123.650 | 401.018 | 33 | -90 | 18.68 | 13 |
| DEX-CZ3133 | 415575.233 | 9674100.958 | 398.815 | 35 | -90 | 20.23 | 8.37 |
| DEX-CZ3134 | 415574.506 | 9674076.162 | 391.528 | 18 | -90 | 6.32 | 9.57 |
| DEX-CZ3135 | 415500.928 | 9674125.749 | 406.114 | 21 | -90 | 19.34 | 3.5 |
| DEX-CZ3136 | 415519.308 | 9674125.540 | 408.053 | 21 | -90 | 15.63 | 1.74 |
| DEX-CZ3137 | 415551.444 | 9674126.120 | 398.160 | 15 | -90 | 11 | 1 |
| DEX-CZ3138 | 415624.615 | 9674125.763 | 401.335 | 16 | -90 | 5.4 | 9 |
| DEX-CZ3139 | 415649.635 | 9674125.920 | 402.068 | 37 | -90 | 16.06 | 19.47 |
| DEX-CZ3140 | 415675.464 | 9674125.943 | 402.141 | 21 | -90 | 16 | 3 |
| DEX-CZ3141 | 415701.478 | 9674124.813 | 400.119 | 39 | -90 | 13.47 | 23 |
| DEX-CZ3142 | 415726.359 | 9674125.348 | 394.000 | 29 | -90 | 8.54 | 19 |
| DEX-CZ3143 | 415750.934 | 9674124.171 | 387.712 | 37 | -90 | 11.31 | 22.34 |
| DEX-CZ3144 | 415776.414 | 9674125.851 | 378.819 | 31 | -90 | 3 | 26 |
| DEX-CZ3145 | 415795.710 | 9674126.011 | 371.373 | 33 | -90 | 7.77 | 20.25 |
| DEX-CZ3146 | 415819.503 | 9674125.341 | 361.318 | 20 | -90 | 6 | 10 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10288 | 416695.478 | 9673264.792 | 393.332 | 27 | -90 | 20 | 5 |
| DEX-CZ10289 | 416675.557 | 9673263.853 | 389.606 | 22 | -90 | 17 | 2 |
| DEX-CZ10290 | 416724.315 | 9673268.494 | 396.473 | 29 | -90 | 25.36 | 0 |
| DEX-CZ10291 | 416752.239 | 9673267.379 | 396.567 | 36 | -90 | 33 | 3 |
| DEX-CZ10292 | 416669.068 | 9673242.253 | 389.533 | 26 | -90 | 22 | 2 |
| DEX-CZ10293 | 416719.453 | 9673243.533 | 399.674 | 31 | -90 | 26 | 2 |
| DEX-CZ10294 | 416819.008 | 9673293.663 | 386.749 | 41 | -90 | 27 | 12 |
| DEX-CZ10295 | 416843.831 | 9673291.446 | 386.548 | 42 | -90 | 22 | 17 |
| DEX-CZ10296 | 416848.235 | 9673267.163 | 392.240 | 24 | -90 | 19 | 1 |
| DEX-CZ10297 | 416871.338 | 9673265.414 | 388.455 | 23 | -90 | 19 | 1 |
| DEX-CZ10298 | 416845.270 | 9673240.329 | 397.851 | 36 | -90 | 21 | 12 |
| DEX-CZ10299 | 416870.057 | 9673240.458 | 392.344 | 52 | -90 | 26 | 24.71 |
| DEX-CZ10300 | 416502.954 | 9673385.393 | 363.284 | 16 | -90 | 8 | 6 |
| DEX-CZ10302 | 416573.619 | 9673391.304 | 372.327 | 23 | -90 | 19.43 | 2 |
| DEX-CZ10303 | 416620.456 | 9673393.196 | 380.490 | 41 | -90 | 36.5 | 3 |
| DEX-CZ10305 | 416469.690 | 9673358.239 | 362.511 | 12 | -90 | 8 | 2 |
| DEX-CZ10306 | 416501.501 | 9673366.097 | 365.035 | 16 | -90 | 13 | 0.3 |
| DEX-CZ10307 | 416525.107 | 9673366.193 | 370.168 | 32 | -90 | 27.03 | 6.37 |
| DEX-CZ10308 | 416545.872 | 9673368.505 | 372.626 | 17 | -90 | 13.21 | 2 |
| DEX-CZ10309 | 416573.963 | 9673364.303 | 377.007 | 29 | -90 | 26.42 | 1 |
| DEX-CZ10310 | 416597.069 | 9673365.665 | 379.517 | 25 | -90 | 20.22 | 2.82 |
| DEX-CZ10311 | 416670.013 | 9673395.915 | 382.905 | 32 | -90 | 18.22 | 12.9 |
| DEX-CZ10312 | 416718.111 | 9673392.055 | 373.569 | 28 | -90 | 19.35 | 6 |
| DEX-CZ10313 | 416722.709 | 9673341.032 | 380.223 | 38 | -90 | 25 | 8.5 |
| DEX-CZ10314 | 416769.010 | 9673340.719 | 377.815 | 29 | -90 | 21.24 | 5 |
| DEX-CZ10315 | 416698.844 | 9673367.551 | 378.366 | 23 | -90 | 18 | 2 |
| DEX-CZ10316 | 416723.424 | 9673367.671 | 376.135 | 26 | -90 | 19 | 5 |
| DEX-CZ10317 | 416746.597 | 9673362.924 | 373.713 | 28 | -90 | 23.26 | 3.75 |
| DEX-CZ10318 | 416601.848 | 9673315.514 | 376.574 | 29 | -90 | 25 | 2 |
| DEX-CZ10319 | 416623.855 | 9673317.566 | 376.472 | 37 | -90 | 28.47 | 8 |
| DEX-CZ10320 | 416646.096 | 9673317.877 | 376.391 | 26 | -90 | 19 | 5 |
| DEX-CZ10321 | 416723.257 | 9673317.476 | 386.330 | 29 | -90 | 23.24 | 4 |
| DEX-CZ10322 | 416746.324 | 9673311.976 | 386.353 | 28 | -90 | 23 | 1 |
| DEX-CZ10323 | 416769.354 | 9673316.214 | 382.227 | 29 | -90 | 23.2 | 4 |
| DEX-CZ10324 | 416796.992 | 9673317.889 | 380.715 | 23 | -90 | 20.26 | 0 |
| DEX-CZ10325 | 416772.545 | 9673288.358 | 391.028 | 25 | -90 | 21 | 3 |
| DEX-CZ10326 | 416796.333 | 9673291.684 | 388.281 | 30 | -90 | 22 | 1 |
| DEX-CZ10327 | 416770.526 | 9673266.017 | 397.182 | 29 | -90 | 21 | 4 |
| DEX-CZ10328 | 416791.660 | 9673268.423 | 395.226 | 27 | -90 | 22 | 1 |
| DEX-CZ10329 | 416829.365 | 9673267.040 | 393.303 | 28 | -90 | 22 | 3 |
| DEX-CZ10330 | 416599.839 | 9673290.137 | 370.732 | 46 | -90 | 31 | 12 |
| DEX-CZ10331 | 416623.168 | 9673292.331 | 373.085 | 41 | -90 | 37.7 | 0 |
| DEX-CZ10332 | 416672.654 | 9673291.881 | 386.098 | 26 | -90 | 22 | 1 |
| DEX-CZ10333 | 416573.214 | 9673261.213 | 368.973 | 36 | -90 | 29 | 4.43 |
| DEX-CZ10334 | 416597.910 | 9673263.680 | 372.498 | 30 | -90 | 26.83 | 1.6 |
| DEX-CZ10335 | 416620.155 | 9673264.934 | 375.867 | 34 | -90 | 29 | 2 |
| DEX-CZ10336 | 416653.644 | 9673267.602 | 383.246 | 26 | -90 | 21 | 2 |
| DEX-CZ10337 | 416527.485 | 9673244.724 | 365.363 | 39 | -90 | 31 | 5 |
| DEX-CZ10338 | 416572.489 | 9673246.159 | 371.423 | 26 | -90 | 23 | 0.63 |
| DEX-CZ10339 | 416625.591 | 9673240.222 | 382.818 | 25 | -90 | 19 | 2 |
| DEX-CZ10340 | 416772.680 | 9673243.684 | 402.611 | 26 | -90 | 21 | 4 |
| DEX-CZ10341 | 416822.316 | 9673243.796 | 399.614 | 39 | -90 | 25 | 11.69 |
| DEX-CZ10342 | 416417.671 | 9673341.861 | 361.933 | 14 | -90 | 10 | 2 |
| DEX-CZ10343 | 416473.320 | 9673341.433 | 368.986 | 23 | -90 | 18.65 | 2 |
| DEX-CZ10344 | 416520.946 | 9673340.603 | 372.794 | 28 | -90 | 23 | 3 |
| DEX-CZ10345 | 416574.017 | 9673343.059 | 377.634 | 35 | -90 | 30.35 | 2 |
| DEX-CZ10347 | 416421.857 | 9673317.105 | 368.081 | 23 | -90 | 20.38 | 0 |
| DEX-CZ10348 | 416446.510 | 9673316.508 | 370.000 | 29 | -90 | 21 | 3 |
| DEX-CZ10349 | 416472.357 | 9673319.308 | 370.000 | 20 | -90 | 16.3 | 0.7 |
| DEX-CZ10350 | 416420.777 | 9673290.057 | 364.737 | 30 | -90 | 27.22 | 0.5 |
| DEX-CZ10351 | 416476.692 | 9673293.291 | 366.042 | 34 | -90 | 29 | 2 |
| DEX-CZ10352 | 416248.480 | 9673270.127 | 361.604 | 24 | -90 | 20.89 | 2 |
| DEX-CZ10353 | 416221.166 | 9673265.399 | 361.876 | 19 | -90 | 17.7 | 0 |
| DEX-CZ10354 | 416222.610 | 9673243.585 | 363.000 | 17 | -90 | 14 | 0 |
| DEX-CZ10355 | 416247.116 | 9673241.510 | 359.691 | 25 | -90 | 17 | 1 |
| DEX-CZ10809 | 418820.745 | 9673766.861 | 391.186 | 31 | -90 | 15 | 5 |
| DEX-CZ10810 | 418798.898 | 9673766.976 | 392.914 | 29 | -90 | 23.24 | 3 |
| DEX-CZ10811 | 418651.332 | 9673747.898 | 396.677 | 13 | -90 | 6 | 4 |
| DEX-CZ10812 | 418673.065 | 9673749.257 | 398.689 | 26 | -90 | 17 | 2 |
| DEX-CZ10813 | 418720.910 | 9673749.491 | 398.006 | 19 | -90 | 10 | 7 |
| DEX-CZ10814 | 418773.148 | 9673743.621 | 399.369 | 40 | -90 | 11 | 12 |
| DEX-CZ10815 | 418602.871 | 9673726.127 | 400.764 | 20 | -90 | 11 | 5.34 |
| DEX-CZ10816 | 418630.738 | 9673720.571 | 405.815 | 19 | -90 | 11 | 4 |
| DEX-CZ10817 | 418650.451 | 9673720.287 | 407.744 | 17 | -90 | 8 | 2 |
| DEX-CZ10818 | 418678.331 | 9673722.226 | 406.930 | 14 | -90 | 9 | 1 |
| DEX-CZ10819 | 418697.357 | 9673721.608 | 407.815 | 21 | -90 | 15 | 2 |
| DEX-CZ10820 | 418729.040 | 9673723.376 | 405.613 | 36 | -90 | 8 | 20 |
| DEX-CZ10821 | 418748.971 | 9673724.816 | 405.251 | 27 | -90 | 8 | 14 |
| DEX-CZ10822 | 418776.867 | 9673714.363 | 406.409 | 32 | -90 | 12 | 19.31 |
| DEX-CZ10823 | 418801.947 | 9673722.871 | 404.294 | 27 | -90 | 10 | 10.31 |
| DEX-CZ10824 | 418575.658 | 9673703.459 | 402.155 | 34 | -90 | 25.28 | 4 |
| DEX-CZ10825 | 418625.805 | 9673697.968 | 411.351 | 20 | -90 | 10 | 5 |
| DEX-CZ10826 | 418675.845 | 9673702.414 | 415.040 | 14 | -90 | 8 | 4 |
| DEX-CZ10827 | 418728.143 | 9673696.962 | 414.271 | 19 | -90 | 8 | 6.43 |
| DEX-CZ10828 | 418773.006 | 9673686.898 | 415.471 | 38 | -90 | 15 | 13.64 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3147 | 415849.606 | 9674124.801 | 361.000 | 10 | -90 | 6 | 1.3 |
| DEX-CZ3148 | 415874.134 | 9674124.804 | 363.756 | 28 | -90 | 4 | 21 |
| DEX-CZ3149 | 415899.259 | 9674125.113 | 374.384 | 29 | -90 | 14.99 | 13 |
| DEX-CZ3151 | 415169.893 | 9674103.160 | 368.547 | 29 | -90 | 22.49 | 5 |
| DEX-CZ3152 | 415223.022 | 9674101.622 | 362.475 | 37 | -90 | 30.44 | 5.66 |
| DEX-CZ3153 | 415272.943 | 9674108.652 | 359.515 | 27 | -90 | 18.23 | 6 |
| DEX-CZ3154 | 415324.707 | 9674097.951 | 363.685 | 22 | -90 | 18.06 | 2.41 |
| DEX-CZ3155 | 415574.407 | 9674023.602 | 368.028 | 13 | -90 | 9.88 | 2 |
| DEX-CZ3156 | 415575.174 | 9673998.485 | 368.404 | 26 | -90 | 10.05 | 1.2 |
| DEX-CZ3157 | 415573.988 | 9673978.064 | 371.000 | 21 | -90 | 10.39 | 10.84 |
| DEX-CZ3158 | 415525.133 | 9674099.000 | 403.991 | 27 | -90 | 16.81 | 9.88 |
| DEX-CZ3159 | 415623.659 | 9674102.549 | 396.285 | 18 | -90 | 8.25 | 6 |
| DEX-CZ3160 | 415673.544 | 9674100.220 | 395.683 | 26 | -90 | 11.83 | 13.96 |
| DEX-CZ3161 | 415726.929 | 9674102.752 | 396.605 | 22 | -90 | 15.47 | 4.61 |
| DEX-CZ3162 | 415775.132 | 9674100.351 | 382.651 | 17 | -90 | 7.69 | 6.5 |
| DEX-CZ3163 | 415825.574 | 9674100.233 | 360.225 | 19 | -90 | 11.16 | 5 |
| DEX-CZ3164 | 415875.512 | 9674099.599 | 373.741 | 9 | -90 | 4 | 3 |
| DEX-CZ3165 | 415126.714 | 9674076.849 | 366.572 | 32 | -90 | 18.88 | 14 |
| DEX-CZ3166 | 415151.261 | 9674074.982 | 363.033 | 33 | -90 | 28.48 | 3 |
| DEX-CZ3167 | 415176.966 | 9674074.388 | 357.058 | 26 | -90 | 20.57 | 5.22 |
| DEX-CZ3168 | 415200.616 | 9674077.087 | 357.328 | 28 | -90 | 24.46 | 3 |
| DEX-CZ3169 | 415223.524 | 9674075.579 | 355.978 | 26 | -90 | 24.09 | 1.62 |
| DEX-CZ3170 | 415248.597 | 9674076.272 | 355.049 | 24 | -90 | 21.4 | 2 |
| DEX-CZ3171 | 415276.293 | 9674081.470 | 356.097 | 30 | -90 | 18 | 10 |
| DEX-CZ3172 | 415298.949 | 9674080.470 | 359.713 | 23 | -90 | 15 | 5 |
| DEX-CZ3173 | 415324.778 | 9674072.575 | 366.853 | 16 | -90 | 9 | 5 |
| DEX-CZ3174 | 415575.458 | 9673869.614 | 359.114 | 5 | -90 | 1 | 1.35 |
| DEX-CZ3175 | 415575.190 | 9673850.484 | 355.155 | 25 | -90 | 14.94 | 9 |
| DEX-CZ3176 | 415575.834 | 9673829.600 | 351.567 | 12 | -90 | 4 | 6.27 |
| DEX-CZ3177 | 415728.045 | 9673778.743 | 356.989 | 8 | -90 | 3 | 2 |
| DEX-CZ3178 | 415753.172 | 9673773.876 | 363.504 | 8 | -90 | 6.47 | 0 |
| DEX-CZ3179 | 415775.213 | 9673774.568 | 368.107 | 33 | -90 | 6.27 | 24 |
| DEX-CZ3180 | 415499.417 | 9674076.385 | 396.247 | 25 | -90 | 18.34 | 5 |
| DEX-CZ3181 | 415525.045 | 9674075.079 | 398.928 | 27 | -90 | 25.65 | 1 |
| DEX-CZ3182 | 415549.707 | 9674076.106 | 390.497 | 20 | -90 | 17.78 | 0 |
| DEX-CZ3183 | 415626.031 | 9674075.270 | 391.442 | 26 | -90 | 15.42 | 8 |
| DEX-CZ3184 | 415648.775 | 9674077.115 | 384.182 | 26 | -90 | 16.21 | 8 |
| DEX-CZ3185 | 415675.912 | 9674077.605 | 389.561 | 36 | -90 | 17 | 12 |
| DEX-CZ3186 | 415698.919 | 9674074.718 | 394.101 | 26 | -90 | 14.31 | 9 |
| DEX-CZ3187 | 415723.158 | 9674076.163 | 395.301 | 41 | -90 | 19.53 | 22 |
| DEX-CZ3188 | 415750.208 | 9674074.884 | 392.189 | 30 | -90 | 11.57 | 18 |
| DEX-CZ3189 | 415773.737 | 9674076.204 | 383.476 | 19 | -90 | 8.74 | 3.48 |
| DEX-CZ3190 | 415796.311 | 9674075.734 | 373.103 | 20 | -90 | 10.22 | 8 |
| DEX-CZ3191 | 415826.590 | 9674076.127 | 358.932 | 14 | -90 | 7 | 4.55 |
| DEX-CZ3192 | 415850.836 | 9674075.555 | 363.019 | 6 | -90 | 3 | 1 |
| DEX-CZ3193 | 415126.751 | 9674052.694 | 357.403 | 22 | -90 | 19.2 | 2 |
| DEX-CZ3194 | 415175.023 | 9674047.084 | 352.246 | 26 | -90 | 23.21 | 2 |
| DEX-CZ3195 | 415222.756 | 9674052.973 | 351.563 | 30 | -90 | 29 | 1 |
| DEX-CZ3196 | 415276.987 | 9674052.608 | 354.717 | 27 | -90 | 17 | 9 |
| DEX-CZ3197 | 415324.425 | 9674050.107 | 368.996 | 19 | -90 | 14.49 | 3 |
| DEX-CZ3198 | 415369.664 | 9674051.725 | 381.201 | 20 | -90 | 7 | 10 |
| DEX-CZ3199 | 415797.363 | 9673776.815 | 371.385 | 26 | -90 | 7.25 | 17 |
| DEX-CZ3200 | 415818.079 | 9673778.381 | 374.569 | 20 | -90 | 6 | 12 |
| DEX-CZ3201 | 415525.029 | 9674050.768 | 390.875 | 38 | -90 | 25.3 | 11 |
| DEX-CZ3202 | 415625.369 | 9674051.595 | 384.505 | 23 | -90 | 10.58 | 9.7 |
| DEX-CZ3203 | 415673.619 | 9674050.041 | 381.970 | 17 | -90 | 8.55 | 5 |
| DEX-CZ3204 | 415724.661 | 9674049.307 | 389.188 | 27 | -90 | 8 | 8 |
| DEX-CZ3205 | 415774.792 | 9674048.929 | 380.935 | 26 | -90 | 14.95 | 9 |
| DEX-CZ3206 | 415825.869 | 9674050.203 | 358.398 | 21 | -90 | 10.63 | 7 |
| DEX-CZ3207 | 415147.313 | 9674026.118 | 348.631 | 21 | -90 | 17.59 | 2 |
| DEX-CZ3208 | 415176.583 | 9674033.975 | 349.327 | 28 | -90 | 26.96 | 1 |
| DEX-CZ3209 | 415200.413 | 9674021.796 | 347.426 | 34 | -90 | 32.52 | 3 |
| DEX-CZ3210 | 415224.891 | 9674027.424 | 348.298 | 39 | -90 | 36.5 | 4 |
| DEX-CZ3211 | 415249.087 | 9674027.385 | 349.619 | 36 | -90 | 27.16 | 8.25 |
| DEX-CZ3212 | 415272.862 | 9674025.754 | 352.470 | 30 | -90 | 25.44 | 4 |
| DEX-CZ3213 | 415302.885 | 9674026.872 | 360.727 | 36 | -90 | 29 | 4 |
| DEX-CZ3214 | 415326.367 | 9674027.382 | 367.800 | 25 | -90 | 22.96 | 0 |
| DEX-CZ3215 | 415343.469 | 9674028.839 | 372.535 | 35 | -90 | 24.22 | 10 |
| DEX-CZ3216 | 415375.278 | 9674024.989 | 380.223 | 29 | -90 | 12.46 | 13.54 |
| DEX-CZ3217 | 415825.716 | 9673749.118 | 377.281 | 19 | -90 | 6 | 9 |
| DEX-CZ3218 | 415824.606 | 9673721.446 | 376.306 | 27 | -90 | 17.35 | 8.2 |
| DEX-CZ3219 | 415797.918 | 9673728.697 | 375.941 | 27 | -90 | 22.98 | 5.34 |
| DEX-CZ3220 | 415474.532 | 9674026.034 | 391.616 | 26 | -90 | 16.05 | 9 |
| DEX-CZ3221 | 415500.774 | 9674025.293 | 389.426 | 35 | -90 | 24.43 | 7.36 |
| DEX-CZ3222 | 415525.136 | 9674026.793 | 384.000 | 31 | -90 | 23.97 | 7.49 |
| DEX-CZ3223 | 415549.935 | 9674025.847 | 380.715 | 30 | -90 | 23.4 | 6 |
| DEX-CZ3224 | 415625.289 | 9674024.466 | 374.779 | 14 | -90 | 11.43 | 1 |
| DEX-CZ3225 | 415650.514 | 9674026.410 | 367.000 | 30 | -90 | 4.4 | 22 |
| DEX-CZ3226 | 415671.688 | 9674023.710 | 372.052 | 26 | -90 | 6 | 11 |
| DEX-CZ3227 | 415700.072 | 9674023.516 | 378.106 | 31 | -90 | 8.62 | 14.38 |
| DEX-CZ3228 | 415725.549 | 9674027.224 | 378.001 | 25 | -90 | 7.34 | 17.45 |
| DEX-CZ3229 | 415749.448 | 9674028.938 | 382.318 | 23 | -90 | 16.89 | 2 |
| DEX-CZ3230 | 415777.715 | 9674026.277 | 375.836 | 10 | -90 | 6 | 1.73 |
| DEX-CZ3231 | 415174.228 | 9674003.300 | 343.910 | 29 | -90 | 26.93 | 1.4 |
| DEX-CZ3232 | 415226.211 | 9674001.646 | 346.499 | 30 | -90 | 23.18 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10829 | 418575.905 | 9673677.831 | 409.011 | 28 | -90 | 14.35 | 5.65 |
| DEX-CZ10830 | 418599.699 | 9673680.614 | 412.429 | 31 | -90 | 21.26 | 5 |
| DEX-CZ10831 | 418629.409 | 9673674.859 | 417.449 | 21 | -90 | 8 | 9 |
| DEX-CZ10832 | 418704.599 | 9673669.044 | 428.338 | 10 | -90 | 4 | 3 |
| DEX-CZ10833 | 418724.199 | 9673673.551 | 425.146 | 8 | -90 | 2 | 2 |
| DEX-CZ10834 | 418749.646 | 9673675.009 | 423.970 | 34 | -90 | 9 | 4 |
| DEX-CZ10835 | 418774.573 | 9673671.940 | 421.536 | 24 | -90 | 14 | 5 |
| DEX-CZ10836 | 418798.309 | 9673671.016 | 421.022 | 24 | -90 | 12.25 | 6.23 |
| DEX-CZ10837 | 418571.367 | 9673650.917 | 415.204 | 32 | -90 | 13 | 13 |
| DEX-CZ10838 | 418624.339 | 9673646.849 | 424.824 | 20 | -90 | 11 | 6 |
| DEX-CZ10839 | 418601.989 | 9673623.947 | 426.400 | 42 | -90 | 13 | 8.95 |
| DEX-CZ10840 | 418629.042 | 9673627.461 | 430.286 | 23 | -90 | 9 | 2.8 |
| DEX-CZ10841 | 418654.295 | 9673630.421 | 432.515 | 20 | -90 | 12 | 5 |
| DEX-CZ10842 | 418671.319 | 9673623.088 | 437.432 | 27 | -90 | 10 | 10 |
| DEX-CZ10843 | 418703.109 | 9673626.128 | 442.160 | 26 | -90 | 6 | 4.23 |
| DEX-CZ10844 | 418723.923 | 9673625.978 | 443.954 | 20 | -90 | 9 | 9 |
| DEX-CZ10845 | 418745.349 | 9673621.324 | 445.495 | 28 | -90 | 9 | 16.46 |
| DEX-CZ10846 | 418627.557 | 9673598.323 | 436.691 | 26 | -90 | 18.25 | 3 |
| DEX-CZ10847 | 418673.753 | 9673595.649 | 444.208 | 17 | -90 | 11 | 4 |
| DEX-CZ10848 | 418726.990 | 9673593.964 | 452.547 | 24 | -90 | 14.21 | 7.6 |
| DEX-CZ10849 | 418659.910 | 9673572.702 | 448.318 | 30 | -90 | 13 | 10.75 |
| DEX-CZ10850 | 418677.191 | 9673572.578 | 451.257 | 31 | -90 | 19 | 10 |
| DEX-CZ10851 | 418703.517 | 9673573.447 | 454.422 | 28 | -90 | 14.21 | 8 |
| DEX-CZ10852 | 418725.458 | 9673567.157 | 458.980 | 25 | -90 | 13.23 | 11 |
| DEX-CZ10853 | 418674.224 | 9673541.938 | 458.051 | 25 | -90 | 8 | 8 |
| DEX-CZ10854 | 418732.429 | 9673550.873 | 464.789 | 34 | -90 | 13.26 | 18.5 |
| DEX-CZ10855 | 418625.807 | 9673520.501 | 452.970 | 24 | -90 | 14 | 3 |
| DEX-CZ10856 | 418649.517 | 9673517.709 | 457.707 | 17 | -90 | 13 | 0 |
| DEX-CZ10857 | 418677.442 | 9673519.799 | 464.582 | 14 | -90 | 5 | 6.9 |
| DEX-CZ10858 | 418696.179 | 9673515.951 | 468.073 | 16 | -90 | 10 | 4 |
| DEX-CZ10859 | 418722.521 | 9673523.779 | 471.452 | 20 | -90 | 11 | 6 |
| DEX-CZ10860 | 418625.686 | 9673498.730 | 458.693 | 14 | -90 | 10 | 1 |
| DEX-CZ10861 | 418652.586 | 9673498.004 | 466.182 | 11 | -90 | 2.75 | 5.25 |
| DEX-CZ10862 | 418674.808 | 9673497.996 | 472.774 | 18 | -90 | 5 | 8.7 |
| DEX-CZ10863 | 418701.263 | 9673495.018 | 476.704 | 21 | -90 | 14 | 7 |
| DEX-CZ10864 | 418721.736 | 9673495.342 | 477.299 | 19 | -90 | 13.28 | 5 |
| DEX-CZ10865 | 418608.398 | 9673471.630 | 457.956 | 32 | -90 | 10 | 4 |
| DEX-CZ10866 | 418629.037 | 9673470.473 | 465.069 | 21 | -90 | 14 | 4.55 |
| DEX-CZ10867 | 418644.828 | 9673474.330 | 470.682 | 23 | -90 | 7 | 14 |
| DEX-CZ10868 | 418674.611 | 9673473.046 | 481.622 | 9 | -90 | 2 | 5 |
| DEX-CZ10869 | 418699.583 | 9673475.009 | 484.724 | 15 | -90 | 5 | 8 |
| DEX-CZ10870 | 418726.574 | 9673476.873 | 484.007 | 15 | -90 | 5 | 2 |
| DEX-CZ10871 | 418646.006 | 9673445.620 | 477.412 | 22 | -90 | 3 | 12.85 |
| DEX-CZ10872 | 418676.833 | 9673451.756 | 489.416 | 6 | -90 | 3 | 2 |
| DEX-CZ10873 | 418695.368 | 9673445.767 | 497.664 | 7 | -90 | 3 | 1 |
| DEX-CZ10874 | 418718.086 | 9673442.514 | 498.893 | 7 | -90 | 4 | 0.57 |
| DEX-CZ10875 | 418975.252 | 9673614.197 | 435.547 | 8 | -90 | 3 | 0 |
| DEX-CZ10876 | 418979.452 | 9673634.644 | 427.400 | 11 | -90 | 5 | 2 |
| DEX-CZ10877 | 419044.905 | 9673733.766 | 385.916 | 24 | -90 | 8 | 4 |
| DEX-CZ10878 | 419022.076 | 9673636.073 | 421.850 | 15 | -90 | 7 | 1 |
| DEX-CZ10879 | 418874.367 | 9673638.147 | 429.906 | 16 | -90 | 5 | 9 |
| DEX-CZ10880 | 418974.371 | 9673690.450 | 404.883 | 16 | -90 | 7 | 2 |
| DEX-CZ10881 | 418993.802 | 9673754.122 | 382.449 | 32 | -90 | 16 | 13 |
| DEX-CZ10882 | 418924.013 | 9673738.484 | 393.482 | 35 | -90 | 10 | 16 |
| DEX-CZ10883 | 418973.482 | 9673663.409 | 417.804 | 15 | -90 | 8 | 4.2 |
| DEX-CZ10885 | 418922.018 | 9673752.960 | 389.186 | 36 | -90 | 13 | 13 |
| DEX-CZ10886 | 418948.142 | 9673704.792 | 401.000 | 41 | -90 | 9 | 27 |
| DEX-CZ10887 | 418967.564 | 9673731.356 | 392.163 | 25 | -90 | 12 | 10 |
| DEX-CZ10888 | 419018.119 | 9673677.175 | 406.999 | 47 | -90 | 12 | 25 |
| DEX-CZ10889 | 419145.022 | 9673627.143 | 405.126 | 35 | -90 | 19 | 3 |
| DEX-CZ10890 | 418854.951 | 9673626.063 | 434.856 | 18 | -90 | 4 | 8 |
| DEX-CZ10891 | 418948.480 | 9673760.447 | 383.808 | 19 | -90 | 12 | 2 |
| DEX-CZ10892 | 419077.018 | 9673737.794 | 378.741 | 30 | -90 | 4 | 5 |
| DEX-CZ10893 | 418868.517 | 9673558.665 | 459.029 | 35 | -90 | 16 | 7.86 |
| DEX-CZ10894 | 418946.019 | 9673733.528 | 392.582 | 22 | -90 | 7 | 8 |
| DEX-CZ10895 | 418970.628 | 9673758.932 | 382.876 | 13 | -90 | 10 | 1 |
| DEX-CZ10896 | 419028.864 | 9673796.088 | 367.540 | 40 | -90 | 25 | 5 |
| DEX-CZ10897 | 419066.742 | 9673709.293 | 390.276 | 24 | -90 | 5 | 4 |
| DEX-CZ10898 | 418967.121 | 9673718.457 | 395.587 | 26 | -90 | 19 | 5 |
| DEX-CZ10899 | 419008.071 | 9673630.530 | 425.801 | 23 | -90 | 6 | 5 |
| DEX-CZ10900 | 418870.888 | 9673591.724 | 446.455 | 36 | -90 | 14 | 12 |
| DEX-CZ10901 | 418929.224 | 9673636.372 | 428.293 | 22 | -90 | 15.25 | 4.88 |
| DEX-CZ10902 | 418957.098 | 9673635.559 | 428.517 | 13 | -90 | 8 | 3 |
| DEX-CZ10903 | 418875.895 | 9673664.873 | 421.345 | 26 | -90 | 8 | 6 |
| DEX-CZ10904 | 418871.565 | 9673613.452 | 438.976 | 16 | -90 | 4 | 5 |
| DEX-CZ10905 | 418905.685 | 9673712.637 | 401.059 | 28 | -90 | 17 | 9 |
| DEX-CZ10906 | 419121.947 | 9673680.553 | 391.621 | 18 | -90 | 5 | 3 |
| DEX-CZ10907 | 418948.606 | 9673668.073 | 415.460 | 36 | -90 | 12 | 18.1 |
| DEX-CZ10908 | 418929.296 | 9673617.512 | 436.173 | 24 | -90 | 13 | 7.36 |
| DEX-CZ10909 | 418895.918 | 9673587.802 | 445.431 | 29 | -90 | 15.32 | 6 |
| DEX-CZ10910 | 418880.607 | 9673688.047 | 413.586 | 40 | -90 | 10 | 20.49 |
| DEX-CZ10911 | 418905.538 | 9673754.366 | 387.188 | 35 | -90 | 16 | 0 |
| DEX-CZ10912 | 418918.887 | 9673689.063 | 408.987 | 27 | -90 | 18 | 6 |
| DEX-CZ10913 | 419095.228 | 9673678.236 | 397.578 | 20 | -90 | 5 | 5 |
| DEX-CZ10914 | 419047.106 | 9673609.188 | 431.149 | 8 | -90 | 4 | 2 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3233 | 415274.666 | 9674002.764 | 351.569 | 30 | -90 | 29.24 | 1 |
| DEX-CZ3234 | 415325.039 | 9674001.858 | 365.950 | 23 | -90 | 20.9 | 0 |
| DEX-CZ3235 | 415375.457 | 9673999.961 | 376.568 | 25 | -90 | 19.51 | 3 |
| DEX-CZ3236 | 415770.517 | 9673725.313 | 374.381 | 15 | -90 | 11.27 | 1 |
| DEX-CZ3237 | 415473.387 | 9674002.060 | 387.563 | 30 | -90 | 24.14 | 5 |
| DEX-CZ3238 | 415523.477 | 9674000.719 | 379.037 | 25 | -90 | 21 | 2 |
| DEX-CZ3239 | 415626.223 | 9674000.693 | 364.124 | 19 | -90 | 8.23 | 9 |
| DEX-CZ3240 | 415673.888 | 9674001.527 | 364.746 | 18 | -90 | 9.43 | 5 |
| DEX-CZ3241 | 415725.833 | 9674005.464 | 366.909 | 15 | -90 | 9.5 | 3.91 |
| DEX-CZ3242 | 415775.495 | 9674001.292 | 364.468 | 42 | -90 | 3 | 30 |
| DEX-CZ3243 | 415148.602 | 9673979.745 | 341.328 | 27 | -90 | 23.56 | 2 |
| DEX-CZ3244 | 415173.541 | 9673975.405 | 341.483 | 30 | -90 | 25 | 5 |
| DEX-CZ3245 | 415200.476 | 9673976.195 | 342.994 | 34 | -90 | 29.02 | 4 |
| DEX-CZ3246 | 415225.023 | 9673973.446 | 343.710 | 24 | -90 | 15.71 | 7 |
| DEX-CZ3247 | 415250.117 | 9673974.696 | 345.586 | 23 | -90 | 20.82 | 1 |
| DEX-CZ3248 | 415275.226 | 9673976.770 | 349.251 | 28 | -90 | 24.99 | 3 |
| DEX-CZ3249 | 415301.786 | 9673977.523 | 354.740 | 25 | -90 | 21.51 | 0 |
| DEX-CZ3250 | 415325.582 | 9673974.942 | 361.052 | 41 | -90 | 33.44 | 8.54 |
| DEX-CZ3251 | 415349.611 | 9673976.471 | 367.076 | 25 | -90 | 21.44 | 2 |
| DEX-CZ3252 | 415374.558 | 9673975.078 | 372.546 | 25 | -90 | 21 | 2 |
| DEX-CZ3253 | 415746.944 | 9673721.824 | 371.326 | 10 | -90 | 4.5 | 1.5 |
| DEX-CZ3254 | 415725.909 | 9673725.034 | 366.889 | 10 | -90 | 4 | 3 |
| DEX-CZ3255 | 415727.605 | 9673748.234 | 364.383 | 22 | -90 | 3.67 | 15.33 |
| DEX-CZ3256 | 415472.019 | 9673976.532 | 381.581 | 29 | -90 | 23.39 | 2.6 |
| DEX-CZ3257 | 415499.494 | 9673975.411 | 379.940 | 30 | -90 | 17.47 | 8 |
| DEX-CZ3258 | 415524.878 | 9673975.767 | 375.543 | 29 | -90 | 22.6 | 6 |
| DEX-CZ3259 | 415548.905 | 9673975.355 | 372.122 | 31 | -90 | 18.89 | 12.71 |
| DEX-CZ3260 | 415625.670 | 9673972.724 | 352.502 | 16 | -90 | 2 | 12 |
| DEX-CZ3261 | 415649.178 | 9673974.714 | 354.131 | 36 | -90 | 4 | 28 |
| DEX-CZ3262 | 415675.845 | 9673974.884 | 356.271 | 9 | -90 | 6 | 0 |
| DEX-CZ3263 | 415703.040 | 9673976.822 | 354.666 | 6 | -90 | 2.5 | 0 |
| DEX-CZ3264 | 415726.043 | 9673975.914 | 353.492 | 44 | -90 | 4 | 30.52 |
| DEX-CZ3265 | 415751.421 | 9673974.627 | 354.143 | 18 | -90 | 3 | 13 |
| DEX-CZ3266 | 415774.655 | 9673975.753 | 350.227 | 6 | -90 | 1.65 | 0 |
| DEX-CZ3267 | 415174.647 | 9673953.458 | 340.313 | 33 | -90 | 28.35 | 3.2 |
| DEX-CZ3268 | 415224.470 | 9673950.827 | 342.425 | 32 | -90 | 29.27 | 2 |
| DEX-CZ3269 | 415273.550 | 9673950.615 | 344.793 | 29 | -90 | 26.72 | 1 |
| DEX-CZ3270 | 415326.786 | 9673950.795 | 357.405 | 44 | -90 | 31.02 | 11 |
| DEX-CZ3271 | 415374.750 | 9673949.981 | 365.537 | 27 | -90 | 20.46 | 5 |
| DEX-CZ3272 | 415426.615 | 9673952.176 | 374.396 | 21 | -90 | 18.41 | 2 |
| DEX-CZ3273 | 415474.017 | 9673947.208 | 374.721 | 13 | -90 | 6.2 | 5.59 |
| DEX-CZ3274 | 415526.631 | 9673952.114 | 371.040 | 29 | -90 | 24.09 | 6.78 |
| DEX-CZ3275 | 415628.425 | 9673949.158 | 347.847 | 16 | -90 | 2 | 7.46 |
| DEX-CZ3276 | 415675.973 | 9673950.754 | 343.869 | 11 | -90 | 2 | 0 |
| DEX-CZ3277 | 415725.765 | 9673947.795 | 347.557 | 26 | -90 | 10.59 | 10.06 |
| DEX-CZ3278 | 415774.633 | 9673954.137 | 356.334 | 5 | -90 | 2 | 0 |
| DEX-CZ3279 | 415350.519 | 9673923.276 | 352.267 | 33 | -90 | 31.91 | 1 |
| DEX-CZ3280 | 415375.249 | 9673922.931 | 357.192 | 26 | -90 | 18.27 | 6 |
| DEX-CZ3281 | 415401.429 | 9673926.086 | 366.017 | 31 | -90 | 24.2 | 5 |
| DEX-CZ3282 | 415422.118 | 9673927.921 | 368.035 | 30 | -90 | 23.24 | 10 |
| DEX-CZ3283 | 415448.725 | 9673927.933 | 369.971 | 27 | -90 | 22.63 | 3 |
| DEX-CZ3284 | 415476.689 | 9673923.116 | 368.091 | 9 | -90 | 5.28 | 1 |
| DEX-CZ3285 | 415500.708 | 9673928.828 | 368.630 | 32 | -90 | 7 | 18.96 |
| DEX-CZ3286 | 415524.305 | 9673928.648 | 365.865 | 30 | -90 | 30.01 | 1 |
| DEX-CZ3287 | 415547.354 | 9673926.136 | 370.146 | 22 | -90 | 18.55 | 4 |
| DEX-CZ3288 | 415628.986 | 9673923.369 | 342.678 | 6 | -90 | 1.6 | 0 |
| DEX-CZ3289 | 415650.798 | 9673921.407 | 343.263 | 9 | -90 | 2 | 5.31 |
| DEX-CZ3290 | 415672.435 | 9673923.239 | 349.747 | 5 | -90 | 2 | 0 |
| DEX-CZ3291 | 415700.441 | 9673926.460 | 352.684 | 19 | -90 | 2 | 11 |
| DEX-CZ3292 | 415723.098 | 9673924.338 | 357.505 | 24 | -90 | 2 | 10 |
| DEX-CZ3293 | 415750.400 | 9673919.611 | 368.300 | 4 | -90 | 1 | 0 |
| DEX-CZ3294 | 415773.376 | 9673929.560 | 371.415 | 15 | -90 | 5 | 7 |
| DEX-CZ3295 | 415374.748 | 9673901.120 | 352.557 | 38 | -90 | 35.63 | 3 |
| DEX-CZ3296 | 415425.020 | 9673899.860 | 359.195 | 21 | -90 | 14.39 | 4 |
| DEX-CZ3297 | 415475.023 | 9673901.024 | 360.289 | 17 | -90 | 13.63 | 2 |
| DEX-CZ3298 | 415524.945 | 9673903.833 | 362.524 | 24 | -90 | 20.84 | 2 |
| DEX-CZ3299 | 415728.910 | 9673902.418 | 368.491 | 13 | -90 | 3.37 | 0.63 |
| DEX-CZ3300 | 415773.853 | 9673904.476 | 383.917 | 28 | -90 | 7 | 11 |
| DEX-CZ3301 | 415350.720 | 9673873.052 | 343.303 | 29 | -90 | 27.2 | 0 |
| DEX-CZ3302 | 415377.336 | 9673875.046 | 346.975 | 26 | -90 | 16.17 | 8 |
| DEX-CZ3303 | 415396.970 | 9673874.377 | 349.948 | 29 | -90 | 20.97 | 7.97 |
| DEX-CZ3304 | 415423.308 | 9673874.354 | 352.508 | 26 | -90 | 15.71 | 12.86 |
| DEX-CZ3305 | 415449.931 | 9673873.176 | 352.145 | 21 | -90 | 12.76 | 6.5 |
| DEX-CZ3306 | 415474.473 | 9673873.768 | 352.966 | 27 | -90 | 20.67 | 4.55 |
| DEX-CZ3307 | 415497.755 | 9673875.055 | 358.107 | 22 | -90 | 12.1 | 8 |
| DEX-CZ3308 | 415526.072 | 9673876.209 | 365.440 | 28 | -90 | 19.43 | 5.67 |
| DEX-CZ3309 | 415547.556 | 9673876.367 | 367.864 | 16 | -90 | 8 | 5.5 |
| DEX-CZ3310 | 415726.588 | 9673873.742 | 381.868 | 10 | -90 | 2 | 5 |
| DEX-CZ3311 | 415745.893 | 9673871.743 | 387.563 | 16 | -90 | 4.64 | 9.36 |
| DEX-CZ3312 | 415772.750 | 9673876.652 | 392.255 | 29 | -90 | 13 | 9 |
| DEX-CZ3313 | 415375.352 | 9673850.751 | 346.324 | 19 | -90 | 16.11 | 2 |
| DEX-CZ3314 | 415426.446 | 9673850.954 | 347.053 | 31 | -90 | 11.21 | 18.51 |
| DEX-CZ3315 | 415473.376 | 9673849.699 | 356.586 | 22 | -90 | 17.7 | 3 |
| DEX-CZ3316 | 415525.295 | 9673850.839 | 363.788 | 21 | -90 | 15.37 | 3.7 |
| DEX-CZ3317 | 415351.432 | 9673822.411 | 344.576 | 18 | -90 | 10.85 | 3.4 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ10915 | 419020.128 | 9673611.407 | 431.354 | 16 | -90 | 7 | 6 |
| DEX-CZ10916 | 418923.795 | 9673716.769 | 400.059 | 30 | -90 | 13 | 13 |
| DEX-CZ10917 | 419000.305 | 9673660.556 | 414.546 | 15 | -90 | 6 | 6.76 |
| DEX-CZ10918R | 419079.829 | 9673660.203 | 406.333 | 24 | -90 | 11 | 1 |
| DEX-CZ10921 | 418875.902 | 9673716.558 | 401.529 | 32 | -90 | 24.18 | 4 |
| DEX-CZ10922 | 418992.404 | 9673737.364 | 386.958 | 30 | -90 | 13.31 | 5.32 |
| DEX-CZ10923 | 419067.494 | 9673671.722 | 404.063 | 31 | -90 | 15 | 3 |
| DEX-CZ10924 | 419043.194 | 9673634.788 | 420.755 | 27 | -90 | 4 | 6 |
| DEX-CZ10925 | 418898.807 | 9673665.802 | 419.075 | 30 | -90 | 17.11 | 5.69 |
| DEX-CZ10926 | 418895.540 | 9673641.623 | 427.429 | 30 | -90 | 14 | 16 |
| DEX-CZ10927 | 418949.363 | 9673687.242 | 407.938 | 36 | -90 | 3 | 20 |
| DEX-CZ10928 | 419099.831 | 9673638.059 | 408.428 | 27 | -90 | 13 | 12 |
| DEX-CZ10929 | 418948.561 | 9673813.095 | 368.437 | 39 | -90 | 26 | 1 |
| DEX-CZ10930 | 419045.901 | 9673661.681 | 410.311 | 30 | -90 | 12 | 3 |
| DEX-CZ10931 | 419072.829 | 9673611.406 | 424.125 | 7 | -90 | 3 | 0.5 |
| DEX-CZ10932 | 418892.107 | 9673737.316 | 393.769 | 26 | -90 | 13 | 2 |
| DEX-CZ10933 | 418921.365 | 9673811.217 | 369.884 | 44 | -90 | 22 | 15 |
| DEX-CZ10934 | 418851.077 | 9673736.574 | 396.401 | 23 | -90 | 13.3 | 5.85 |
| DEX-CZ10935 | 419022.710 | 9673730.978 | 387.766 | 41 | -90 | 7 | 32 |
| DEX-CZ10936 | 418874.652 | 9673743.122 | 391.476 | 27 | -90 | 12 | 13 |
| DEX-CZ10937 | 418990.559 | 9673700.247 | 399.660 | 14 | -90 | 9 | 3 |
| DEX-CZ10938 | 419091.545 | 9673711.395 | 385.722 | 29 | -90 | 10 | 7.7 |
| DEX-CZ10939 | 419044.490 | 9673713.779 | 391.969 | 42 | -90 | 13 | 7 |
| DEX-CZ10940 | 418954.583 | 9673612.583 | 436.990 | 23 | -90 | 8 | 1 |
| DEX-CZ10941 | 418901.342 | 9673812.047 | 371.208 | 55 | -90 | 23 | 3 |
| DEX-CZ10942 | 419023.509 | 9673710.340 | 394.799 | 39 | -90 | 8 | 24 |
| DEX-CZ10943 | 419128.659 | 9673634.521 | 404.686 | 34 | -90 | 21 | 5 |
| DEX-CZ10944 | 418996.821 | 9673609.797 | 433.510 | 23 | -90 | 8 | 13.6 |
| DEX-CZ10946 | 419037.621 | 9673674.325 | 407.242 | 26 | -90 | 15 | 9 |
| DEX-CZ10947 | 418996.150 | 9673683.170 | 405.836 | 35 | -90 | 4 | 10 |
| DEX-CZ10948 | 419023.009 | 9673661.209 | 412.949 | 39 | -90 | 10 | 20 |
| DEX-CZ10949 | 419070.980 | 9673812.480 | 361.729 | 42 | -90 | 26 | 14 |
| DEX-CZ10950 | 419101.948 | 9673607.953 | 418.584 | 21 | -90 | 13 | 7 |
| DEX-CZ10951 | 419096.138 | 9673718.402 | 380.927 | 35 | -90 | 10 | 3 |
| DEX-CZ10952 | 419125.543 | 9673610.813 | 412.985 | 27 | -90 | 11 | 7.4 |
| DEX-CZ10953 | 418927.852 | 9673659.420 | 420.195 | 24 | -90 | 13.28 | 8.85 |
| DEX-CZ10954 | 418696.295 | 9673210.122 | 495.881 | 35 | -90 | 14 | 18.02 |
| DEX-CZ10955 | 418397.986 | 9673299.989 | 441.567 | 24 | -90 | 11 | 8 |
| DEX-CZ10956 | 418496.497 | 9673303.294 | 454.320 | 34 | -90 | 16.2 | 12.5 |
| DEX-CZ10957 | 418596.376 | 9673299.959 | 473.906 | 10 | -90 | 3 | 4.45 |
| DEX-CZ10958 | 418690.447 | 9673296.768 | 497.188 | 26 | -90 | 15.23 | 6.24 |
| DEX-CZ10959 | 418590.696 | 9673396.943 | 461.420 | 25 | -90 | 4 | 11 |
| DEX-CZ10960 | 418691.007 | 9673401.729 | 508.802 | 12 | -90 | 8 | 0.4 |
| DEX-CZ10961 | 418774.385 | 9673185.575 | 519.057 | 4 | -90 | 1 | 2 |
| DEX-CZ10962 | 418500.568 | 9673401.049 | 438.444 | 41 | -90 | 20.8 | 17.6 |
| DEX-CZ10963 | 416382.688 | 9672076.409 | 417.066 | 26 | -90 | 21 | 3 |
| DEX-CZ10964 | 416397.793 | 9672075.812 | 417.825 | 20 | -90 | 14 | 3 |
| DEX-CZ10965 | 416423.046 | 9672074.121 | 417.719 | 31 | -90 | 27 | 1 |
| DEX-CZ10966 | 416453.619 | 9672074.557 | 415.150 | 32 | -90 | 26 | 2.7 |
| DEX-CZ10967 | 416471.550 | 9672072.160 | 416.304 | 31 | -90 | 13 | 15.75 |
| DEX-CZ10968 | 416421.753 | 9672054.978 | 411.321 | 23 | -90 | 17 | 0 |
| DEX-CZ10969 | 416449.134 | 9672061.843 | 409.172 | 22 | -90 | 19 | 0 |
| DEX-CZ10970 | 416444.451 | 9672036.302 | 398.760 | 27 | -90 | 22.4 | 0 |
| DEX-CZ10971 | 416377.432 | 9672095.806 | 419.862 | 26 | -90 | 22 | 1.65 |
| DEX-CZ10972 | 416424.327 | 9672093.061 | 421.397 | 10 | -90 | 6 | 1 |
| DEX-CZ10973 | 416476.284 | 9672098.412 | 420.444 | 27 | -90 | 17 | 4 |
| DEX-CZ10974 | 416525.570 | 9672097.835 | 420.585 | 8 | -90 | 3 | 3 |
| DEX-CZ10975 | 416354.817 | 9672126.094 | 419.000 | 22 | -90 | 18 | 1 |
| DEX-CZ10976 | 416376.248 | 9672126.651 | 420.529 | 35 | -90 | 26 | 7 |
| DEX-CZ10977 | 416399.656 | 9672125.701 | 422.580 | 26 | -90 | 19 | 4.85 |
| DEX-CZ10978 | 416423.545 | 9672125.324 | 423.000 | 24 | -90 | 20 | 2 |
| DEX-CZ10979 | 416472.749 | 9672124.164 | 423.478 | 12 | -90 | 4 | 4 |
| DEX-CZ10980 | 416496.693 | 9672126.044 | 424.870 | 6 | -90 | 1 | 2 |
| DEX-CZ10981 | 416522.124 | 9672123.070 | 421.814 | 7 | -90 | 7 | 0 |
| DEX-CZ10982 | 416325.777 | 9672148.271 | 417.449 | 32 | -90 | 25 | 5 |
| DEX-CZ10983 | 416370.556 | 9672145.354 | 419.532 | 24 | -90 | 17 | 5 |
| DEX-CZ10984 | 416424.154 | 9672143.650 | 422.693 | 18 | -90 | 14 | 0 |
| DEX-CZ10985 | 416476.540 | 9672145.412 | 424.880 | 8 | -90 | 5 | 1 |
| DEX-CZ10986 | 416527.509 | 9672143.663 | 420.307 | 12 | -90 | 5 | 5 |
| DEX-CZ10987 | 416297.139 | 9672173.707 | 417.251 | 28 | -90 | 20 | 6 |
| DEX-CZ10988 | 416329.038 | 9672171.751 | 415.333 | 28 | -90 | 17 | 7 |
| DEX-CZ10990 | 416350.939 | 9672179.815 | 415.482 | 31 | -90 | 27 | 1 |
| DEX-CZ10991 | 416402.200 | 9672171.732 | 419.648 | 39 | -90 | 15 | 22 |
| DEX-CZ10992 | 416430.200 | 9672176.912 | 421.907 | 24 | -90 | 17 | 4 |
| DEX-CZ10993 | 416478.658 | 9672170.095 | 423.306 | 14 | -90 | 6 | 6 |
| DEX-CZ10994 | 416503.022 | 9672174.136 | 419.913 | 15 | -90 | 7 | 4 |
| DEX-CZ10995 | 416525.678 | 9672168.229 | 417.210 | 21 | -90 | 16 | 2 |
| DEX-CZ10996 | 416541.733 | 9672171.795 | 414.972 | 25 | -90 | 12 | 10 |
| DEX-CZ10997 | 416576.096 | 9672177.481 | 411.352 | 24 | -90 | 7 | 14 |
| DEX-CZ10998 | 416327.701 | 9672195.144 | 411.854 | 16 | -90 | 12 | 0 |
| DEX-CZ10999 | 416377.752 | 9672200.351 | 418.178 | 30 | -90 | 16 | 12 |
| DEX-CZ11000 | 416544.074 | 9672202.682 | 409.396 | 23 | -90 | 18 | 3 |
| DEX-CZ11001 | 416571.945 | 9672199.115 | 408.459 | 30 | -90 | 15 | 12 |
| DEX-CZ11002 | 416630.125 | 9672204.257 | 405.128 | 24 | -90 | 20 | 1 |
| DEX-CZ11003 | 416350.088 | 9672224.048 | 415.421 | 30 | -90 | 13 | 8 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3319 | 415401.572 | 9673825.801 | 345.161 | 12 | -90 | 8.84 | 1.47 |
| DEX-CZ3320 | 415423.623 | 9673821.775 | 344.025 | 40 | -90 | 27.45 | 14 |
| DEX-CZ3321 | 415449.846 | 9673826.755 | 352.183 | 18 | -90 | 8 | 7.7 |
| DEX-CZ3322 | 415474.444 | 9673824.703 | 357.854 | 21 | -90 | 4 | 14.18 |
| DEX-CZ3323 | 415500.556 | 9673825.635 | 360.254 | 13 | -90 | 6.39 | 4.75 |
| DEX-CZ3324 | 415525.926 | 9673826.965 | 359.080 | 12 | -90 | 8 | 2 |
| DEX-CZ3325 | 415549.334 | 9673827.441 | 356.885 | 13 | -90 | 6.15 | 5 |
| DEX-CZ3326 | 415372.787 | 9673799.291 | 343.467 | 18 | -90 | 10.82 | 7 |
| DEX-CZ3327 | 415424.736 | 9673796.372 | 342.068 | 17 | -90 | 5.5 | 9.5 |
| DEX-CZ3328 | 415469.623 | 9673800.558 | 353.442 | 10 | -90 | 5.22 | 1 |
| DEX-CZ3329 | 415519.949 | 9673805.574 | 353.641 | 12 | -90 | 2 | 6 |
| DEX-CZ3330 | 415348.998 | 9673775.919 | 335.344 | 15 | -90 | 11.82 | 3 |
| DEX-CZ3331 | 415375.847 | 9673772.204 | 338.123 | 18 | -90 | 12.57 | 3 |
| DEX-CZ3332 | 415399.898 | 9673774.355 | 338.570 | 18 | -90 | 7 | 6 |
| DEX-CZ3333 | 415427.379 | 9673777.969 | 339.669 | 10 | -90 | 6.4 | 0.6 |
| DEX-CZ3334 | 415450.741 | 9673773.623 | 342.521 | 14 | -90 | 3 | 6 |
| DEX-CZ3335 | 415476.000 | 9673774.002 | 344.794 | 16 | -90 | 4.45 | 10.55 |
| DEX-CZ3336 | 415498.422 | 9673774.388 | 344.914 | 13 | -90 | 4.35 | 0 |
| DEX-CZ3337 | 415523.984 | 9673778.361 | 341.948 | 12 | -90 | 7.15 | 2.5 |
| DEX-CZ3338 | 415775.518 | 9673750.279 | 372.780 | 12 | -90 | 4 | 5 |
| DEX-CZ3338A | 415545.875 | 9673775.364 | 339.373 | 9 | -90 | 3 | 3 |
| DEX-CZ3339 | 415382.620 | 9673750.832 | 334.347 | 12 | -90 | 10.3 | 1 |
| DEX-CZ3340 | 415425.561 | 9673751.756 | 335.943 | 28 | -90 | 13.42 | 14 |
| DEX-CZ3341 | 415474.221 | 9673750.505 | 337.848 | 25 | -90 | 9.36 | 13 |
| DEX-CZ3342 | 415521.981 | 9673750.502 | 334.658 | 18 | -90 | 13.54 | 3 |
| DEX-CZ3343 | 416027.900 | 9674129.040 | 415.621 | 32 | -90 | 26.8 | 5.3 |
| DEX-CZ3344 | 415998.577 | 9674136.135 | 401.705 | 15 | -90 | 4 | 9.3 |
| DEX-CZ3345 | 415956.725 | 9674140.265 | 393.315 | 43 | -90 | 19.3 | 20 |
| DEX-CZ3346 | 416051.352 | 9674125.802 | 423.796 | 30 | -90 | 21.04 | 4 |
| DEX-CZ3347 | 415974.957 | 9674136.732 | 399.691 | 15 | -90 | 6 | 6 |
| DEX-CZ3348 | 415930.326 | 9674137.909 | 380.889 | 20 | -90 | 13.74 | 5 |
| DEX-CZ3634 | 414816.971 | 9671821.430 | 215.327 | 13 | -90 | 4 | 6.25 |
| DEX-CZ3635 | 414894.930 | 9671829.356 | 210.343 | 18 | -90 | 11 | 5 |
| DEX-CZ3636 | 414991.541 | 9671800.002 | 205.602 | 17 | -90 | 7 | 8 |
| DEX-CZ3642 | 414721.922 | 9671919.892 | 187.564 | 12 | -90 | 8 | 0 |
| DEX-CZ3643 | 414806.905 | 9671911.984 | 191.733 | 10 | -90 | 4 | 4 |
| DEX-CZ3644 | 414896.569 | 9671910.910 | 193.228 | 9 | -90 | 6 | 1 |
| DEX-CZ3645 | 414964.023 | 9671919.828 | 190.332 | 12 | -90 | 6 | 4 |
| DEX-CZ3654 | 414605.322 | 9672006.065 | 183.556 | 12 | -90 | 6 | 4 |
| DEX-CZ3655 | 414703.339 | 9672028.988 | 190.013 | 9 | -90 | 5 | 2 |
| DEX-CZ3656 | 414815.410 | 9672027.928 | 188.134 | 16 | -90 | 9 | 5 |
| DEX-CZ3657 | 414896.951 | 9672015.300 | 195.354 | 16 | -90 | 4 | 10 |
| DEX-CZ3658 | 415010.807 | 9672014.451 | 188.352 | 11 | -90 | 8 | 0 |
| DEX-CZ3668 | 414000.562 | 9672130.317 | 239.406 | 11 | -90 | 7 | 2 |
| DEX-CZ3669 | 414136.226 | 9672126.835 | 250.325 | 8 | -90 | 2 | 3 |
| DEX-CZ3670 | 414204.512 | 9672125.406 | 237.803 | 17 | -90 | 5 | 10 |
| DEX-CZ3671 | 414312.255 | 9672103.727 | 215.198 | 17 | -90 | 10 | 5 |
| DEX-CZ3672 | 414405.995 | 9672119.311 | 214.127 | 16 | -90 | 6 | 8 |
| DEX-CZ3673 | 414509.785 | 9672120.595 | 197.653 | 15 | -90 | 4 | 9 |
| DEX-CZ3674 | 414593.599 | 9672107.400 | 190.563 | 9 | -90 | 5 | 2 |
| DEX-CZ3675 | 414705.106 | 9672123.679 | 207.763 | 10 | -90 | 5 | 3 |
| DEX-CZ3676 | 414821.395 | 9672111.319 | 202.294 | 18 | -90 | 4 | 11.4 |
| DEX-CZ3677 | 414926.134 | 9672174.809 | 216.342 | 17 | -90 | 6 | 8.75 |
| DEX-CZ3678 | 414992.653 | 9672127.785 | 192.547 | 7 | -90 | 3 | 1 |
| DEX-CZ3688 | 414022.697 | 9672231.255 | 259.857 | 17 | -90 | 5 | 5 |
| DEX-CZ3689 | 414119.926 | 9672201.596 | 235.763 | 10 | -90 | 2 | 0 |
| DEX-CZ3690 | 414210.875 | 9672215.978 | 219.460 | 11 | -90 | 5 | 3.3 |
| DEX-CZ3691 | 414306.778 | 9672230.566 | 214.783 | 11 | -90 | 4 | 5 |
| DEX-CZ3692 | 414398.748 | 9672236.644 | 223.793 | 16 | -90 | 9 | 5 |
| DEX-CZ3693 | 414517.077 | 9672218.168 | 227.165 | 22 | -90 | 6 | 14 |
| DEX-CZ3694 | 414609.516 | 9672211.066 | 200.831 | 9 | -90 | 6 | 0 |
| DEX-CZ3695 | 414698.111 | 9672209.627 | 226.116 | 13 | -90 | 7 | 2 |
| DEX-CZ3696 | 414804.088 | 9672220.417 | 222.609 | 6 | -90 | 3 | 1 |
| DEX-CZ3697 | 414903.297 | 9672212.941 | 226.217 | 15 | -90 | 9 | 4 |
| DEX-CZ3698 | 414972.583 | 9672212.012 | 216.592 | 11 | -90 | 8 | 0 |
| DEX-CZ3709 | 414015.951 | 9672309.163 | 260.624 | 14 | -90 | 2 | 4 |
| DEX-CZ3710 | 414108.493 | 9672309.503 | 249.595 | 24 | -90 | 3 | 19 |
| DEX-CZ3711 | 414207.021 | 9672321.186 | 219.339 | 9 | -90 | 3 | 4 |
| DEX-CZ3712 | 414310.968 | 9672318.438 | 236.000 | 12 | -90 | 3 | 7 |
| DEX-CZ3713 | 414392.713 | 9672326.648 | 226.548 | 8 | -90 | 4 | 2 |
| DEX-CZ3714 | 414514.792 | 9672315.644 | 236.227 | 16 | -90 | 7 | 7 |
| DEX-CZ3715 | 414619.206 | 9672319.898 | 226.335 | 12 | -90 | 7 | 3 |
| DEX-CZ3716 | 414712.749 | 9672319.096 | 236.268 | 7 | -90 | 3 | 2 |
| DEX-CZ3717 | 414803.472 | 9672320.478 | 257.881 | 15 | -90 | 9 | 4 |
| DEX-CZ3718 | 414900.046 | 9672328.196 | 248.136 | 8 | -90 | 3 | 0 |
| DEX-CZ3719 | 415005.497 | 9672318.441 | 220.677 | 12 | -90 | 8 | 0 |
| DEX-CZ3729 | 413818.644 | 9672425.488 | 267.834 | 25 | -90 | 8 | 5 |
| DEX-CZ3730 | 413906.725 | 9672410.341 | 272.627 | 8 | -90 | 4 | 0 |
| DEX-CZ3731 | 414027.120 | 9672410.052 | 273.437 | 18 | -90 | 5 | 4 |
| DEX-CZ3732 | 414101.655 | 9672385.489 | 255.338 | 20 | -90 | 6 | 1 |
| DEX-CZ3733 | 414201.233 | 9672427.070 | 241.214 | 4 | -90 | 1.35 | 0 |
| DEX-CZ3734 | 414282.046 | 9672488.363 | 246.225 | 9 | -90 | 6 | 0 |
| DEX-CZ3735 | 414411.441 | 9672415.696 | 257.819 | 18 | -90 | 12 | 4 |
| DEX-CZ3736 | 414511.233 | 9672423.662 | 260.613 | 13 | -90 | 8 | 2.54 |
| DEX-CZ3737 | 414606.009 | 9672421.882 | 248.490 | 7 | -90 | 4 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ11004 | 416375.028 | 9672217.596 | 417.965 | 30 | -90 | 18 | 9 |
| DEX-CZ11005 | 416396.464 | 9672223.532 | 417.893 | 27 | -90 | 15 | 9 |
| DEX-CZ11006 | 416423.575 | 9672223.337 | 416.305 | 17 | -90 | 4 | 5 |
| DEX-CZ11007 | 416526.065 | 9672220.587 | 405.988 | 20 | -90 | 14 | 2 |
| DEX-CZ11008 | 416548.721 | 9672219.897 | 404.953 | 21 | -90 | 16 | 3 |
| DEX-CZ11009 | 416581.124 | 9672223.833 | 404.792 | 23 | -90 | 14 | 3 |
| DEX-CZ11010 | 416603.108 | 9672219.124 | 404.988 | 21 | -90 | 14 | 5 |
| DEX-CZ11011 | 416627.277 | 9672218.965 | 403.025 | 19 | -90 | 13 | 4 |
| DEX-CZ11012 | 416327.299 | 9672325.956 | 385.325 | 32 | -90 | 16 | 2 |
| DEX-CZ11013 | 416345.669 | 9672320.162 | 388.176 | 32 | -90 | 15 | 7 |
| DEX-CZ11014 | 416382.047 | 9672327.726 | 390.927 | 33 | -90 | 23 | 8 |
| DEX-CZ11015 | 416408.906 | 9672319.585 | 391.716 | 28 | -90 | 16 | 7 |
| DEX-CZ11016 | 416426.314 | 9672321.302 | 393.224 | 34 | -90 | 30 | 2 |
| DEX-CZ11017 | 416453.482 | 9672316.867 | 395.037 | 30 | -90 | 17 | 8 |
| DEX-CZ11018 | 416472.365 | 9672317.689 | 395.210 | 24 | -90 | 17 | 5 |
| DEX-CZ11019 | 416500.508 | 9672325.427 | 393.454 | 26 | -90 | 13 | 11 |
| DEX-CZ11020 | 416522.260 | 9672321.287 | 391.527 | 28 | -90 | 17 | 9 |
| DEX-CZ11021 | 416503.309 | 9672246.831 | 399.181 | 23 | -90 | 18 | 4 |
| DEX-CZ11022 | 416547.550 | 9672248.250 | 398.138 | 30 | -90 | 23 | 6 |
| DEX-CZ11023 | 416604.226 | 9672247.289 | 399.549 | 22 | -90 | 9 | 10 |
| DEX-CZ11024 | 416329.657 | 9672350.011 | 384.289 | 34 | -90 | 17 | 8 |
| DEX-CZ11025 | 416493.783 | 9672345.784 | 391.183 | 19 | -90 | 11 | 6 |
| DEX-CZ11026 | 417343.868 | 9672399.863 | 441.760 | 18 | -90 | 15 | 1 |
| DEX-CZ11027 | 417440.477 | 9672396.346 | 429.561 | 18 | -90 | 6 | 9.55 |
| DEX-CZ11028 | 417546.758 | 9672394.632 | 423.509 | 24 | -90 | 17.5 | 2.5 |
| DEX-CZ11029 | 417344.797 | 9672354.910 | 441.234 | 7 | -90 | 4 | 1 |
| DEX-CZ11030 | 417395.132 | 9672347.251 | 435.423 | 19 | -90 | 5 | 10 |
| DEX-CZ11031 | 417446.058 | 9672349.240 | 435.000 | 14 | -90 | 9 | 2.85 |
| DEX-CZ11032 | 417498.051 | 9672350.636 | 433.411 | 12 | -90 | 6 | 3.75 |
| DEX-CZ11033 | 417546.807 | 9672350.685 | 429.585 | 28 | -90 | 18 | 1 |
| DEX-CZ11034 | 417592.107 | 9672344.156 | 426.760 | 39 | -90 | 23 | 13.35 |
| DEX-CZ11035 | 417343.853 | 9672303.928 | 434.718 | 26 | -90 | 4 | 21 |
| DEX-CZ11036 | 417442.214 | 9672297.360 | 433.846 | 26 | -90 | 15 | 5 |
| DEX-CZ11037 | 417544.284 | 9672289.401 | 429.978 | 50 | -90 | 15 | 20 |
| DEX-CZ11038 | 417649.215 | 9672302.824 | 427.000 | 25 | -90 | 10 | 11 |
| DEX-CZ11039 | 417542.515 | 9672500.946 | 410.278 | 20 | -90 | 9 | 8 |
| DEX-CZ11040 | 417565.475 | 9672498.207 | 408.916 | 26 | -90 | 8 | 15 |
| DEX-CZ11041 | 417615.352 | 9672498.232 | 400.251 | 28 | -90 | 20 | 6 |
| DEX-CZ11042 | 417520.356 | 9672479.796 | 411.502 | 28 | -90 | 13 | 5 |
| DEX-CZ11043 | 417541.582 | 9672474.257 | 414.276 | 43 | -90 | 18 | 6 |
| DEX-CZ11044 | 417566.505 | 9672474.334 | 412.438 | 38 | -90 | 25 | 8 |
| DEX-CZ11045 | 417592.786 | 9672477.104 | 406.470 | 22 | -90 | 14 | 6 |
| DEX-CZ11046 | 417625.144 | 9672472.220 | 403.957 | 39 | -90 | 11 | 20 |
| DEX-CZ11047 | 417649.565 | 9672470.803 | 410.079 | 43 | -90 | 11 | 29 |
| DEX-CZ11052 | 417474.798 | 9672450.363 | 424.876 | 39 | -90 | 18.25 | 16 |
| DEX-CZ11053 | 417498.019 | 9672453.670 | 417.833 | 40 | -90 | 8 | 24.37 |
| DEX-CZ11054 | 417519.446 | 9672451.999 | 417.367 | 37 | -90 | 18 | 8 |
| DEX-CZ11055 | 417545.597 | 9672445.094 | 417.398 | 48 | -90 | 16 | 22.9 |
| DEX-CZ11056 | 417570.745 | 9672443.833 | 413.715 | 35 | -90 | 11 | 10 |
| DEX-CZ11057 | 417595.786 | 9672449.150 | 411.083 | 40 | -90 | 18 | 15 |
| DEX-CZ11058 | 417620.226 | 9672454.320 | 406.547 | 26 | -90 | 5 | 19 |
| DEX-CZ11064 | 417471.497 | 9672428.327 | 424.833 | 19 | -90 | 9 | 8.3 |
| DEX-CZ11065 | 417491.648 | 9672429.711 | 420.840 | 30 | -90 | 16.25 | 4 |
| DEX-CZ11066 | 417514.570 | 9672422.422 | 422.767 | 38 | -90 | 17.35 | 15 |
| DEX-CZ11067 | 417543.550 | 9672421.797 | 419.440 | 20 | -90 | 13 | 3 |
| DEX-CZ11068 | 417563.395 | 9672423.193 | 417.658 | 29 | -90 | 18 | 7.8 |
| DEX-CZ11069 | 417593.897 | 9672424.968 | 413.684 | 23 | -90 | 16 | 3.25 |
| DEX-CZ11070 | 417619.987 | 9672425.082 | 410.278 | 50 | -90 | 14 | 29 |
| DEX-CZ11077 | 417573.157 | 9672400.108 | 420.296 | 23 | -90 | 18 | 3 |
| DEX-CZ11078 | 417597.908 | 9672401.713 | 416.607 | 19 | -90 | 15.3 | 2 |
| DEX-CZ11079 | 417622.718 | 9672399.780 | 415.106 | 33 | -90 | 19 | 9 |
| DEX-CZ11080 | 417645.668 | 9672402.117 | 413.455 | 25 | -90 | 13 | 10 |
| DEX-CZ11082 | 417323.605 | 9672370.680 | 438.744 | 12 | -90 | 3 | 6 |
| DEX-CZ11090 | 417569.943 | 9672374.780 | 425.281 | 51 | -90 | 19 | 29.3 |
| DEX-CZ11091 | 417593.934 | 9672371.014 | 424.286 | 25 | -90 | 18.63 | 2.85 |
| DEX-CZ11092 | 417618.944 | 9672373.401 | 420.458 | 32 | -90 | 14 | 10 |
| DEX-CZ11093 | 417639.154 | 9672368.449 | 420.896 | 37 | -90 | 19 | 15.85 |
| DEX-CZ11094 | 417667.072 | 9672375.603 | 418.779 | 36 | -90 | 18.3 | 12.76 |
| DEX-CZ11095 | 417697.312 | 9672374.577 | 422.496 | 25 | -90 | 18 | 4.86 |
| DEX-CZ11096 | 417315.380 | 9672341.260 | 434.799 | 7 | -90 | 1 | 2 |
| DEX-CZ11100 | 417575.148 | 9672353.267 | 427.263 | 42 | -90 | 16.5 | 23 |
| DEX-CZ11101 | 417620.655 | 9672350.025 | 424.117 | 49 | -90 | 16 | 18 |
| DEX-CZ11102 | 417644.657 | 9672348.166 | 424.097 | 47 | -90 | 21 | 14 |
| DEX-CZ11103 | 417669.880 | 9672344.150 | 423.020 | 37 | -90 | 28 | 5 |
| DEX-CZ11104 | 417696.172 | 9672346.422 | 424.269 | 35 | -90 | 21 | 8 |
| DEX-CZ11105 | 417717.160 | 9672352.857 | 424.192 | 31 | -90 | 16.32 | 9 |
| DEX-CZ11106 | 417344.735 | 9672322.871 | 435.850 | 21 | -90 | 7 | 11 |
| DEX-CZ11107 | 417374.122 | 9672324.935 | 435.000 | 35 | -90 | 8 | 17 |
| DEX-CZ11108 | 417393.996 | 9672324.867 | 434.988 | 47 | -90 | 7 | 25 |
| DEX-CZ11109 | 417417.790 | 9672324.183 | 435.000 | 50 | -90 | 13 | 26 |
| DEX-CZ11114 | 417573.981 | 9672321.697 | 428.821 | 38 | -90 | 17 | 5 |
| DEX-CZ11115 | 417592.816 | 9672324.054 | 427.903 | 34 | -90 | 13 | 14 |
| DEX-CZ11116 | 417618.317 | 9672323.240 | 427.339 | 51 | -90 | 24 | 17.87 |
| DEX-CZ11117 | 417642.427 | 9672324.519 | 426.902 | 46 | -90 | 17 | 22 |
| DEX-CZ11118 | 417672.573 | 9672323.676 | 425.612 | 37 | -90 | 24 | 5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3738 | 414704.617 | 9672417.057 | 261.182 | 10 | -90 | 6 | 2 |
| DEX-CZ3739 | 414816.001 | 9672426.370 | 286.310 | 30 | -90 | 9 | 19 |
| DEX-CZ3740 | 414917.392 | 9672403.351 | 258.487 | 8 | -90 | 5 | 0 |
| DEX-CZ3741 | 414968.738 | 9672418.671 | 259.281 | 20 | -90 | 6 | 5 |
| DEX-CZ3751 | 413610.970 | 9672520.643 | 289.302 | 12 | -90 | 3 | 6 |
| DEX-CZ3752 | 413711.711 | 9672509.201 | 297.000 | 15 | -90 | 7 | 2 |
| DEX-CZ3753 | 413818.292 | 9672517.082 | 281.816 | 40 | -90 | 13 | 21 |
| DEX-CZ3754 | 413917.097 | 9672519.045 | 275.045 | 21 | -90 | 3 | 11 |
| DEX-CZ3755 | 414004.886 | 9672507.351 | 276.718 | 10 | -90 | 5 | 3 |
| DEX-CZ3756 | 414114.798 | 9672509.010 | 271.762 | 18 | -90 | 6 | 9 |
| DEX-CZ3757 | 414210.638 | 9672510.987 | 252.153 | 15 | -90 | 4 | 9 |
| DEX-CZ3758 | 414242.157 | 9672552.303 | 263.353 | 7 | -90 | 1.47 | 1.53 |
| DEX-CZ3759 | 414467.097 | 9672509.701 | 263.942 | 10 | -90 | 4 | 2.26 |
| DEX-CZ3760 | 414502.582 | 9672522.258 | 271.234 | 16 | -90 | 8 | 6 |
| DEX-CZ3761 | 414613.038 | 9672512.926 | 277.914 | 16 | -90 | 9 | 5 |
| DEX-CZ3762 | 414708.534 | 9672517.677 | 281.108 | 13 | -90 | 5 | 5 |
| DEX-CZ3763 | 414853.700 | 9672536.920 | 310.000 | 24 | -90 | 16 | 3 |
| DEX-CZ3764 | 414938.927 | 9672540.215 | 297.703 | 21 | -90 | 17.73 | 0 |
| DEX-CZ3766 | 415102.335 | 9672522.152 | 286.291 | 9 | -90 | 3 | 3 |
| DEX-CZ3767 | 415190.978 | 9672528.220 | 306.472 | 22 | -90 | 19.66 | 2 |
| DEX-CZ3769 | 415403.814 | 9672536.151 | 350.000 | 17 | -90 | 6 | 5 |
| DEX-CZ3770 | 415516.699 | 9672514.904 | 301.965 | 9 | -90 | 3 | 1 |
| DEX-CZ3774 | 413314.226 | 9672629.318 | 318.129 | 19 | -90 | 0 | 13 |
| DEX-CZ3775 | 413410.235 | 9672623.321 | 312.544 | 16 | -90 | 2 | 12 |
| DEX-CZ3776 | 413507.415 | 9672614.320 | 310.000 | 18 | -90 | 3 | 5.5 |
| DEX-CZ3777 | 413600.006 | 9672611.720 | 294.803 | 11 | -90 | 8 | 1 |
| DEX-CZ3778 | 413702.622 | 9672610.564 | 278.843 | 15 | -90 | 7 | 6 |
| DEX-CZ3779 | 413804.777 | 9672619.694 | 265.851 | 6 | -90 | 3 | 1 |
| DEX-CZ3780 | 413913.531 | 9672614.901 | 249.045 | 24 | -90 | 7 | 15 |
| DEX-CZ3781 | 414018.792 | 9672618.352 | 248.959 | 16 | -90 | 2 | 12 |
| DEX-CZ3782 | 414107.412 | 9672621.167 | 270.813 | 13 | -90 | 9.84 | 2 |
| DEX-CZ3783 | 414206.802 | 9672618.029 | 267.473 | 22 | -90 | 17.67 | 1.33 |
| DEX-CZ3784 | 414310.843 | 9672616.959 | 275.384 | 10 | -90 | 6 | 1 |
| DEX-CZ3785 | 414409.244 | 9672616.341 | 277.193 | 11 | -90 | 5.7 | 3.3 |
| DEX-CZ3786 | 414503.819 | 9672620.227 | 283.383 | 17 | -90 | 6 | 6 |
| DEX-CZ3787 | 414611.855 | 9672619.397 | 282.845 | 25 | -90 | 9 | 8 |
| DEX-CZ3788 | 414706.742 | 9672613.759 | 286.557 | 36 | -90 | 10.34 | 6.25 |
| DEX-CZ3789 | 414811.414 | 9672612.141 | 297.761 | 25 | -90 | 8.25 | 12.89 |
| DEX-CZ3790 | 414904.986 | 9672617.592 | 301.191 | 15 | -90 | 13.31 | 1 |
| DEX-CZ3791 | 415015.674 | 9672602.226 | 289.290 | 25 | -90 | 7.26 | 16.73 |
| DEX-CZ3792 | 415122.465 | 9672624.198 | 302.147 | 22 | -90 | 19.9 | 1 |
| DEX-CZ3793 | 415203.750 | 9672606.571 | 318.751 | 32 | -90 | 10.23 | 19 |
| DEX-CZ3794 | 415315.123 | 9672611.312 | 339.415 | 35 | -90 | 29.95 | 7.26 |
| DEX-CZ3795 | 415418.979 | 9672613.020 | 348.914 | 16 | -90 | 9 | 5 |
| DEX-CZ3796 | 415501.820 | 9672601.758 | 326.964 | 8 | -90 | 3.48 | 2.52 |
| DEX-CZ3800 | 413211.947 | 9672725.375 | 301.597 | 7 | -90 | 2 | 2 |
| DEX-CZ3801 | 413301.373 | 9672723.140 | 320.167 | 8 | -90 | 0 | 3 |
| DEX-CZ3802 | 413401.994 | 9672715.920 | 299.874 | 30 | -90 | 10 | 4 |
| DEX-CZ3805 | 413704.537 | 9672715.727 | 258.683 | 12 | -90 | 6 | 1 |
| DEX-CZ3806 | 413809.221 | 9672703.079 | 254.143 | 8 | -90 | 4 | 1 |
| DEX-CZ3809 | 414112.070 | 9672701.111 | 245.000 | 18 | -90 | 10 | 6 |
| DEX-CZ3810 | 414213.026 | 9672719.977 | 255.054 | 27 | -90 | 7.27 | 19.58 |
| DEX-CZ3811 | 414250.469 | 9672706.044 | 264.390 | 16 | -90 | 10.37 | 4.04 |
| DEX-CZ3812 | 414410.191 | 9672716.147 | 279.002 | 20 | -90 | 14 | 4 |
| DEX-CZ3813 | 414514.859 | 9672729.596 | 286.130 | 9 | -90 | 3 | 1 |
| DEX-CZ3814 | 414613.080 | 9672717.215 | 279.923 | 7 | -90 | 0 | 0 |
| DEX-CZ3815 | 414727.784 | 9672792.886 | 290.530 | 13 | -90 | 7 | 1.35 |
| DEX-CZ3816 | 414852.089 | 9672694.898 | 296.302 | 21 | -90 | 10 | 3 |
| DEX-CZ3817 | 414903.564 | 9672717.205 | 295.161 | 10 | -90 | 6 | 1 |
| DEX-CZ3819 | 415117.255 | 9672719.438 | 299.276 | 23 | -90 | 23.47 | 1 |
| DEX-CZ3820 | 415212.148 | 9672713.002 | 314.368 | 32 | -90 | 31.52 | 1.3 |
| DEX-CZ3821 | 415300.234 | 9672710.451 | 328.574 | 32 | -90 | 25.08 | 5.27 |
| DEX-CZ3822 | 415410.314 | 9672706.380 | 351.917 | 25 | -90 | 23.04 | 2 |
| DEX-CZ3823 | 415519.585 | 9672722.372 | 336.241 | 4 | -90 | 1 | 0 |
| DEX-CZ3824 | 415613.680 | 9672716.809 | 292.983 | 14 | -90 | 6 | 4.5 |
| DEX-CZ3827 | 413203.172 | 9672835.906 | 273.975 | 9 | -90 | 0 | 5 |
| DEX-CZ3828 | 413303.186 | 9672814.758 | 295.854 | 12 | -90 | 1 | 5 |
| DEX-CZ3831 | 414107.980 | 9672821.147 | 281.974 | 30 | -90 | 7.35 | 7.6 |
| DEX-CZ3832 | 414193.302 | 9672810.076 | 268.655 | 25 | -90 | 14.56 | 8.31 |
| DEX-CZ3833 | 414306.150 | 9672813.479 | 261.150 | 26 | -90 | 0 | 21 |
| DEX-CZ3834 | 414395.336 | 9672815.101 | 279.192 | 16 | -90 | 13.19 | 1 |
| DEX-CZ3835 | 414507.718 | 9672816.054 | 277.067 | 15 | -90 | 4 | 9 |
| DEX-CZ3836 | 414613.420 | 9672814.658 | 273.927 | 10 | -90 | 0 | 8 |
| DEX-CZ3837 | 414716.672 | 9672854.351 | 301.085 | 21 | -90 | 3 | 8 |
| DEX-CZ3838 | 414821.948 | 9672822.517 | 292.775 | 9 | -90 | 4 | 3 |
| DEX-CZ3839 | 414904.614 | 9672859.895 | 294.024 | 13 | -90 | 8 | 3 |
| DEX-CZ3840 | 415029.462 | 9672823.893 | 289.661 | 26 | -90 | 24.37 | 2.31 |
| DEX-CZ3841 | 415074.841 | 9672747.931 | 295.176 | 19 | -90 | 16.01 | 1 |
| DEX-CZ3842 | 415192.084 | 9672845.458 | 318.481 | 47 | -90 | 33.01 | 9 |
| DEX-CZ3843 | 415304.372 | 9672819.021 | 338.472 | 27 | -90 | 24.34 | 1 |
| DEX-CZ3846 | 415601.717 | 9672821.394 | 295.749 | 5 | -90 | 2.45 | 0 |
| DEX-CZ3849 | 413218.809 | 9672913.553 | 281.716 | 10 | -90 | 0 | 8 |
| DEX-CZ3850 | 413294.901 | 9672898.813 | 280.795 | 8 | -90 | 0 | 5 |
| DEX-CZ3852 | 414115.058 | 9672911.194 | 291.097 | 15 | -90 | 11.14 | 1.6 |
| DEX-CZ3853 | 414208.625 | 9672926.630 | 284.748 | 26 | -90 | 20.73 | 5.66 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ11119 | 417692.432 | 9672326.002 | 425.425 | 34 | -90 | 16 | 13 |
| DEX-CZ11120 | 417370.681 | 9672304.114 | 434.193 | 47 | -90 | 8 | 24.84 |
| DEX-CZ11121 | 417417.822 | 9672303.983 | 434.682 | 36 | -90 | 21 | 6 |
| DEX-CZ11124 | 417569.144 | 9672301.567 | 429.463 | 48 | -90 | 19 | 22.65 |
| DEX-CZ11126 | 417672.277 | 9672299.487 | 426.220 | 19 | -90 | 13 | 1 |
| DEX-CZ11127 | 417693.769 | 9672299.188 | 426.000 | 37 | -90 | 17 | 17 |
| DEX-CZ11128 | 417371.499 | 9672280.442 | 431.251 | 60 | -90 | 13 | 36.6 |
| DEX-CZ11129 | 417393.959 | 9672274.463 | 431.349 | 25 | -90 | 18 | 3 |
| DEX-CZ11130 | 417421.588 | 9672274.783 | 432.290 | 50 | -90 | 19 | 29 |
| DEX-CZ11131 | 417444.993 | 9672276.189 | 430.837 | 27 | -90 | 19 | 4.35 |
| DEX-CZ11132 | 417471.186 | 9672273.784 | 432.710 | 20 | -90 | 13 | 4 |
| DEX-CZ11138 | 417643.491 | 9672271.619 | 423.417 | 33 | -90 | 12 | 13 |
| DEX-CZ11139 | 417668.706 | 9672275.228 | 423.639 | 29 | -90 | 7 | 15 |
| DEX-CZ11140 | 417693.188 | 9672273.708 | 423.389 | 24 | -90 | 14 | 7 |
| DEX-CZ11141 | 417399.869 | 9672252.791 | 427.630 | 37 | -90 | 15 | 17.85 |
| DEX-CZ11142 | 417422.583 | 9672246.603 | 427.132 | 31 | -90 | 24.87 | 1 |
| DEX-CZ11143 | 417443.613 | 9672250.902 | 426.532 | 45 | -90 | 21 | 17 |
| DEX-CZ11144 | 417471.887 | 9672247.434 | 428.924 | 22 | -90 | 17 | 1.55 |
| DEX-CZ11145 | 417495.215 | 9672249.187 | 429.536 | 24 | -90 | 7 | 5 |
| DEX-CZ11146 | 417523.844 | 9672253.257 | 428.199 | 48 | -90 | 13 | 13 |
| DEX-CZ11147 | 417546.324 | 9672253.086 | 425.904 | 60 | -90 | 24 | 10 |
| DEX-CZ11148 | 417571.398 | 9672250.992 | 423.630 | 50 | -90 | 13 | 28 |
| DEX-CZ11149 | 417595.148 | 9672246.093 | 420.982 | 54 | -90 | 15 | 35 |
| DEX-CZ11150 | 417620.993 | 9672245.473 | 420.593 | 48 | -90 | 17 | 26 |
| DEX-CZ11151 | 417644.174 | 9672247.216 | 418.864 | 40 | -90 | 5 | 27 |
| DEX-CZ11152 | 417667.167 | 9672249.886 | 417.180 | 52 | -90 | 18 | 23 |
| DEX-CZ11153 | 417492.695 | 9672571.055 | 405.107 | 34 | -90 | 14 | 5 |
| DEX-CZ11154 | 417492.811 | 9672543.951 | 407.340 | 36 | -90 | 15 | 12 |
| DEX-CZ11155 | 416987.700 | 9672616.216 | 405.532 | 11 | -90 | 4 | 6 |
| DEX-CZ11156 | 417046.627 | 9672627.141 | 417.019 | 33 | -90 | 20 | 10 |
| DEX-CZ11157 | 417097.165 | 9672620.719 | 414.183 | 20 | -90 | 11 | 4 |
| DEX-CZ11158 | 417144.226 | 9672624.424 | 407.698 | 21 | -90 | 12 | 6 |
| DEX-CZ11159 | 417195.711 | 9672617.760 | 393.000 | 31 | -90 | 10 | 19 |
| DEX-CZ11160 | 417248.190 | 9672619.650 | 411.312 | 8 | -90 | 5 | 0 |
| DEX-CZ11161 | 416944.441 | 9672585.554 | 421.797 | 30 | -90 | 13 | 12 |
| DEX-CZ11162 | 416998.404 | 9672570.616 | 415.401 | 16 | -90 | 8 | 4 |
| DEX-CZ11163 | 417045.102 | 9672575.354 | 419.905 | 17 | -90 | 7 | 7 |
| DEX-CZ11164 | 417143.939 | 9672578.269 | 412.753 | 31 | -90 | 8 | 21 |
| DEX-CZ11165 | 417193.701 | 9672572.968 | 396.968 | 21 | -90 | 6 | 10 |
| DEX-CZ11166 | 417244.410 | 9672575.730 | 409.205 | 40 | -90 | 12 | 25 |
| DEX-CZ11167 | 416944.005 | 9672477.134 | 431.840 | 26 | -90 | 12 | 7 |
| DEX-CZ11168 | 416964.393 | 9672475.794 | 430.658 | 20 | -90 | 10 | 8 |
| DEX-CZ11169 | 416991.136 | 9672475.209 | 427.574 | 23 | -90 | 13 | 5 |
| DEX-CZ11170 | 417020.902 | 9672481.371 | 425.710 | 14 | -90 | 7 | 5 |
| DEX-CZ11171 | 416940.612 | 9672453.019 | 430.044 | 16 | -90 | 10 | 2 |
| DEX-CZ11172 | 416971.787 | 9672449.510 | 427.721 | 29 | -90 | 15 | 8 |
| DEX-CZ11173 | 416995.784 | 9672447.437 | 425.000 | 32 | -90 | 15 | 11 |
| DEX-CZ11174 | 417020.516 | 9672460.185 | 424.803 | 14 | -90 | 6 | 5.35 |
| DEX-CZ11175 | 417193.705 | 9672447.308 | 427.189 | 19 | -90 | 15 | 1 |
| DEX-CZ11177 | 416945.296 | 9672427.307 | 425.918 | 30 | -90 | 16 | 4 |
| DEX-CZ11178 | 417168.906 | 9672424.110 | 430.308 | 36 | -90 | 15 | 19 |
| DEX-CZ11180 | 417195.453 | 9672396.692 | 430.901 | 29 | -90 | 12 | 15 |
| DEX-CZ11181 | 417217.473 | 9672399.935 | 429.260 | 38 | -90 | 17 | 19 |
| DEX-CZ11182 | 417246.329 | 9672396.581 | 425.850 | 21 | -90 | 16 | 0 |
| DEX-CZ11183 | 417222.879 | 9672377.740 | 428.897 | 27 | -90 | 17 | 8 |
| DEX-CZ11185 | 417246.825 | 9672374.790 | 427.000 | 25 | -90 | 14 | 6 |
| DEX-CZ11186 | 417242.731 | 9672355.595 | 427.277 | 29 | -90 | 18 | 5 |
| DEX-CZ11187 | 416944.998 | 9672071.528 | 424.709 | 12 | -90 | 7.5 | 2.35 |
| DEX-CZ11188 | 416970.440 | 9672074.709 | 425.643 | 23 | -90 | 6 | 12 |
| DEX-CZ11189 | 416990.706 | 9672076.482 | 426.238 | 20 | -90 | 6 | 3 |
| DEX-CZ11190 | 417021.195 | 9672078.063 | 428.392 | 40 | -90 | 14 | 13 |
| DEX-CZ11191 | 417050.799 | 9672075.884 | 430.651 | 30 | -90 | 19.65 | 7 |
| DEX-CZ11192 | 417075.275 | 9672074.399 | 433.595 | 11 | -90 | 5 | 4 |
| DEX-CZ11193 | 417101.408 | 9672072.909 | 437.000 | 8 | -90 | 5 | 0.6 |
| DEX-CZ11194 | 417123.696 | 9672073.901 | 438.923 | 12 | -90 | 5 | 2.85 |
| DEX-CZ11195 | 417148.592 | 9672076.426 | 439.902 | 16 | -90 | 7 | 6 |
| DEX-CZ11196 | 417172.686 | 9672077.272 | 438.787 | 13 | -90 | 9 | 2 |
| DEX-CZ11197 | 416967.211 | 9672047.690 | 420.507 | 17 | -90 | 12 | 3.8 |
| DEX-CZ11198 | 417000.554 | 9672051.182 | 422.720 | 26 | -90 | 8 | 8.65 |
| DEX-CZ11199 | 417020.845 | 9672050.310 | 424.975 | 22 | -90 | 8 | 3 |
| DEX-CZ11200 | 417043.994 | 9672048.758 | 426.544 | 19 | -90 | 14 | 1.6 |
| DEX-CZ11201 | 417070.245 | 9672048.946 | 429.402 | 9 | -90 | 4 | 1 |
| DEX-CZ11202 | 417093.149 | 9672045.520 | 431.019 | 13 | -90 | 2 | 3 |
| DEX-CZ11203 | 417115.509 | 9672045.272 | 433.781 | 7 | -90 | 4 | 1 |
| DEX-CZ11204 | 417150.381 | 9672046.525 | 433.152 | 10 | -90 | 3 | 4 |
| DEX-CZ11205 | 418551.941 | 9673396.908 | 448.669 | 60 | -90 | 14 | 31 |
| DEX-CZ11206 | 418653.175 | 9673403.961 | 491.992 | 15 | -90 | 1 | 5 |
| DEX-CZ11207 | 418749.883 | 9673397.070 | 514.249 | 18 | -90 | 9 | 2 |
| DEX-CZ11208 | 418559.735 | 9673353.659 | 456.629 | 28 | -90 | 14 | 2 |
| DEX-CZ11209 | 418597.283 | 9673348.696 | 470.639 | 13 | -90 | 6 | 4 |
| DEX-CZ11210 | 418655.870 | 9673354.652 | 494.052 | 32 | -90 | 2 | 22 |
| DEX-CZ11211 | 418710.224 | 9673352.069 | 514.249 | 10 | -90 | 3 | 4 |
| DEX-CZ11212 | 418746.125 | 9673348.010 | 523.002 | 18 | -90 | 7 | 1 |
| DEX-CZ11213 | 418446.773 | 9673294.952 | 448.471 | 44 | -90 | 18.5 | 17 |
| DEX-CZ11214 | 418555.299 | 9673294.053 | 465.875 | 25 | -90 | 12 | 10 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3854 | 414305.862 | 9672915.708 | 277.511 | 21 | -90 | 16 | 2 |
| DEX-CZ3855 | 414416.830 | 9672870.248 | 275.768 | 23 | -90 | 7 | 14 |
| DEX-CZ3856 | 414508.760 | 9672907.929 | 270.954 | 11 | -90 | 0 | 6 |
| DEX-CZ3857 | 414615.609 | 9672858.257 | 271.824 | 10 | -90 | 0 | 6 |
| DEX-CZ3858 | 414709.836 | 9672920.603 | 297.655 | 20 | -90 | 5 | 11 |
| DEX-CZ3859 | 414808.908 | 9672978.488 | 295.241 | 16 | -90 | 4.7 | 7.9 |
| DEX-CZ3860 | 414908.035 | 9672918.444 | 296.061 | 18 | -90 | 11.24 | 4 |
| DEX-CZ3861 | 414998.058 | 9672916.698 | 294.787 | 20 | -90 | 16.25 | 2.23 |
| DEX-CZ3862 | 415051.718 | 9672893.017 | 296.833 | 25 | -90 | 20 | 3 |
| DEX-CZ3863 | 415248.445 | 9672900.913 | 344.190 | 21 | -90 | 16 | 1 |
| DEX-CZ3864 | 415313.699 | 9672913.763 | 365.569 | 26 | -90 | 16.62 | 4 |
| DEX-CZ3865 | 415403.213 | 9672926.408 | 387.616 | 11 | -90 | 8 | 1 |
| DEX-CZ3867 | 415605.052 | 9672907.031 | 298.721 | 7 | -90 | 4 | 0 |
| DEX-CZ3871 | 414100.219 | 9673021.383 | 282.799 | 19 | -90 | 11.22 | 7.25 |
| DEX-CZ3872 | 414206.177 | 9673017.488 | 287.615 | 25 | -90 | 15.75 | 4.39 |
| DEX-CZ3873 | 414311.161 | 9673008.115 | 274.623 | 26 | -90 | 9.75 | 9 |
| DEX-CZ3874 | 414420.424 | 9672963.794 | 260.657 | 13 | -90 | 2 | 6 |
| DEX-CZ3875 | 414501.051 | 9673016.953 | 263.967 | 12 | -90 | 0 | 0 |
| DEX-CZ3876 | 414594.375 | 9673025.242 | 279.570 | 16 | -90 | 6 | 6 |
| DEX-CZ3877 | 414710.061 | 9673017.708 | 301.263 | 24 | -90 | 12 | 9 |
| DEX-CZ3878 | 414811.468 | 9673022.096 | 289.820 | 8 | -90 | 2 | 4.32 |
| DEX-CZ3879 | 414910.701 | 9673021.625 | 303.673 | 25 | -90 | 7 | 14.64 |
| DEX-CZ3880 | 415003.100 | 9673014.511 | 305.905 | 25 | -90 | 13.87 | 7 |
| DEX-CZ3881 | 415125.813 | 9673074.377 | 325.589 | 38 | -90 | 27.7 | 9 |
| DEX-CZ3882 | 415214.854 | 9673017.368 | 348.032 | 25 | -90 | 21.11 | 2 |
| DEX-CZ3883 | 415310.594 | 9673026.451 | 367.427 | 35 | -90 | 11.27 | 15.24 |
| DEX-CZ3884 | 415425.964 | 9672984.692 | 395.518 | 23 | -90 | 1 | 16 |
| DEX-CZ3885 | 415509.342 | 9673015.939 | 356.942 | 22 | -90 | 11.21 | 8 |
| DEX-CZ3890 | 414112.076 | 9673110.899 | 281.466 | 35 | -90 | 4 | 22.26 |
| DEX-CZ3891 | 414252.255 | 9673093.495 | 283.772 | 23 | -90 | 7 | 9.55 |
| DEX-CZ3892 | 414307.758 | 9673115.960 | 275.000 | 12 | -90 | 4.5 | 3.5 |
| DEX-CZ3893 | 414342.780 | 9673098.778 | 263.078 | 21 | -90 | 3 | 14 |
| DEX-CZ3894 | 414493.226 | 9673122.994 | 275.966 | 9 | -90 | 4 | 1 |
| DEX-CZ3895 | 414604.798 | 9673111.882 | 306.361 | 21 | -90 | 17.77 | 3 |
| DEX-CZ3896 | 414708.121 | 9673108.356 | 325.372 | 17 | -90 | 10.37 | 5 |
| DEX-CZ3897 | 414814.392 | 9673074.257 | 300.485 | 30 | -90 | 4.2 | 26 |
| DEX-CZ3898 | 414938.537 | 9673116.379 | 302.030 | 13 | -90 | 5 | 5 |
| DEX-CZ3899 | 415004.091 | 9673117.631 | 311.902 | 24 | -90 | 6 | 16.6 |
| DEX-CZ3900 | 415104.415 | 9673118.503 | 315.517 | 22 | -90 | 10 | 9 |
| DEX-CZ3901 | 415206.378 | 9673111.348 | 327.486 | 16 | -90 | 11 | 3 |
| DEX-CZ3902 | 415306.529 | 9673115.220 | 336.148 | 22 | -90 | 14.94 | 7.22 |
| DEX-CZ3903 | 415407.575 | 9673109.033 | 345.606 | 16 | -90 | 13.63 | 1 |
| DEX-CZ3904 | 415513.723 | 9673113.445 | 357.431 | 39 | -90 | 18 | 19 |
| DEX-CZ3905 | 415611.737 | 9673113.116 | 336.683 | 18 | -90 | 8 | 8 |
| DEX-CZ3906 | 415705.301 | 9673126.099 | 321.997 | 16 | -90 | 8 | 5 |
| DEX-CZ3909 | 414204.801 | 9673155.500 | 281.517 | 25 | -90 | 17.61 | 5 |
| DEX-CZ391 | 416342.770 | 9674250.671 | 374.911 | 21 | -90 | 16.99 | 3 |
| DEX-CZ3910 | 414260.325 | 9673211.685 | 259.590 | 4 | -90 | 1 | 0 |
| DEX-CZ3911 | 414318.975 | 9673234.865 | 251.471 | 10 | -90 | 3 | 2 |
| DEX-CZ3912 | 414432.315 | 9673211.082 | 274.082 | 22 | -90 | 8 | 8 |
| DEX-CZ3913 | 414510.604 | 9673209.703 | 288.472 | 23 | -90 | 7 | 12 |
| DEX-CZ3914 | 414605.484 | 9673196.804 | 306.825 | 11 | -90 | 6 | 3 |
| DEX-CZ3915 | 414704.919 | 9673222.482 | 316.676 | 24 | -90 | 18 | 4 |
| DEX-CZ3916 | 414805.187 | 9673216.183 | 308.780 | 36 | -90 | 16 | 18 |
| DEX-CZ3918 | 415005.966 | 9673216.939 | 298.307 | 25 | -90 | 15.66 | 6 |
| DEX-CZ3919 | 415108.200 | 9673214.541 | 305.374 | 24 | -90 | 19.83 | 2 |
| DEX-CZ3920 | 415201.995 | 9673217.102 | 313.753 | 31 | -90 | 22.51 | 8 |
| DEX-CZ3921 | 415303.409 | 9673162.214 | 319.991 | 35 | -90 | 27.01 | 10.6 |
| DEX-CZ3922 | 415402.370 | 9673221.625 | 336.129 | 31 | -90 | 8 | 18 |
| DEX-CZ3923 | 415515.054 | 9673218.547 | 377.551 | 38 | -90 | 26.55 | 10 |
| DEX-CZ3924 | 415610.978 | 9673219.379 | 379.585 | 16 | -90 | 10 | 3 |
| DEX-CZ3925 | 415701.933 | 9673221.793 | 363.961 | 37 | -90 | 15.06 | 16 |
| DEX-CZ3926 | 415801.258 | 9673214.212 | 339.728 | 11 | -90 | 4 | 4 |
| DEX-CZ3928 | 414081.618 | 9673315.687 | 285.300 | 19 | -90 | 4 | 8 |
| DEX-CZ3929 | 414197.141 | 9673315.685 | 265.142 | 10 | -90 | 4.7 | 2.55 |
| DEX-CZ3930 | 414313.212 | 9673313.200 | 263.489 | 34 | -90 | 7 | 18 |
| DEX-CZ3931 | 414401.657 | 9673321.086 | 276.699 | 31 | -90 | 16.18 | 4.25 |
| DEX-CZ3932 | 414509.305 | 9673309.430 | 274.379 | 21 | -90 | 2 | 14 |
| DEX-CZ3933 | 414604.712 | 9673315.315 | 296.336 | 13 | -90 | 7 | 3 |
| DEX-CZ3935 | 414108.033 | 9673423.601 | 295.491 | 28 | -90 | 11.93 | 10.55 |
| DEX-CZ3936 | 414215.176 | 9673419.284 | 277.827 | 23 | -90 | 7.42 | 12 |
| DEX-CZ3937 | 414313.394 | 9673413.006 | 274.799 | 27 | -90 | 4 | 20.15 |
| DEX-CZ3938 | 414408.198 | 9673420.721 | 290.859 | 23 | -90 | 11 | 5 |
| DEX-CZ3939 | 414505.374 | 9673400.852 | 276.406 | 5 | -90 | 1.67 | 0.33 |
| DEX-CZ3940 | 414600.563 | 9673419.414 | 287.743 | 40 | -90 | 5 | 7 |
| DEX-CZ3941 | 414014.982 | 9673519.371 | 308.243 | 8 | -90 | 4 | 2 |
| DEX-CZ3942 | 414118.070 | 9673530.558 | 312.126 | 14 | -90 | 4.18 | 3 |
| DEX-CZ3943 | 414204.299 | 9673515.670 | 304.692 | 23 | -90 | 8 | 9.55 |
| DEX-CZ3944 | 414310.558 | 9673536.156 | 285.211 | 12 | -90 | 2 | 4 |
| DEX-CZ3945 | 414432.591 | 9673502.472 | 298.737 | 30 | -90 | 26.22 | 2.2 |
| DEX-CZ3946 | 414507.518 | 9673513.519 | 303.000 | 36 | -90 | 19 | 14 |
| DEX-CZ3947 | 414007.286 | 9673614.667 | 314.920 | 27 | -90 | 16.84 | 9 |
| DEX-CZ3948 | 414109.143 | 9673608.091 | 321.912 | 20 | -90 | 9.3 | 8.33 |
| DEX-CZ3949 | 414215.821 | 9673652.586 | 309.848 | 36 | -90 | 16.1 | 17.4 |
| DEX-CZ3950 | 414304.951 | 9673610.056 | 291.373 | 10 | -90 | 5 | 2.75 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ11215 | 418644.666 | 9673290.619 | 484.515 | 38 | -90 | 15 | 15 |
| DEX-CZ11216 | 418745.084 | 9673296.423 | 519.126 | 20 | -90 | 4 | 6 |
| DEX-CZ11217 | 418398.834 | 9673252.348 | 446.140 | 24 | -90 | 11 | 8 |
| DEX-CZ11218 | 418447.390 | 9673250.742 | 454.451 | 26 | -90 | 8 | 13.28 |
| DEX-CZ11219 | 418493.960 | 9673256.591 | 459.705 | 49 | -90 | 19 | 22 |
| DEX-CZ11220 | 418551.137 | 9673251.538 | 468.749 | 47 | -90 | 11 | 29 |
| DEX-CZ11221 | 418595.655 | 9673255.303 | 479.230 | 43 | -90 | 16 | 18.44 |
| DEX-CZ11222 | 418641.754 | 9673251.620 | 486.857 | 16 | -90 | 9 | 5 |
| DEX-CZ11223 | 418699.754 | 9673247.300 | 496.085 | 42 | -90 | 18 | 7 |
| DEX-CZ11224 | 418750.536 | 9673249.579 | 513.964 | 32 | -90 | 1 | 19 |
| DEX-CZ11225 | 418646.222 | 9673222.144 | 487.803 | 34 | -90 | 18.27 | 14 |
| DEX-CZ11226 | 418730.235 | 9673209.272 | 503.121 | 21 | -90 | 12 | 4 |
| DEX-CZ11227 | 418738.406 | 9673161.211 | 497.997 | 24 | -90 | 15 | 2 |
| DEX-CZ11228 | 418550.667 | 9673420.624 | 446.153 | 41 | -90 | 20 | 6 |
| DEX-CZ11229 | 418577.339 | 9673419.220 | 452.891 | 38 | -90 | 20 | 9 |
| DEX-CZ11230 | 418526.210 | 9673400.903 | 442.045 | 57 | -90 | 17 | 12 |
| DEX-CZ11231 | 418576.457 | 9673394.368 | 456.817 | 20 | -90 | 3 | 5 |
| DEX-CZ11232 | 418476.543 | 9673376.264 | 439.232 | 30 | -90 | 21 | 2 |
| DEX-CZ11233 | 418499.507 | 9673377.499 | 442.049 | 35 | -90 | 18 | 7 |
| DEX-CZ11234 | 418528.816 | 9673377.123 | 446.235 | 43 | -90 | 16 | 20 |
| DEX-CZ11235 | 418553.665 | 9673374.402 | 452.934 | 35 | -90 | 14 | 14 |
| DEX-CZ11236 | 418577.118 | 9673373.442 | 460.074 | 25 | -90 | 10 | 5 |
| DEX-CZ11237 | 418603.413 | 9673372.915 | 470.229 | 21 | -90 | 2 | 5 |
| DEX-CZ11238 | 418629.328 | 9673375.079 | 481.926 | 21 | -90 | 2 | 4 |
| DEX-CZ11239 | 418653.334 | 9673375.234 | 494.663 | 24 | -90 | 2 | 10 |
| DEX-CZ11240 | 418674.399 | 9673368.951 | 504.503 | 19 | -90 | 4 | 0 |
| DEX-CZ11241 | 418475.395 | 9673351.360 | 443.479 | 26 | -90 | 6 | 16 |
| DEX-CZ11242 | 418527.636 | 9673347.997 | 450.455 | 36 | -90 | 22 | 3 |
| DEX-CZ11243 | 418576.050 | 9673349.786 | 462.727 | 24 | -90 | 5 | 4 |
| DEX-CZ11244 | 418625.418 | 9673346.742 | 480.948 | 22 | -90 | 7.6 | 5 |
| DEX-CZ11245 | 418673.290 | 9673346.154 | 501.348 | 14 | -90 | 2 | 6 |
| DEX-CZ11246 | 418424.315 | 9673322.710 | 443.566 | 22 | -90 | 14 | 5.26 |
| DEX-CZ11247 | 418448.530 | 9673322.419 | 445.541 | 28 | -90 | 13 | 6 |
| DEX-CZ11248 | 418528.024 | 9673323.953 | 455.339 | 30 | -90 | 16 | 9 |
| DEX-CZ11249 | 418551.772 | 9673327.381 | 458.751 | 31 | -90 | 15 | 8 |
| DEX-CZ11250 | 418575.228 | 9673326.233 | 466.192 | 26 | -90 | 4 | 7 |
| DEX-CZ11251 | 418629.423 | 9673329.326 | 482.864 | 13 | -90 | 6 | 4 |
| DEX-CZ11252 | 418648.115 | 9673326.228 | 489.390 | 23 | -90 | 10 | 12 |
| DEX-CZ11253 | 418675.347 | 9673320.738 | 495.234 | 21 | -90 | 13 | 5 |
| DEX-CZ11254 | 418423.426 | 9673301.573 | 444.975 | 26 | -90 | 16 | 1 |
| DEX-CZ11255 | 418481.147 | 9673301.809 | 452.563 | 37 | -90 | 13.65 | 21.06 |
| DEX-CZ11256 | 418525.057 | 9673302.015 | 458.536 | 30 | -90 | 12 | 6 |
| DEX-CZ11257 | 418577.427 | 9673302.909 | 468.921 | 32 | -90 | 3 | 20 |
| DEX-CZ11258 | 418627.666 | 9673305.156 | 483.027 | 21 | -90 | 11 | 6 |
| DEX-CZ11259 | 418671.437 | 9673302.001 | 492.435 | 31 | -90 | 18 | 11 |
| DEX-CZ11260 | 418377.700 | 9673267.535 | 441.489 | 31 | -90 | 11 | 14 |
| DEX-CZ11261 | 418399.975 | 9673273.795 | 445.154 | 23 | -90 | 6 | 4 |
| DEX-CZ11262 | 418422.019 | 9673276.978 | 448.170 | 29 | -90 | 14.6 | 7.56 |
| DEX-CZ11263 | 418477.308 | 9673275.375 | 454.887 | 44 | -90 | 13 | 24.85 |
| DEX-CZ11264 | 418504.973 | 9673278.007 | 458.414 | 44 | -90 | 17 | 19.62 |
| DEX-CZ11265 | 418526.706 | 9673272.480 | 463.318 | 44 | -90 | 15.25 | 23 |
| DEX-CZ11266 | 418556.371 | 9673270.489 | 469.619 | 31 | -90 | 8 | 9 |
| DEX-CZ11267 | 418579.737 | 9673272.789 | 474.801 | 46 | -90 | 2 | 14 |
| DEX-CZ11268 | 418610.232 | 9673272.256 | 481.074 | 20 | -90 | 10 | 8 |
| DEX-CZ11269 | 418631.726 | 9673274.498 | 483.660 | 27 | -90 | 18 | 3 |
| DEX-CZ11270 | 418653.023 | 9673272.565 | 486.038 | 30 | -90 | 20.26 | 8 |
| DEX-CZ11271 | 418682.322 | 9673273.222 | 491.967 | 46 | -90 | 19 | 9 |
| DEX-CZ11272 | 418373.460 | 9673246.389 | 440.721 | 32 | -90 | 5 | 22.85 |
| DEX-CZ11273 | 418477.730 | 9673250.621 | 457.503 | 44 | -90 | 13 | 27.55 |
| DEX-CZ11274 | 418524.174 | 9673246.969 | 465.473 | 44 | -90 | 24 | 11 |
| DEX-CZ11275 | 418580.920 | 9673249.693 | 475.444 | 41 | -90 | 8 | 27.85 |
| DEX-CZ11276 | 418630.311 | 9673249.017 | 485.151 | 26 | -90 | 12 | 13 |
| DEX-CZ11277 | 418677.676 | 9673245.182 | 491.770 | 31 | -90 | 18 | 8.89 |
| DEX-CZ11278 | 418717.726 | 9673246.904 | 500.788 | 28 | -90 | 13 | 5 |
| DEX-CZ11279 | 418702.503 | 9673217.300 | 496.177 | 35 | -90 | 21 | 4 |
| DEX-CZ11280 | 418701.030 | 9673197.333 | 496.218 | 35 | -90 | 20 | 4 |
| DEX-CZ11281 | 418722.368 | 9673198.175 | 501.102 | 40 | -90 | 17 | 10.62 |
| DEX-CZ11282 | 418703.228 | 9673175.332 | 493.996 | 32 | -90 | 17 | 5 |
| DEX-CZ11283 | 418726.424 | 9673177.442 | 498.211 | 36 | -90 | 20 | 5 |
| DEX-CZ11284 | 418701.331 | 9673155.192 | 491.486 | 21 | -90 | 9 | 4 |
| DEX-CZ2529 | 416014.720 | 9671995.132 | 379.483 | 23 | -90 | 9.19 | 8.22 |
| DEX-CZ2530 | 416104.738 | 9671992.761 | 398.231 | 52 | -90 | 26.99 | 24.56 |
| DEX-CZ2531 | 416208.240 | 9671994.424 | 404.486 | 26 | -90 | 22.73 | 3 |
| DEX-CZ2532 | 416284.343 | 9671986.215 | 388.649 | 28 | -90 | 21.91 | 7 |
| DEX-CZ2533 | 416410.079 | 9672006.165 | 384.593 | 32 | -90 | 9.52 | 12.27 |
| DEX-CZ2534 | 416507.663 | 9672000.754 | 411.849 | 25 | -90 | 17.1 | 4 |
| DEX-CZ2540 | 415999.734 | 9672107.297 | 389.179 | 39 | -90 | 24.4 | 6 |
| DEX-CZ2541 | 416105.911 | 9672096.923 | 400.136 | 38 | -90 | 23.29 | 8 |
| DEX-CZ2542 | 416196.524 | 9672097.333 | 418.469 | 40 | -90 | 12 | 22 |
| DEX-CZ2543 | 416306.589 | 9672109.301 | 417.806 | 29 | -90 | 24.32 | 3 |
| DEX-CZ2544 | 416407.762 | 9672111.322 | 423.000 | 8 | -90 | 4.7 | 0.3 |
| DEX-CZ2545 | 416502.896 | 9672106.156 | 422.591 | 10 | -90 | 6 | 1 |
| DEX-CZ2546 | 416573.699 | 9672100.659 | 416.650 | 53 | -90 | 26.06 | 28.6 |
| DEX-CZ2555 | 415902.375 | 9672193.093 | 371.806 | 45 | -90 | 8 | 34 |
| DEX-CZ2556 | 416002.627 | 9672193.963 | 397.030 | 23 | -90 | 18.23 | 3.75 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3951 | 414416.324 | 9673604.233 | 301.509 | 11 | -90 | 2 | 5 |
| DEX-CZ3952 | 414010.733 | 9673708.203 | 295.341 | 19 | -90 | 4 | 10.27 |
| DEX-CZ3953 | 414100.290 | 9673703.114 | 304.241 | 21 | -90 | 10.56 | 8 |
| DEX-CZ3954 | 414205.732 | 9673706.856 | 309.721 | 29 | -90 | 18.06 | 8 |
| DEX-CZ3955 | 414310.864 | 9673715.612 | 310.490 | 26 | -90 | 7.6 | 4.24 |
| DEX-CZ3956 | 414403.664 | 9673724.513 | 332.897 | 12 | -90 | 5 | 4 |
| DEX-CZ3960 | 414278.948 | 9673790.938 | 308.639 | 14 | -90 | 5.5 | 4.5 |
| DEX-CZ3972 | 415176.499 | 9673925.818 | 339.466 | 39 | -90 | 25.96 | 11.2 |
| DEX-CZ3973 | 415198.784 | 9673923.053 | 339.894 | 26 | -90 | 21.23 | 3 |
| DEX-CZ3974 | 415224.134 | 9673923.325 | 339.559 | 29 | -90 | 25.13 | 2.5 |
| DEX-CZ3975 | 415328.630 | 9673926.313 | 350.135 | 26 | -90 | 24.14 | 1 |
| DEX-CZ3976 | 415328.286 | 9673897.740 | 345.276 | 34 | -90 | 23 | 1 |
| DEX-CZ3977 | 415326.227 | 9673873.757 | 342.289 | 33 | -90 | 19.98 | 7.44 |
| DEX-CZ3978 | 415323.971 | 9673851.497 | 339.850 | 25 | -90 | 17.86 | 1.62 |
| DEX-CZ3979 | 415327.446 | 9673824.902 | 341.159 | 18 | -90 | 13 | 3 |
| DEX-CZ3980 | 415329.067 | 9673775.971 | 333.105 | 36 | -90 | 10.78 | 21 |
| DEX-CZ3981 | 415325.000 | 9673749.429 | 329.526 | 38 | -90 | 16.74 | 20 |
| DEX-CZ3982 | 415326.946 | 9673727.286 | 329.248 | 20 | -90 | 10.76 | 9 |
| DEX-CZ3983 | 415351.554 | 9673725.151 | 331.204 | 24 | -90 | 16.02 | 7 |
| DEX-CZ3984 | 415376.434 | 9673723.359 | 331.807 | 20 | -90 | 14 | 5 |
| DEX-CZ3985 | 415399.147 | 9673724.387 | 333.208 | 27 | -90 | 18.31 | 7 |
| DEX-CZ3986 | 415424.916 | 9673726.637 | 333.325 | 28 | -90 | 23.55 | 2 |
| DEX-CZ3987 | 415450.254 | 9673725.129 | 332.399 | 22 | -90 | 16.97 | 4 |
| DEX-CZ3988 | 415477.008 | 9673727.191 | 333.055 | 14 | -90 | 6.17 | 5 |
| DEX-CZ3989 | 415499.961 | 9673729.556 | 332.481 | 15 | -90 | 9 | 4 |
| DEX-CZ3990 | 415525.138 | 9673729.066 | 331.624 | 24 | -90 | 20.45 | 4 |
| DEX-CZ3991 | 415573.923 | 9673725.331 | 334.404 | 27 | -90 | 17.66 | 5 |
| DEX-CZ3993 | 415575.591 | 9673700.226 | 335.723 | 23 | -90 | 17.57 | 1 |
| DEX-CZ3994 | 415622.183 | 9673699.358 | 350.491 | 37 | -90 | 3 | 29 |
| DEX-CZ3995 | 415524.404 | 9673676.365 | 331.812 | 32 | -90 | 15 | 14.5 |
| DEX-CZ3996 | 415549.306 | 9673676.362 | 332.474 | 22 | -90 | 17.31 | 2.5 |
| DEX-CZ3997 | 415576.538 | 9673676.166 | 337.513 | 34 | -90 | 11 | 14 |
| DEX-CZ3998 | 415598.434 | 9673674.172 | 346.053 | 32 | -90 | 2.35 | 3.4 |
| DEX-CZ3999 | 415623.398 | 9673676.100 | 356.369 | 12 | -90 | 6 | 1 |
| DEX-CZ4000 | 415650.796 | 9673674.941 | 362.933 | 11 | -90 | 2 | 5 |
| DEX-CZ4001 | 415673.235 | 9673675.547 | 363.918 | 15 | -90 | 12.75 | 0 |
| DEX-CZ4002 | 415700.682 | 9673675.538 | 363.024 | 23 | -90 | 18.73 | 3.22 |
| DEX-CZ4003 | 415721.568 | 9673684.988 | 364.603 | 24 | -90 | 11.75 | 6 |
| DEX-CZ4004 | 415520.056 | 9673653.485 | 330.903 | 22 | -90 | 14.75 | 5 |
| DEX-CZ4005 | 415576.343 | 9673654.012 | 341.569 | 16 | -90 | 2 | 6.18 |
| DEX-CZ4006 | 415624.290 | 9673649.884 | 361.095 | 11 | -90 | 4 | 3 |
| DEX-CZ4007 | 415675.265 | 9673649.774 | 361.632 | 30 | -90 | 8.17 | 16 |
| DEX-CZ4008 | 415725.293 | 9673650.393 | 355.867 | 25 | -90 | 4 | 18 |
| DEX-CZ4009 | 415475.038 | 9673625.283 | 329.353 | 30 | -90 | 25 | 3 |
| DEX-CZ4010 | 415500.041 | 9673626.543 | 330.000 | 35 | -90 | 27.1 | 9.63 |
| DEX-CZ4011 | 415525.858 | 9673623.855 | 330.608 | 40 | -90 | 21.13 | 14.4 |
| DEX-CZ4012 | 415551.462 | 9673627.837 | 336.043 | 35 | -90 | 7.25 | 19 |
| DEX-CZ4013 | 415574.866 | 9673628.302 | 344.939 | 25 | -90 | 6.35 | 12.91 |
| DEX-CZ4014 | 415599.820 | 9673627.402 | 353.739 | 12 | -90 | 2.49 | 3.51 |
| DEX-CZ4015 | 415625.031 | 9673624.712 | 358.353 | 18 | -90 | 7.28 | 7 |
| DEX-CZ4016 | 415649.323 | 9673624.372 | 359.140 | 13 | -90 | 6.34 | 3 |
| DEX-CZ4017 | 415675.668 | 9673625.458 | 358.193 | 18 | -90 | 4.3 | 9.7 |
| DEX-CZ4018 | 415725.372 | 9673624.302 | 347.733 | 14 | -90 | 9.74 | 3 |
| DEX-CZ4019 | 415476.071 | 9673600.168 | 329.010 | 30 | -90 | 25.75 | 5 |
| DEX-CZ4020 | 415524.627 | 9673600.927 | 330.936 | 43 | -90 | 16.29 | 24.81 |
| DEX-CZ4021 | 415576.612 | 9673599.940 | 346.013 | 13 | -90 | 9.28 | 1 |
| DEX-CZ4022 | 415624.303 | 9673598.830 | 353.952 | 13 | -90 | 7.25 | 3.4 |
| DEX-CZ4023 | 415674.557 | 9673600.947 | 351.024 | 14 | -90 | 8.21 | 3 |
| DEX-CZ4024 | 415724.749 | 9673599.516 | 343.660 | 14 | -90 | 4 | 8 |
| DEX-CZ4025 | 415475.902 | 9673577.783 | 328.483 | 34 | -90 | 28.7 | 6.27 |
| DEX-CZ4026 | 415497.649 | 9673575.754 | 329.000 | 37 | -90 | 23.76 | 14.4 |
| DEX-CZ4027 | 415523.252 | 9673579.540 | 331.239 | 15 | -90 | 12 | 0 |
| DEX-CZ4028 | 415550.501 | 9673574.297 | 339.841 | 26 | -90 | 12.22 | 8.25 |
| DEX-CZ4029 | 415576.024 | 9673577.808 | 344.799 | 17 | -90 | 11.6 | 3 |
| DEX-CZ4030 | 415598.385 | 9673577.873 | 348.758 | 30 | -90 | 15 | 12 |
| DEX-CZ4031 | 415625.594 | 9673575.896 | 349.964 | 19 | -90 | 8.79 | 7.16 |
| DEX-CZ4032 | 415649.929 | 9673575.810 | 347.631 | 22 | -90 | 13.34 | 7 |
| DEX-CZ4033 | 415673.458 | 9673578.952 | 346.075 | 17 | -90 | 13 | 2 |
| DEX-CZ4034 | 415699.248 | 9673574.586 | 343.341 | 24 | -90 | 14 | 8 |
| DEX-CZ4035 | 415728.689 | 9673576.610 | 339.467 | 21 | -90 | 9 | 10.81 |
| DEX-CZ4036 | 415524.666 | 9673549.297 | 335.282 | 22 | -90 | 12.7 | 5.3 |
| DEX-CZ4037 | 415574.546 | 9673549.910 | 344.255 | 17 | -90 | 9.37 | 5 |
| DEX-CZ4038 | 415625.676 | 9673550.122 | 344.390 | 29 | -90 | 16.88 | 11.94 |
| DEX-CZ4039 | 415523.903 | 9673526.956 | 335.715 | 23 | -90 | 18.25 | 3.4 |
| DEX-CZ4040 | 415549.775 | 9673525.859 | 340.102 | 18 | -90 | 10.45 | 6 |
| DEX-CZ4041 | 415574.992 | 9673524.600 | 342.108 | 21 | -90 | 13 | 6 |
| DEX-CZ4042 | 415600.650 | 9673524.355 | 339.687 | 30 | -90 | 12.3 | 13.7 |
| DEX-CZ4043 | 415625.288 | 9673525.358 | 338.636 | 24 | -90 | 17.08 | 6.74 |
| DEX-CZ4044 | 415650.375 | 9673526.340 | 336.457 | 26 | -90 | 21.66 | 3 |
| DEX-CZ4045 | 415676.584 | 9673524.720 | 336.298 | 30 | -90 | 23 | 3 |
| DEX-CZ4046 | 415700.536 | 9673524.996 | 337.588 | 31 | -90 | 32.13 | 0.5 |
| DEX-CZ4047 | 415627.385 | 9673501.754 | 334.060 | 24 | -90 | 17.23 | 4 |
| DEX-CZ4048 | 415675.194 | 9673500.587 | 336.457 | 51 | -90 | 28.83 | 23 |
| DEX-CZ4049 | 415626.045 | 9673476.090 | 334.445 | 38 | -90 | 30.69 | 8 |
| DEX-CZ4050 | 415647.979 | 9673475.873 | 335.000 | 23 | -90 | 22.16 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2557 | 416097.374 | 9672199.109 | 414.116 | 35 | -90 | 15 | 6 |
| DEX-CZ2558 | 416204.911 | 9672199.211 | 425.373 | 23 | -90 | 13 | 4 |
| DEX-CZ2559 | 416294.406 | 9672193.175 | 417.304 | 35 | -90 | 13.62 | 10.79 |
| DEX-CZ2560 | 416415.356 | 9672198.448 | 419.881 | 33 | -90 | 23.17 | 7.25 |
| DEX-CZ2561 | 416504.594 | 9672202.609 | 413.985 | 30 | -90 | 10 | 10 |
| DEX-CZ2562 | 416596.810 | 9672206.828 | 407.266 | 26 | -90 | 11.46 | 7.72 |
| DEX-CZ2570 | 417394.104 | 9672261.913 | 429.376 | 28 | -90 | 15.48 | 11.35 |
| DEX-CZ2571 | 417504.410 | 9672198.558 | 418.665 | 36 | -90 | 21.41 | 8.67 |
| DEX-CZ2572 | 417601.477 | 9672216.520 | 412.642 | 28 | -90 | 22.98 | 3 |
| DEX-CZ2574 | 417800.966 | 9672199.751 | 413.436 | 22 | -90 | 15.85 | 3.33 |
| DEX-CZ2575 | 417893.167 | 9672207.805 | 410.292 | 28 | -90 | 4 | 15 |
| DEX-CZ2577 | 415915.020 | 9672305.419 | 366.401 | 12 | -90 | 7 | 3 |
| DEX-CZ2578 | 416004.825 | 9672297.117 | 355.755 | 18 | -90 | 7 | 3 |
| DEX-CZ2579 | 416100.367 | 9672303.034 | 366.383 | 11 | -90 | 2 | 1 |
| DEX-CZ2580 | 416200.987 | 9672294.871 | 386.498 | 21 | -90 | 2 | 2 |
| DEX-CZ2581 | 416304.119 | 9672302.452 | 377.597 | 20 | -90 | 12 | 4.39 |
| DEX-CZ2582 | 416398.897 | 9672304.640 | 393.331 | 41 | -90 | 25.84 | 13.35 |
| DEX-CZ2583 | 416501.218 | 9672305.882 | 394.371 | 24 | -90 | 15.31 | 7 |
| DEX-CZ2584 | 416596.884 | 9672296.841 | 390.342 | 26 | -90 | 16.9 | 2 |
| DEX-CZ2585 | 416643.306 | 9672290.547 | 383.166 | 32 | -90 | 8.21 | 18 |
| DEX-CZ2591 | 417307.964 | 9672328.664 | 433.340 | 19 | -90 | 5.25 | 7 |
| DEX-CZ2592 | 417395.935 | 9672303.582 | 434.246 | 40 | -90 | 15.79 | 10.4 |
| DEX-CZ2593 | 417495.048 | 9672297.488 | 434.079 | 19 | -90 | 5.19 | 8.23 |
| DEX-CZ2594 | 417599.578 | 9672300.815 | 428.451 | 41 | -90 | 23.17 | 17.84 |
| DEX-CZ2595 | 417700.744 | 9672306.477 | 426.000 | 36 | -90 | 11.43 | 23.19 |
| DEX-CZ2596 | 417801.233 | 9672309.290 | 428.148 | 42 | -90 | 26.99 | 14 |
| DEX-CZ2597 | 417900.540 | 9672302.598 | 425.501 | 31 | -90 | 12.61 | 11.21 |
| DEX-CZ2599 | 415893.930 | 9672420.726 | 320.089 | 5 | -90 | 2 | 0 |
| DEX-CZ2600 | 415997.867 | 9672384.444 | 331.931 | 24 | -90 | 12 | 4 |
| DEX-CZ2601 | 416108.381 | 9672407.896 | 326.465 | 20 | -90 | 5 | 8.37 |
| DEX-CZ2602 | 416205.179 | 9672386.187 | 341.514 | 19 | -90 | 7 | 5.38 |
| DEX-CZ2604 | 416387.647 | 9672404.987 | 365.619 | 8 | -90 | 1 | 2 |
| DEX-CZ2605 | 416490.755 | 9672396.700 | 370.365 | 22 | -90 | 11 | 9 |
| DEX-CZ2606 | 416609.792 | 9672399.540 | 376.640 | 23 | -90 | 11.57 | 9.26 |
| DEX-CZ2607 | 416704.144 | 9672400.862 | 388.255 | 36 | -90 | 14.43 | 16.48 |
| DEX-CZ2608 | 416801.174 | 9672400.590 | 396.202 | 29 | -90 | 7.23 | 11 |
| DEX-CZ2609 | 416909.779 | 9672419.601 | 422.345 | 19 | -90 | 13.69 | 4 |
| DEX-CZ2610 | 417004.419 | 9672452.194 | 424.836 | 37 | -90 | 16.36 | 20.68 |
| DEX-CZ2612 | 417194.624 | 9672415.072 | 430.452 | 32 | -90 | 18.12 | 12.54 |
| DEX-CZ2613 | 417299.638 | 9672389.799 | 432.990 | 30 | -90 | 13.84 | 12 |
| DEX-CZ2614 | 417403.326 | 9672404.120 | 434.394 | 28 | -90 | 12.61 | 13.23 |
| DEX-CZ2615 | 417495.003 | 9672393.000 | 428.763 | 36 | -90 | 20.47 | 12.69 |
| DEX-CZ2616 | 417607.873 | 9672399.670 | 416.675 | 24 | -90 | 14.69 | 4 |
| DEX-CZ2617 | 417700.399 | 9672400.730 | 420.112 | 31 | -90 | 19.37 | 4.4 |
| DEX-CZ2618 | 417801.053 | 9672397.376 | 418.713 | 35 | -90 | 19.62 | 9 |
| DEX-CZ2619 | 417901.801 | 9672403.662 | 408.917 | 31 | -90 | 16.64 | 11 |
| DEX-CZ2622 | 416187.558 | 9672509.956 | 366.907 | 21 | -90 | 2 | 16 |
| DEX-CZ2623 | 416299.151 | 9672502.800 | 385.185 | 26 | -90 | 1.52 | 12.48 |
| DEX-CZ2624 | 416396.331 | 9672504.824 | 381.952 | 32 | -90 | 11.28 | 16 |
| DEX-CZ2625 | 416502.307 | 9672505.156 | 394.492 | 15 | -90 | 6 | 4 |
| DEX-CZ2626 | 416602.509 | 9672500.074 | 404.422 | 43 | -90 | 21.67 | 22 |
| DEX-CZ2627 | 416700.531 | 9672506.152 | 415.728 | 19 | -90 | 8.26 | 9 |
| DEX-CZ2628 | 416794.958 | 9672507.369 | 425.211 | 44 | -90 | 37.26 | 8.4 |
| DEX-CZ2629 | 416889.602 | 9672501.497 | 432.000 | 15 | -90 | 7.57 | 3 |
| DEX-CZ2630 | 417010.662 | 9672497.820 | 425.965 | 25 | -90 | 13.44 | 4.52 |
| DEX-CZ2631 | 417099.106 | 9672499.424 | 415.928 | 32 | -90 | 21.97 | 7.15 |
| DEX-CZ2632 | 417195.063 | 9672499.731 | 413.458 | 23 | -90 | 10.37 | 4.2 |
| DEX-CZ2633 | 417299.788 | 9672491.646 | 424.104 | 26 | -90 | 10.88 | 15.31 |
| DEX-CZ2634 | 417398.296 | 9672496.518 | 432.787 | 26 | -90 | 6.32 | 17 |
| DEX-CZ2635 | 417496.472 | 9672503.899 | 415.239 | 20 | -90 | 6.31 | 11 |
| DEX-CZ2636 | 417598.440 | 9672502.624 | 401.296 | 27 | -90 | 8 | 17 |
| DEX-CZ2637 | 417703.775 | 9672500.104 | 415.846 | 16 | -90 | 7 | 7 |
| DEX-CZ2638 | 417797.770 | 9672495.521 | 411.721 | 31 | -90 | 19.1 | 10 |
| DEX-CZ2639 | 417899.824 | 9672508.491 | 397.972 | 28 | -90 | 18.42 | 8 |
| DEX-CZ2640 | 417992.687 | 9672500.299 | 394.320 | 27 | -90 | 17 | 7 |
| DEX-CZ2641 | 418501.652 | 9672501.808 | 356.196 | 18 | -90 | 1 | 8 |
| DEX-CZ2642 | 418597.386 | 9672494.608 | 353.240 | 26 | -90 | 2 | 16 |
| DEX-CZ2644 | 415898.699 | 9672596.388 | 352.551 | 15 | -90 | 4 | 5 |
| DEX-CZ2645 | 415995.807 | 9672609.773 | 374.787 | 12 | -90 | 6.54 | 3.46 |
| DEX-CZ2646 | 416101.055 | 9672596.340 | 374.170 | 20 | -90 | 13.55 | 1 |
| DEX-CZ2647 | 416185.818 | 9672593.459 | 376.085 | 22 | -90 | 18 | 1.8 |
| DEX-CZ2648 | 416304.608 | 9672597.357 | 388.261 | 45 | -90 | 22.41 | 3 |
| DEX-CZ2649 | 416400.721 | 9672597.453 | 393.485 | 48 | -90 | 28.36 | 8 |
| DEX-CZ2650 | 416498.125 | 9672602.146 | 398.463 | 32 | -90 | 22.94 | 5.67 |
| DEX-CZ2651 | 416601.635 | 9672596.196 | 408.226 | 39 | -90 | 10 | 23 |
| DEX-CZ2652 | 416697.960 | 9672594.920 | 419.319 | 40 | -90 | 18.28 | 14.71 |
| DEX-CZ2653 | 416796.848 | 9672602.739 | 426.993 | 34 | -90 | 27.71 | 6 |
| DEX-CZ2654 | 416900.844 | 9672601.724 | 424.557 | 27 | -90 | 14.71 | 7 |
| DEX-CZ2655 | 417002.043 | 9672602.805 | 413.341 | 35 | -90 | 17.75 | 4 |
| DEX-CZ2656 | 417097.215 | 9672600.686 | 416.952 | 37 | -90 | 12.74 | 11 |
| DEX-CZ2657 | 417203.210 | 9672602.568 | 394.200 | 32 | -90 | 7.8 | 21.6 |
| DEX-CZ2658 | 417298.852 | 9672595.502 | 417.569 | 58 | -90 | 7 | 43.92 |
| DEX-CZ2659 | 417402.269 | 9672598.404 | 416.818 | 46 | -90 | 11.89 | 25.87 |
| DEX-CZ2660 | 417499.845 | 9672596.211 | 405.005 | 40 | -90 | 22.96 | 14 |
| DEX-CZ2661 | 417596.810 | 9672603.429 | 390.382 | 40 | -90 | 10.4 | 21 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4051 | 415674.828 | 9673475.949 | 336.561 | 41 | -90 | 23.83 | 18 |
| DEX-CZ4052 | 415700.091 | 9673474.904 | 339.351 | 32 | -90 | 18.51 | 15 |
| DEX-CZ4054 | 415051.402 | 9674304.869 | 425.836 | 12 | -90 | 4 | 2 |
| DEX-CZ4055 | 415072.782 | 9674302.878 | 432.358 | 34 | -90 | 12.35 | 19.65 |
| DEX-CZ4056 | 415073.820 | 9674276.252 | 425.343 | 8 | -90 | 2 | 4 |
| DEX-CZ4057 | 415049.505 | 9674278.255 | 416.785 | 20 | -90 | 10 | 1 |
| DEX-CZ4058 | 415024.354 | 9674278.761 | 404.928 | 13 | -90 | 4 | 6 |
| DEX-CZ4059 | 415021.436 | 9674254.431 | 396.311 | 17 | -90 | 7.27 | 8 |
| DEX-CZ4060 | 415025.695 | 9674223.541 | 394.963 | 36 | -90 | 19.65 | 15 |
| DEX-CZ4061 | 415023.916 | 9674195.415 | 389.903 | 36 | -90 | 10.96 | 22.29 |
| DEX-CZ4062 | 415022.308 | 9674176.837 | 385.547 | 24 | -90 | 18 | 4 |
| DEX-CZ4063 | 415024.553 | 9674074.508 | 364.410 | 23 | -90 | 19.29 | 2 |
| DEX-CZ4064 | 415047.343 | 9674075.977 | 367.731 | 33 | -90 | 31.36 | 2 |
| DEX-CZ4065 | 415075.798 | 9674074.567 | 369.613 | 32 | -90 | 23.78 | 4 |
| DEX-CZ4066 | 415102.439 | 9674073.657 | 368.874 | 40 | -90 | 27.34 | 12 |
| DEX-CZ4067 | 415028.267 | 9674048.959 | 359.693 | 25 | -90 | 17.62 | 6 |
| DEX-CZ4068 | 415076.913 | 9674050.806 | 364.000 | 34 | -90 | 28.48 | 6 |
| DEX-CZ4069 | 415027.436 | 9674024.160 | 355.693 | 23 | -90 | 14.25 | 7 |
| DEX-CZ4070 | 415048.468 | 9674021.337 | 357.940 | 27 | -90 | 24.86 | 1.25 |
| DEX-CZ4071 | 415072.087 | 9674023.771 | 356.677 | 29 | -90 | 24.93 | 2.28 |
| DEX-CZ4072 | 415099.540 | 9674033.647 | 357.703 | 23 | -90 | 14.44 | 4.77 |
| DEX-CZ4073 | 415122.087 | 9674020.742 | 350.261 | 23 | -90 | 17 | 3.5 |
| DEX-CZ4074 | 415121.082 | 9674001.620 | 345.192 | 25 | -90 | 21.7 | 2 |
| DEX-CZ4075 | 415126.317 | 9673980.098 | 341.314 | 25 | -90 | 21.97 | 0 |
| DEX-CZ4076 | 414799.750 | 9673997.204 | 348.857 | 34 | -90 | 33.21 | 3 |
| DEX-CZ4077 | 414699.494 | 9674000.761 | 354.410 | 36 | -90 | 30.98 | 6.38 |
| DEX-CZ4078 | 415202.810 | 9673901.926 | 338.616 | 40 | -90 | 34.59 | 6 |
| DEX-CZ4079 | 415100.247 | 9673897.134 | 339.000 | 41 | -90 | 34.22 | 9.06 |
| DEX-CZ4080 | 414997.498 | 9673884.435 | 341.335 | 36 | -90 | 24.47 | 2 |
| DEX-CZ4081 | 414897.000 | 9673901.635 | 344.338 | 39 | -90 | 28.19 | 9.64 |
| DEX-CZ4082 | 414799.632 | 9673898.518 | 349.417 | 41 | -90 | 27.56 | 15.79 |
| DEX-CZ4083 | 415299.724 | 9673800.439 | 334.515 | 28 | -90 | 7.42 | 8.47 |
| DEX-CZ4084 | 415195.683 | 9673791.251 | 334.633 | 12 | -90 | 7.93 | 1.61 |
| DEX-CZ4085 | 415399.215 | 9673698.968 | 330.402 | 32 | -90 | 21.77 | 8 |
| DEX-CZ4086 | 415400.030 | 9673599.889 | 328.000 | 32 | -90 | 27.68 | 4.11 |
| DEX-CZ4087 | 415400.832 | 9673498.816 | 327.976 | 32 | -90 | 25.31 | 7 |
| DEX-CZ4088 | 415301.267 | 9673550.015 | 341.841 | 10 | -90 | 2 | 3.4 |
| DEX-CZ4089 | 415400.239 | 9673400.165 | 355.372 | 13 | -90 | 4 | 5 |
| DEX-CZ430 | 416495.385 | 9674046.541 | 369.648 | 21 | -90 | 7.85 | 13 |
| DEX-CZ431 | 416538.959 | 9674000.065 | 344.171 | 11 | -90 | 7.31 | 2.12 |
| DEX-CZ432 | 416449.612 | 9673987.645 | 376.462 | 32 | -90 | 17.73 | 15 |
| DEX-CZ433 | 416362.145 | 9673996.162 | 396.649 | 17 | -90 | 13.14 | 3 |
| DEX-CZ435 | 416149.310 | 9674006.833 | 430.329 | 21 | -90 | 20.7 | 0 |
| DEX-CZ437 | 415951.934 | 9674007.729 | 419.160 | 20 | -90 | 17.06 | 4.48 |
| DEX-CZ438 | 415949.244 | 9673955.050 | 422.119 | 11 | -90 | 7.83 | 2.44 |
| DEX-CZ439 | 416010.139 | 9673960.179 | 429.680 | 20 | -90 | 19.09 | 3 |
| DEX-CZ440 | 416047.906 | 9673954.004 | 426.145 | 21 | -90 | 25.03 | 1 |
| DEX-CZ444 | 416241.687 | 9673944.049 | 418.388 | 23 | -90 | 22.89 | 2.01 |
| DEX-CZ446 | 416343.568 | 9673953.177 | 401.966 | 15 | -90 | 11.15 | 3 |
| DEX-CZ447 | 416404.488 | 9673949.691 | 386.007 | 17 | -90 | 14.42 | 3 |
| DEX-CZ448 | 416443.229 | 9673947.604 | 374.516 | 14 | -90 | 7.83 | 5.1 |
| DEX-CZ4489 | 415694.134 | 9673397.150 | 347.310 | 28 | -90 | 22.28 | 3 |
| DEX-CZ449 | 416506.669 | 9673938.040 | 352.784 | 5 | -90 | 2 | 1 |
| DEX-CZ4490 | 415603.654 | 9673395.985 | 345.794 | 21 | -90 | 17.53 | 2 |
| DEX-CZ4491 | 415499.144 | 9673398.714 | 346.991 | 20 | -90 | 1 | 13 |
| DEX-CZ4492 | 415297.396 | 9673401.105 | 355.060 | 13 | -90 | 2 | 7 |
| DEX-CZ4493 | 415201.506 | 9673379.483 | 335.662 | 22 | -90 | 3 | 17 |
| DEX-CZ4494 | 415100.884 | 9673400.960 | 308.637 | 9 | -90 | 5.75 | 1.25 |
| DEX-CZ4495 | 415000.190 | 9673399.246 | 304.881 | 20 | -90 | 15.2 | 2 |
| DEX-CZ4496 | 415701.163 | 9673300.754 | 366.527 | 22 | -90 | 17 | 4 |
| DEX-CZ4497 | 415598.461 | 9673300.222 | 382.582 | 15 | -90 | 6.3 | 5.7 |
| DEX-CZ4498 | 415501.503 | 9673301.502 | 363.023 | 16 | -90 | 11.4 | 3 |
| DEX-CZ4499 | 415396.357 | 9673300.963 | 333.135 | 36 | -90 | 26.57 | 9 |
| DEX-CZ450 | 416534.164 | 9673965.872 | 343.325 | 7 | -90 | 4 | 1 |
| DEX-CZ4500 | 415298.416 | 9673300.852 | 330.582 | 19 | -90 | 16.76 | 0 |
| DEX-CZ4501 | 415200.727 | 9673300.519 | 336.354 | 10 | -90 | 4 | 4 |
| DEX-CZ4502 | 415098.894 | 9673303.791 | 323.391 | 28 | -90 | 17.88 | 9 |
| DEX-CZ4503 | 414999.087 | 9673301.799 | 298.361 | 9 | -90 | 5 | 2 |
| DEX-CZ4504 | 416856.300 | 9674550.000 | 430.160 | 16 | -90 | 7 | 7.47 |
| DEX-CZ4508 | 417099.567 | 9674596.793 | 406.223 | 24 | -90 | 7 | 14 |
| DEX-CZ4510 | 417151.428 | 9674597.734 | 394.832 | 21 | -90 | 9.24 | 10 |
| DEX-CZ4511 | 417253.638 | 9674599.910 | 367.523 | 16 | -90 | 5 | 8 |
| DEX-CZ4512 | 417350.320 | 9674605.760 | 367.575 | 24 | -90 | 10.88 | 11.53 |
| DEX-CZ4518 | 417107.111 | 9674652.135 | 387.658 | 22 | -90 | 19.21 | 1 |
| DEX-CZ4519 | 417160.047 | 9674652.003 | 379.453 | 28 | -90 | 22 | 3 |
| DEX-CZ452 | 416450.930 | 9673891.870 | 372.728 | 26 | -90 | 17.56 | 5.15 |
| DEX-CZ4520 | 417201.340 | 9674656.894 | 374.330 | 25 | -90 | 16 | 4 |
| DEX-CZ4521 | 417252.225 | 9674654.891 | 368.612 | 17 | -90 | 6 | 8.55 |
| DEX-CZ4523 | 417351.637 | 9674646.057 | 373.361 | 32 | -90 | 7 | 16 |
| DEX-CZ4525 | 416849.309 | 9674700.405 | 420.203 | 20 | -90 | 14 | 3.51 |
| DEX-CZ4526 | 416949.700 | 9674701.000 | 421.000 | 25 | -90 | 6 | 10 |
| DEX-CZ4528 | 417148.713 | 9674702.134 | 388.704 | 10 | -90 | 4.66 | 3.34 |
| DEX-CZ453 | 416336.573 | 9673890.582 | 397.274 | 14 | -90 | 11 | 2 |
| DEX-CZ4530 | 417347.603 | 9674687.229 | 375.727 | 33 | -90 | 5.6 | 25.4 |
| DEX-CZ4531 | 416853.115 | 9674749.119 | 423.260 | 14 | -90 | 11.65 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2662 | 417698.422 | 9672601.522 | 400.934 | 20 | -90 | 15 | 2 |
| DEX-CZ2663 | 417798.874 | 9672600.134 | 402.860 | 21 | -90 | 11.72 | 8 |
| DEX-CZ2664 | 417903.404 | 9672604.412 | 400.457 | 27 | -90 | 17.1 | 8 |
| DEX-CZ2665 | 417995.996 | 9672598.720 | 416.639 | 23 | -90 | 2 | 13 |
| DEX-CZ2666 | 418301.181 | 9672601.061 | 354.355 | 38 | -90 | 5 | 6 |
| DEX-CZ2668 | 418595.026 | 9672594.950 | 377.212 | 36 | -90 | 3 | 3 |
| DEX-CZ2669 | 418622.431 | 9672600.918 | 378.577 | 18 | -90 | 4 | 7 |
| DEX-CZ2670 | 415904.223 | 9672689.385 | 349.788 | 8 | -90 | 2 | 2 |
| DEX-CZ2671 | 416003.427 | 9672690.541 | 368.870 | 47 | -90 | 30.4 | 17 |
| DEX-CZ2672 | 416099.813 | 9672697.202 | 365.288 | 30 | -90 | 17.31 | 14.06 |
| DEX-CZ2673 | 416204.215 | 9672704.225 | 363.148 | 43 | -90 | 26.21 | 14 |
| DEX-CZ2674 | 416305.923 | 9672705.218 | 376.675 | 26 | -90 | 19.27 | 4 |
| DEX-CZ2675 | 416399.972 | 9672707.373 | 385.721 | 36 | -90 | 13.15 | 21.85 |
| DEX-CZ2676 | 416497.570 | 9672699.430 | 386.560 | 44 | -90 | 31.51 | 5 |
| DEX-CZ2677 | 416599.102 | 9672700.396 | 398.978 | 28 | -90 | 15.97 | 5.91 |
| DEX-CZ2678 | 416699.552 | 9672696.527 | 408.692 | 39 | -90 | 18.02 | 20 |
| DEX-CZ2679 | 416798.470 | 9672696.536 | 416.523 | 45 | -90 | 4.73 | 13.27 |
| DEX-CZ2680 | 416894.455 | 9672693.692 | 411.589 | 20 | -90 | 9 | 9 |
| DEX-CZ2681 | 417001.473 | 9672703.930 | 401.442 | 21 | -90 | 10.27 | 8 |
| DEX-CZ2682 | 417091.885 | 9672704.177 | 400.370 | 35 | -90 | 9 | 26.68 |
| DEX-CZ2683 | 417217.407 | 9672705.623 | 402.668 | 28 | -90 | 22.82 | 3 |
| DEX-CZ2684 | 417299.674 | 9672696.324 | 412.656 | 23 | -90 | 18.48 | 3.73 |
| DEX-CZ2685 | 417399.573 | 9672694.233 | 401.079 | 37 | -90 | 13.1 | 22.54 |
| DEX-CZ2686 | 417509.639 | 9672696.645 | 390.925 | 27 | -90 | 7 | 16 |
| DEX-CZ2687 | 417601.792 | 9672697.774 | 383.259 | 35 | -90 | 27.67 | 6 |
| DEX-CZ2688 | 417702.894 | 9672691.552 | 381.943 | 36 | -90 | 19.69 | 9 |
| DEX-CZ2689 | 417803.117 | 9672698.846 | 381.627 | 46 | -90 | 26 | 13 |
| DEX-CZ2690 | 417896.861 | 9672709.913 | 383.554 | 28 | -90 | 17.45 | 9.6 |
| DEX-CZ2691 | 417997.551 | 9672699.058 | 413.135 | 11 | -90 | 4 | 5 |
| DEX-CZ2692 | 418304.482 | 9672693.120 | 371.772 | 11 | -90 | 7 | 1.5 |
| DEX-CZ2693 | 418402.128 | 9672691.508 | 346.049 | 11 | -90 | 2 | 5 |
| DEX-CZ2694 | 418507.785 | 9672687.882 | 356.719 | 21 | -90 | 4 | 13 |
| DEX-CZ2695 | 418605.941 | 9672694.762 | 375.892 | 37 | -90 | 1 | 15 |
| DEX-CZ2696 | 418675.146 | 9672701.641 | 385.887 | 22 | -90 | 10.24 | 9 |
| DEX-CZ2699 | 416102.094 | 9672795.103 | 340.615 | 20 | -90 | 4 | 5 |
| DEX-CZ2700 | 416208.373 | 9672795.489 | 372.751 | 27 | -90 | 18.29 | 9 |
| DEX-CZ2701 | 416304.338 | 9672802.084 | 385.000 | 22 | -90 | 17.56 | 1 |
| DEX-CZ2702 | 416390.653 | 9672803.934 | 389.984 | 34 | -90 | 28.85 | 5.54 |
| DEX-CZ2703 | 416503.312 | 9672796.121 | 374.454 | 35 | -90 | 7 | 21 |
| DEX-CZ2704 | 416600.051 | 9672801.550 | 389.515 | 21 | -90 | 9.24 | 10 |
| DEX-CZ2705 | 416700.801 | 9672801.887 | 395.020 | 27 | -90 | 15 | 9 |
| DEX-CZ2706 | 416797.544 | 9672798.100 | 404.070 | 27 | -90 | 25.37 | 0 |
| DEX-CZ2707 | 416892.622 | 9672796.111 | 390.448 | 15 | -90 | 11 | 2 |
| DEX-CZ2708 | 417000.686 | 9672795.970 | 396.000 | 26 | -90 | 15.73 | 9 |
| DEX-CZ2709 | 417205.112 | 9672791.715 | 407.411 | 36 | -90 | 29.09 | 10.32 |
| DEX-CZ2710 | 417301.449 | 9672798.221 | 411.691 | 25 | -90 | 11 | 7 |
| DEX-CZ2711 | 417397.529 | 9672794.358 | 394.060 | 28 | -90 | 15.52 | 9 |
| DEX-CZ2712 | 417500.024 | 9672795.370 | 377.490 | 30 | -90 | 20.07 | 11 |
| DEX-CZ2713 | 417599.053 | 9672805.935 | 370.514 | 21 | -90 | 18.2 | 1 |
| DEX-CZ2714 | 417799.017 | 9672803.744 | 370.274 | 40 | -90 | 19.91 | 17 |
| DEX-CZ2715 | 417903.920 | 9672799.716 | 379.662 | 50 | -90 | 13.54 | 21 |
| DEX-CZ2716 | 418006.373 | 9672803.511 | 401.419 | 30 | -90 | 12.05 | 12.21 |
| DEX-CZ2717 | 418091.636 | 9672806.384 | 382.299 | 45 | -90 | 5 | 7 |
| DEX-CZ2719 | 418297.610 | 9672794.953 | 413.817 | 25 | -90 | 9 | 6 |
| DEX-CZ2720 | 418396.564 | 9672803.770 | 388.988 | 12 | -90 | 5 | 1 |
| DEX-CZ2721 | 418500.196 | 9672810.438 | 379.412 | 26 | -90 | 17 | 6 |
| DEX-CZ2722 | 418602.410 | 9672796.168 | 379.143 | 27 | -90 | 25.34 | 1 |
| DEX-CZ2723 | 418677.802 | 9672793.459 | 391.128 | 9 | -90 | 4 | 2 |
| DEX-CZ2725 | 416111.252 | 9672890.122 | 323.752 | 8 | -90 | 5 | 1 |
| DEX-CZ2726 | 416193.678 | 9672886.577 | 348.350 | 13 | -90 | 6 | 5 |
| DEX-CZ2727 | 416317.089 | 9672881.992 | 363.053 | 21 | -90 | 4 | 11 |
| DEX-CZ2728 | 416399.415 | 9672891.709 | 356.839 | 9 | -90 | 1.7 | 0 |
| DEX-CZ2729 | 416498.923 | 9672890.497 | 360.648 | 20 | -90 | 10 | 4 |
| DEX-CZ2730 | 416595.442 | 9672896.457 | 377.612 | 20 | -90 | 11.51 | 9 |
| DEX-CZ2731 | 416701.365 | 9672902.550 | 382.329 | 33 | -90 | 24.49 | 11 |
| DEX-CZ2732 | 416795.254 | 9672891.278 | 378.960 | 20 | -90 | 12.71 | 6 |
| DEX-CZ2733 | 416903.146 | 9672903.712 | 390.154 | 16 | -90 | 12 | 2 |
| DEX-CZ2734 | 417001.594 | 9672900.300 | 382.582 | 18 | -90 | 12.2 | 1 |
| DEX-CZ2735 | 417097.683 | 9672901.040 | 396.533 | 22 | -90 | 14 | 6 |
| DEX-CZ2736 | 417200.327 | 9672895.189 | 399.004 | 43 | -90 | 20.98 | 22.42 |
| DEX-CZ2737 | 417296.722 | 9672893.535 | 388.666 | 19 | -90 | 10 | 7.26 |
| DEX-CZ2738 | 417396.631 | 9672893.910 | 376.930 | 31 | -90 | 17.26 | 15 |
| DEX-CZ2739 | 417599.195 | 9672900.014 | 375.695 | 31 | -90 | 17.52 | 12 |
| DEX-CZ2740 | 417698.450 | 9672899.310 | 380.215 | 36 | -90 | 28.7 | 7 |
| DEX-CZ2741 | 417797.108 | 9672904.151 | 377.221 | 34 | -90 | 21.17 | 13.3 |
| DEX-CZ2742 | 417904.369 | 9672893.820 | 380.387 | 22 | -90 | 19.29 | 1.41 |
| DEX-CZ2743 | 418005.804 | 9672899.942 | 405.631 | 20 | -90 | 4 | 11 |
| DEX-CZ2744 | 418100.392 | 9672899.452 | 399.810 | 26 | -90 | 12 | 9 |
| DEX-CZ2745 | 418200.458 | 9672900.396 | 424.739 | 36 | -90 | 10 | 3.82 |
| DEX-CZ2746 | 418297.839 | 9672901.330 | 446.635 | 28 | -90 | 11.83 | 17 |
| DEX-CZ2747R | 418400.652 | 9672903.449 | 444.113 | 24 | -90 | 1 | 8 |
| DEX-CZ2748 | 418497.751 | 9672905.455 | 423.343 | 12 | -90 | 1 | 0 |
| DEX-CZ2749 | 418601.715 | 9672843.517 | 394.013 | 30 | -90 | 7.22 | 13.3 |
| DEX-CZ2750 | 418669.320 | 9672884.739 | 416.939 | 25 | -90 | 7 | 9 |
| DEX-CZ2752 | 415897.255 | 9673008.037 | 340.072 | 21 | -90 | 8 | 7 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4532 | 416900.002 | 9674750.468 | 422.913 | 32 | -90 | 17 | 9 |
| DEX-CZ4533 | 416948.560 | 9674750.798 | 422.027 | 35 | -90 | 29 | 4 |
| DEX-CZ4534 | 417004.365 | 9674760.582 | 418.150 | 52 | -90 | 29 | 21 |
| DEX-CZ4537 | 417152.391 | 9674749.339 | 395.576 | 27 | -90 | 10.4 | 9 |
| DEX-CZ4538 | 417196.643 | 9674750.909 | 384.163 | 14 | -90 | 9 | 2.55 |
| DEX-CZ454 | 416241.631 | 9673907.723 | 416.632 | 28 | -90 | 23.62 | 5.34 |
| DEX-CZ4542 | 416848.780 | 9674799.935 | 416.771 | 25 | -90 | 19.51 | 2.49 |
| DEX-CZ4543 | 416954.015 | 9674802.694 | 424.277 | 32 | -90 | 22 | 5 |
| DEX-CZ4545 | 417098.900 | 9674800.000 | 417.374 | 33 | -90 | 21.22 | 13 |
| DEX-CZ4549 | 416853.278 | 9674855.831 | 415.000 | 18 | -90 | 11.17 | 1 |
| DEX-CZ455 | 416143.740 | 9673902.243 | 410.010 | 20 | -90 | 16.88 | 5.51 |
| DEX-CZ4550 | 416899.568 | 9674849.104 | 419.304 | 19 | -90 | 16.05 | 1.3 |
| DEX-CZ4551 | 416949.718 | 9674847.744 | 423.643 | 31 | -90 | 16.23 | 13 |
| DEX-CZ4552 | 417001.584 | 9674851.257 | 426.000 | 27 | -90 | 16 | 7.97 |
| DEX-CZ4553 | 417049.500 | 9674851.000 | 425.752 | 29 | -90 | 13.45 | 12.41 |
| DEX-CZ4559 | 416850.845 | 9674902.110 | 415.832 | 29 | -90 | 18 | 3 |
| DEX-CZ456 | 415953.215 | 9673902.537 | 406.222 | 16 | -90 | 7.11 | 7.44 |
| DEX-CZ4560 | 416949.628 | 9674899.638 | 422.857 | 29 | -90 | 27.6 | 1.5 |
| DEX-CZ4564 | 416852.234 | 9674949.542 | 417.007 | 30 | -90 | 16.17 | 13 |
| DEX-CZ4565 | 416899.936 | 9674951.181 | 417.729 | 36 | -90 | 20 | 13 |
| DEX-CZ4566 | 416948.772 | 9674950.812 | 420.817 | 28 | -90 | 16 | 9 |
| DEX-CZ4567 | 417046.633 | 9674949.161 | 414.117 | 24 | -90 | 8 | 8 |
| DEX-CZ4568 | 417098.311 | 9674952.351 | 407.313 | 30 | -90 | 15.57 | 6 |
| DEX-CZ4569 | 417145.680 | 9674952.048 | 402.825 | 22 | -90 | 13.22 | 7 |
| DEX-CZ457 | 415956.820 | 9673855.587 | 397.407 | 20 | -90 | 10.82 | 8.23 |
| DEX-CZ4572 | 416900.376 | 9674914.667 | 419.528 | 25 | -90 | 16.71 | 4.35 |
| DEX-CZ4576 | 416999.387 | 9674995.844 | 414.193 | 30 | -90 | 11.97 | 12.35 |
| DEX-CZ458 | 415985.644 | 9673867.342 | 400.814 | 29 | -90 | 26.83 | 6.22 |
| DEX-CZ4585 | 417197.421 | 9673748.339 | 354.368 | 30 | -90 | 27.12 | 3.24 |
| DEX-CZ4589 | 417199.207 | 9673898.375 | 379.890 | 36 | -90 | 16.65 | 8 |
| DEX-CZ459 | 416041.296 | 9673848.866 | 383.170 | 7 | -90 | 3 | 2 |
| DEX-CZ4594 | 417300.986 | 9674001.165 | 373.000 | 25 | -90 | 20 | 5 |
| DEX-CZ460 | 416091.231 | 9673851.273 | 385.871 | 20 | -90 | 12.63 | 8 |
| DEX-CZ4603 | 417100.200 | 9674550.000 | 419.610 | 4 | -90 | 1 | 0 |
| DEX-CZ4604 | 417153.082 | 9674555.365 | 400.968 | 24 | -90 | 2 | 16 |
| DEX-CZ4607 | 417204.662 | 9674550.882 | 391.011 | 22 | -90 | 5 | 14.3 |
| DEX-CZ4608 | 417297.409 | 9674546.822 | 357.564 | 26 | -90 | 4 | 19 |
| DEX-CZ4609 | 417298.217 | 9674503.243 | 350.732 | 8 | -90 | 3.5 | 2.5 |
| DEX-CZ461 | 416142.601 | 9673878.189 | 398.685 | 10 | -90 | 5.8 | 3.07 |
| DEX-CZ4611 | 417327.361 | 9674503.495 | 359.367 | 20 | -90 | 2 | 12 |
| DEX-CZ4613 | 417005.187 | 9674956.216 | 419.002 | 23 | -90 | 10 | 11 |
| DEX-CZ4615 | 417403.036 | 9674694.015 | 361.518 | 9 | -90 | 1.5 | 3.5 |
| DEX-CZ462 | 416214.873 | 9673845.576 | 408.579 | 27 | -90 | 22.13 | 5 |
| DEX-CZ4622 | 417151.700 | 9674459.000 | 400.465 | 28 | -90 | 21.76 | 7 |
| DEX-CZ4623 | 417199.741 | 9674449.194 | 386.371 | 15 | -90 | 8 | 5 |
| DEX-CZ4624 | 417247.003 | 9674452.890 | 375.276 | 20 | -90 | 8 | 10 |
| DEX-CZ4628 | 417002.233 | 9674351.705 | 407.185 | 21 | -90 | 16.39 | 3.43 |
| DEX-CZ463 | 416259.698 | 9673849.259 | 406.716 | 32 | -90 | 31.35 | 4 |
| DEX-CZ4631 | 417152.653 | 9674351.821 | 393.965 | 31 | -90 | 29.19 | 2 |
| DEX-CZ4632 | 417203.160 | 9674354.597 | 383.116 | 29 | -90 | 9 | 16 |
| DEX-CZ4633 | 417258.068 | 9674353.678 | 375.487 | 20 | -90 | 7 | 10 |
| DEX-CZ4635 | 417311.264 | 9674406.367 | 365.670 | 23 | -90 | 16.21 | 5 |
| DEX-CZ4636 | 417255.504 | 9674413.044 | 376.297 | 19 | -90 | 11.98 | 5 |
| DEX-CZ4638 | 417344.364 | 9674395.362 | 356.465 | 15 | -90 | 6 | 6 |
| DEX-CZ464 | 416307.639 | 9673853.089 | 402.448 | 31 | -90 | 33.27 | 3 |
| DEX-CZ4640 | 417253.765 | 9674301.161 | 381.740 | 27 | -90 | 12 | 12.25 |
| DEX-CZ4642 | 417051.265 | 9674255.764 | 401.448 | 38 | -90 | 22.33 | 13 |
| DEX-CZ4643 | 417101.266 | 9674250.408 | 396.595 | 32 | -90 | 15.98 | 15 |
| DEX-CZ4645 | 417147.810 | 9674257.669 | 391.987 | 30 | -90 | 8.23 | 16 |
| DEX-CZ4646 | 417151.037 | 9674301.690 | 390.432 | 23 | -90 | 11.47 | 10 |
| DEX-CZ4647 | 417051.048 | 9674300.265 | 407.416 | 18 | -90 | 15.52 | 1 |
| DEX-CZ4648 | 417199.637 | 9674258.495 | 382.752 | 22 | -90 | 18.71 | 2 |
| DEX-CZ4649 | 417300.995 | 9674257.028 | 377.856 | 34 | -90 | 28.85 | 4 |
| DEX-CZ465 | 416337.060 | 9673848.914 | 399.320 | 32 | -90 | 17.06 | 13.36 |
| DEX-CZ4651 | 417094.831 | 9674151.328 | 394.000 | 30 | -90 | 21.98 | 7 |
| DEX-CZ4652 | 417048.157 | 9674197.539 | 394.847 | 36 | -90 | 16.26 | 12 |
| DEX-CZ4653 | 417148.266 | 9674200.715 | 387.811 | 34 | -90 | 18.22 | 10 |
| DEX-CZ4655 | 417251.075 | 9674197.917 | 362.773 | 27 | -90 | 2 | 19 |
| DEX-CZ4656 | 417357.948 | 9674206.026 | 357.722 | 18 | -90 | 5 | 11 |
| DEX-CZ4657 | 417153.153 | 9674148.636 | 385.266 | 21 | -90 | 15.76 | 2 |
| DEX-CZ4658 | 417200.254 | 9674150.242 | 382.924 | 28 | -90 | 19.87 | 8 |
| DEX-CZ4659 | 417256.406 | 9674151.577 | 367.835 | 53 | -90 | 5.6 | 42.4 |
| DEX-CZ466 | 416404.317 | 9673852.250 | 394.606 | 25 | -90 | 21.74 | 3.53 |
| DEX-CZ4660 | 417303.891 | 9674149.829 | 373.000 | 40 | -90 | 7 | 25 |
| DEX-CZ4661 | 417351.064 | 9674145.795 | 367.840 | 13 | -90 | 5 | 5 |
| DEX-CZ4662 | 417401.739 | 9674157.784 | 348.704 | 24 | -90 | 18 | 4 |
| DEX-CZ4663 | 417097.925 | 9674063.663 | 392.902 | 19 | -90 | 14.71 | 2 |
| DEX-CZ4664 | 417149.922 | 9674059.489 | 386.132 | 14 | -90 | 7 | 5 |
| DEX-CZ4665 | 417200.928 | 9674059.706 | 379.104 | 33 | -90 | 25 | 3 |
| DEX-CZ4666 | 417249.888 | 9674060.372 | 378.563 | 22 | -90 | 17.32 | 3 |
| DEX-CZ4667 | 417249.583 | 9674098.855 | 376.934 | 35 | -90 | 23.43 | 10.75 |
| DEX-CZ4668 | 417152.090 | 9674108.006 | 386.591 | 25 | -90 | 20.45 | 4 |
| DEX-CZ4669 | 417060.030 | 9674003.681 | 395.488 | 29 | -90 | 21.43 | 5 |
| DEX-CZ4670 | 417058.262 | 9673953.870 | 397.000 | 25 | -90 | 19.79 | 4 |
| DEX-CZ4671 | 417107.513 | 9673949.449 | 398.000 | 21 | -90 | 14.48 | 5 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ2753 | 415984.541 | 9673009.180 | 344.326 | 12 | -90 | 4 | 6 |
| DEX-CZ2754 | 416105.370 | 9673006.721 | 367.207 | 6 | -90 | 2 | 2 |
| DEX-CZ2755 | 416203.732 | 9673009.944 | 357.792 | 8 | -90 | 1 | 4.38 |
| DEX-CZ2756 | 416294.848 | 9673015.053 | 370.083 | 16 | -90 | 4 | 9 |
| DEX-CZ2757 | 416396.100 | 9673006.729 | 389.997 | 15 | -90 | 7 | 5 |
| DEX-CZ2758 | 416499.309 | 9673002.109 | 379.039 | 26 | -90 | 7 | 16.25 |
| DEX-CZ2759 | 416602.403 | 9673004.106 | 368.491 | 14 | -90 | 7.27 | 0 |
| DEX-CZ2760 | 416701.246 | 9673007.166 | 366.731 | 17 | -90 | 9.2 | 4.8 |
| DEX-CZ2761 | 416794.050 | 9672998.939 | 378.578 | 26 | -90 | 7 | 11 |
| DEX-CZ2762 | 416899.495 | 9672996.830 | 388.465 | 16 | -90 | 7 | 7 |
| DEX-CZ2763 | 416997.170 | 9673000.511 | 385.509 | 31 | -90 | 13.6 | 7.78 |
| DEX-CZ2764 | 417104.457 | 9672998.588 | 391.127 | 25 | -90 | 16.24 | 8 |
| DEX-CZ2765 | 417204.645 | 9672991.131 | 373.111 | 16 | -90 | 12 | 1 |
| DEX-CZ2766 | 417395.764 | 9673002.919 | 375.949 | 24 | -90 | 22.29 | 4 |
| DEX-CZ2767 | 417493.192 | 9673006.357 | 378.835 | 26 | -90 | 15.96 | 11 |
| DEX-CZ2768 | 417598.479 | 9673000.736 | 384.385 | 29 | -90 | 17 | 7 |
| DEX-CZ2769R | 417705.980 | 9673006.725 | 406.812 | 19 | -90 | 12.62 | 5 |
| DEX-CZ2769RR | 417698.857 | 9673002.619 | 404.437 | 8 | -90 | 7 | 0 |
| DEX-CZ2770 | 417801.932 | 9673004.929 | 406.263 | 20 | -90 | 15 | 3 |
| DEX-CZ2771 | 417899.759 | 9673002.500 | 385.757 | 24 | -90 | 11.28 | 11 |
| DEX-CZ2772 | 418005.696 | 9672995.679 | 403.712 | 12 | -90 | 2 | 7 |
| DEX-CZ2773 | 418102.322 | 9672999.795 | 420.755 | 9 | -90 | 5 | 2 |
| DEX-CZ2774 | 418197.993 | 9672999.959 | 434.810 | 26 | -90 | 8 | 17.27 |
| DEX-CZ2775 | 418299.933 | 9672998.241 | 449.429 | 23 | -90 | 10.29 | 11.23 |
| DEX-CZ2776 | 418397.437 | 9672998.424 | 454.379 | 37 | -90 | 20.19 | 13 |
| DEX-CZ2777 | 418501.689 | 9673001.599 | 464.372 | 17 | -90 | 8 | 7.35 |
| DEX-CZ2778 | 418592.319 | 9672997.017 | 471.103 | 52 | -90 | 17.07 | 25.39 |
| DEX-CZ2779 | 418673.484 | 9672993.140 | 472.937 | 33 | -90 | 7.24 | 8 |
| DEX-CZ2781 | 415908.168 | 9673094.866 | 351.082 | 17 | -90 | 4.8 | 6.2 |
| DEX-CZ2782 | 416106.083 | 9673102.491 | 356.031 | 27 | -90 | 23.3 | 4 |
| DEX-CZ2783 | 416207.042 | 9673102.341 | 355.640 | 25 | -90 | 16.58 | 6.6 |
| DEX-CZ2784 | 416301.205 | 9673098.003 | 370.304 | 13 | -90 | 10 | 1 |
| DEX-CZ2785 | 416401.892 | 9673092.542 | 392.970 | 18 | -90 | 9 | 6 |
| DEX-CZ2786 | 416506.487 | 9673098.743 | 403.592 | 13 | -90 | 10 | 1 |
| DEX-CZ2787 | 416592.936 | 9673103.201 | 408.079 | 16 | -90 | 12.47 | 0 |
| DEX-CZ2788 | 416695.186 | 9673104.133 | 407.258 | 15 | -90 | 7 | 5 |
| DEX-CZ2789 | 416793.452 | 9673100.247 | 391.326 | 18 | -90 | 5 | 7 |
| DEX-CZ2790 | 416896.092 | 9673096.789 | 387.838 | 29 | -90 | 11 | 12.32 |
| DEX-CZ2791 | 416998.681 | 9673099.113 | 390.905 | 19 | -90 | 14.83 | 3 |
| DEX-CZ2792 | 417196.724 | 9673105.241 | 376.449 | 17 | -90 | 13 | 2 |
| DEX-CZ2793 | 417296.911 | 9673106.221 | 382.843 | 32 | -90 | 19.4 | 15 |
| DEX-CZ2794 | 417399.181 | 9673098.928 | 388.917 | 29 | -90 | 24.61 | 8.22 |
| DEX-CZ2795 | 417501.815 | 9673108.324 | 401.107 | 28 | -90 | 18.49 | 12 |
| DEX-CZ2796 | 417597.813 | 9673102.197 | 408.134 | 24 | -90 | 3 | 10 |
| DEX-CZ2797 | 417706.503 | 9673100.597 | 419.000 | 34 | -90 | 21.8 | 2 |
| DEX-CZ2798 | 417795.810 | 9673097.278 | 417.479 | 47 | -90 | 7 | 35 |
| DEX-CZ2799 | 417897.829 | 9673104.091 | 406.659 | 27 | -90 | 14 | 10.76 |
| DEX-CZ2800 | 417999.943 | 9673096.946 | 392.925 | 44 | -90 | 18 | 20.41 |
| DEX-CZ2801 | 418099.699 | 9673098.631 | 403.033 | 25 | -90 | 11 | 10 |
| DEX-CZ2802 | 418199.399 | 9673098.611 | 426.701 | 28 | -90 | 12 | 13 |
| DEX-CZ2803 | 418301.973 | 9673098.572 | 442.431 | 44 | -90 | 17.53 | 20.71 |
| DEX-CZ2804 | 418402.141 | 9673102.352 | 455.430 | 25 | -90 | 11 | 10 |
| DEX-CZ2805 | 418496.792 | 9673102.398 | 463.609 | 26 | -90 | 7 | 11.88 |
| DEX-CZ2806 | 418597.142 | 9673103.628 | 479.220 | 12 | -90 | 3 | 7 |
| DEX-CZ2807 | 418676.065 | 9673100.802 | 483.540 | 26 | -90 | 17.08 | 7 |
| DEX-CZ2809 | 416503.975 | 9673190.811 | 373.282 | 21 | -90 | 20.63 | 0 |
| DEX-CZ2810 | 416607.684 | 9673195.307 | 389.631 | 29 | -90 | 20.59 | 2 |
| DEX-CZ2811 | 416710.909 | 9673197.657 | 405.478 | 21 | -90 | 18.82 | 2 |
| DEX-CZ2812 | 416805.481 | 9673200.222 | 412.100 | 28 | -90 | 19.8 | 4 |
| DEX-CZ2813 | 416897.620 | 9673198.127 | 396.611 | 24 | -90 | 23.05 | 2 |
| DEX-CZ2814 | 417004.839 | 9673200.464 | 366.407 | 17 | -90 | 3 | 8 |
| DEX-CZ2815 | 417097.863 | 9673199.037 | 364.763 | 10 | -90 | 3.52 | 4.48 |
| DEX-CZ2816 | 417198.253 | 9673200.347 | 372.096 | 17 | -90 | 5.24 | 8.76 |
| DEX-CZ2817 | 417297.140 | 9673200.200 | 383.771 | 34 | -90 | 22.83 | 16 |
| DEX-CZ2818 | 417399.985 | 9673196.582 | 384.744 | 50 | -90 | 25.43 | 7 |
| DEX-CZ2819 | 417497.689 | 9673194.140 | 410.363 | 18 | -90 | 10 | 5 |
| DEX-CZ2819R | 417497.866 | 9673198.020 | 410.903 | 26 | -90 | 17.15 | 3 |
| DEX-CZ2820 | 417600.039 | 9673196.823 | 413.342 | 17 | -90 | 11.13 | 4 |
| DEX-CZ2821 | 417992.927 | 9673199.267 | 416.245 | 19 | -90 | 6 | 9 |
| DEX-CZ2822 | 418396.890 | 9673202.084 | 451.562 | 45 | -90 | 19 | 18 |
| DEX-CZ2823 | 418502.819 | 9673201.662 | 464.437 | 33 | -90 | 17.32 | 10 |
| DEX-CZ2824 | 418601.774 | 9673195.510 | 479.773 | 26 | -90 | 14.8 | 6 |
| DEX-CZ2825 | 418669.532 | 9673190.585 | 490.659 | 30 | -90 | 12.45 | 16 |
| DEX-CZ3349 | 417448.605 | 9673197.535 | 398.950 | 38 | -90 | 33.14 | 4 |
| DEX-CZ3350 | 417354.682 | 9673199.734 | 381.997 | 24 | -90 | 19.42 | 0 |
| DEX-CZ3351 | 417251.450 | 9673199.440 | 381.524 | 28 | -90 | 22.26 | 4 |
| DEX-CZ3352 | 417146.715 | 9673197.537 | 376.000 | 20 | -90 | 8 | 10 |
| DEX-CZ3353 | 417036.940 | 9673202.642 | 356.083 | 12 | -90 | 5 | 2 |
| DEX-CZ3354 | 418645.383 | 9673150.702 | 484.839 | 39 | -90 | 14.15 | 15 |
| DEX-CZ3355 | 418600.980 | 9673151.060 | 482.218 | 24 | -90 | 17.14 | 5.27 |
| DEX-CZ3356 | 418544.530 | 9673147.967 | 470.139 | 35 | -90 | 14.5 | 16.8 |
| DEX-CZ3357 | 418495.627 | 9673153.934 | 463.079 | 30 | -90 | 17.5 | 9.56 |
| DEX-CZ3358 | 418445.991 | 9673157.488 | 462.885 | 10 | -90 | 5 | 2.74 |
| DEX-CZ3359 | 418392.922 | 9673148.193 | 455.232 | 20 | -90 | 3 | 13 |
| DEX-CZ3360 | 418354.726 | 9673148.884 | 446.840 | 34 | -90 | 23.1 | 4 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4672 | 417153.789 | 9673951.657 | 394.346 | 20 | -90 | 12.18 | 6 |
| DEX-CZ4673 | 417199.380 | 9673957.115 | 392.500 | 17 | -90 | 5 | 10 |
| DEX-CZ4674 | 417253.385 | 9673951.955 | 382.665 | 7 | -90 | 3 | 2 |
| DEX-CZ4675 | 417302.715 | 9673950.541 | 370.269 | 15 | -90 | 10.22 | 3 |
| DEX-CZ4676 | 417348.682 | 9673952.619 | 362.067 | 20 | -90 | 6 | 11 |
| DEX-CZ4677 | 417401.221 | 9673949.532 | 354.890 | 26 | -90 | 16 | 7 |
| DEX-CZ4678 | 417059.013 | 9673908.219 | 394.439 | 11 | -90 | 6 | 2 |
| DEX-CZ4679 | 417105.441 | 9673850.511 | 377.831 | 45 | -90 | 30.16 | 14 |
| DEX-CZ4680 | 417150.850 | 9673850.781 | 372.459 | 38 | -90 | 19.6 | 17 |
| DEX-CZ4681 | 417201.083 | 9673851.760 | 366.364 | 40 | -90 | 25.55 | 8 |
| DEX-CZ4682 | 417257.567 | 9673852.522 | 360.376 | 37 | -90 | 20.84 | 14 |
| DEX-CZ4683 | 417303.952 | 9673849.455 | 355.537 | 20 | -90 | 16.26 | 2 |
| DEX-CZ4684 | 417349.684 | 9673849.767 | 352.432 | 28 | -90 | 20.56 | 8.23 |
| DEX-CZ4685 | 417402.700 | 9673850.000 | 348.000 | 28 | -90 | 18.46 | 8 |
| DEX-CZ4686 | 417155.622 | 9673792.869 | 363.439 | 56 | -90 | 20.94 | 25 |
| DEX-CZ4689 | 417152.279 | 9673901.986 | 382.758 | 34 | -90 | 10 | 20 |
| DEX-CZ4690 | 417254.942 | 9673903.746 | 375.777 | 6 | -90 | 2 | 2 |
| DEX-CZ4692 | 417149.837 | 9673748.057 | 357.642 | 38 | -90 | 29.4 | 11 |
| DEX-CZ4693 | 417113.269 | 9673742.764 | 358.160 | 33 | -90 | 20.7 | 10 |
| DEX-CZ4699 | 417153.705 | 9673717.773 | 353.513 | 41 | -90 | 31.56 | 8 |
| DEX-CZ4700 | 417251.200 | 9673725.000 | 346.668 | 41 | -90 | 38.96 | 1 |
| DEX-CZ4702 | 417350.108 | 9674102.633 | 373.483 | 26 | -90 | 6 | 13 |
| DEX-CZ4703 | 417302.339 | 9674060.648 | 375.710 | 24 | -90 | 9 | 13 |
| DEX-CZ4704 | 417351.034 | 9673996.511 | 363.334 | 36 | -90 | 13.25 | 17.75 |
| DEX-CZ4705 | 417404.439 | 9674058.534 | 361.850 | 13 | -90 | 6 | 5 |
| DEX-CZ4706 | 417352.431 | 9674063.558 | 370.381 | 13 | -90 | 9.25 | 1.6 |
| DEX-CZ4707 | 417469.484 | 9674056.539 | 354.274 | 28 | -90 | 10 | 16 |
| DEX-CZ4708 | 417468.332 | 9674000.651 | 354.295 | 47 | -90 | 13.71 | 22.27 |
| DEX-CZ471 | 416452.515 | 9673803.228 | 394.812 | 17 | -90 | 5.32 | 9 |
| DEX-CZ4710 | 417150.115 | 9673672.539 | 348.572 | 43 | -90 | 28.54 | 10.55 |
| DEX-CZ4711 | 417198.504 | 9673674.415 | 346.319 | 53 | -90 | 34.67 | 12 |
| DEX-CZ473 | 416250.607 | 9673801.773 | 399.943 | 34 | -90 | 20.96 | 12.3 |
| DEX-CZ474 | 416147.908 | 9673815.150 | 385.519 | 9 | -90 | 6 | 1 |
| DEX-CZ475 | 416038.251 | 9673796.461 | 377.348 | 23 | -90 | 22.69 | 2.8 |
| DEX-CZ476 | 416053.748 | 9673752.592 | 377.000 | 43 | -90 | 39.82 | 8 |
| DEX-CZ477 | 416107.321 | 9673752.996 | 372.234 | 30 | -90 | 25.01 | 4 |
| DEX-CZ478 | 416156.533 | 9673764.155 | 390.153 | 41 | -90 | 41.47 | 1 |
| DEX-CZ479 | 416202.164 | 9673760.301 | 393.342 | 24 | -90 | 20.24 | 4.69 |
| DEX-CZ4816 | 417133.277 | 9673691.625 | 351.856 | 36 | -90 | 33.84 | 4 |
| DEX-CZ4818 | 417226.400 | 9673693.000 | 346.481 | 39 | -90 | 38.04 | 0 |
| DEX-CZ4819 | 417129.601 | 9673722.765 | 355.642 | 30 | -90 | 26.44 | 3 |
| DEX-CZ4822 | 417227.100 | 9673723.000 | 348.837 | 43 | -90 | 42.09 | 2 |
| DEX-CZ4824 | 417128.301 | 9673752.361 | 359.926 | 45 | -90 | 34.54 | 11 |
| DEX-CZ4827 | 417133.525 | 9673770.403 | 361.719 | 24 | -90 | 18.26 | 3.74 |
| DEX-CZ4829 | 417182.948 | 9673772.580 | 357.689 | 45 | -90 | 22.75 | 15 |
| DEX-CZ4830 | 417205.032 | 9673773.503 | 356.142 | 40 | -90 | 32.89 | 6 |
| DEX-CZ4831 | 417228.246 | 9673771.474 | 353.132 | 25 | -90 | 19.34 | 3 |
| DEX-CZ4832 | 417183.100 | 9673822.000 | 363.938 | 19 | -90 | 12.29 | 7 |
| DEX-CZ4833 | 417204.300 | 9673817.000 | 360.215 | 23 | -90 | 20.77 | 0 |
| DEX-CZ4836 | 417180.321 | 9673804.783 | 362.333 | 45 | -90 | 13.24 | 26 |
| DEX-CZ4838 | 417333.314 | 9673851.660 | 355.524 | 29 | -90 | 14.25 | 13 |
| DEX-CZ4841 | 417130.900 | 9673849.000 | 376.000 | 30 | -90 | 15 | 12 |
| DEX-CZ4842 | 417080.737 | 9673858.607 | 382.165 | 27 | -90 | 24.73 | 2 |
| DEX-CZ4844 | 417230.534 | 9673856.903 | 363.934 | 28 | -90 | 24.82 | 1 |
| DEX-CZ4845 | 417333.635 | 9673878.614 | 358.587 | 18 | -90 | 11.16 | 5.26 |
| DEX-CZ4848 | 417382.800 | 9673815.000 | 346.338 | 27 | -90 | 19 | 3 |
| DEX-CZ4849 | 417075.799 | 9673878.911 | 386.237 | 7 | -90 | 2 | 3 |
| DEX-CZ4850 | 417110.789 | 9673879.099 | 384.778 | 23 | -90 | 11 | 10 |
| DEX-CZ4853 | 417181.535 | 9673885.138 | 375.963 | 24 | -90 | 11.5 | 8 |
| DEX-CZ4854 | 417206.285 | 9673884.056 | 374.706 | 19 | -90 | 11.64 | 3 |
| DEX-CZ4855 | 417230.402 | 9673884.148 | 372.986 | 20 | -90 | 13.67 | 4 |
| DEX-CZ4856 | 417253.005 | 9673880.898 | 368.900 | 28 | -90 | 14.86 | 12.27 |
| DEX-CZ4857 | 417333.588 | 9673897.566 | 359.972 | 18 | -90 | 11.41 | 5 |
| DEX-CZ4859 | 417078.698 | 9673902.400 | 393.584 | 8 | -90 | 3 | 2 |
| DEX-CZ4862 | 417331.157 | 9673930.170 | 363.048 | 14 | -90 | 8.21 | 5 |
| DEX-CZ4863 | 417354.491 | 9673933.172 | 359.664 | 16 | -90 | 7.25 | 7 |
| DEX-CZ4867 | 417059.552 | 9673931.433 | 397.000 | 29 | -90 | 16.84 | 11 |
| DEX-CZ4868 | 417079.437 | 9673929.376 | 398.000 | 11 | -90 | 5.5 | 3.5 |
| DEX-CZ4869 | 417103.900 | 9673927.000 | 397.280 | 17 | -90 | 3 | 9 |
| DEX-CZ4872 | 417180.615 | 9673928.730 | 386.851 | 22 | -90 | 4 | 14.8 |
| DEX-CZ4873 | 417203.552 | 9673929.489 | 387.997 | 30 | -90 | 12.85 | 16 |
| DEX-CZ4874 | 417333.869 | 9673951.183 | 363.654 | 14 | -90 | 7.22 | 5 |
| DEX-CZ4876 | 417431.606 | 9673950.563 | 353.592 | 26 | -90 | 10.35 | 12 |
| DEX-CZ4877 | 417456.750 | 9673950.861 | 351.517 | 22 | -90 | 8 | 8 |
| DEX-CZ4878 | 417080.767 | 9673950.931 | 397.266 | 28 | -90 | 15.8 | 9 |
| DEX-CZ4879 | 417129.080 | 9673946.457 | 397.332 | 18 | -90 | 8 | 7 |
| DEX-CZ4880 | 417179.003 | 9673950.668 | 390.971 | 21 | -90 | 7 | 12 |
| DEX-CZ4881 | 417232.877 | 9673896.395 | 375.906 | 37 | -90 | 12.32 | 20.52 |
| DEX-CZ4882 | 417334.135 | 9673978.852 | 366.524 | 16 | -90 | 10 | 4 |
| DEX-CZ4883 | 417354.364 | 9673968.845 | 362.230 | 18 | -90 | 7 | 7 |
| DEX-CZ4884 | 417381.584 | 9673978.150 | 358.674 | 34 | -90 | 14.85 | 18 |
| DEX-CZ4885 | 417408.860 | 9673980.161 | 356.750 | 20 | -90 | 8.28 | 8.26 |
| DEX-CZ4886 | 417435.892 | 9673977.890 | 357.576 | 16 | -90 | 7 | 7 |
| DEX-CZ4887 | 417059.521 | 9673980.998 | 397.000 | 23 | -90 | 19.15 | 3 |
| DEX-CZ4888 | 417080.580 | 9673979.231 | 395.948 | 38 | -90 | 16.21 | 20 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3361 | 418301.313 | 9673151.234 | 441.065 | 34 | -90 | 25.48 | 5.27 |
| DEX-CZ3362 | 418248.019 | 9673146.674 | 430.903 | 35 | -90 | 11.5 | 2 |
| DEX-CZ3363R | 418199.972 | 9673151.690 | 419.606 | 42 | -90 | 15 | 10 |
| DEX-CZ3364 | 418151.837 | 9673152.762 | 422.236 | 34 | -90 | 17.05 | 5.26 |
| DEX-CZ3365 | 418098.737 | 9673148.330 | 409.427 | 24 | -90 | 19.36 | 2 |
| DEX-CZ3366 | 418047.918 | 9673147.591 | 405.464 | 32 | -90 | 14.32 | 10 |
| DEX-CZ3367 | 418000.035 | 9673154.640 | 407.039 | 32 | -90 | 11 | 19 |
| DEX-CZ3368 | 417951.646 | 9673152.494 | 403.951 | 32 | -90 | 17 | 6 |
| DEX-CZ3369 | 417901.359 | 9673149.899 | 400.417 | 21 | -90 | 13 | 6 |
| DEX-CZ3370 | 417847.129 | 9673146.792 | 405.727 | 23 | -90 | 12.64 | 10 |
| DEX-CZ3371 | 417798.224 | 9673149.079 | 408.437 | 32 | -90 | 6.35 | 23.22 |
| DEX-CZ3372 | 417749.778 | 9673149.810 | 410.649 | 37 | -90 | 11 | 24.37 |
| DEX-CZ3374 | 417651.040 | 9673150.918 | 416.976 | 47 | -90 | 28.06 | 10 |
| DEX-CZ3375 | 417600.955 | 9673149.442 | 411.006 | 34 | -90 | 19.77 | 12 |
| DEX-CZ3376 | 417548.189 | 9673150.909 | 405.077 | 23 | -90 | 21.62 | 1 |
| DEX-CZ3377 | 417501.024 | 9673151.029 | 405.426 | 30 | -90 | 17.15 | 11 |
| DEX-CZ3378 | 417452.894 | 9673150.892 | 398.694 | 15 | -90 | 11 | 2 |
| DEX-CZ3379 | 417397.116 | 9673151.569 | 391.651 | 25 | -90 | 17.17 | 7 |
| DEX-CZ3380 | 417346.753 | 9673148.881 | 389.000 | 28 | -90 | 21.45 | 4 |
| DEX-CZ3381 | 417301.119 | 9673143.281 | 380.222 | 20 | -90 | 11.35 | 1 |
| DEX-CZ3382 | 417248.295 | 9673150.440 | 381.064 | 23 | -90 | 6 | 11 |
| DEX-CZ3383 | 417198.843 | 9673152.986 | 377.739 | 20 | -90 | 7 | 10 |
| DEX-CZ3384 | 417149.131 | 9673151.753 | 362.617 | 28 | -90 | 4 | 9 |
| DEX-CZ3385 | 416948.884 | 9673150.443 | 396.013 | 13 | -90 | 11.12 | 0 |
| DEX-CZ3386 | 416896.520 | 9673153.642 | 402.000 | 17 | -90 | 4 | 6 |
| DEX-CZ3387 | 416842.839 | 9673154.495 | 408.303 | 15 | -90 | 2 | 10.22 |
| DEX-CZ3388 | 418650.584 | 9673105.332 | 484.151 | 23 | -90 | 17.11 | 4 |
| DEX-CZ3389 | 418553.787 | 9673098.454 | 469.891 | 29 | -90 | 9.27 | 10 |
| DEX-CZ3390 | 418450.478 | 9673103.546 | 459.496 | 25 | -90 | 19.94 | 6 |
| DEX-CZ3391 | 418351.581 | 9673104.585 | 449.169 | 25 | -90 | 16.06 | 7 |
| DEX-CZ3392 | 418251.480 | 9673100.106 | 426.578 | 27 | -90 | 3 | 6 |
| DEX-CZ3394 | 418050.551 | 9673102.506 | 397.832 | 35 | -90 | 25.95 | 5 |
| DEX-CZ3395 | 417948.691 | 9673100.535 | 394.000 | 51 | -90 | 10.26 | 35.74 |
| DEX-CZ3396 | 417849.565 | 9673099.853 | 411.934 | 34 | -90 | 16.03 | 18 |
| DEX-CZ3397 | 417748.555 | 9673100.694 | 423.000 | 38 | -90 | 11 | 17 |
| DEX-CZ3398 | 417649.239 | 9673099.226 | 415.612 | 8 | -90 | 4 | 2 |
| DEX-CZ3399 | 417551.684 | 9673098.200 | 395.453 | 26 | -90 | 24.73 | 1 |
| DEX-CZ3400 | 417447.647 | 9673097.536 | 396.084 | 21 | -90 | 9 | 10 |
| DEX-CZ3401 | 417350.198 | 9673099.411 | 380.284 | 29 | -90 | 21.17 | 1 |
| DEX-CZ3402 | 417253.425 | 9673102.935 | 368.226 | 34 | -90 | 15.35 | 2 |
| DEX-CZ3403 | 416951.229 | 9673103.128 | 395.907 | 18 | -90 | 9 | 5 |
| DEX-CZ3404 | 416847.937 | 9673102.859 | 385.496 | 17 | -90 | 5 | 10 |
| DEX-CZ3405 | 418651.678 | 9673053.506 | 479.847 | 20 | -90 | 14 | 4 |
| DEX-CZ3406 | 418596.162 | 9673049.136 | 470.967 | 28 | -90 | 12.12 | 9.74 |
| DEX-CZ3407 | 418550.231 | 9673054.095 | 466.612 | 31 | -90 | 7.16 | 21.61 |
| DEX-CZ3408 | 418498.910 | 9673051.966 | 462.718 | 37 | -90 | 21.6 | 17 |
| DEX-CZ3409 | 418451.131 | 9673050.577 | 456.281 | 19 | -90 | 13.68 | 3.34 |
| DEX-CZ3410 | 418401.535 | 9673050.477 | 449.867 | 21 | -90 | 10.87 | 5 |
| DEX-CZ3411 | 418349.829 | 9673049.387 | 441.871 | 10 | -90 | 4 | 2 |
| DEX-CZ3412 | 418299.103 | 9673054.426 | 440.463 | 43 | -90 | 6 | 29 |
| DEX-CZ3413 | 418255.059 | 9673048.812 | 440.892 | 17 | -90 | 8 | 4 |
| DEX-CZ3416 | 418100.728 | 9673049.452 | 414.649 | 23 | -90 | 18.34 | 3 |
| DEX-CZ3417 | 418049.121 | 9673056.428 | 405.878 | 27 | -90 | 15.49 | 5 |
| DEX-CZ3418 | 417999.456 | 9673051.269 | 392.322 | 11 | -90 | 8 | 0 |
| DEX-CZ3419 | 417948.513 | 9673050.555 | 388.720 | 31 | -90 | 16 | 13 |
| DEX-CZ3420 | 417898.866 | 9673051.149 | 399.759 | 26 | -90 | 6 | 18 |
| DEX-CZ3421 | 417850.989 | 9673053.779 | 407.512 | 38 | -90 | 8.91 | 21.25 |
| DEX-CZ3422 | 417798.647 | 9673051.264 | 415.517 | 18 | -90 | 11.36 | 5 |
| DEX-CZ3423 | 417750.057 | 9673050.023 | 418.988 | 22 | -90 | 16.66 | 4.23 |
| DEX-CZ3425 | 417650.421 | 9673052.837 | 403.174 | 18 | -90 | 13 | 2 |
| DEX-CZ3426 | 417601.309 | 9673048.826 | 393.860 | 44 | -90 | 30.25 | 6 |
| DEX-CZ3427 | 417549.107 | 9673052.188 | 391.076 | 25 | -90 | 14.25 | 9.2 |
| DEX-CZ3428 | 417501.319 | 9673052.149 | 386.460 | 27 | -90 | 24.8 | 1 |
| DEX-CZ3429 | 417447.001 | 9673049.230 | 384.340 | 32 | -90 | 15.62 | 16 |
| DEX-CZ3430 | 417400.508 | 9673050.472 | 382.172 | 32 | -90 | 22.83 | 9 |
| DEX-CZ3431 | 417349.676 | 9673048.123 | 380.833 | 24 | -90 | 14.48 | 1 |
| DEX-CZ3432 | 417296.735 | 9673049.526 | 372.392 | 46 | -90 | 26.82 | 2 |
| DEX-CZ3433 | 417247.786 | 9673055.340 | 363.957 | 21 | -90 | 4 | 1 |
| DEX-CZ3434 | 416999.931 | 9673054.370 | 389.936 | 29 | -90 | 8.24 | 7.17 |
| DEX-CZ3435 | 416946.200 | 9673049.510 | 379.068 | 32 | -90 | 17.1 | 13.3 |
| DEX-CZ3436 | 416898.017 | 9673052.853 | 371.176 | 15 | -90 | 8.5 | 0 |
| DEX-CZ3437 | 416853.648 | 9673050.820 | 372.043 | 11 | -90 | 5 | 4 |
| DEX-CZ3438 | 418648.733 | 9672999.529 | 476.165 | 14 | -90 | 4.22 | 7.78 |
| DEX-CZ3439 | 418551.249 | 9672998.988 | 471.000 | 12 | -90 | 3 | 5.09 |
| DEX-CZ3440 | 418350.420 | 9673000.293 | 452.124 | 28 | -90 | 13.52 | 7 |
| DEX-CZ3442 | 418149.585 | 9673002.960 | 421.518 | 34 | -90 | 9 | 23.39 |
| DEX-CZ3443 | 418049.113 | 9672996.716 | 419.198 | 19 | -90 | 4 | 13 |
| DEX-CZ3444 | 417948.472 | 9673002.242 | 385.108 | 30 | -90 | 19.97 | 7.25 |
| DEX-CZ3445 | 417853.690 | 9672999.073 | 392.136 | 11 | -90 | 7.3 | 1 |
| DEX-CZ3447 | 417650.035 | 9672999.924 | 395.065 | 25 | -90 | 14 | 7 |
| DEX-CZ3448 | 417551.727 | 9672999.029 | 380.731 | 26 | -90 | 14.9 | 10 |
| DEX-CZ3449 | 417450.713 | 9672999.901 | 373.898 | 33 | -90 | 23.19 | 12.15 |
| DEX-CZ3450 | 417149.021 | 9673000.552 | 382.989 | 18 | -90 | 11.22 | 5 |
| DEX-CZ3451 | 417050.359 | 9673005.650 | 392.885 | 34 | -90 | 12.49 | 19 |
| DEX-CZ3452 | 416944.980 | 9672993.992 | 377.876 | 18 | -90 | 7.18 | 8.23 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4889 | 417107.174 | 9673977.062 | 395.819 | 14 | -90 | 8 | 4 |
| DEX-CZ489 | 416252.528 | 9673700.873 | 388.752 | 20 | -90 | 13.42 | 3 |
| DEX-CZ4890 | 417130.352 | 9673975.015 | 395.946 | 19 | -90 | 9.22 | 6 |
| DEX-CZ4891 | 417153.680 | 9673975.227 | 394.379 | 20 | -90 | 8 | 8.18 |
| DEX-CZ4892 | 417178.278 | 9673982.280 | 393.000 | 20 | -90 | 7 | 10 |
| DEX-CZ4893 | 417207.995 | 9673979.970 | 391.388 | 16 | -90 | 4 | 10 |
| DEX-CZ4894 | 417231.265 | 9673980.770 | 386.057 | 22 | -90 | 6 | 13 |
| DEX-CZ4895 | 417385.870 | 9674000.397 | 359.102 | 20 | -90 | 14.46 | 4 |
| DEX-CZ4896 | 417434.463 | 9673998.165 | 358.000 | 37 | -90 | 26.37 | 7 |
| DEX-CZ4897 | 417458.272 | 9673998.008 | 355.488 | 37 | -90 | 9.3 | 16.22 |
| DEX-CZ4898 | 417078.841 | 9673998.612 | 394.977 | 28 | -90 | 22.86 | 5.29 |
| DEX-CZ4899 | 417128.039 | 9673998.339 | 392.682 | 19 | -90 | 10.23 | 7 |
| DEX-CZ490 | 416157.446 | 9673710.941 | 382.899 | 41 | -90 | 23.95 | 18.3 |
| DEX-CZ4900 | 417152.622 | 9673998.643 | 391.171 | 23 | -90 | 14.4 | 6.63 |
| DEX-CZ4901 | 417179.881 | 9674000.362 | 390.597 | 25 | -90 | 16.21 | 5.43 |
| DEX-CZ4902 | 417233.394 | 9674001.589 | 385.066 | 12 | -90 | 5 | 3 |
| DEX-CZ4903 | 417254.840 | 9673995.937 | 381.925 | 15 | -90 | 13 | 0 |
| DEX-CZ4904 | 417306.290 | 9674031.028 | 370.870 | 16 | -90 | 12.33 | 2 |
| DEX-CZ4905 | 417332.542 | 9674031.943 | 368.124 | 18 | -90 | 14.54 | 2 |
| DEX-CZ4906 | 417350.941 | 9674032.745 | 365.747 | 16 | -90 | 12.42 | 1 |
| DEX-CZ4907 | 417381.119 | 9674027.863 | 361.983 | 32 | -90 | 8 | 23.45 |
| DEX-CZ4908 | 417406.917 | 9674027.781 | 359.851 | 23 | -90 | 10 | 11.44 |
| DEX-CZ4909 | 417433.870 | 9674026.244 | 357.944 | 29 | -90 | 9.15 | 21.46 |
| DEX-CZ491 | 416054.921 | 9673698.992 | 374.770 | 37 | -90 | 28.33 | 10 |
| DEX-CZ4910 | 417157.236 | 9674033.295 | 385.810 | 28 | -90 | 7 | 18.2 |
| DEX-CZ4911 | 417183.001 | 9674028.905 | 384.928 | 26 | -90 | 18.7 | 0 |
| DEX-CZ4912 | 417207.281 | 9674027.613 | 384.416 | 23 | -90 | 13.42 | 6 |
| DEX-CZ4913 | 417228.645 | 9674034.753 | 381.832 | 28 | -90 | 23.7 | 3 |
| DEX-CZ4914 | 417257.444 | 9674030.200 | 379.993 | 26 | -90 | 9.21 | 11 |
| DEX-CZ4915 | 417277.782 | 9674028.448 | 376.475 | 13 | -90 | 8.18 | 2 |
| DEX-CZ4916 | 417304.746 | 9674048.349 | 373.505 | 8 | -90 | 5 | 1 |
| DEX-CZ4917 | 417332.832 | 9674051.098 | 370.595 | 21 | -90 | 12 | 6 |
| DEX-CZ4918 | 417356.684 | 9674048.612 | 367.393 | 12 | -90 | 8 | 2 |
| DEX-CZ4919 | 417381.921 | 9674052.744 | 364.963 | 17 | -90 | 9.94 | 5.35 |
| DEX-CZ492 | 415998.375 | 9673664.394 | 373.542 | 20 | -90 | 5.36 | 12.23 |
| DEX-CZ4920 | 417402.875 | 9674052.941 | 361.694 | 16 | -90 | 4 | 8.15 |
| DEX-CZ4921 | 417432.787 | 9674049.732 | 358.265 | 21 | -90 | 12.52 | 7.54 |
| DEX-CZ4922 | 417188.773 | 9674068.470 | 380.545 | 21 | -90 | 12.45 | 5 |
| DEX-CZ4923 | 417204.576 | 9674070.248 | 378.538 | 48 | -90 | 20.6 | 16 |
| DEX-CZ4924 | 417229.495 | 9674070.042 | 377.764 | 30 | -90 | 24.75 | 4 |
| DEX-CZ4925 | 417253.535 | 9674072.334 | 378.028 | 32 | -90 | 21.7 | 7 |
| DEX-CZ4926 | 417273.612 | 9674071.555 | 378.000 | 23 | -90 | 16.4 | 4 |
| DEX-CZ4927 | 417281.273 | 9674049.488 | 375.943 | 18 | -90 | 13.24 | 2 |
| DEX-CZ4928 | 417328.450 | 9674068.543 | 374.320 | 18 | -90 | 7 | 8 |
| DEX-CZ4929 | 417382.661 | 9674076.687 | 367.433 | 19 | -90 | 7 | 10.43 |
| DEX-CZ493 | 416059.243 | 9673649.129 | 377.332 | 36 | -90 | 18.34 | 17.65 |
| DEX-CZ4930 | 417431.766 | 9674080.289 | 359.242 | 53 | -90 | 7 | 45.37 |
| DEX-CZ4931 | 417179.142 | 9674100.784 | 378.485 | 37 | -90 | 26.69 | 10 |
| DEX-CZ4932 | 417235.679 | 9674096.216 | 375.128 | 35 | -90 | 23.73 | 10 |
| DEX-CZ4933 | 417280.578 | 9674095.137 | 378.000 | 27 | -90 | 16.47 | 7 |
| DEX-CZ4934 | 417333.855 | 9674100.527 | 375.661 | 21 | -90 | 3 | 16 |
| DEX-CZ4935 | 417383.027 | 9674097.849 | 368.721 | 25 | -90 | 7 | 17 |
| DEX-CZ4936 | 417432.975 | 9674101.326 | 359.070 | 24 | -90 | 8.2 | 14 |
| DEX-CZ4937 | 417179.641 | 9674128.897 | 383.598 | 38 | -90 | 32.31 | 6.49 |
| DEX-CZ4938 | 417203.115 | 9674128.523 | 382.441 | 38 | -90 | 31.85 | 5.23 |
| DEX-CZ4939 | 417225.091 | 9674129.474 | 378.265 | 35 | -90 | 32.79 | 3 |
| DEX-CZ494 | 416102.146 | 9673654.099 | 379.982 | 22 | -90 | 21.31 | 2 |
| DEX-CZ4941 | 417284.426 | 9674131.868 | 374.679 | 37 | -90 | 13.85 | 21.72 |
| DEX-CZ4942 | 417179.488 | 9674051.719 | 382.125 | 28 | -90 | 8.22 | 16.2 |
| DEX-CZ4943 | 417207.455 | 9674049.653 | 379.641 | 26 | -90 | 17.37 | 7 |
| DEX-CZ4944 | 417231.288 | 9674053.554 | 379.351 | 25 | -90 | 12.39 | 11 |
| DEX-CZ4945 | 417255.880 | 9674052.357 | 378.224 | 26 | -90 | 12 | 11 |
| DEX-CZ4946 | 417177.635 | 9674146.412 | 385.000 | 29 | -90 | 25.86 | 2.27 |
| DEX-CZ4947 | 417229.482 | 9674148.895 | 377.181 | 27 | -90 | 15.9 | 6.81 |
| DEX-CZ4948 | 417355.900 | 9674131.815 | 370.418 | 19 | -90 | 7 | 10 |
| DEX-CZ4949 | 417383.339 | 9674132.188 | 366.404 | 18 | -90 | 4 | 9 |
| DEX-CZ495 | 416141.299 | 9673664.878 | 378.421 | 38 | -90 | 18.34 | 20.01 |
| DEX-CZ4950 | 417405.398 | 9674128.255 | 363.280 | 15 | -90 | 6 | 7 |
| DEX-CZ4951 | 417432.303 | 9674131.622 | 358.087 | 31 | -90 | 25.38 | 3 |
| DEX-CZ4953 | 417359.723 | 9674178.021 | 350.653 | 32 | -90 | 29.71 | 1 |
| DEX-CZ4954 | 417380.035 | 9674177.392 | 348.112 | 13 | -90 | 5 | 8 |
| DEX-CZ4956 | 417378.284 | 9674205.881 | 360.958 | 13 | -90 | 9 | 2 |
| DEX-CZ4958 | 417354.426 | 9674224.888 | 365.592 | 14 | -90 | 10 | 1 |
| DEX-CZ496 | 416183.207 | 9673659.890 | 374.560 | 37 | -90 | 20.63 | 17.59 |
| DEX-CZ4961 | 417228.446 | 9674258.893 | 381.076 | 45 | -90 | 19.4 | 23 |
| DEX-CZ4962 | 417280.747 | 9674257.974 | 378.338 | 26 | -90 | 22.88 | 2 |
| DEX-CZ4964 | 417205.849 | 9674278.638 | 381.638 | 39 | -90 | 13 | 18.13 |
| DEX-CZ4965 | 417233.024 | 9674281.238 | 382.244 | 36 | -90 | 12.58 | 22 |
| DEX-CZ4966 | 417257.055 | 9674280.462 | 380.675 | 19 | -90 | 11 | 5 |
| DEX-CZ4967 | 417281.622 | 9674279.674 | 380.448 | 31 | -90 | 20.96 | 12.23 |
| DEX-CZ497 | 416250.465 | 9673654.320 | 381.721 | 29 | -90 | 21.93 | 4.48 |
| DEX-CZ4970 | 417227.256 | 9674301.385 | 383.029 | 27 | -90 | 8.27 | 17 |
| DEX-CZ4971 | 417280.487 | 9674297.011 | 380.026 | 18 | -90 | 12.27 | 4.25 |
| DEX-CZ4972 | 417203.099 | 9674328.152 | 386.717 | 18 | -90 | 7.62 | 8.38 |
| DEX-CZ4973 | 417228.300 | 9674330.821 | 384.121 | 20 | -90 | 14.1 | 4.5 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3453 | 416849.374 | 9672999.631 | 388.622 | 14 | -90 | 6.23 | 6 |
| DEX-CZ3461 | 418152.540 | 9672948.370 | 417.573 | 49 | -90 | 4 | 38 |
| DEX-CZ3462 | 418100.711 | 9672946.610 | 411.354 | 31 | -90 | 4 | 25 |
| DEX-CZ3463 | 418052.531 | 9672951.796 | 418.490 | 20 | -90 | 7 | 10 |
| DEX-CZ3464 | 417995.839 | 9672942.728 | 402.147 | 15 | -90 | 6.23 | 7.28 |
| DEX-CZ3465 | 417949.898 | 9672950.380 | 387.933 | 31 | -90 | 12.95 | 17.24 |
| DEX-CZ3466 | 417909.926 | 9672947.639 | 381.418 | 37 | -90 | 23 | 15 |
| DEX-CZ3467 | 417849.409 | 9672952.248 | 383.569 | 38 | -90 | 21.09 | 8 |
| DEX-CZ3468 | 417799.928 | 9672952.320 | 391.904 | 20 | -90 | 11.86 | 5.31 |
| DEX-CZ3469 | 417749.799 | 9672952.237 | 395.943 | 19 | -90 | 13 | 4 |
| DEX-CZ3470 | 417691.873 | 9672945.920 | 391.603 | 30 | -90 | 15.8 | 13.31 |
| DEX-CZ3471 | 417653.444 | 9672953.733 | 388.241 | 17 | -90 | 12 | 3 |
| DEX-CZ3472 | 417597.253 | 9672947.591 | 378.231 | 47 | -90 | 43.06 | 6 |
| DEX-CZ3473 | 417549.946 | 9672952.155 | 374.520 | 35 | -90 | 28.28 | 9.06 |
| DEX-CZ3474 | 417498.011 | 9672950.148 | 370.316 | 34 | -90 | 31 | 1 |
| DEX-CZ3475 | 417450.030 | 9672949.525 | 370.547 | 30 | -90 | 26.31 | 5 |
| DEX-CZ3476 | 417402.195 | 9672948.378 | 364.000 | 36 | -90 | 23.39 | 12.55 |
| DEX-CZ3477 | 417348.459 | 9672948.815 | 366.274 | 17 | -90 | 13.25 | 2 |
| DEX-CZ3478 | 417253.348 | 9672949.612 | 377.958 | 49 | -90 | 29.52 | 19.41 |
| DEX-CZ3479 | 417198.329 | 9672949.111 | 388.861 | 21 | -90 | 11.95 | 7.3 |
| DEX-CZ3480 | 417150.614 | 9672954.389 | 395.471 | 35 | -90 | 17.22 | 9.17 |
| DEX-CZ3481 | 417094.927 | 9672952.523 | 398.000 | 31 | -90 | 16 | 9 |
| DEX-CZ3482 | 417049.025 | 9672950.402 | 393.778 | 34 | -90 | 19.47 | 4 |
| DEX-CZ3483 | 416999.526 | 9672950.550 | 376.356 | 14 | -90 | 7.28 | 5 |
| DEX-CZ3484 | 416941.203 | 9672953.377 | 388.138 | 23 | -90 | 8 | 13.2 |
| DEX-CZ3485 | 416894.577 | 9672947.294 | 392.000 | 27 | -90 | 18.4 | 4 |
| DEX-CZ3486 | 416844.092 | 9672956.907 | 389.844 | 14 | -90 | 10.23 | 1 |
| DEX-CZ3490 | 418151.902 | 9672900.872 | 406.928 | 9 | -90 | 5 | 4 |
| DEX-CZ3491 | 418050.619 | 9672896.733 | 408.715 | 27 | -90 | 9.97 | 16 |
| DEX-CZ3492 | 417950.098 | 9672900.905 | 388.383 | 20 | -90 | 13.99 | 1.74 |
| DEX-CZ3493 | 417853.268 | 9672903.474 | 376.422 | 45 | -90 | 33.24 | 17.91 |
| DEX-CZ3494 | 417751.041 | 9672902.198 | 380.394 | 30 | -90 | 19.35 | 8 |
| DEX-CZ3495 | 417646.623 | 9672899.007 | 376.169 | 41 | -90 | 21 | 16 |
| DEX-CZ3496 | 417550.513 | 9672900.624 | 368.935 | 38 | -90 | 35 | 1 |
| DEX-CZ3497 | 417500.256 | 9672899.905 | 366.000 | 33 | -90 | 31.09 | 4 |
| DEX-CZ3498 | 417446.160 | 9672901.277 | 365.691 | 15 | -90 | 10 | 3 |
| DEX-CZ3499 | 417350.406 | 9672900.752 | 380.913 | 20 | -90 | 14.25 | 3 |
| DEX-CZ3500 | 417249.212 | 9672900.455 | 392.930 | 21 | -90 | 11 | 8 |
| DEX-CZ3501 | 417151.717 | 9672897.070 | 401.551 | 45 | -90 | 19.4 | 23 |
| DEX-CZ3503 | 418298.557 | 9672850.103 | 434.156 | 18 | -90 | 11.23 | 4 |
| DEX-CZ3504 | 418250.386 | 9672851.007 | 436.489 | 15 | -90 | 5.18 | 6 |
| DEX-CZ3506 | 418149.216 | 9672850.259 | 395.854 | 23 | -90 | 8 | 12 |
| DEX-CZ3507 | 418093.143 | 9672848.590 | 390.751 | 15 | -90 | 5.25 | 8 |
| DEX-CZ3508 | 418051.968 | 9672850.715 | 402.976 | 19 | -90 | 14.55 | 5 |
| DEX-CZ3509 | 418004.799 | 9672850.572 | 402.081 | 24 | -90 | 11.55 | 12 |
| DEX-CZ3510 | 417950.230 | 9672853.005 | 388.533 | 23 | -90 | 12.97 | 8 |
| DEX-CZ3511 | 417897.658 | 9672853.026 | 379.990 | 39 | -90 | 19.07 | 19 |
| DEX-CZ3512 | 417850.840 | 9672849.774 | 376.329 | 29 | -90 | 26.44 | 5.35 |
| DEX-CZ3513 | 417800.215 | 9672851.781 | 374.983 | 33 | -90 | 29.49 | 5 |
| DEX-CZ3514 | 417752.688 | 9672849.423 | 371.000 | 30 | -90 | 27.86 | 1 |
| DEX-CZ3515 | 417702.145 | 9672847.843 | 371.608 | 33 | -90 | 29.09 | 4.22 |
| DEX-CZ3516 | 417646.245 | 9672851.335 | 368.000 | 36 | -90 | 27 | 7 |
| DEX-CZ3517 | 417601.443 | 9672851.940 | 367.000 | 57 | -90 | 34.3 | 19.37 |
| DEX-CZ3518 | 417549.125 | 9672849.452 | 369.881 | 23 | -90 | 17 | 4 |
| DEX-CZ3519 | 417499.381 | 9672850.080 | 370.852 | 38 | -90 | 25.92 | 3.82 |
| DEX-CZ3520 | 417455.871 | 9672855.732 | 374.539 | 16 | -90 | 14.09 | 2 |
| DEX-CZ3521 | 417400.294 | 9672849.406 | 387.522 | 30 | -90 | 20.13 | 8.45 |
| DEX-CZ3522 | 417350.854 | 9672849.316 | 396.167 | 27 | -90 | 18 | 8 |
| DEX-CZ3523 | 417300.372 | 9672850.476 | 400.549 | 21 | -90 | 7 | 9 |
| DEX-CZ3524 | 417250.250 | 9672849.000 | 405.416 | 17 | -90 | 12 | 2 |
| DEX-CZ3525 | 417204.753 | 9672849.596 | 405.496 | 36 | -90 | 17.88 | 15 |
| DEX-CZ3526 | 417151.820 | 9672848.935 | 401.715 | 30 | -90 | 26.71 | 2 |
| DEX-CZ3527 | 417100.944 | 9672847.376 | 391.648 | 32 | -90 | 17.39 | 12 |
| DEX-CZ3529 | 418158.798 | 9672803.883 | 390.381 | 12 | -90 | 2 | 5 |
| DEX-CZ3530 | 418050.088 | 9672802.879 | 397.001 | 17 | -90 | 7.18 | 6 |
| DEX-CZ3531 | 417949.800 | 9672802.705 | 389.743 | 27 | -90 | 14.39 | 9 |
| DEX-CZ3532 | 417848.795 | 9672798.510 | 373.681 | 18 | -90 | 16.45 | 2.27 |
| DEX-CZ3533 | 417752.393 | 9672800.826 | 369.000 | 44 | -90 | 32 | 10 |
| DEX-CZ3534 | 417701.149 | 9672801.548 | 368.283 | 54 | -90 | 35.38 | 18.42 |
| DEX-CZ3535 | 417646.705 | 9672796.936 | 368.510 | 44 | -90 | 29.18 | 14 |
| DEX-CZ3536 | 417548.696 | 9672802.545 | 374.000 | 43 | -90 | 30 | 9 |
| DEX-CZ3537 | 417449.893 | 9672800.480 | 381.469 | 27 | -90 | 15.37 | 10 |
| DEX-CZ3538 | 417350.792 | 9672799.423 | 403.480 | 26 | -90 | 17.62 | 7.22 |
| DEX-CZ3539 | 417250.241 | 9672799.908 | 412.371 | 31 | -90 | 23 | 6 |
| DEX-CZ3540 | 417149.854 | 9672799.720 | 395.570 | 42 | -90 | 24.72 | 13 |
| DEX-CZ3541 | 418148.758 | 9672753.197 | 365.090 | 9 | -90 | 2 | 6 |
| DEX-CZ3542 | 418096.807 | 9672748.033 | 379.714 | 10 | -90 | 1 | 5 |
| DEX-CZ3543 | 418051.323 | 9672750.448 | 401.113 | 16 | -90 | 11.03 | 3 |
| DEX-CZ3544 | 417999.271 | 9672751.128 | 402.232 | 25 | -90 | 21.23 | 4 |
| DEX-CZ3545 | 417949.210 | 9672752.000 | 388.757 | 22 | -90 | 19.26 | 2 |
| DEX-CZ3546 | 417903.511 | 9672750.656 | 379.752 | 31 | -90 | 20.13 | 9 |
| DEX-CZ3547 | 417853.481 | 9672751.232 | 375.932 | 26 | -90 | 10 | 4 |
| DEX-CZ3548 | 417796.810 | 9672750.874 | 372.703 | 48 | -90 | 49.6 | 4 |
| DEX-CZ3549 | 417750.983 | 9672752.790 | 371.279 | 46 | -90 | 40.15 | 7 |
| DEX-CZ3551 | 417648.841 | 9672749.698 | 374.631 | 40 | -90 | 32.82 | 5.5 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4974 | 417255.249 | 9674325.459 | 381.403 | 32 | -90 | 22.91 | 7.51 |
| DEX-CZ4975 | 417276.036 | 9674331.936 | 378.121 | 14 | -90 | 9 | 2 |
| DEX-CZ4977 | 417227.561 | 9674346.871 | 382.946 | 29 | -90 | 15.26 | 11 |
| DEX-CZ4978 | 417279.799 | 9674344.070 | 376.826 | 18 | -90 | 11 | 4 |
| DEX-CZ4980 | 417176.415 | 9674382.194 | 380.661 | 16 | -90 | 3 | 2 |
| DEX-CZ4981 | 417197.989 | 9674378.395 | 375.556 | 20 | -90 | 6 | 9 |
| DEX-CZ4982 | 417231.987 | 9674383.039 | 365.715 | 9 | -90 | 4 | 3 |
| DEX-CZ4983 | 417250.946 | 9674388.546 | 363.503 | 8 | -90 | 5 | 1 |
| DEX-CZ4984 | 417280.757 | 9674378.771 | 357.361 | 12 | -90 | 6 | 3 |
| DEX-CZ4985 | 417301.979 | 9674380.836 | 354.060 | 13 | -90 | 10 | 1 |
| DEX-CZ4986 | 417329.079 | 9674374.569 | 348.147 | 8 | -90 | 3 | 5 |
| DEX-CZ4988 | 417184.875 | 9674405.983 | 388.733 | 25 | -90 | 21.95 | 2 |
| DEX-CZ4989 | 417231.748 | 9674398.589 | 373.868 | 11 | -90 | 4 | 5 |
| DEX-CZ4991 | 417338.880 | 9674400.041 | 358.368 | 17 | -90 | 10 | 4 |
| DEX-CZ4993 | 416900.382 | 9674428.978 | 420.743 | 32 | -90 | 18.3 | 12 |
| DEX-CZ4994 | 416922.784 | 9674431.666 | 420.423 | 24 | -90 | 17.03 | 6 |
| DEX-CZ4995 | 417128.509 | 9674428.090 | 403.674 | 23 | -90 | 15.5 | 8 |
| DEX-CZ4996 | 417151.118 | 9674429.470 | 398.734 | 35 | -90 | 24.67 | 5 |
| DEX-CZ4997 | 417170.937 | 9674429.831 | 394.684 | 21 | -90 | 15.94 | 4 |
| DEX-CZ4998 | 417208.776 | 9674428.844 | 387.213 | 17 | -90 | 10 | 4 |
| DEX-CZ4999 | 417236.309 | 9674430.607 | 382.930 | 27 | -90 | 15.82 | 12 |
| DEX-CZ5000 | 417258.540 | 9674429.528 | 379.573 | 13 | -90 | 9 | 2 |
| DEX-CZ5001 | 417282.658 | 9674425.646 | 374.896 | 27 | -90 | 14 | 11.78 |
| DEX-CZ5002 | 417301.405 | 9674414.404 | 369.714 | 23 | -90 | 10 | 10.49 |
| DEX-CZ5003 | 417313.675 | 9674410.399 | 366.419 | 23 | -90 | 16.34 | 5 |
| DEX-CZ5006 | 416927.427 | 9674461.449 | 426.505 | 26 | -90 | 14.05 | 8.07 |
| DEX-CZ5007 | 417100.972 | 9674470.362 | 414.378 | 39 | -90 | 14.34 | 22.86 |
| DEX-CZ5008 | 417127.815 | 9674460.139 | 406.074 | 28 | -90 | 17.34 | 10 |
| DEX-CZ5009 | 417177.357 | 9674456.304 | 392.417 | 30 | -90 | 19.16 | 9 |
| DEX-CZ5017 | 417127.451 | 9674548.795 | 409.571 | 21 | -90 | 3 | 15 |
| DEX-CZ5018 | 417128.374 | 9674480.271 | 407.694 | 32 | -90 | 17.89 | 11 |
| DEX-CZ5019 | 417154.247 | 9674481.328 | 399.749 | 41 | -90 | 8 | 26 |
| DEX-CZ5020 | 417180.694 | 9674468.737 | 389.599 | 26 | -90 | 18.56 | 4 |
| DEX-CZ5021 | 417208.001 | 9674473.600 | 379.077 | 8 | -90 | 4 | 2 |
| DEX-CZ5022 | 417226.502 | 9674471.080 | 372.579 | 24 | -90 | 5 | 17.48 |
| DEX-CZ5023 | 417253.708 | 9674467.836 | 368.152 | 4 | -90 | 1 | 2 |
| DEX-CZ5024 | 417283.436 | 9674479.262 | 354.174 | 6 | -90 | 1 | 1 |
| DEX-CZ5025 | 417311.937 | 9674468.344 | 347.107 | 7 | -90 | 1 | 1 |
| DEX-CZ5026 | 417335.825 | 9674472.321 | 348.656 | 9 | -90 | 5 | 3 |
| DEX-CZ5027 | 416875.100 | 9674501.000 | 428.708 | 20 | -90 | 11 | 4 |
| DEX-CZ5028 | 417102.878 | 9674530.461 | 419.250 | 34 | -90 | 6 | 24.16 |
| DEX-CZ5029 | 417077.957 | 9674498.347 | 422.613 | 20 | -90 | 9 | 8 |
| DEX-CZ5030 | 417128.184 | 9674501.467 | 408.663 | 24 | -90 | 10 | 13 |
| DEX-CZ5031 | 417179.057 | 9674503.316 | 393.091 | 45 | -90 | 10 | 31.19 |
| DEX-CZ5032 | 417229.154 | 9674499.417 | 382.570 | 12 | -90 | 6 | 3 |
| DEX-CZ5033 | 417293.299 | 9674499.601 | 350.023 | 10 | -90 | 3.31 | 0 |
| DEX-CZ5037 | 417003.490 | 9674527.147 | 439.846 | 42 | -90 | 12 | 28.41 |
| DEX-CZ5038 | 417028.719 | 9674530.822 | 436.084 | 25 | -90 | 11.23 | 10.68 |
| DEX-CZ5039 | 417054.032 | 9674530.146 | 431.355 | 15 | -90 | 10 | 1.5 |
| DEX-CZ504 | 416451.860 | 9673604.254 | 369.428 | 26 | -90 | 7.42 | 1 |
| DEX-CZ5040 | 417080.359 | 9674530.320 | 425.765 | 24 | -90 | 5 | 12 |
| DEX-CZ5041 | 417129.342 | 9674529.668 | 409.104 | 21 | -90 | 5 | 13.57 |
| DEX-CZ5042 | 417152.195 | 9674529.204 | 402.279 | 24 | -90 | 5.5 | 15.5 |
| DEX-CZ5043 | 417180.970 | 9674527.700 | 396.469 | 24 | -90 | 5 | 12.45 |
| DEX-CZ5044 | 417204.650 | 9674529.507 | 394.289 | 26 | -90 | 3 | 19 |
| DEX-CZ5045 | 417223.547 | 9674530.674 | 390.489 | 10 | -90 | 1 | 5 |
| DEX-CZ5046 | 417252.279 | 9674526.756 | 378.706 | 15 | -90 | 5 | 2 |
| DEX-CZ5047 | 417280.710 | 9674531.735 | 364.361 | 28 | -90 | 2 | 22 |
| DEX-CZ5048 | 417304.700 | 9674533.644 | 355.973 | 19 | -90 | 1 | 13 |
| DEX-CZ5049 | 417322.440 | 9674520.145 | 362.000 | 19 | -90 | 2 | 11 |
| DEX-CZ505 | 416340.613 | 9673601.110 | 365.442 | 48 | -90 | 12.54 | 12.55 |
| DEX-CZ5051 | 417027.979 | 9674549.606 | 436.555 | 21 | -90 | 3 | 15 |
| DEX-CZ5052 | 417076.676 | 9674548.908 | 427.285 | 16 | -90 | 3 | 13 |
| DEX-CZ5053 | 417157.228 | 9674579.604 | 396.876 | 18 | -90 | 3 | 12 |
| DEX-CZ5054 | 417180.827 | 9674578.717 | 388.728 | 9 | -90 | 3 | 4 |
| DEX-CZ5055 | 417229.154 | 9674550.434 | 384.781 | 8 | -90 | 3 | 4 |
| DEX-CZ5056 | 417279.174 | 9674548.475 | 363.886 | 30 | -90 | 3 | 20.36 |
| DEX-CZ5057 | 417321.868 | 9674549.553 | 363.922 | 36 | -90 | 4 | 17 |
| DEX-CZ5058 | 416852.110 | 9674578.569 | 430.061 | 22 | -90 | 5 | 11 |
| DEX-CZ5059 | 416876.600 | 9674579.000 | 436.104 | 12 | -90 | 1 | 8 |
| DEX-CZ506 | 416249.503 | 9673604.149 | 371.764 | 38 | -90 | 23.25 | 17.85 |
| DEX-CZ5060 | 417004.015 | 9674579.594 | 435.444 | 16 | -90 | 3.75 | 8.25 |
| DEX-CZ5061 | 417028.925 | 9674578.229 | 432.743 | 12 | -90 | 1 | 7 |
| DEX-CZ5062 | 417058.323 | 9674578.170 | 427.587 | 8 | -90 | 1 | 1.5 |
| DEX-CZ5063 | 417080.319 | 9674579.106 | 419.351 | 4 | -90 | 1 | 0 |
| DEX-CZ5064 | 417233.429 | 9674578.506 | 377.185 | 15 | -90 | 5 | 7.53 |
| DEX-CZ5065 | 417254.099 | 9674579.974 | 367.887 | 22 | -90 | 5 | 14 |
| DEX-CZ5066 | 417277.338 | 9674578.477 | 361.000 | 11 | -90 | 7 | 2 |
| DEX-CZ5067 | 417306.687 | 9674578.948 | 367.304 | 41 | -90 | 30.3 | 10 |
| DEX-CZ5068 | 417330.031 | 9674579.196 | 364.973 | 21 | -90 | 9 | 4 |
| DEX-CZ5069 | 416878.296 | 9674602.488 | 434.576 | 9 | -90 | 5 | 2 |
| DEX-CZ507 | 416148.776 | 9673588.296 | 381.220 | 34 | -90 | 33 | 9.21 |
| DEX-CZ5070 | 417028.782 | 9674599.264 | 422.238 | 16 | -90 | 3 | 8 |
| DEX-CZ5071 | 417078.069 | 9674600.875 | 410.896 | 7 | -90 | 1 | 3 |
| DEX-CZ5072 | 417275.181 | 9674599.166 | 362.181 | 17 | -90 | 4 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3552 | 417598.696 | 9672747.112 | 373.982 | 40 | -90 | 32.99 | 5 |
| DEX-CZ3553 | 417553.740 | 9672745.460 | 375.560 | 39 | -90 | 31.22 | 5 |
| DEX-CZ3554 | 417499.869 | 9672746.882 | 382.971 | 27 | -90 | 11 | 15.65 |
| DEX-CZ3555 | 417448.633 | 9672750.152 | 388.494 | 29 | -90 | 23.5 | 3 |
| DEX-CZ3556 | 417400.837 | 9672750.685 | 396.815 | 24 | -90 | 9 | 12 |
| DEX-CZ3557 | 417347.901 | 9672747.493 | 408.761 | 35 | -90 | 20.03 | 11.77 |
| DEX-CZ3559 | 417247.501 | 9672747.974 | 411.308 | 22 | -90 | 7.29 | 14 |
| DEX-CZ3560 | 417198.725 | 9672735.000 | 400.113 | 39 | -90 | 21.36 | 12 |
| DEX-CZ3561 | 417150.632 | 9672746.651 | 385.763 | 42 | -90 | 25.34 | 15.24 |
| DEX-CZ3562 | 418045.401 | 9672702.100 | 406.482 | 4 | -90 | 1 | 2 |
| DEX-CZ3563 | 417957.257 | 9672700.648 | 400.083 | 19 | -90 | 13.61 | 3 |
| DEX-CZ3564 | 417850.496 | 9672702.665 | 382.429 | 21 | -90 | 20 | 1 |
| DEX-CZ3565 | 417750.992 | 9672701.832 | 379.091 | 27 | -90 | 26.64 | 0 |
| DEX-CZ3566 | 417652.672 | 9672702.026 | 381.580 | 45 | -90 | 31.3 | 5 |
| DEX-CZ3567 | 417549.231 | 9672700.248 | 382.450 | 32 | -90 | 17.25 | 12.24 |
| DEX-CZ3568 | 417448.956 | 9672699.946 | 395.523 | 20 | -90 | 3 | 11 |
| DEX-CZ3570 | 417999.075 | 9672653.409 | 422.662 | 13 | -90 | 5 | 4 |
| DEX-CZ3571 | 417944.911 | 9672648.457 | 408.084 | 13 | -90 | 7.6 | 0.82 |
| DEX-CZ3572 | 417899.635 | 9672652.323 | 396.585 | 17 | -90 | 8.52 | 5.48 |
| DEX-CZ3573 | 417847.433 | 9672648.837 | 390.639 | 19 | -90 | 16.1 | 3 |
| DEX-CZ3574 | 417798.271 | 9672651.634 | 393.082 | 10 | -90 | 7 | 0.42 |
| DEX-CZ3575 | 417749.420 | 9672649.198 | 388.660 | 24 | -90 | 20.66 | 0 |
| DEX-CZ3577 | 417650.463 | 9672649.312 | 391.280 | 23 | -90 | 17.55 | 4 |
| DEX-CZ3578 | 417602.526 | 9672647.277 | 389.887 | 18 | -90 | 13.25 | 2 |
| DEX-CZ3579 | 417544.550 | 9672651.407 | 386.922 | 24 | -90 | 6.65 | 12.35 |
| DEX-CZ3580 | 417498.549 | 9672649.348 | 399.209 | 23 | -90 | 6.27 | 11 |
| DEX-CZ3581 | 417449.290 | 9672650.314 | 407.432 | 9 | -90 | 5 | 2 |
| DEX-CZ3582 | 417400.118 | 9672651.179 | 406.924 | 24 | -90 | 13.48 | 7.75 |
| DEX-CZ3584 | 417953.545 | 9672602.091 | 413.559 | 19 | -90 | 6 | 9 |
| DEX-CZ3585 | 417851.043 | 9672604.864 | 396.868 | 13 | -90 | 10 | 0 |
| DEX-CZ3586 | 417751.892 | 9672600.070 | 399.424 | 38 | -90 | 10.25 | 26.34 |
| DEX-CZ3587 | 417650.510 | 9672600.019 | 398.126 | 17 | -90 | 8.26 | 7 |
| DEX-CZ3588 | 417548.861 | 9672599.439 | 394.068 | 25 | -90 | 8.23 | 14.5 |
| DEX-CZ3589 | 417449.746 | 9672600.371 | 412.898 | 34 | -90 | 10.22 | 20 |
| DEX-CZ3590 | 417349.956 | 9672600.121 | 417.259 | 35 | -90 | 8.3 | 5.7 |
| DEX-CZ3592 | 417997.878 | 9672550.878 | 404.441 | 8 | -90 | 3 | 4 |
| DEX-CZ3593 | 417952.093 | 9672547.956 | 404.098 | 16 | -90 | 10.78 | 3 |
| DEX-CZ3594 | 417896.482 | 9672549.510 | 396.000 | 25 | -90 | 19.45 | 5 |
| DEX-CZ3595 | 417846.264 | 9672555.595 | 404.530 | 11 | -90 | 8 | 1 |
| DEX-CZ3596 | 417801.088 | 9672553.228 | 409.755 | 16 | -90 | 6 | 5.6 |
| DEX-CZ3597 | 417750.979 | 9672550.300 | 410.646 | 23 | -90 | 8.26 | 11 |
| DEX-CZ3599 | 417649.498 | 9672549.880 | 404.497 | 20 | -90 | 11 | 6 |
| DEX-CZ3600 | 417600.121 | 9672549.958 | 394.523 | 23 | -90 | 14.4 | 6.81 |
| DEX-CZ3601 | 417549.624 | 9672549.564 | 398.764 | 27 | -90 | 8 | 17 |
| DEX-CZ3602 | 417399.414 | 9672550.402 | 421.993 | 24 | -90 | 9 | 11 |
| DEX-CZ3603 | 417350.763 | 9672550.590 | 422.054 | 28 | -90 | 13 | 12 |
| DEX-CZ3605 | 417946.712 | 9672502.118 | 391.073 | 22 | -90 | 17.56 | 4 |
| DEX-CZ3606 | 417849.792 | 9672498.553 | 404.652 | 20 | -90 | 17.43 | 1.45 |
| DEX-CZ3607 | 417748.278 | 9672501.518 | 415.976 | 23 | -90 | 5.6 | 13.4 |
| DEX-CZ3610 | 417952.176 | 9672448.604 | 398.153 | 23 | -90 | 14.9 | 4 |
| DEX-CZ3611 | 417900.755 | 9672448.049 | 402.716 | 23 | -90 | 14.19 | 8 |
| DEX-CZ3612 | 417855.955 | 9672451.493 | 405.904 | 37 | -90 | 21.84 | 14 |
| DEX-CZ3613 | 417800.500 | 9672449.439 | 412.107 | 29 | -90 | 14.7 | 14.3 |
| DEX-CZ3614 | 417950.105 | 9672399.036 | 405.039 | 26 | -90 | 14.86 | 8 |
| DEX-CZ3615 | 417851.861 | 9672399.212 | 415.900 | 21 | -90 | 11 | 8 |
| DEX-CZ3616 | 417947.293 | 9672351.071 | 415.675 | 15 | -90 | 9 | 3 |
| DEX-CZ3617 | 417900.348 | 9672349.702 | 420.186 | 19 | -90 | 9.44 | 7 |
| DEX-CZ3618 | 417853.298 | 9672349.428 | 422.765 | 20 | -90 | 8 | 8 |
| DEX-CZ3619 | 417799.455 | 9672350.226 | 423.261 | 22 | -90 | 6 | 14 |
| DEX-CZ3620 | 417751.069 | 9672350.274 | 424.410 | 34 | -90 | 18.65 | 14 |
| DEX-CZ3621 | 417350.937 | 9672654.532 | 408.106 | 41 | -90 | 31.92 | 8 |
| DEX-CZ3622 | 417301.324 | 9672550.873 | 418.206 | 31 | -90 | 7 | 21.46 |
| DEX-CZ3623 | 417299.026 | 9672651.978 | 413.368 | 28 | -90 | 13.21 | 13.27 |
| DEX-CZ3624 | 417451.267 | 9672550.496 | 413.513 | 15 | -90 | 7.23 | 5 |
| DEX-CZ3625 | 418454.458 | 9673203.297 | 457.460 | 8 | -90 | 4 | 2 |
| DEX-CZ3626 | 418552.690 | 9673202.645 | 469.682 | 21 | -90 | 13.9 | 3 |
| DEX-CZ3627 | 416996.813 | 9673153.313 | 386.731 | 24 | -90 | 12.3 | 10 |
| DEX-CZ3628 | 416951.236 | 9673201.361 | 384.564 | 31 | -90 | 16.46 | 13 |
| DEX-CZ3629 | 416849.400 | 9673201.634 | 405.063 | 28 | -90 | 20.49 | 4 |
| DEX-CZ3630 | 417246.911 | 9673003.355 | 362.499 | 34 | -90 | 27.49 | 5 |
| DEX-CZ3631 | 417300.362 | 9672949.938 | 370.309 | 47 | -90 | 41.38 | 7.46 |
| DEX-CZ3632 | 417301.245 | 9672999.453 | 362.373 | 24 | -90 | 12.34 | 1 |
| DEX-CZ3633 | 417347.376 | 9672999.746 | 370.867 | 36 | -90 | 24.42 | 4.2 |
| DEX-CZ3639 | 415502.842 | 9671831.747 | 258.133 | 23 | -90 | 11.2 | 2.8 |
| DEX-CZ3649 | 415410.343 | 9671913.084 | 249.645 | 14 | -90 | 4 | 4 |
| DEX-CZ3650 | 415512.142 | 9671904.892 | 256.637 | 10 | -90 | 4 | 1 |
| DEX-CZ3651 | 415604.926 | 9671919.059 | 295.815 | 25 | -90 | 4 | 13.35 |
| DEX-CZ3652 | 415709.824 | 9671917.779 | 328.210 | 27 | -90 | 9 | 11 |
| DEX-CZ3653 | 415807.183 | 9671913.958 | 352.465 | 32 | -90 | 16.41 | 9.25 |
| DEX-CZ3661 | 415318.864 | 9672020.309 | 236.744 | 11 | -90 | 2 | 1 |
| DEX-CZ3662 | 415398.205 | 9672000.609 | 237.840 | 16 | -90 | 2 | 3 |
| DEX-CZ3664 | 415613.955 | 9672078.893 | 293.603 | 16 | -90 | 5 | 8 |
| DEX-CZ3665 | 415714.041 | 9672012.596 | 323.719 | 10 | -90 | 5 | 3 |
| DEX-CZ3666 | 415801.800 | 9672010.140 | 344.881 | 27 | -90 | 4 | 14 |
| DEX-CZ3681 | 415307.411 | 9672107.819 | 262.277 | 20 | -90 | 2.6 | 0 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5073 | 417305.647 | 9674599.674 | 368.000 | 35 | -90 | 8.36 | 23.73 |
| DEX-CZ5074 | 417330.698 | 9674600.504 | 366.151 | 28 | -90 | 5 | 20.55 |
| DEX-CZ5075 | 417377.468 | 9674605.099 | 359.053 | 25 | -90 | 16.12 | 3 |
| DEX-CZ5076 | 416852.673 | 9674629.178 | 427.456 | 21 | -90 | 12.66 | 9 |
| DEX-CZ5077 | 416875.337 | 9674624.197 | 431.906 | 17 | -90 | 11.35 | 4 |
| DEX-CZ5078 | 417007.157 | 9674628.436 | 419.057 | 20 | -90 | 11.89 | 4 |
| DEX-CZ5079 | 417026.441 | 9674630.605 | 411.171 | 23 | -90 | 10 | 5.86 |
| DEX-CZ508 | 416043.259 | 9673607.865 | 381.362 | 30 | -90 | 9.32 | 21.14 |
| DEX-CZ5080 | 417055.595 | 9674629.471 | 402.125 | 13 | -90 | 2 | 6 |
| DEX-CZ5081 | 417074.103 | 9674628.627 | 399.284 | 19 | -90 | 2.45 | 10.55 |
| DEX-CZ5082 | 417128.263 | 9674627.920 | 390.775 | 25 | -90 | 11 | 10 |
| DEX-CZ5083 | 417154.453 | 9674629.603 | 385.011 | 14 | -90 | 8 | 3 |
| DEX-CZ5084 | 417177.200 | 9674629.675 | 381.000 | 17 | -90 | 13.73 | 0 |
| DEX-CZ5085 | 417203.263 | 9674628.621 | 374.857 | 29 | -90 | 18.89 | 10.48 |
| DEX-CZ5086 | 417227.748 | 9674630.162 | 369.823 | 16 | -90 | 10 | 4 |
| DEX-CZ5087 | 417251.431 | 9674631.438 | 366.225 | 23 | -90 | 9 | 12 |
| DEX-CZ5088 | 417275.720 | 9674630.982 | 366.946 | 16 | -90 | 3 | 11 |
| DEX-CZ5089 | 417301.448 | 9674631.875 | 370.227 | 32 | -90 | 4 | 26 |
| DEX-CZ509 | 415943.193 | 9673602.526 | 385.663 | 20 | -90 | 12.43 | 8.03 |
| DEX-CZ5090 | 417327.377 | 9674631.395 | 371.344 | 29 | -90 | 4.45 | 16.55 |
| DEX-CZ5091 | 417354.164 | 9674631.631 | 371.731 | 43 | -90 | 8 | 29 |
| DEX-CZ5092 | 416875.789 | 9674646.504 | 428.341 | 36 | -90 | 30.39 | 2 |
| DEX-CZ5093 | 417033.042 | 9674649.389 | 403.489 | 26 | -90 | 17.49 | 5 |
| DEX-CZ5094 | 417079.285 | 9674651.767 | 392.397 | 22 | -90 | 17.96 | 1 |
| DEX-CZ5095 | 417129.032 | 9674650.175 | 384.678 | 30 | -90 | 19.49 | 6 |
| DEX-CZ5096 | 417179.085 | 9674650.218 | 376.823 | 13 | -90 | 6 | 4.46 |
| DEX-CZ5097 | 417225.664 | 9674650.727 | 370.842 | 25 | -90 | 6 | 7 |
| DEX-CZ5098 | 417279.860 | 9674649.388 | 370.374 | 16 | -90 | 7 | 7 |
| DEX-CZ5099 | 417326.662 | 9674651.569 | 374.708 | 28 | -90 | 4 | 15 |
| DEX-CZ510 | 415942.781 | 9673549.438 | 385.898 | 15 | -90 | 4 | 10 |
| DEX-CZ5100 | 417378.088 | 9674651.917 | 370.976 | 24 | -90 | 5 | 13 |
| DEX-CZ5101 | 416849.439 | 9674679.179 | 422.762 | 25 | -90 | 21.63 | 1.63 |
| DEX-CZ5103 | 416900.200 | 9674679.000 | 424.768 | 33 | -90 | 18.09 | 16 |
| DEX-CZ5105 | 416925.991 | 9674831.218 | 421.851 | 35 | -90 | 15.77 | 19 |
| DEX-CZ5107 | 417002.165 | 9674680.422 | 408.137 | 24 | -90 | 11 | 10.86 |
| DEX-CZ5108 | 417031.021 | 9674677.748 | 404.203 | 36 | -90 | 8 | 19 |
| DEX-CZ5109 | 417053.841 | 9674680.318 | 398.937 | 20 | -90 | 12.45 | 5.46 |
| DEX-CZ511 | 415999.265 | 9673551.469 | 380.314 | 14 | -90 | 6.46 | 5 |
| DEX-CZ5112 | 417152.292 | 9674680.966 | 386.112 | 14 | -90 | 6 | 6 |
| DEX-CZ5113 | 417181.627 | 9674678.170 | 379.931 | 19 | -90 | 15.46 | 2.72 |
| DEX-CZ5114 | 417206.737 | 9674682.117 | 375.864 | 19 | -90 | 10 | 8 |
| DEX-CZ5115 | 417227.845 | 9674682.134 | 373.136 | 19 | -90 | 4 | 13 |
| DEX-CZ5116 | 417252.791 | 9674679.447 | 372.960 | 32 | -90 | 5 | 13 |
| DEX-CZ5117 | 417281.433 | 9674681.090 | 372.696 | 42 | -90 | 5 | 32 |
| DEX-CZ5118 | 417304.403 | 9674679.276 | 374.343 | 32 | -90 | 11.27 | 18.53 |
| DEX-CZ5119 | 417332.051 | 9674677.030 | 376.779 | 19 | -90 | 14.89 | 3 |
| DEX-CZ512 | 416060.215 | 9673555.992 | 381.476 | 13 | -90 | 9.39 | 2 |
| DEX-CZ5120 | 417354.360 | 9674681.125 | 376.271 | 13 | -90 | 5 | 7 |
| DEX-CZ5121 | 417380.865 | 9674680.904 | 373.200 | 20 | -90 | 2 | 15 |
| DEX-CZ5126 | 417030.084 | 9674701.048 | 408.631 | 16 | -90 | 11 | 3 |
| DEX-CZ5129 | 417177.452 | 9674701.128 | 381.402 | 24 | -90 | 16.65 | 6 |
| DEX-CZ513 | 416103.090 | 9673555.590 | 382.000 | 14 | -90 | 6.24 | 6.13 |
| DEX-CZ5130 | 417203.590 | 9674699.166 | 377.588 | 14 | -90 | 11 | 1 |
| DEX-CZ5131 | 417231.156 | 9674700.222 | 375.836 | 23 | -90 | 3 | 17 |
| DEX-CZ5132 | 417280.457 | 9674700.249 | 374.038 | 25 | -90 | 6 | 12 |
| DEX-CZ5133 | 417328.712 | 9674694.557 | 375.702 | 24 | -90 | 6 | 13 |
| DEX-CZ5134 | 417377.798 | 9674698.888 | 371.015 | 6 | -90 | 2 | 1 |
| DEX-CZ5135 | 416849.085 | 9674721.238 | 420.460 | 12 | -90 | 9.39 | 0 |
| DEX-CZ5136 | 416875.683 | 9674720.981 | 423.475 | 18 | -90 | 7 | 8.25 |
| DEX-CZ5137 | 416900.396 | 9674718.997 | 423.899 | 29 | -90 | 26.14 | 5.83 |
| DEX-CZ5138 | 416928.700 | 9674701.000 | 423.000 | 30 | -90 | 11.97 | 11 |
| DEX-CZ5139 | 417030.056 | 9674751.847 | 416.978 | 28 | -90 | 27.34 | 2 |
| DEX-CZ514 | 416149.622 | 9673556.205 | 380.310 | 11 | -90 | 5.62 | 4 |
| DEX-CZ5141 | 417080.274 | 9674721.950 | 403.188 | 34 | -90 | 23.21 | 9.88 |
| DEX-CZ5142 | 417106.612 | 9674721.448 | 396.802 | 22 | -90 | 16.31 | 3 |
| DEX-CZ5144 | 417156.500 | 9674719.000 | 386.000 | 41 | -90 | 10 | 22.41 |
| DEX-CZ5145 | 417179.372 | 9674719.188 | 382.888 | 17 | -90 | 7 | 10 |
| DEX-CZ5146 | 417204.225 | 9674722.024 | 379.305 | 23 | -90 | 5 | 18 |
| DEX-CZ5147 | 417230.205 | 9674719.474 | 379.134 | 24 | -90 | 3 | 16 |
| DEX-CZ5148 | 417254.180 | 9674719.534 | 377.700 | 31 | -90 | 5 | 21.5 |
| DEX-CZ5149 | 417280.676 | 9674720.340 | 374.358 | 29 | -90 | 5 | 20 |
| DEX-CZ515 | 416204.732 | 9673551.688 | 366.303 | 21 | -90 | 5 | 13 |
| DEX-CZ5150 | 417306.449 | 9674719.751 | 369.702 | 7 | -90 | 4 | 1 |
| DEX-CZ5151 | 417329.330 | 9674720.703 | 364.938 | 32 | -90 | 2 | 28 |
| DEX-CZ5155 | 416874.525 | 9674750.362 | 424.000 | 24 | -90 | 22.96 | 3 |
| DEX-CZ5156 | 416975.600 | 9674752.000 | 422.000 | 42 | -90 | 29.93 | 11 |
| DEX-CZ5159R | 416953.694 | 9674720.225 | 420.926 | 36 | -90 | 11 | 22 |
| DEX-CZ516 | 416258.714 | 9673559.908 | 371.290 | 10 | -90 | 6 | 3 |
| DEX-CZ5160 | 416977.853 | 9674721.298 | 420.231 | 36 | -90 | 28.46 | 6.84 |
| DEX-CZ5161 | 417000.292 | 9674719.584 | 418.084 | 33 | -90 | 16.82 | 16.24 |
| DEX-CZ5162 | 417027.838 | 9674719.510 | 409.234 | 40 | -90 | 9.43 | 24.33 |
| DEX-CZ5163 | 417051.108 | 9674721.816 | 407.571 | 24 | -90 | 14 | 8 |
| DEX-CZ5164 | 417132.112 | 9674748.671 | 398.869 | 21 | -90 | 14.24 | 6 |
| DEX-CZ5165 | 417179.307 | 9674751.657 | 389.009 | 19 | -90 | 10 | 7 |
| DEX-CZ5166 | 417235.526 | 9674753.927 | 383.510 | 28 | -90 | 11.43 | 15.71 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ3682 | 415404.851 | 9672118.692 | 292.763 | 21 | -90 | 7 | 9.25 |
| DEX-CZ3683 | 415514.887 | 9672116.994 | 291.690 | 31 | -90 | 19.88 | 7 |
| DEX-CZ3684 | 415600.993 | 9672128.671 | 307.519 | 29 | -90 | 15 | 10.23 |
| DEX-CZ3685 | 415711.760 | 9672112.237 | 307.227 | 24 | -90 | 4 | 15 |
| DEX-CZ3686 | 415814.131 | 9672123.903 | 326.631 | 14 | -90 | 5 | 6 |
| DEX-CZ3699 | 415118.681 | 9672219.427 | 224.219 | 15 | -90 | 10 | 3 |
| DEX-CZ3700 | 415223.367 | 9672220.888 | 249.450 | 20 | -90 | 6 | 5 |
| DEX-CZ3701 | 415311.794 | 9672210.872 | 286.593 | 20 | -90 | 7 | 2 |
| DEX-CZ3702 | 415399.206 | 9672219.205 | 308.036 | 33 | -90 | 11.5 | 13.25 |
| DEX-CZ3703 | 415504.981 | 9672218.835 | 300.426 | 15 | -90 | 10.25 | 0 |
| DEX-CZ3704 | 415606.322 | 9672216.127 | 326.853 | 29 | -90 | 4 | 21.65 |
| DEX-CZ3705 | 415700.771 | 9672214.955 | 350.835 | 20 | -90 | 5 | 10 |
| DEX-CZ3706 | 415806.109 | 9672210.282 | 363.670 | 36 | -90 | 4 | 11.35 |
| DEX-CZ3720 | 415153.623 | 9672291.690 | 241.712 | 20 | -90 | 5 | 12 |
| DEX-CZ3721 | 415196.787 | 9672311.006 | 255.692 | 12 | -90 | 4.63 | 1.37 |
| DEX-CZ3722 | 415300.445 | 9672309.880 | 294.290 | 18 | -90 | 12.3 | 2 |
| DEX-CZ3723 | 415401.957 | 9672304.676 | 309.895 | 14 | -90 | 4 | 6 |
| DEX-CZ3724 | 415506.158 | 9672313.590 | 286.000 | 6 | -90 | 2 | 1 |
| DEX-CZ3725 | 415623.005 | 9672318.216 | 294.739 | 10 | -90 | 5 | 2 |
| DEX-CZ3726 | 415712.889 | 9672324.399 | 316.336 | 17 | -90 | 14 | 1 |
| DEX-CZ3727 | 415839.620 | 9672305.262 | 371.773 | 16 | -90 | 4 | 11.6 |
| DEX-CZ3746 | 415505.216 | 9672413.333 | 289.542 | 10 | -90 | 5 | 0 |
| DEX-CZ3747 | 415611.739 | 9672398.381 | 329.643 | 4 | -90 | 1 | 0 |
| DEX-CZ3749 | 415803.233 | 9672431.061 | 309.176 | 9 | -90 | 3 | 2 |
| DEX-CZ3771 | 415594.766 | 9672528.606 | 292.910 | 8 | -90 | 3 | 3 |
| DEX-CZ3772 | 415714.558 | 9672527.880 | 322.952 | 11 | -90 | 5 | 3 |
| DEX-CZ3773 | 415805.969 | 9672512.704 | 324.875 | 27 | -90 | 17.6 | 4.4 |
| DEX-CZ3797 | 415641.436 | 9672635.760 | 289.780 | 25 | -90 | 12 | 10 |
| DEX-CZ3798 | 415701.446 | 9672607.278 | 296.403 | 20 | -90 | 12 | 5.45 |
| DEX-CZ3799 | 415812.393 | 9672596.640 | 343.924 | 4 | -90 | 1 | 2 |
| DEX-CZ3825 | 415706.399 | 9672702.270 | 295.297 | 16 | -90 | 8.53 | 5.18 |
| DEX-CZ3826 | 415803.090 | 9672716.980 | 312.554 | 15 | -90 | 6 | 7 |
| DEX-CZ3847 | 415717.098 | 9672819.676 | 317.618 | 17 | -90 | 3 | 5 |
| DEX-CZ3848 | 415810.592 | 9672812.327 | 299.799 | 21 | -90 | 2 | 4 |
| DEX-CZ3868 | 415705.529 | 9672916.656 | 323.923 | 16 | -90 | 7 | 2 |
| DEX-CZ3869 | 415800.776 | 9672916.041 | 308.959 | 27 | -90 | 20.83 | 5 |
| DEX-CZ3888 | 415799.863 | 9673012.180 | 335.000 | 20 | -90 | 1 | 8 |
| DEX-CZ3907 | 415811.488 | 9673114.549 | 305.505 | 9 | -90 | 5 | 0.5 |
| DEX-CZ3962 | 415898.129 | 9672911.273 | 304.457 | 16 | -90 | 10 | 2 |
| DEX-CZ3963 | 416004.182 | 9672902.891 | 311.936 | 23 | -90 | 14.57 | 6.42 |
| DEX-CZ3964 | 415912.500 | 9672808.228 | 307.000 | 16 | -90 | 5 | 9 |
| DEX-CZ3965 | 415899.444 | 9672513.391 | 319.887 | 28 | -90 | 18 | 10 |
| DEX-CZ3966 | 415918.003 | 9672100.234 | 356.726 | 17 | -90 | 2 | 5 |
| DEX-CZ3967 | 415911.663 | 9672022.242 | 341.761 | 20 | -90 | 3.63 | 2.37 |
| DEX-CZ3968 | 415893.812 | 9671934.339 | 366.299 | 29 | -90 | 4 | 19 |
| DEX-CZ4090 | 417054.606 | 9673049.248 | 388.131 | 41 | -90 | 9 | 30 |
| DEX-CZ4091 | 417099.108 | 9673049.820 | 376.629 | 15 | -90 | 9 | 4 |
| DEX-CZ4092 | 417102.293 | 9672801.885 | 382.000 | 23 | -90 | 20.2 | 1.4 |
| DEX-CZ4093 | 417099.179 | 9672748.670 | 392.258 | 23 | -90 | 7.23 | 14.26 |
| DEX-CZ4094 | 417052.646 | 9672749.915 | 397.329 | 37 | -90 | 13.64 | 23.06 |
| DEX-CZ4095 | 417049.691 | 9672803.270 | 390.866 | 39 | -90 | 34.71 | 3 |
| DEX-CZ4096 | 417046.295 | 9672705.013 | 402.724 | 41 | -90 | 24.24 | 16.26 |
| DEX-CZ4097 | 417001.361 | 9672750.219 | 398.716 | 30 | -90 | 19.2 | 9 |
| DEX-CZ4098 | 416951.806 | 9672798.779 | 389.243 | 33 | -90 | 4 | 28 |
| DEX-CZ4099 | 416950.320 | 9672749.647 | 386.373 | 34 | -90 | 19.49 | 15 |
| DEX-CZ4100 | 416949.480 | 9672704.529 | 399.038 | 23 | -90 | 16.41 | 5 |
| DEX-CZ4101 | 417159.548 | 9672707.304 | 387.000 | 50 | -90 | 26.26 | 20.62 |
| DEX-CZ4102 | 417102.472 | 9672647.266 | 407.416 | 30 | -90 | 19.78 | 10 |
| DEX-CZ4103 | 417153.712 | 9672646.536 | 399.099 | 34 | -90 | 16 | 13 |
| DEX-CZ4104 | 417750.746 | 9672448.525 | 418.000 | 22 | -90 | 16.5 | 3.5 |
| DEX-CZ4105 | 417743.242 | 9672397.234 | 420.496 | 34 | -90 | 21.68 | 12.5 |
| DEX-CZ4106 | 417752.775 | 9672301.126 | 427.327 | 17 | -90 | 9.37 | 7 |
| DEX-CZ4107 | 417851.032 | 9672297.297 | 427.743 | 24 | -90 | 21.01 | 3 |
| DEX-CZ4108 | 417704.613 | 9672348.134 | 424.458 | 29 | -90 | 20.53 | 7 |
| DEX-CZ4109 | 417702.228 | 9672449.504 | 416.910 | 29 | -90 | 18.31 | 10 |
| DEX-CZ4110 | 417700.744 | 9672254.393 | 418.613 | 19 | -90 | 10 | 2.38 |
| DEX-CZ4111 | 417755.382 | 9672250.864 | 418.930 | 26 | -90 | 12 | 11 |
| DEX-CZ4112 | 417804.737 | 9672249.854 | 423.917 | 25 | -90 | 12.29 | 9 |
| DEX-CZ4113 | 417848.244 | 9672247.297 | 423.083 | 26 | -90 | 9 | 13.72 |
| DEX-CZ4114 | 417150.488 | 9673052.041 | 363.421 | 29 | -90 | 8 | 20.22 |
| DEX-CZ4115 | 416950.388 | 9672847.846 | 389.930 | 11 | -90 | 6 | 5 |
| DEX-CZ4116 | 417000.474 | 9672850.742 | 390.790 | 22 | -90 | 13.26 | 7 |
| DEX-CZ4117 | 417051.689 | 9672849.026 | 379.000 | 21 | -90 | 16 | 2 |
| DEX-CZ4118 | 417050.769 | 9672652.109 | 411.831 | 36 | -90 | 17.23 | 16.48 |
| DEX-CZ4119 | 417000.076 | 9672651.231 | 400.833 | 16 | -90 | 7.27 | 8 |
| DEX-CZ4120 | 416950.219 | 9672653.102 | 411.471 | 28 | -90 | 13.18 | 13 |
| DEX-CZ4121 | 416898.165 | 9672849.377 | 376.898 | 27 | -90 | 20.5 | 5 |
| DEX-CZ4122 | 416901.002 | 9672751.626 | 397.033 | 11 | -90 | 6 | 2 |
| DEX-CZ4123 | 417053.520 | 9673147.016 | 364.867 | 19 | -90 | 6 | 7 |
| DEX-CZ4124 | 416895.284 | 9672650.235 | 421.002 | 25 | -90 | 14.26 | 6 |
| DEX-CZ4125 | 415957.597 | 9671950.884 | 370.526 | 30 | -90 | 19.22 | 10 |
| DEX-CZ4126 | 416006.428 | 9671952.779 | 378.045 | 27 | -90 | 18.24 | 6 |
| DEX-CZ4127 | 416060.000 | 9671947.887 | 387.698 | 22 | -90 | 12 | 1 |
| DEX-CZ4128 | 416103.475 | 9671943.926 | 394.158 | 26 | -90 | 11 | 6 |
| DEX-CZ4129 | 416154.783 | 9671949.402 | 397.487 | 22 | -90 | 12 | 4 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5167 | 417279.963 | 9674749.603 | 377.617 | 20 | -90 | 8 | 11.3 |
| DEX-CZ5168 | 417326.096 | 9674747.257 | 368.580 | 16 | -90 | 5 | 5 |
| DEX-CZ5169 | 416831.346 | 9674771.669 | 419.060 | 42 | -90 | 11.93 | 30.03 |
| DEX-CZ517 | 416300.738 | 9673551.219 | 370.407 | 21 | -90 | 9.68 | 11 |
| DEX-CZ5170 | 416849.955 | 9674772.193 | 420.851 | 42 | -90 | 24.77 | 20.74 |
| DEX-CZ5171 | 416874.391 | 9674771.194 | 420.519 | 42 | -90 | 39.36 | 8.8 |
| DEX-CZ5172 | 416898.167 | 9674770.707 | 420.000 | 41 | -90 | 21.94 | 18.38 |
| DEX-CZ5173 | 416929.211 | 9674768.045 | 421.085 | 55 | -90 | 39.07 | 14.32 |
| DEX-CZ5174 | 416950.400 | 9674770.000 | 422.000 | 43 | -90 | 27.33 | 14 |
| DEX-CZ5175 | 416973.700 | 9674769.000 | 422.000 | 45 | -90 | 18.21 | 27.6 |
| DEX-CZ5179 | 417078.800 | 9674772.000 | 416.273 | 37 | -90 | 17.91 | 15 |
| DEX-CZ518 | 416348.104 | 9673556.099 | 364.835 | 12 | -90 | 5 | 5.74 |
| DEX-CZ5180 | 417105.619 | 9674768.398 | 411.328 | 20 | -90 | 13.26 | 4 |
| DEX-CZ5181 | 417132.076 | 9674771.506 | 406.278 | 10 | -90 | 7 | 1 |
| DEX-CZ5182 | 417151.218 | 9674769.119 | 400.595 | 14 | -90 | 11.27 | 0 |
| DEX-CZ5183 | 417180.900 | 9674773.000 | 391.083 | 8 | -90 | 4 | 1 |
| DEX-CZ5186 | 417254.067 | 9674767.905 | 382.995 | 29 | -90 | 4.5 | 20.5 |
| DEX-CZ5187 | 417281.332 | 9674768.152 | 379.833 | 15 | -90 | 3 | 9 |
| DEX-CZ5188 | 417305.394 | 9674767.073 | 374.117 | 36 | -90 | 4 | 22 |
| DEX-CZ519 | 416387.621 | 9673558.536 | 350.939 | 32 | -90 | 8.98 | 22 |
| DEX-CZ5190 | 416829.257 | 9674802.363 | 415.269 | 32 | -90 | 32.36 | 4 |
| DEX-CZ5191 | 416880.663 | 9674801.857 | 419.647 | 33 | -90 | 12.22 | 19.2 |
| DEX-CZ5192 | 416928.844 | 9674799.931 | 422.797 | 27 | -90 | 17.51 | 9 |
| DEX-CZ5193 | 416976.201 | 9674800.531 | 424.774 | 41 | -90 | 23.05 | 18.21 |
| DEX-CZ5194 | 417004.164 | 9674801.272 | 425.043 | 36 | -90 | 26.29 | 9.5 |
| DEX-CZ5195 | 417029.007 | 9674799.759 | 424.660 | 46 | -90 | 32.85 | 16.08 |
| DEX-CZ5196 | 417130.653 | 9674797.802 | 409.955 | 17 | -90 | 1 | 1 |
| DEX-CZ5197 | 417181.409 | 9674800.543 | 392.066 | 22 | -90 | 10.35 | 7 |
| DEX-CZ5200 | 417282.181 | 9674802.462 | 382.862 | 17 | -90 | 6 | 8 |
| DEX-CZ5201 | 416824.870 | 9674833.029 | 415.094 | 33 | -90 | 23.8 | 10.8 |
| DEX-CZ5203 | 416878.335 | 9674830.247 | 419.010 | 35 | -90 | 24.73 | 4 |
| DEX-CZ5204 | 416901.418 | 9674831.992 | 421.027 | 26 | -90 | 19.48 | 5 |
| DEX-CZ5206 | 416952.527 | 9674828.602 | 424.337 | 46 | -90 | 36.36 | 7 |
| DEX-CZ5207 | 416975.822 | 9674830.876 | 426.000 | 52 | -90 | 47.6 | 8 |
| DEX-CZ5208 | 417003.993 | 9674829.613 | 426.000 | 33 | -90 | 18.62 | 9.51 |
| DEX-CZ5209 | 417029.998 | 9674833.192 | 426.000 | 49 | -90 | 25.88 | 22.28 |
| DEX-CZ5210 | 417048.912 | 9674830.011 | 425.314 | 28 | -90 | 21.52 | 5 |
| DEX-CZ5211 | 417080.566 | 9674830.290 | 421.861 | 18 | -90 | 11.24 | 3 |
| DEX-CZ5212 | 417101.436 | 9674828.730 | 419.033 | 20 | -90 | 8 | 5 |
| DEX-CZ5214 | 417154.373 | 9674828.735 | 402.344 | 11 | -90 | 2 | 5 |
| DEX-CZ5215 | 417179.223 | 9674830.355 | 396.121 | 22 | -90 | 7 | 8 |
| DEX-CZ5216 | 417208.020 | 9674831.052 | 392.694 | 33 | -90 | 14.38 | 16.29 |
| DEX-CZ5217 | 417233.004 | 9674821.790 | 390.300 | 50 | -90 | 20.54 | 29.23 |
| DEX-CZ5219 | 417281.265 | 9674830.693 | 390.091 | 25 | -90 | 18 | 4 |
| DEX-CZ5220 | 417299.656 | 9674828.688 | 387.424 | 39 | -90 | 20.16 | 19.6 |
| DEX-CZ5221 | 416820.350 | 9674872.308 | 415.089 | 18 | -90 | 14.16 | 1 |
| DEX-CZ5222 | 416852.329 | 9674930.980 | 416.000 | 29 | -90 | 21.22 | 6 |
| DEX-CZ5223 | 416830.532 | 9674855.523 | 415.000 | 19 | -90 | 13.26 | 0 |
| DEX-CZ5224 | 416874.487 | 9674851.007 | 417.376 | 18 | -90 | 10.23 | 2 |
| DEX-CZ5225 | 416948.712 | 9674933.076 | 422.027 | 25 | -90 | 10.3 | 13.58 |
| DEX-CZ5226 | 416926.798 | 9674851.511 | 421.026 | 31 | -90 | 18.58 | 11.4 |
| DEX-CZ5227 | 416978.097 | 9674849.172 | 426.000 | 25 | -90 | 16.69 | 4.43 |
| DEX-CZ5228 | 417027.258 | 9674850.370 | 426.000 | 26 | -90 | 19.92 | 4 |
| DEX-CZ5229 | 417078.261 | 9674851.934 | 422.841 | 10 | -90 | 6 | 1 |
| DEX-CZ523 | 416344.205 | 9673499.371 | 351.206 | 16 | -90 | 8.4 | 6 |
| DEX-CZ5230 | 417129.347 | 9674847.208 | 411.803 | 23 | -90 | 12.71 | 3.52 |
| DEX-CZ5231 | 417182.192 | 9674849.567 | 399.880 | 20 | -90 | 10 | 5 |
| DEX-CZ5233 | 417276.134 | 9674847.873 | 390.988 | 22 | -90 | 13.48 | 7.08 |
| DEX-CZ5234 | 416927.799 | 9674904.705 | 421.363 | 24 | -90 | 13.5 | 7 |
| DEX-CZ5235 | 416848.228 | 9674881.514 | 415.170 | 21 | -90 | 11.46 | 7 |
| DEX-CZ5236 | 416872.482 | 9674877.879 | 417.150 | 23 | -90 | 12.24 | 8 |
| DEX-CZ5237 | 416901.222 | 9674878.848 | 418.602 | 23 | -90 | 20.18 | 1 |
| DEX-CZ5238 | 416927.372 | 9674879.624 | 420.774 | 26 | -90 | 18.79 | 5 |
| DEX-CZ5239 | 416951.490 | 9674878.544 | 423.669 | 31 | -90 | 11 | 15 |
| DEX-CZ524 | 416247.058 | 9673510.642 | 342.940 | 34 | -90 | 1 | 30 |
| DEX-CZ5242 | 417079.159 | 9674869.518 | 421.062 | 27 | -90 | 17.81 | 7.5 |
| DEX-CZ5243 | 417099.599 | 9674871.276 | 417.767 | 18 | -90 | 12.54 | 3 |
| DEX-CZ5244 | 417129.139 | 9674883.564 | 411.352 | 31 | -90 | 20.53 | 7 |
| DEX-CZ5245 | 417151.984 | 9674869.698 | 407.085 | 36 | -90 | 18.06 | 6 |
| DEX-CZ5246 | 417181.400 | 9674873.000 | 401.470 | 33 | -90 | 13.5 | 18 |
| DEX-CZ5249 | 417272.901 | 9674870.231 | 390.916 | 11 | -90 | 6 | 2 |
| DEX-CZ525 | 416161.320 | 9673506.127 | 367.152 | 26 | -90 | 13.38 | 13 |
| DEX-CZ5250 | 416899.887 | 9674932.109 | 418.839 | 33 | -90 | 22.12 | 9.6 |
| DEX-CZ5251 | 416926.007 | 9674936.807 | 420.415 | 21 | -90 | 14.26 | 4 |
| DEX-CZ5252 | 416874.483 | 9674899.930 | 417.286 | 19 | -90 | 14.37 | 1 |
| DEX-CZ5253 | 416898.884 | 9674897.619 | 418.664 | 26 | -90 | 14.34 | 3 |
| DEX-CZ5254 | 417054.586 | 9674870.198 | 424.197 | 32 | -90 | 28.73 | 4 |
| DEX-CZ5255 | 417078.500 | 9674899.597 | 415.981 | 24 | -90 | 6 | 16 |
| DEX-CZ5256 | 417104.606 | 9674899.499 | 412.895 | 19 | -90 | 7 | 7 |
| DEX-CZ5257 | 417025.600 | 9674899.000 | 423.248 | 24 | -90 | 5 | 12 |
| DEX-CZ5259 | 417129.464 | 9674902.249 | 409.754 | 33 | -90 | 13.9 | 10.9 |
| DEX-CZ526 | 415941.298 | 9673501.181 | 367.038 | 20 | -90 | 12.96 | 6 |
| DEX-CZ5261 | 417229.278 | 9674893.275 | 396.393 | 30 | -90 | 18.73 | 8.89 |
| DEX-CZ5262 | 417252.257 | 9674872.601 | 395.011 | 14 | -90 | 7 | 0 |
| DEX-CZ5266 | 417078.298 | 9674929.336 | 412.001 | 17 | -90 | 11.59 | 3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4130 | 416198.539 | 9671945.658 | 393.133 | 25 | -90 | 15.23 | 4 |
| DEX-CZ4131 | 416248.064 | 9671939.303 | 380.604 | 18 | -90 | 6 | 7 |
| DEX-CZ4132 | 416303.917 | 9671949.235 | 367.157 | 31 | -90 | 7 | 21 |
| DEX-CZ4133 | 416347.157 | 9671952.960 | 366.860 | 15 | -90 | 8 | 5 |
| DEX-CZ4134 | 415953.188 | 9672011.746 | 353.696 | 33 | -90 | 7 | 23 |
| DEX-CZ4135 | 416052.815 | 9671992.575 | 388.588 | 27 | -90 | 17.23 | 5.27 |
| DEX-CZ4136 | 416150.874 | 9671990.610 | 402.884 | 19 | -90 | 8 | 7 |
| DEX-CZ4137 | 416254.106 | 9672001.592 | 399.238 | 27 | -90 | 15.76 | 10 |
| DEX-CZ4138 | 416345.513 | 9671997.099 | 377.917 | 12 | -90 | 3 | 7 |
| DEX-CZ4139 | 415954.267 | 9672053.790 | 365.795 | 18 | -90 | 11 | 3 |
| DEX-CZ4140 | 416000.630 | 9672047.684 | 377.677 | 40 | -90 | 8 | 26 |
| DEX-CZ4141 | 416059.108 | 9672046.743 | 386.909 | 45 | -90 | 18.33 | 20.45 |
| DEX-CZ4142 | 416102.998 | 9672050.536 | 399.450 | 29 | -90 | 21.59 | 4 |
| DEX-CZ4143 | 416152.023 | 9672051.014 | 410.504 | 18 | -90 | 11.54 | 3 |
| DEX-CZ4144 | 416204.203 | 9672044.839 | 414.636 | 28 | -90 | 11.6 | 9.81 |
| DEX-CZ4145 | 416246.656 | 9672046.442 | 416.854 | 11 | -90 | 5 | 4 |
| DEX-CZ4146 | 416292.779 | 9672058.742 | 414.022 | 21 | -90 | 13 | 6.21 |
| DEX-CZ4147 | 416506.673 | 9672053.737 | 415.434 | 21 | -90 | 8 | 5 |
| DEX-CZ4148 | 416552.324 | 9672054.042 | 419.273 | 29 | -90 | 16.44 | 11 |
| DEX-CZ4149 | 415954.345 | 9672104.334 | 372.746 | 23 | -90 | 3 | 8 |
| DEX-CZ4150 | 416045.339 | 9672097.303 | 393.677 | 35 | -90 | 11 | 3 |
| DEX-CZ4151 | 416153.260 | 9672103.821 | 411.127 | 31 | -90 | 16.61 | 10.36 |
| DEX-CZ4152 | 416253.801 | 9672096.304 | 421.277 | 29 | -90 | 19.47 | 9 |
| DEX-CZ4153 | 416547.881 | 9672092.924 | 419.317 | 15 | -90 | 4 | 1 |
| DEX-CZ4154 | 415900.480 | 9672153.538 | 355.432 | 9 | -90 | 3.5 | 3.5 |
| DEX-CZ4155 | 415954.623 | 9672147.090 | 380.075 | 7 | -90 | 4 | 1 |
| DEX-CZ4156 | 415998.979 | 9672154.157 | 394.009 | 24 | -90 | 17.29 | 5 |
| DEX-CZ4157 | 416053.235 | 9672156.894 | 401.746 | 31 | -90 | 17.88 | 9 |
| DEX-CZ4158 | 416102.979 | 9672156.650 | 409.747 | 14 | -90 | 6 | 6 |
| DEX-CZ4159 | 416153.222 | 9672150.895 | 411.928 | 49 | -90 | 44.03 | 5 |
| DEX-CZ4160 | 416197.716 | 9672153.179 | 415.326 | 25 | -90 | 13.49 | 10.12 |
| DEX-CZ4161 | 416249.572 | 9672151.268 | 417.621 | 25 | -90 | 24.37 | 0 |
| DEX-CZ4162 | 416299.301 | 9672148.297 | 417.347 | 42 | -90 | 14 | 25.02 |
| DEX-CZ4163 | 416602.088 | 9672153.827 | 411.938 | 22 | -90 | 5 | 5 |
| DEX-CZ4164 | 415950.931 | 9672201.035 | 388.150 | 20 | -90 | 5 | 9 |
| DEX-CZ4165 | 416052.259 | 9672198.989 | 402.159 | 11 | -90 | 4 | 5 |
| DEX-CZ4166 | 415900.918 | 9672250.234 | 382.568 | 14 | -90 | 11 | 1 |
| DEX-CZ4167 | 415935.088 | 9672253.797 | 382.692 | 32 | -90 | 4 | 17 |
| DEX-CZ4168 | 416000.775 | 9672254.497 | 372.100 | 16 | -90 | 5.6 | 2.4 |
| DEX-CZ4169 | 415954.456 | 9672302.468 | 359.576 | 8 | -90 | 4.6 | 0.4 |
| DEX-CZ4170 | 416351.962 | 9672298.727 | 392.668 | 32 | -90 | 31.78 | 2 |
| DEX-CZ4171 | 415944.498 | 9672353.052 | 347.612 | 27 | -90 | 11 | 9.24 |
| DEX-CZ4172 | 416003.672 | 9672351.841 | 341.267 | 14 | -90 | 9.54 | 3 |
| DEX-CZ4173 | 416349.269 | 9672346.374 | 385.524 | 36 | -90 | 8 | 19 |
| DEX-CZ4174 | 416404.586 | 9672343.740 | 388.589 | 41 | -90 | 15 | 25.58 |
| DEX-CZ4175 | 416451.604 | 9672344.838 | 393.017 | 22 | -90 | 12 | 8 |
| DEX-CZ4176 | 416554.086 | 9672348.951 | 380.300 | 16 | -90 | 8 | 5.55 |
| DEX-CZ4177 | 416603.743 | 9672348.685 | 376.802 | 15 | -90 | 4 | 9 |
| DEX-CZ4178 | 416648.667 | 9672348.733 | 376.725 | 22 | -90 | 4 | 9.52 |
| DEX-CZ4179 | 415948.969 | 9672402.569 | 330.311 | 17 | -90 | 10.32 | 2 |
| DEX-CZ4180 | 416043.893 | 9672393.585 | 329.082 | 8 | -90 | 5 | 1 |
| DEX-CZ4181 | 416553.797 | 9672403.084 | 366.925 | 16 | -90 | 4 | 9 |
| DEX-CZ4182 | 416650.314 | 9672397.314 | 373.955 | 8 | -90 | 4 | 2 |
| DEX-CZ4183 | 416755.559 | 9672399.193 | 396.397 | 31 | -90 | 4 | 18.24 |
| DEX-CZ4184 | 415947.757 | 9672448.318 | 316.000 | 32 | -90 | 21.7 | 10.5 |
| DEX-CZ4185 | 415996.719 | 9672446.516 | 316.426 | 42 | -90 | 17.53 | 11.21 |
| DEX-CZ4186 | 416051.006 | 9672446.817 | 318.000 | 30 | -90 | 7 | 19 |
| DEX-CZ4187 | 416109.498 | 9672451.761 | 327.015 | 20 | -90 | 14.47 | 4.59 |
| DEX-CZ4188 | 416145.214 | 9672465.046 | 335.144 | 7 | -90 | 4 | 0 |
| DEX-CZ4191 | 416305.425 | 9672460.988 | 366.279 | 24 | -90 | 9 | 13 |
| DEX-CZ4192 | 416364.927 | 9672449.587 | 358.415 | 4 | -90 | 2 | 0 |
| DEX-CZ4193 | 416398.634 | 9672454.993 | 359.008 | 29 | -90 | 5 | 20.7 |
| DEX-CZ4194 | 416453.040 | 9672445.382 | 357.536 | 53 | -90 | 10.38 | 29.84 |
| DEX-CZ4195 | 416554.022 | 9672448.465 | 386.281 | 22 | -90 | 15 | 5 |
| DEX-CZ4196 | 416609.062 | 9672449.642 | 392.086 | 28 | -90 | 15.32 | 9.27 |
| DEX-CZ4197 | 416651.122 | 9672461.881 | 397.564 | 37 | -90 | 24.51 | 10 |
| DEX-CZ4198 | 416693.222 | 9672458.083 | 398.887 | 20 | -90 | 15.23 | 2 |
| DEX-CZ4199 | 416756.840 | 9672451.113 | 398.284 | 19 | -90 | 10.24 | 7 |
| DEX-CZ4200 | 416807.617 | 9672446.930 | 405.874 | 33 | -90 | 13.23 | 16 |
| DEX-CZ4201 | 415955.396 | 9672502.663 | 326.822 | 23 | -90 | 11.28 | 10.23 |
| DEX-CZ4202 | 416001.581 | 9672504.554 | 330.125 | 12 | -90 | 8 | 2 |
| DEX-CZ4203 | 416054.778 | 9672499.128 | 332.516 | 15 | -90 | 8 | 2 |
| DEX-CZ4205 | 416154.614 | 9672507.717 | 360.603 | 10 | -90 | 4 | 3 |
| DEX-CZ4206 | 416251.163 | 9672498.232 | 377.441 | 24 | -90 | 3 | 17 |
| DEX-CZ4207 | 416351.385 | 9672495.770 | 378.579 | 23 | -90 | 6 | 16 |
| DEX-CZ4208 | 416449.043 | 9672499.544 | 380.084 | 26 | -90 | 20.48 | 5.45 |
| DEX-CZ4209 | 416555.408 | 9672500.628 | 400.219 | 21 | -90 | 6 | 13 |
| DEX-CZ4210 | 416650.484 | 9672497.878 | 408.209 | 19 | -90 | 9 | 7.22 |
| DEX-CZ4211 | 416752.360 | 9672498.398 | 418.903 | 10 | -90 | 6 | 1 |
| DEX-CZ4212 | 415908.050 | 9672542.669 | 333.476 | 18 | -90 | 14.34 | 3.2 |
| DEX-CZ4213 | 415950.622 | 9672543.002 | 341.674 | 11 | -90 | 5 | 4 |
| DEX-CZ4214 | 416004.149 | 9672556.930 | 359.410 | 18 | -90 | 5 | 3 |
| DEX-CZ4215 | 416050.996 | 9672553.176 | 362.832 | 14 | -90 | 5 | 7 |
| DEX-CZ4216 | 416147.493 | 9672553.768 | 375.284 | 20 | -90 | 13 | 1 |
| DEX-CZ4217 | 416200.614 | 9672548.617 | 378.485 | 35 | -90 | 5 | 18.52 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5267 | 417103.501 | 9674930.935 | 409.170 | 27 | -90 | 7 | 15 |
| DEX-CZ5269 | 417127.763 | 9674929.810 | 406.621 | 38 | -90 | 13.29 | 7 |
| DEX-CZ527 | 415847.777 | 9673446.983 | 355.611 | 32 | -90 | 12.93 | 10.14 |
| DEX-CZ5272 | 417203.231 | 9674926.196 | 396.837 | 29 | -90 | 10 | 12 |
| DEX-CZ5273 | 417228.750 | 9674933.448 | 392.877 | 42 | -90 | 13 | 21 |
| DEX-CZ5274 | 417251.110 | 9674934.990 | 388.426 | 27 | -90 | 12.44 | 9 |
| DEX-CZ5276 | 416879.670 | 9674951.940 | 417.000 | 27 | -90 | 17.69 | 8 |
| DEX-CZ5277 | 416927.800 | 9674955.211 | 419.175 | 33 | -90 | 15.51 | 14 |
| DEX-CZ5278 | 416925.514 | 9674981.848 | 416.201 | 26 | -90 | 17 | 2 |
| DEX-CZ5279 | 416879.872 | 9674933.061 | 417.416 | 38 | -90 | 21.13 | 15.3 |
| DEX-CZ528 | 415891.185 | 9673448.265 | 351.012 | 24 | -90 | 13.08 | 8 |
| DEX-CZ5280 | 417230.973 | 9674954.539 | 388.322 | 23 | -90 | 15.35 | 5 |
| DEX-CZ5281 | 417379.915 | 9674630.605 | 368.230 | 17 | -90 | 9 | 6 |
| DEX-CZ5283 | 417202.775 | 9674580.024 | 383.468 | 15 | -90 | 4 | 7 |
| DEX-CZ5284 | 417179.438 | 9674549.459 | 396.534 | 28 | -90 | 2 | 18 |
| DEX-CZ5286 | 417091.786 | 9674627.612 | 395.875 | 8 | -90 | 2.51 | 0 |
| DEX-CZ5287 | 417103.033 | 9674579.124 | 412.225 | 12 | -90 | 4 | 6 |
| DEX-CZ5288 | 417360.213 | 9673832.005 | 349.071 | 33 | -90 | 22.68 | 10 |
| DEX-CZ529 | 415951.871 | 9673450.882 | 350.994 | 23 | -90 | 16.01 | 7.78 |
| DEX-CZ5292 | 417458.263 | 9673980.443 | 354.805 | 19 | -90 | 10 | 6 |
| DEX-CZ5293 | 417459.491 | 9674082.747 | 355.116 | 17 | -90 | 9.24 | 5 |
| DEX-CZ5294 | 417461.694 | 9674049.598 | 355.017 | 34 | -90 | 13.14 | 17.4 |
| DEX-CZ5295 | 417458.275 | 9674027.167 | 355.536 | 30 | -90 | 14 | 11.54 |
| DEX-CZ5296 | 417279.496 | 9674154.292 | 371.646 | 43 | -90 | 5 | 36 |
| DEX-CZ5297 | 417407.869 | 9674071.330 | 362.432 | 8 | -90 | 4 | 2 |
| DEX-CZ5298 | 417356.637 | 9674079.214 | 371.866 | 13 | -90 | 8 | 3 |
| DEX-CZ5299 | 417304.525 | 9674073.496 | 377.096 | 15 | -90 | 11 | 2 |
| DEX-CZ530 | 416001.836 | 9673455.703 | 343.390 | 18 | -90 | 12 | 3 |
| DEX-CZ5305 | 417274.699 | 9673853.461 | 358.351 | 31 | -90 | 17.49 | 8 |
| DEX-CZ5306 | 417274.857 | 9673881.294 | 364.683 | 37 | -90 | 19.11 | 17.31 |
| DEX-CZ531 | 416062.109 | 9673455.593 | 356.066 | 20 | -90 | 12.42 | 7 |
| DEX-CZ532 | 416099.709 | 9673458.003 | 357.021 | 14 | -90 | 7.52 | 7 |
| DEX-CZ533 | 416166.546 | 9673450.458 | 343.031 | 10 | -90 | 2 | 6 |
| DEX-CZ534 | 416212.527 | 9673445.300 | 326.634 | 15 | -90 | 5 | 7.62 |
| DEX-CZ535 | 416264.136 | 9673452.203 | 327.598 | 23 | -90 | 2 | 17 |
| DEX-CZ536 | 416308.336 | 9673446.520 | 325.765 | 19 | -90 | 5 | 11.55 |
| DEX-CZ537 | 416358.928 | 9673467.235 | 334.361 | 21 | -90 | 2 | 10 |
| DEX-CZ541 | 416052.193 | 9673407.897 | 339.386 | 21 | -90 | 12.94 | 5 |
| DEX-CZ542 | 415943.110 | 9673401.751 | 331.650 | 16 | -90 | 13.98 | 0 |
| DEX-CZ543 | 415850.798 | 9673390.893 | 344.250 | 23 | -90 | 5.85 | 13.72 |
| DEX-CZ544 | 415845.228 | 9673341.099 | 331.889 | 23 | -90 | 12.54 | 9.1 |
| DEX-CZ545 | 415893.971 | 9673343.211 | 321.476 | 40 | -90 | 9.78 | 19.97 |
| DEX-CZ546 | 415945.435 | 9673352.480 | 318.379 | 18 | -90 | 5.35 | 8.79 |
| DEX-CZ548 | 416053.531 | 9673345.358 | 315.839 | 18 | -90 | 15.19 | 1.74 |
| DEX-CZ549 | 416094.566 | 9673362.386 | 317.923 | 22 | -90 | 17.88 | 5.34 |
| DEX-CZ556 | 415961.330 | 9673305.366 | 311.295 | 8 | -90 | 2 | 3.1 |
| DEX-CZ557 | 415854.383 | 9673297.845 | 318.544 | 22 | -90 | 4.44 | 17.29 |
| DEX-CZ558 | 415852.602 | 9673251.869 | 334.328 | 12 | -90 | 1 | 7 |
| DEX-CZ559 | 415894.254 | 9673257.589 | 318.434 | 9 | -90 | 2 | 4 |
| DEX-CZ5597 | 415648.700 | 9673252.000 | 378.954 | 36 | -90 | 17.89 | 17 |
| DEX-CZ5599 | 415548.300 | 9673252.000 | 386.893 | 26 | -90 | 13 | 11 |
| DEX-CZ5611 | 415397.500 | 9673450.794 | 342.509 | 6 | -90 | 3 | 0 |
| DEX-CZ5622 | 415447.538 | 9673494.990 | 327.000 | 33 | -90 | 30.4 | 0 |
| DEX-CZ5623 | 415449.580 | 9673549.334 | 327.604 | 34 | -90 | 26 | 6 |
| DEX-CZ5624 | 415398.658 | 9673546.336 | 327.000 | 35 | -90 | 27.3 | 5 |
| DEX-CZ5626 | 415399.988 | 9673650.218 | 328.997 | 47 | -90 | 39.2 | 4 |
| DEX-CZ5627 | 415352.525 | 9673650.788 | 328.747 | 45 | -90 | 17.35 | 19 |
| DEX-CZ5628 | 415304.959 | 9673648.873 | 331.489 | 21 | -90 | 9.59 | 9.78 |
| DEX-CZ5629 | 415251.923 | 9673650.113 | 347.096 | 30 | -90 | 10 | 18 |
| DEX-CZ5630 | 415248.156 | 9673598.652 | 358.867 | 20 | -90 | 3 | 7 |
| DEX-CZ5632 | 415448.474 | 9673649.979 | 329.000 | 29 | -90 | 25 | 2 |
| DEX-CZ5633 | 415447.898 | 9673584.569 | 328.000 | 37 | -90 | 24 | 10 |
| DEX-CZ5634 | 414848.741 | 9673896.288 | 345.312 | 30 | -90 | 24 | 4 |
| DEX-CZ5635 | 414848.673 | 9673851.411 | 345.717 | 41 | -90 | 30.35 | 2 |
| DEX-CZ5636 | 414901.532 | 9673855.707 | 343.878 | 33 | -90 | 26 | 5 |
| DEX-CZ5637 | 414946.535 | 9673851.834 | 343.000 | 42 | -90 | 32.24 | 7 |
| DEX-CZ5638 | 414933.211 | 9673899.673 | 343.520 | 37 | -90 | 30.18 | 5 |
| DEX-CZ5639 | 414810.266 | 9673946.733 | 347.330 | 19 | -90 | 13 | 4 |
| DEX-CZ5640 | 415004.341 | 9673846.522 | 341.907 | 38 | -90 | 31.17 | 7.78 |
| DEX-CZ5641 | 415045.310 | 9673851.846 | 341.086 | 32 | -90 | 24.52 | 6.78 |
| DEX-CZ5642 | 415039.473 | 9673916.005 | 340.214 | 30 | -90 | 25.4 | 3 |
| DEX-CZ5645 | 415007.534 | 9673750.608 | 357.528 | 9 | -90 | 5 | 2 |
| DEX-CZ5646 | 415052.394 | 9673751.107 | 356.463 | 33 | -90 | 7 | 13.32 |
| DEX-CZ5647 | 415106.092 | 9673753.199 | 352.346 | 17 | -90 | 8.3 | 4 |
| DEX-CZ5648 | 415043.576 | 9673800.520 | 344.703 | 21 | -90 | 14.41 | 5 |
| DEX-CZ5649 | 415148.026 | 9673802.952 | 339.698 | 22 | -90 | 10.66 | 10.32 |
| DEX-CZ5650 | 415146.526 | 9673748.244 | 347.018 | 31 | -90 | 13.38 | 9 |
| DEX-CZ5651 | 415203.297 | 9673750.771 | 339.443 | 20 | -90 | 4 | 12.01 |
| DEX-CZ5652 | 415248.851 | 9673746.193 | 334.664 | 31 | -90 | 14.3 | 9.27 |
| DEX-CZ5653 | 415274.358 | 9673796.772 | 333.000 | 21 | -90 | 10 | 7 |
| DEX-CZ5654 | 415247.461 | 9673845.813 | 335.260 | 26 | -90 | 21 | 1 |
| DEX-CZ5655 | 415209.968 | 9673847.746 | 336.461 | 28 | -90 | 22.12 | 3 |
| DEX-CZ5656 | 414807.301 | 9674096.442 | 360.449 | 27 | -90 | 18 | 7 |
| DEX-CZ5657 | 414757.352 | 9674056.219 | 353.792 | 38 | -90 | 34 | 2 |
| DEX-CZ5658 | 414708.086 | 9674050.214 | 353.881 | 32 | -90 | 23 | 7 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4218 | 416249.256 | 9672549.457 | 387.816 | 16 | -90 | 4 | 7 |
| DEX-CZ4219 | 416300.409 | 9672549.473 | 392.907 | 20 | -90 | 8 | 10 |
| DEX-CZ4220 | 416349.668 | 9672547.630 | 391.750 | 32 | -90 | 21.97 | 7.78 |
| DEX-CZ4221 | 416406.377 | 9672557.845 | 393.083 | 43 | -90 | 27.98 | 13 |
| DEX-CZ4222 | 416451.227 | 9672551.209 | 395.266 | 23 | -90 | 19.26 | 3.28 |
| DEX-CZ4223 | 416501.051 | 9672554.579 | 401.455 | 25 | -90 | 18.64 | 7.33 |
| DEX-CZ4224 | 416554.925 | 9672545.580 | 407.001 | 21 | -90 | 13 | 6.5 |
| DEX-CZ4225 | 416600.852 | 9672546.011 | 410.432 | 27 | -90 | 14.4 | 7.29 |
| DEX-CZ4226 | 416655.130 | 9672549.761 | 416.853 | 11 | -90 | 3 | 5 |
| DEX-CZ4227 | 416699.358 | 9672548.722 | 423.267 | 21 | -90 | 3 | 13.17 |
| DEX-CZ4228 | 416752.937 | 9672548.098 | 427.149 | 16 | -90 | 6 | 8 |
| DEX-CZ4229 | 416799.904 | 9672550.446 | 429.000 | 25 | -90 | 15.3 | 8 |
| DEX-CZ4230 | 416354.548 | 9672595.937 | 393.000 | 37 | -90 | 16.3 | 7 |
| DEX-CZ4231 | 416455.129 | 9672600.931 | 394.646 | 19 | -90 | 13 | 5 |
| DEX-CZ4232 | 416554.325 | 9672594.580 | 404.342 | 21 | -90 | 4 | 16 |
| DEX-CZ4233 | 416648.416 | 9672599.670 | 413.464 | 24 | -90 | 12.2 | 6 |
| DEX-CZ4234 | 416752.670 | 9672598.966 | 422.877 | 20 | -90 | 16.82 | 1 |
| DEX-CZ4235 | 415906.668 | 9672653.610 | 358.363 | 8 | -90 | 3 | 3 |
| DEX-CZ4236 | 415948.372 | 9672647.775 | 369.684 | 8 | -90 | 4 | 2 |
| DEX-CZ4237 | 416001.134 | 9672648.165 | 372.628 | 30 | -90 | 14 | 4 |
| DEX-CZ4238 | 416051.222 | 9672644.645 | 373.000 | 30 | -90 | 18.3 | 11 |
| DEX-CZ4239 | 416098.146 | 9672648.924 | 370.382 | 36 | -90 | 18.07 | 13 |
| DEX-CZ4240 | 416142.495 | 9672641.007 | 366.435 | 54 | -90 | 33.41 | 21 |
| DEX-CZ4241 | 416200.882 | 9672651.346 | 356.833 | 18 | -90 | 6 | 10 |
| DEX-CZ4242 | 416249.690 | 9672650.890 | 366.664 | 22 | -90 | 12 | 8 |
| DEX-CZ4243 | 416300.523 | 9672651.122 | 380.773 | 20 | -90 | 11 | 5 |
| DEX-CZ4244 | 416350.070 | 9672650.995 | 385.615 | 20 | -90 | 12.23 | 3 |
| DEX-CZ4245 | 416400.140 | 9672649.922 | 387.700 | 35 | -90 | 13.4 | 4 |
| DEX-CZ4246 | 416457.810 | 9672651.250 | 391.811 | 32 | -90 | 21.21 | 5 |
| DEX-CZ4247 | 416501.278 | 9672648.663 | 394.781 | 39 | -90 | 23.25 | 8 |
| DEX-CZ4248 | 416545.793 | 9672649.434 | 397.445 | 34 | -90 | 13.61 | 20.12 |
| DEX-CZ4249 | 416597.794 | 9672644.619 | 401.845 | 27 | -90 | 18.61 | 8 |
| DEX-CZ4250 | 416650.599 | 9672653.851 | 408.417 | 40 | -90 | 29.41 | 6 |
| DEX-CZ4251 | 416699.204 | 9672650.860 | 413.858 | 24 | -90 | 11.24 | 11.4 |
| DEX-CZ4252 | 416748.940 | 9672648.908 | 418.857 | 39 | -90 | 28.71 | 9 |
| DEX-CZ4253 | 415958.199 | 9672698.886 | 359.002 | 31 | -90 | 9 | 10.95 |
| DEX-CZ4254 | 416050.623 | 9672698.073 | 369.269 | 15 | -90 | 11 | 1 |
| DEX-CZ4255 | 416152.543 | 9672696.853 | 350.623 | 30 | -90 | 15.55 | 14.48 |
| DEX-CZ4256 | 416247.720 | 9672699.639 | 368.312 | 20 | -90 | 11.41 | 3.43 |
| DEX-CZ4257 | 416349.019 | 9672701.348 | 378.550 | 32 | -90 | 24.51 | 2 |
| DEX-CZ4258 | 416451.427 | 9672699.381 | 388.000 | 32 | -90 | 14 | 6.6 |
| DEX-CZ4259 | 416551.859 | 9672698.643 | 393.000 | 19 | -90 | 6.62 | 9.38 |
| DEX-CZ4260 | 416654.128 | 9672693.607 | 404.466 | 23 | -90 | 18.27 | 4.3 |
| DEX-CZ4261 | 416751.277 | 9672699.803 | 415.030 | 30 | -90 | 9.31 | 17 |
| DEX-CZ4262 | 415901.423 | 9672748.407 | 320.757 | 8 | -90 | 3 | 2 |
| DEX-CZ4263 | 415950.313 | 9672740.843 | 338.515 | 16 | -90 | 6 | 7 |
| DEX-CZ4264 | 416007.732 | 9672742.745 | 350.417 | 6 | -90 | 2.58 | 0.99 |
| DEX-CZ4265 | 416050.906 | 9672756.958 | 353.079 | 21 | -90 | 6 | 11.38 |
| DEX-CZ4266 | 416097.506 | 9672747.207 | 352.057 | 16 | -90 | 7.72 | 6.28 |
| DEX-CZ4267 | 416159.693 | 9672751.898 | 359.353 | 24 | -90 | 10.7 | 2 |
| DEX-CZ4268 | 416198.701 | 9672745.911 | 368.633 | 25 | -90 | 11.91 | 7.65 |
| DEX-CZ4269 | 416248.543 | 9672745.567 | 375.793 | 46 | -90 | 37.98 | 10 |
| DEX-CZ4270 | 416304.504 | 9672747.712 | 382.000 | 41 | -90 | 30.38 | 12.3 |
| DEX-CZ4271 | 416349.834 | 9672753.955 | 385.367 | 30 | -90 | 24.58 | 4 |
| DEX-CZ4272 | 416401.050 | 9672749.235 | 389.217 | 26 | -90 | 19 | 5 |
| DEX-CZ4273 | 416453.096 | 9672748.331 | 390.840 | 21 | -90 | 15 | 3.22 |
| DEX-CZ4274 | 416550.930 | 9672750.730 | 388.601 | 25 | -90 | 19.22 | 3.27 |
| DEX-CZ4275 | 416601.161 | 9672750.111 | 392.501 | 29 | -90 | 29.27 | 1 |
| DEX-CZ4276 | 416649.264 | 9672747.554 | 396.678 | 32 | -90 | 17.42 | 7 |
| DEX-CZ4277 | 416700.427 | 9672749.232 | 405.679 | 21 | -90 | 21.67 | 3 |
| DEX-CZ4278 | 416753.110 | 9672750.680 | 411.464 | 44 | -90 | 13 | 24.66 |
| DEX-CZ4281 | 416053.351 | 9672801.446 | 335.827 | 12 | -90 | 7.46 | 3.4 |
| DEX-CZ4282 | 416156.598 | 9672800.950 | 358.815 | 6 | -90 | 1 | 2 |
| DEX-CZ4283 | 416248.998 | 9672802.493 | 378.915 | 18 | -90 | 12.48 | 5 |
| DEX-CZ4284 | 416353.515 | 9672798.440 | 386.956 | 24 | -90 | 21.94 | 4 |
| DEX-CZ4285 | 416449.058 | 9672802.476 | 387.825 | 20 | -90 | 18.54 | 1 |
| DEX-CZ4286 | 416549.640 | 9672802.379 | 379.402 | 39 | -90 | 9 | 20.2 |
| DEX-CZ4287 | 416651.410 | 9672799.542 | 387.569 | 44 | -90 | 15 | 25.62 |
| DEX-CZ4288 | 416751.786 | 9672800.294 | 403.369 | 29 | -90 | 19.99 | 9 |
| DEX-CZ4289 | 415903.464 | 9672851.276 | 304.888 | 12 | -90 | 6 | 4 |
| DEX-CZ4291 | 416001.975 | 9672845.888 | 333.908 | 6 | -90 | 1.56 | 2.42 |
| DEX-CZ4292 | 416038.047 | 9672842.847 | 334.996 | 8 | -90 | 1 | 5 |
| DEX-CZ4293 | 416105.668 | 9672847.460 | 329.328 | 5 | -90 | 3 | 0 |
| DEX-CZ4294 | 416153.619 | 9672844.551 | 347.905 | 5 | -90 | 3 | 0.21 |
| DEX-CZ4295 | 416205.371 | 9672845.475 | 364.306 | 24 | -90 | 6 | 15 |
| DEX-CZ4296 | 416258.581 | 9672848.588 | 375.981 | 17 | -90 | 10.6 | 5.28 |
| DEX-CZ4297 | 416300.555 | 9672847.799 | 379.725 | 26 | -90 | 22.35 | 2 |
| DEX-CZ4298 | 416350.048 | 9672853.708 | 377.717 | 18 | -90 | 9.81 | 4 |
| DEX-CZ4299 | 416404.615 | 9672850.377 | 380.564 | 12 | -90 | 8.75 | 0.55 |
| DEX-CZ4300 | 416452.424 | 9672851.143 | 375.732 | 13 | -90 | 5 | 5 |
| DEX-CZ4301 | 416504.754 | 9672846.150 | 368.163 | 10 | -90 | 2 | 5 |
| DEX-CZ4302 | 416553.360 | 9672849.536 | 383.732 | 23 | -90 | 7 | 9.5 |
| DEX-CZ4303 | 416596.602 | 9672851.361 | 387.737 | 20 | -90 | 11.41 | 8 |
| DEX-CZ4304 | 416649.263 | 9672847.909 | 378.932 | 34 | -90 | 10.37 | 22.34 |
| DEX-CZ4305 | 416701.478 | 9672847.621 | 389.141 | 19 | -90 | 11 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5659 | 414700.481 | 9673953.704 | 357.865 | 19 | -90 | 10 | 6 |
| DEX-CZ5660 | 414748.697 | 9673947.776 | 351.386 | 18 | -90 | 11 | 3 |
| DEX-CZ5661 | 414752.744 | 9674001.236 | 350.734 | 30 | -90 | 27 | 1 |
| DEX-CZ5662 | 414794.377 | 9674056.316 | 353.404 | 29 | -90 | 25 | 4 |
| DEX-CZ5663 | 414762.434 | 9674106.046 | 361.099 | 39 | -90 | 18 | 19 |
| DEX-CZ5664 | 414450.847 | 9673848.666 | 362.059 | 9 | -90 | 3.7 | 2.3 |
| DEX-CZ5665 | 414496.404 | 9673850.044 | 374.656 | 10 | -90 | 4 | 3 |
| DEX-CZ5666 | 414545.255 | 9673845.484 | 395.422 | 19 | -90 | 8 | 8.6 |
| DEX-CZ5667 | 414603.058 | 9673847.830 | 405.851 | 22 | -90 | 11 | 8 |
| DEX-CZ5668 | 414643.011 | 9673846.786 | 400.672 | 28 | -90 | 10 | 16 |
| DEX-CZ5669 | 414646.144 | 9673803.994 | 408.777 | 29 | -90 | 16.2 | 4 |
| DEX-CZ5670 | 414646.217 | 9673751.246 | 399.516 | 13 | -90 | 4 | 6.4 |
| DEX-CZ5671 | 414696.931 | 9673747.037 | 397.723 | 32 | -90 | 18 | 7 |
| DEX-CZ5672 | 414753.503 | 9673702.213 | 396.230 | 28 | -90 | 9 | 17 |
| DEX-CZ5679 | 414447.999 | 9673705.965 | 343.113 | 18 | -90 | 3 | 13 |
| DEX-CZ568 | 415902.797 | 9673303.943 | 311.777 | 20 | -90 | 13.21 | 8 |
| DEX-CZ5680 | 414452.019 | 9673750.733 | 363.703 | 14 | -90 | 3 | 9 |
| DEX-CZ5681 | 414395.797 | 9673755.283 | 340.114 | 12 | -90 | 3 | 5.6 |
| DEX-CZ5682 | 414448.800 | 9673799.607 | 377.445 | 13 | -90 | 3 | 5 |
| DEX-CZ5683 | 414493.125 | 9673802.644 | 395.187 | 23 | -90 | 3.8 | 12.6 |
| DEX-CZ5685 | 414541.686 | 9673754.343 | 410.141 | 24 | -90 | 2 | 12 |
| DEX-CZ5686 | 414549.898 | 9673795.919 | 414.392 | 13 | -90 | 1 | 4 |
| DEX-CZ5687 | 414596.521 | 9673800.311 | 417.074 | 24 | -90 | 2 | 19 |
| DEX-CZ5688 | 414585.364 | 9673750.136 | 410.838 | 18 | -90 | 2 | 3 |
| DEX-CZ5689 | 414396.650 | 9673798.807 | 354.856 | 20 | -90 | 1 | 8 |
| DEX-CZ5690 | 414408.881 | 9673833.298 | 353.149 | 11 | -90 | 2 | 5 |
| DEX-CZ5691 | 414750.351 | 9673749.712 | 394.594 | 32 | -90 | 17 | 13 |
| DEX-CZ5692 | 414808.668 | 9673754.186 | 376.482 | 20 | -90 | 3 | 13 |
| DEX-CZ5693 | 414803.320 | 9673645.883 | 392.691 | 27 | -90 | 3.54 | 19.46 |
| DEX-CZ5694 | 414751.673 | 9673652.212 | 396.309 | 25 | -90 | 2 | 16 |
| DEX-CZ5695 | 414848.007 | 9673690.387 | 376.298 | 7 | -90 | 4 | 1 |
| DEX-CZ5696 | 414846.354 | 9673745.258 | 366.108 | 27 | -90 | 9 | 8 |
| DEX-CZ5697 | 414849.709 | 9673656.558 | 387.472 | 9 | -90 | 3 | 0.65 |
| DEX-CZ5698 | 414649.541 | 9673397.868 | 300.568 | 22 | -90 | 10 | 8 |
| DEX-CZ5699 | 414698.559 | 9673402.463 | 322.151 | 16 | -90 | 4 | 5 |
| DEX-CZ5700 | 414701.367 | 9673450.708 | 327.721 | 7 | -90 | 3 | 1 |
| DEX-CZ5701 | 414748.891 | 9673446.652 | 345.821 | 10 | -90 | 4 | 5 |
| DEX-CZ5702 | 414749.033 | 9673501.524 | 357.140 | 11 | -90 | 1 | 6 |
| DEX-CZ5703 | 414755.124 | 9673555.103 | 370.076 | 6 | -90 | 2 | 2 |
| DEX-CZ5704 | 414803.283 | 9673547.365 | 366.201 | 23 | -90 | 2 | 5 |
| DEX-CZ5705 | 414846.839 | 9673551.140 | 349.760 | 12 | -90 | 4 | 5 |
| DEX-CZ5706 | 414896.438 | 9673548.512 | 337.784 | 27 | -90 | 12 | 12.24 |
| DEX-CZ5707 | 414948.078 | 9673550.332 | 329.735 | 14 | -90 | 4 | 8 |
| DEX-CZ5708 | 414945.839 | 9673496.306 | 320.188 | 37 | -90 | 22.51 | 13.28 |
| DEX-CZ5709 | 414949.344 | 9673445.748 | 314.207 | 26 | -90 | 15.31 | 7.26 |
| DEX-CZ5710 | 414948.388 | 9673398.790 | 305.982 | 23 | -90 | 18.32 | 3 |
| DEX-CZ5711 | 414903.462 | 9673400.912 | 319.423 | 27 | -90 | 13 | 12 |
| DEX-CZ5712 | 414847.703 | 9673400.578 | 330.734 | 17 | -90 | 13 | 2 |
| DEX-CZ5713 | 414752.957 | 9673392.433 | 334.008 | 55 | -90 | 11 | 32 |
| DEX-CZ5714 | 414699.696 | 9673345.660 | 327.262 | 11 | -90 | 3 | 6 |
| DEX-CZ5715 | 414750.910 | 9673340.116 | 327.386 | 36 | -90 | 11 | 8 |
| DEX-CZ5716 | 414801.645 | 9673352.711 | 322.137 | 19 | -90 | 15 | 2 |
| DEX-CZ5717 | 414851.913 | 9673341.362 | 313.691 | 28 | -90 | 20 | 3 |
| DEX-CZ5718 | 414905.387 | 9673339.370 | 302.214 | 21 | -90 | 17 | 1 |
| DEX-CZ5719 | 414945.315 | 9673338.872 | 299.885 | 29 | -90 | 14 | 5 |
| DEX-CZ5720 | 414803.305 | 9673453.017 | 350.384 | 35 | -90 | 14 | 12 |
| DEX-CZ5721 | 414847.317 | 9673449.773 | 343.585 | 22 | -90 | 9.26 | 11 |
| DEX-CZ5722 | 414905.241 | 9673448.327 | 326.968 | 26 | -90 | 16.29 | 7 |
| DEX-CZ5723 | 414842.369 | 9673498.979 | 349.344 | 20 | -90 | 5.5 | 11.5 |
| DEX-CZ5724 | 415005.302 | 9673445.680 | 308.069 | 27 | -90 | 9.33 | 13.32 |
| DEX-CZ5725 | 415002.411 | 9673545.485 | 327.974 | 13 | -90 | 2 | 9 |
| DEX-CZ5726 | 414699.331 | 9673284.882 | 317.645 | 22 | -90 | 15 | 4 |
| DEX-CZ5727 | 415048.689 | 9673239.587 | 303.481 | 20 | -90 | 12 | 5 |
| DEX-CZ5728 | 415098.171 | 9673249.471 | 313.177 | 19 | -90 | 16.59 | 0 |
| DEX-CZ5729 | 415148.478 | 9673243.407 | 315.345 | 20 | -90 | 13 | 5 |
| DEX-CZ5733 | 415048.161 | 9673290.881 | 311.829 | 20 | -90 | 6 | 11 |
| DEX-CZ5737 | 415204.100 | 9673339.000 | 348.000 | 8 | -90 | 2 | 3.62 |
| DEX-CZ5739 | 415252.370 | 9673395.780 | 341.396 | 11 | -90 | 2 | 4 |
| DEX-CZ574 | 416017.017 | 9673404.829 | 343.285 | 18 | -90 | 15.48 | 2.67 |
| DEX-CZ5740 | 415146.422 | 9673392.005 | 325.442 | 28 | -90 | 10.55 | 15 |
| DEX-CZ5741 | 415146.549 | 9673437.331 | 308.447 | 5 | -90 | 1.68 | 0 |
| DEX-CZ5742 | 415190.851 | 9673452.580 | 315.218 | 7 | -90 | 2 | 1.46 |
| DEX-CZ5744 | 415115.192 | 9673441.277 | 306.080 | 5 | -90 | 2.22 | 0 |
| DEX-CZ5745 | 415048.636 | 9673501.268 | 317.183 | 9 | -90 | 5 | 0.65 |
| DEX-CZ5746 | 415145.807 | 9673494.723 | 320.762 | 18 | -90 | 10 | 6 |
| DEX-CZ5747 | 415057.966 | 9673546.584 | 326.443 | 14 | -90 | 4 | 5 |
| DEX-CZ5748 | 415105.073 | 9673554.604 | 341.502 | 11 | -90 | 1 | 6 |
| DEX-CZ5749 | 415142.924 | 9673548.488 | 343.686 | 6 | -90 | 2 | 1 |
| DEX-CZ575 | 415993.533 | 9673694.860 | 371.927 | 24 | -90 | 16.3 | 7.5 |
| DEX-CZ5750 | 415145.872 | 9673599.405 | 362.762 | 16 | -90 | 2 | 10 |
| DEX-CZ5751 | 415048.242 | 9673596.373 | 347.533 | 7 | -90 | 3 | 1 |
| DEX-CZ5753 | 414946.024 | 9673800.659 | 344.055 | 27 | -90 | 21.49 | 4 |
| DEX-CZ5754 | 414952.793 | 9673749.678 | 353.552 | 21 | -90 | 5 | 12 |
| DEX-CZ5755 | 415044.826 | 9673451.346 | 307.959 | 12 | -90 | 7 | 2.6 |
| DEX-CZ5756 | 415037.763 | 9673401.074 | 301.110 | 15 | -90 | 4 | 8.21 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4306 | 416751.278 | 9672846.659 | 394.667 | 37 | -90 | 13 | 22 |
| DEX-CZ4307 | 415955.836 | 9672891.325 | 308.580 | 15 | -90 | 6 | 4 |
| DEX-CZ4308 | 416250.742 | 9672899.305 | 354.902 | 4 | -90 | 1 | 1 |
| DEX-CZ4309 | 416351.762 | 9672906.151 | 344.379 | 10 | -90 | 2 | 6 |
| DEX-CZ4310 | 416450.147 | 9672895.957 | 359.734 | 16 | -90 | 4 | 9.6 |
| DEX-CZ4311 | 416551.342 | 9672898.783 | 374.444 | 13 | -90 | 11.35 | 0 |
| DEX-CZ4312 | 416650.718 | 9672902.206 | 370.362 | 17 | -90 | 6 | 11 |
| DEX-CZ4313 | 416748.392 | 9672900.672 | 379.221 | 29 | -90 | 13.32 | 14.26 |
| DEX-CZ4314 | 415902.370 | 9672947.658 | 312.872 | 12 | -90 | 6 | 6 |
| DEX-CZ4315 | 415941.409 | 9672950.571 | 307.537 | 15 | -90 | 4 | 7 |
| DEX-CZ4316 | 415996.844 | 9672950.650 | 312.039 | 8 | -90 | 4 | 0.44 |
| DEX-CZ4317 | 416237.431 | 9672943.011 | 333.567 | 6 | -90 | 3.62 | 0.38 |
| DEX-CZ4319 | 416354.153 | 9672951.785 | 357.721 | 9 | -90 | 4 | 2 |
| DEX-CZ4320 | 416396.037 | 9672951.661 | 360.492 | 12 | -90 | 4 | 3 |
| DEX-CZ4321 | 416448.879 | 9672953.646 | 359.511 | 8 | -90 | 3 | 3 |
| DEX-CZ4322 | 416500.436 | 9672948.606 | 353.790 | 34 | -90 | 12 | 21.91 |
| DEX-CZ4323 | 416548.170 | 9672950.855 | 352.074 | 12 | -90 | 5.26 | 5 |
| DEX-CZ4324 | 416603.082 | 9672950.562 | 356.072 | 8 | -90 | 2 | 4 |
| DEX-CZ4325 | 416651.346 | 9672947.683 | 371.101 | 17 | -90 | 7 | 8.22 |
| DEX-CZ4326 | 416700.970 | 9672949.137 | 370.519 | 10 | -90 | 6 | 1.3 |
| DEX-CZ4327 | 416750.763 | 9672949.815 | 363.000 | 10 | -90 | 4 | 1.55 |
| DEX-CZ4328 | 416798.121 | 9672950.752 | 377.967 | 21 | -90 | 14.27 | 5 |
| DEX-CZ4329 | 415948.964 | 9673007.306 | 338.105 | 20 | -90 | 7 | 11 |
| DEX-CZ4330 | 416252.312 | 9673016.414 | 365.640 | 14 | -90 | 5 | 7 |
| DEX-CZ4331 | 416351.164 | 9673010.485 | 387.635 | 14 | -90 | 6 | 6 |
| DEX-CZ4332 | 416454.682 | 9672999.732 | 382.802 | 15 | -90 | 7 | 6 |
| DEX-CZ4333 | 416551.834 | 9673005.594 | 376.356 | 24 | -90 | 4 | 18 |
| DEX-CZ4334 | 416650.641 | 9672999.329 | 358.955 | 13 | -90 | 10.21 | 0 |
| DEX-CZ4335 | 416749.517 | 9673000.080 | 363.465 | 21 | -90 | 4 | 15 |
| DEX-CZ4336 | 415895.063 | 9673046.242 | 345.506 | 38 | -90 | 15.89 | 20.44 |
| DEX-CZ4337 | 415948.164 | 9673054.840 | 356.261 | 19 | -90 | 16.4 | 0 |
| DEX-CZ4338 | 415997.800 | 9673053.311 | 357.787 | 15 | -90 | 8 | 4 |
| DEX-CZ4339 | 416048.146 | 9673052.825 | 365.191 | 17 | -90 | 14.26 | 1 |
| DEX-CZ4340 | 416101.908 | 9673049.960 | 367.865 | 31 | -90 | 28.82 | 0 |
| DEX-CZ4341 | 416145.233 | 9673043.881 | 364.124 | 17 | -90 | 13 | 3 |
| DEX-CZ4342 | 416201.193 | 9673050.997 | 363.692 | 24 | -90 | 13 | 9 |
| DEX-CZ4343 | 416251.955 | 9673050.838 | 371.549 | 24 | -90 | 20 | 2 |
| DEX-CZ4344 | 416302.757 | 9673050.395 | 380.785 | 13 | -90 | 7.37 | 3.63 |
| DEX-CZ4345 | 416350.377 | 9673051.185 | 394.000 | 30 | -90 | 11.77 | 9.87 |
| DEX-CZ4346 | 416401.394 | 9673054.294 | 399.053 | 26 | -90 | 10.92 | 13.53 |
| DEX-CZ4347 | 416451.729 | 9673050.662 | 400.037 | 18 | -90 | 14 | 2 |
| DEX-CZ4348 | 416502.848 | 9673050.424 | 397.751 | 20 | -90 | 17.67 | 1 |
| DEX-CZ4349 | 416550.202 | 9673046.898 | 396.358 | 25 | -90 | 21 | 2 |
| DEX-CZ4350 | 416599.215 | 9673045.431 | 388.268 | 9 | -90 | 6 | 1 |
| DEX-CZ4351 | 416650.223 | 9673051.633 | 384.179 | 14 | -90 | 4 | 6 |
| DEX-CZ4352 | 416702.738 | 9673049.890 | 383.619 | 20 | -90 | 5 | 9 |
| DEX-CZ4353 | 416749.294 | 9673049.915 | 373.478 | 16 | -90 | 8 | 5 |
| DEX-CZ4354 | 416797.393 | 9673047.159 | 366.451 | 13 | -90 | 9 | 1.24 |
| DEX-CZ4355 | 415950.747 | 9673098.795 | 367.114 | 12 | -90 | 2.45 | 2.9 |
| DEX-CZ4356 | 416050.029 | 9673101.241 | 362.548 | 23 | -90 | 15.67 | 6 |
| DEX-CZ4357 | 416154.852 | 9673097.044 | 353.201 | 29 | -90 | 23.31 | 2.69 |
| DEX-CZ4358 | 416254.921 | 9673092.245 | 364.225 | 18 | -90 | 11 | 2 |
| DEX-CZ4359 | 415902.491 | 9673150.423 | 331.595 | 21 | -90 | 4 | 2 |
| DEX-CZ4360 | 415954.946 | 9673153.044 | 352.199 | 20 | -90 | 3 | 9.17 |
| DEX-CZ4361 | 416007.550 | 9673147.779 | 362.424 | 23 | -90 | 15.02 | 3.77 |
| DEX-CZ4362 | 416048.597 | 9673152.278 | 361.973 | 12 | -90 | 5.65 | 0.35 |
| DEX-CZ4363 | 416100.440 | 9673150.649 | 352.160 | 25 | -90 | 20.94 | 4 |
| DEX-CZ4364 | 416150.691 | 9673152.932 | 346.961 | 31 | -90 | 25.16 | 4.17 |
| DEX-CZ4365 | 416203.231 | 9673144.097 | 347.832 | 36 | -90 | 34.94 | 0 |
| DEX-CZ4366 | 416802.475 | 9673151.055 | 412.746 | 17 | -90 | 12 | 1 |
| DEX-CZ4368 | 415950.870 | 9673194.532 | 334.840 | 13 | -90 | 5 | 6 |
| DEX-CZ4369 | 416051.121 | 9673194.940 | 348.585 | 28 | -90 | 6 | 18 |
| DEX-CZ4370 | 416146.541 | 9673197.837 | 348.036 | 32 | -90 | 25 | 4 |
| DEX-CZ4371 | 416853.435 | 9672550.893 | 429.537 | 21 | -90 | 16.2 | 3 |
| DEX-CZ4372 | 416851.859 | 9672502.592 | 428.515 | 23 | -90 | 8 | 9 |
| DEX-CZ4373 | 416853.616 | 9672450.468 | 425.076 | 26 | -90 | 14.22 | 10 |
| DEX-CZ4374 | 416041.979 | 9672247.977 | 380.597 | 8 | -90 | 3 | 2 |
| DEX-CZ4375 | 416040.831 | 9672345.308 | 342.525 | 17 | -90 | 7 | 7.52 |
| DEX-CZ4376 | 416354.245 | 9672055.998 | 409.817 | 31 | -90 | 19.22 | 9 |
| DEX-CZ4377 | 415850.878 | 9673046.952 | 336.554 | 33 | -90 | 19.84 | 12 |
| DEX-CZ4378 | 415852.807 | 9673003.399 | 332.472 | 13 | -90 | 4 | 7 |
| DEX-CZ4379 | 415853.253 | 9672951.574 | 313.547 | 11 | -90 | 8 | 0 |
| DEX-CZ4380 | 415851.022 | 9672893.936 | 303.297 | 18 | -90 | 16.46 | 0 |
| DEX-CZ4381 | 415852.472 | 9672844.524 | 301.067 | 26 | -90 | 6 | 6 |
| DEX-CZ4382 | 415852.941 | 9672798.709 | 307.046 | 17 | -90 | 9 | 5.52 |
| DEX-CZ4383 | 415850.752 | 9672752.592 | 319.883 | 15 | -90 | 3 | 10 |
| DEX-CZ4384 | 415853.733 | 9672549.171 | 333.185 | 17 | -90 | 12.46 | 2 |
| DEX-CZ4385 | 415855.074 | 9672508.606 | 318.109 | 29 | -90 | 22.6 | 4 |
| DEX-CZ4386 | 415906.580 | 9672354.527 | 352.647 | 16 | -90 | 10.35 | 4 |
| DEX-CZ4387 | 416556.771 | 9672149.622 | 415.914 | 23 | -90 | 10 | 8 |
| DEX-CZ4388 | 415853.593 | 9672338.435 | 361.770 | 7 | -90 | 1 | 2 |
| DEX-CZ4389 | 415858.265 | 9672254.788 | 384.346 | 23 | -90 | 2 | 18 |
| DEX-CZ4390 | 415850.643 | 9672212.469 | 368.858 | 25 | -90 | 5.7 | 16.3 |
| DEX-CZ4391 | 415860.857 | 9672148.878 | 344.633 | 14 | -90 | 7.22 | 4 |
| DEX-CZ4392 | 415856.231 | 9672104.162 | 327.329 | 10 | -90 | 3 | 4 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5757 | 415003.239 | 9673345.938 | 299.002 | 8 | -90 | 4 | 2 |
| DEX-CZ5758 | 415047.951 | 9673650.627 | 374.213 | 20 | -90 | 4 | 11 |
| DEX-CZ5759 | 415105.661 | 9673655.758 | 371.886 | 6 | -90 | 0 | 4 |
| DEX-CZ576 | 416027.198 | 9673901.833 | 410.686 | 15 | -90 | 5 | 3.75 |
| DEX-CZ5760 | 415147.621 | 9673647.444 | 367.265 | 16 | -90 | 6 | 8 |
| DEX-CZ577 | 415999.192 | 9674096.609 | 416.174 | 41 | -90 | 24.83 | 19.07 |
| DEX-CZ578 | 415992.445 | 9673491.441 | 353.965 | 15 | -90 | 10.37 | 4.91 |
| DEX-CZ579 | 415996.765 | 9673600.211 | 382.449 | 12 | -90 | 6.04 | 5.9 |
| DEX-CZ581 | 416293.041 | 9674005.427 | 415.553 | 27 | -90 | 25.45 | 3 |
| DEX-CZ582 | 416294.389 | 9674105.143 | 404.140 | 22 | -90 | 12.06 | 7.55 |
| DEX-CZ583 | 416291.822 | 9673600.952 | 372.950 | 37 | -90 | 7.33 | 28.62 |
| DEX-CZ585 | 416402.641 | 9673701.834 | 385.669 | 24 | -90 | 12.6 | 9 |
| DEX-CZ586 | 416397.781 | 9673800.588 | 403.053 | 34 | -90 | 28.39 | 8.84 |
| DEX-CZ587 | 416399.007 | 9673907.794 | 375.000 | 32 | -90 | 13.08 | 4 |
| DEX-CZ588 | 416384.848 | 9673507.775 | 341.113 | 18 | -90 | 4 | 12 |
| DEX-CZ589 | 416390.685 | 9673592.193 | 347.971 | 27 | -90 | 21.51 | 6 |
| DEX-CZ590 | 416095.465 | 9673396.482 | 324.827 | 13 | -90 | 9 | 2 |
| DEX-CZ591 | 416101.821 | 9673697.965 | 379.577 | 37 | -90 | 23.69 | 14 |
| DEX-CZ592 | 416091.684 | 9673802.994 | 382.635 | 21 | -90 | 15.41 | 6 |
| DEX-CZ593 | 416107.119 | 9674003.368 | 430.133 | 29 | -90 | 28.56 | 5 |
| DEX-CZ595 | 416102.938 | 9673499.689 | 368.931 | 28 | -90 | 9.93 | 14.1 |
| DEX-CZ596 | 416101.152 | 9673600.233 | 381.000 | 45 | -90 | 31.38 | 17.41 |
| DEX-CZ597 | 416203.712 | 9673706.514 | 390.134 | 34 | -90 | 31.51 | 2.19 |
| DEX-CZ598 | 416191.596 | 9673792.736 | 399.892 | 46 | -90 | 32.83 | 20.15 |
| DEX-CZ600 | 416205.801 | 9674100.620 | 424.260 | 23 | -90 | 19.19 | 4.8 |
| DEX-CZ601 | 416202.603 | 9673502.332 | 355.935 | 11 | -90 | 5.79 | 4.21 |
| DEX-CZ602 | 416193.573 | 9673602.928 | 372.918 | 24 | -90 | 13.09 | 6.12 |
| DEX-CZ603 | 416000.159 | 9674213.415 | 407.026 | 37 | -90 | 12.17 | 20 |
| DEX-CZ605 | 415996.979 | 9674300.893 | 417.098 | 45 | -90 | 23.08 | 16.6 |
| DEX-CZ606 | 416003.281 | 9674391.271 | 415.387 | 29 | -90 | 26.12 | 3.35 |
| DEX-CZ637 | 416204.219 | 9674201.548 | 414.622 | 30 | -90 | 21.97 | 8.7 |
| DEX-CZ643 | 416104.715 | 9674201.620 | 425.542 | 35 | -90 | 28.6 | 7 |
| DEX-CZ646 | 416103.803 | 9674098.174 | 432.210 | 28 | -90 | 20.83 | 7.33 |
| DEX-CZ647 | 416056.875 | 9673491.090 | 363.500 | 26 | -90 | 20.08 | 7 |
| DEX-CZ653 | 416239.445 | 9673760.092 | 399.140 | 36 | -90 | 23.01 | 14.64 |
| DEX-CZ690 | 416001.615 | 9674007.079 | 428.838 | 28 | -90 | 26.3 | 2 |
| DEX-CZ691 | 416402.963 | 9673997.555 | 388.473 | 19 | -90 | 19.04 | 2 |
| DEX-CZ697 | 416704.155 | 9673647.089 | 335.083 | 19 | -90 | 5.22 | 11 |
| DEX-CZ698 | 416751.211 | 9673652.200 | 335.025 | 11 | -90 | 1 | 7.04 |
| DEX-CZ704 | 416645.174 | 9673697.798 | 328.273 | 26 | -90 | 3.1 | 15.35 |
| DEX-CZ705 | 416747.728 | 9673704.113 | 355.128 | 14 | -90 | 9.82 | 3.13 |
| DEX-CZ706 | 416849.336 | 9673702.548 | 341.466 | 20 | -90 | 7.29 | 9.42 |
| DEX-CZ707 | 416947.729 | 9673699.997 | 354.035 | 20 | -90 | 18.64 | 1 |
| DEX-CZ7089 | 417229.615 | 9673675.235 | 344.262 | 30 | -90 | 25.36 | 3 |
| DEX-CZ7099 | 417256.315 | 9673698.177 | 345.000 | 40 | -90 | 29.71 | 9.25 |
| DEX-CZ714 | 416948.334 | 9673748.787 | 354.733 | 30 | -90 | 23.79 | 2.82 |
| DEX-CZ7143 | 417356.956 | 9673779.206 | 346.467 | 45 | -90 | 36.56 | 6 |
| DEX-CZ7161 | 417400.164 | 9673828.044 | 347.442 | 28 | -90 | 14.98 | 9 |
| DEX-CZ734 | 416757.043 | 9673946.010 | 371.871 | 41 | -90 | 38.25 | 8.95 |
| DEX-CZ7563 | 415756.000 | 9673224.230 | 355.251 | 14 | -90 | 5.7 | 5.3 |
| DEX-CZ7564 | 415645.807 | 9673220.755 | 374.554 | 22 | -90 | 16.25 | 4 |
| DEX-CZ7565 | 415561.155 | 9673219.081 | 384.039 | 25 | -90 | 21.59 | 2 |
| DEX-CZ7566 | 415561.717 | 9673176.727 | 371.758 | 14 | -90 | 4 | 7 |
| DEX-CZ7567 | 415554.977 | 9673126.483 | 353.818 | 14 | -90 | 5 | 5 |
| DEX-CZ7571 | 415507.187 | 9673170.848 | 367.303 | 22 | -90 | 15 | 6 |
| DEX-CZ7572 | 415499.707 | 9673074.418 | 355.360 | 25 | -90 | 16.36 | 3 |
| DEX-CZ7574 | 415459.643 | 9673218.593 | 357.975 | 16 | -90 | 8 | 4 |
| DEX-CZ7575 | 415458.498 | 9673170.838 | 356.075 | 20 | -90 | 16.18 | 2 |
| DEX-CZ7576 | 415458.442 | 9673112.458 | 347.686 | 35 | -90 | 19.65 | 13 |
| DEX-CZ7577 | 415448.119 | 9673064.244 | 361.705 | 9 | -90 | 6 | 2 |
| DEX-CZ7579 | 415446.753 | 9673019.534 | 379.012 | 14 | -90 | 5 | 7 |
| DEX-CZ7581 | 415411.323 | 9673164.612 | 335.704 | 11 | -90 | 8 | 1 |
| DEX-CZ7582 | 415408.955 | 9673067.230 | 363.394 | 13 | -90 | 4 | 5 |
| DEX-CZ7583 | 415404.195 | 9672965.995 | 396.020 | 6 | -90 | 3 | 1 |
| DEX-CZ7585 | 415370.411 | 9673167.477 | 325.414 | 25 | -90 | 18 | 5 |
| DEX-CZ7586 | 415350.310 | 9673112.116 | 340.546 | 11 | -90 | 8 | 1 |
| DEX-CZ7587 | 415350.369 | 9673065.534 | 361.246 | 25 | -90 | 12.41 | 12.22 |
| DEX-CZ7588 | 415354.437 | 9673014.476 | 378.072 | 19 | -90 | 9 | 7 |
| DEX-CZ7589 | 415415.328 | 9673010.199 | 388.230 | 18 | -90 | 4 | 11 |
| DEX-CZ7590 | 415357.204 | 9672967.029 | 384.294 | 7 | -90 | 3 | 4 |
| DEX-CZ7591 | 415361.857 | 9672914.622 | 377.204 | 35 | -90 | 30.7 | 3 |
| DEX-CZ7592 | 415354.090 | 9672868.830 | 362.542 | 27 | -90 | 17 | 10.4 |
| DEX-CZ7593 | 415351.493 | 9672826.005 | 348.125 | 45 | -90 | 25.4 | 17 |
| DEX-CZ7594 | 415306.118 | 9673170.446 | 318.747 | 34 | -90 | 31.25 | 1 |
| DEX-CZ7595 | 415303.247 | 9673061.034 | 357.086 | 13 | -90 | 5 | 6 |
| DEX-CZ7596 | 415310.791 | 9672966.411 | 370.059 | 24 | -90 | 16 | 6 |
| DEX-CZ7597 | 415304.502 | 9672871.640 | 353.777 | 30 | -90 | 15 | 10 |
| DEX-CZ7598 | 415155.788 | 9673011.222 | 336.193 | 20 | -90 | 15.38 | 1 |
| DEX-CZ7599 | 415262.989 | 9673168.591 | 314.288 | 33 | -90 | 16 | 12 |
| DEX-CZ7600 | 415257.325 | 9673067.017 | 346.314 | 20 | -90 | 15.38 | 3 |
| DEX-CZ7601 | 415256.845 | 9672963.477 | 355.095 | 42 | -90 | 7 | 31 |
| DEX-CZ7602 | 415256.824 | 9673014.932 | 357.582 | 22 | -90 | 12 | 5 |
| DEX-CZ7603 | 415259.727 | 9672870.021 | 338.905 | 20 | -90 | 10 | 3 |
| DEX-CZ7604 | 415254.119 | 9672815.445 | 327.222 | 35 | -90 | 24 | 9 |
| DEX-CZ7605 | 415208.236 | 9673168.764 | 310.364 | 35 | -90 | 25.68 | 8 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4393 | 416502.836 | 9672151.536 | 422.937 | 11 | -90 | 8 | 0 |
| DEX-CZ4394 | 416351.033 | 9672242.719 | 411.182 | 22 | -90 | 16.23 | 0 |
| DEX-CZ4395 | 416404.409 | 9672251.962 | 411.130 | 23 | -90 | 4 | 19 |
| DEX-CZ4396 | 416352.751 | 9672195.821 | 415.934 | 25 | -90 | 16.89 | 7 |
| DEX-CZ4397 | 416354.855 | 9672150.485 | 418.292 | 22 | -90 | 20.5 | 2 |
| DEX-CZ4398 | 416403.837 | 9672153.392 | 420.991 | 28 | -90 | 28.28 | 0 |
| DEX-CZ4399 | 416450.858 | 9672297.901 | 395.953 | 22 | -90 | 18.98 | 2.41 |
| DEX-CZ4400 | 416452.529 | 9672246.897 | 405.076 | 26 | -90 | 14.3 | 6 |
| DEX-CZ4401 | 416450.864 | 9672195.289 | 421.219 | 14 | -90 | 8 | 5 |
| DEX-CZ4402 | 416450.903 | 9672152.883 | 424.247 | 8 | -90 | 5 | 0 |
| DEX-CZ4403 | 416358.942 | 9672087.811 | 417.720 | 26 | -90 | 23.8 | 1 |
| DEX-CZ4404 | 416454.802 | 9672094.596 | 419.963 | 18 | -90 | 10 | 6 |
| DEX-CZ4405 | 416043.738 | 9672303.904 | 357.845 | 11 | -90 | 5 | 3.28 |
| DEX-CZ4406 | 416096.174 | 9672559.002 | 375.000 | 27 | -90 | 7 | 6 |
| DEX-CZ4408 | 416050.277 | 9672896.463 | 313.878 | 25 | -90 | 8 | 15 |
| DEX-CZ4409 | 416040.364 | 9672939.004 | 313.072 | 12 | -90 | 6 | 2 |
| DEX-CZ4410 | 415851.995 | 9673100.139 | 325.349 | 32 | -90 | 8 | 15 |
| DEX-CZ4411 | 415847.746 | 9673150.158 | 310.187 | 15 | -90 | 1.29 | 3.71 |
| DEX-CZ4412 | 416250.670 | 9673151.031 | 351.033 | 36 | -90 | 29.26 | 4 |
| DEX-CZ4413 | 416748.212 | 9673097.120 | 392.629 | 8 | -90 | 3 | 2 |
| DEX-CZ4414 | 416751.997 | 9673151.979 | 417.000 | 18 | -90 | 13.86 | 3.34 |
| DEX-CZ4415 | 415804.172 | 9673063.121 | 316.562 | 17 | -90 | 4 | 7.44 |
| DEX-CZ4416 | 415752.848 | 9673057.827 | 312.554 | 5 | -90 | 2.6 | 0 |
| DEX-CZ4417 | 415752.786 | 9673008.841 | 336.000 | 14 | -90 | 1 | 5 |
| DEX-CZ4418 | 415803.647 | 9672958.796 | 320.010 | 19 | -90 | 3 | 10.7 |
| DEX-CZ4419 | 415750.184 | 9672960.991 | 324.911 | 22 | -90 | 8 | 4 |
| DEX-CZ4420 | 415751.401 | 9672903.060 | 312.114 | 25 | -90 | 16.35 | 8 |
| DEX-CZ4421 | 415805.118 | 9672845.841 | 300.437 | 5 | -90 | 2 | 0 |
| DEX-CZ4422 | 415760.830 | 9672849.481 | 308.882 | 6 | -90 | 3.41 | 0.59 |
| DEX-CZ4423 | 415900.624 | 9672450.100 | 315.899 | 16 | -90 | 12 | 1.43 |
| DEX-CZ4424 | 415854.745 | 9672449.751 | 312.820 | 15 | -90 | 8 | 3 |
| DEX-CZ4428 | 415758.003 | 9671873.148 | 331.832 | 13 | -90 | 5 | 5 |
| DEX-CZ4429 | 415716.592 | 9671880.810 | 325.857 | 16 | -90 | 12 | 2 |
| DEX-CZ4430 | 415674.115 | 9671869.053 | 313.033 | 16 | -90 | 10 | 6 |
| DEX-CZ4431 | 415676.800 | 9671924.880 | 319.461 | 27 | -90 | 11 | 9.13 |
| DEX-CZ4432 | 415759.588 | 9671925.937 | 342.819 | 23 | -90 | 16.82 | 5 |
| DEX-CZ4433 | 415851.957 | 9671915.277 | 361.533 | 19 | -90 | 2.56 | 14.44 |
| DEX-CZ4434 | 415897.816 | 9671948.541 | 366.317 | 27 | -90 | 12 | 8 |
| DEX-CZ4435 | 415847.231 | 9671950.466 | 366.000 | 15 | -90 | 3 | 10 |
| DEX-CZ4436 | 415809.595 | 9671947.873 | 358.677 | 17 | -90 | 2 | 10 |
| DEX-CZ4437 | 415760.601 | 9671948.594 | 343.480 | 18 | -90 | 8 | 7.21 |
| DEX-CZ4438 | 415713.229 | 9671954.940 | 327.605 | 22 | -90 | 12 | 5.25 |
| DEX-CZ4439 | 415662.360 | 9671959.352 | 312.218 | 24 | -90 | 7 | 15.76 |
| DEX-CZ4440 | 415756.545 | 9672107.005 | 309.574 | 16 | -90 | 11.23 | 2 |
| DEX-CZ4441 | 415753.888 | 9672160.490 | 335.938 | 29 | -90 | 10.2 | 14 |
| DEX-CZ4442 | 415767.001 | 9672198.042 | 355.787 | 14 | -90 | 3.75 | 8.25 |
| DEX-CZ4443 | 415761.553 | 9672243.965 | 362.394 | 16 | -90 | 4 | 4.8 |
| DEX-CZ4445 | 415546.695 | 9672098.962 | 285.638 | 19 | -90 | 14.31 | 2 |
| DEX-CZ4446 | 415460.175 | 9672099.631 | 291.413 | 28 | -90 | 20.85 | 6.36 |
| DEX-CZ4447 | 415710.300 | 9672151.778 | 326.515 | 11 | -90 | 2 | 2 |
| DEX-CZ4448 | 415646.639 | 9672155.631 | 325.243 | 20 | -90 | 8 | 10 |
| DEX-CZ4449 | 415606.101 | 9672149.946 | 315.143 | 23 | -90 | 16.28 | 7 |
| DEX-CZ4450 | 415556.546 | 9672160.002 | 305.695 | 35 | -90 | 24.74 | 9 |
| DEX-CZ4451 | 415509.764 | 9672156.708 | 298.332 | 19 | -90 | 9 | 7.52 |
| DEX-CZ4452 | 415454.048 | 9672147.886 | 297.613 | 25 | -90 | 20.24 | 3.96 |
| DEX-CZ4453 | 415662.549 | 9672197.942 | 339.480 | 17 | -90 | 7 | 7 |
| DEX-CZ4454 | 415554.460 | 9672200.201 | 312.971 | 40 | -90 | 18.19 | 21 |
| DEX-CZ4455 | 415703.017 | 9672261.865 | 338.031 | 9 | -90 | 4 | 3 |
| DEX-CZ4456 | 415655.919 | 9672254.996 | 323.933 | 28 | -90 | 8 | 11.9 |
| DEX-CZ4457 | 415609.437 | 9672260.651 | 312.248 | 17 | -90 | 7 | 6 |
| DEX-CZ4458 | 415564.106 | 9672261.341 | 299.726 | 17 | -90 | 5 | 11 |
| DEX-CZ4459 | 415754.364 | 9672052.175 | 327.243 | 7 | -90 | 3 | 1 |
| DEX-CZ4460 | 415700.855 | 9672043.730 | 314.807 | 18 | -90 | 7 | 8 |
| DEX-CZ4461 | 415654.160 | 9672068.253 | 286.422 | 8 | -90 | 5 | 0 |
| DEX-CZ4462 | 415549.907 | 9672045.014 | 268.993 | 10 | -90 | 3 | 5 |
| DEX-CZ4463 | 415614.968 | 9672001.051 | 285.521 | 12 | -90 | 6 | 3 |
| DEX-CZ4464 | 415667.056 | 9672004.373 | 306.925 | 20 | -90 | 16 | 4 |
| DEX-CZ4465 | 415551.278 | 9672006.392 | 262.918 | 6 | -90 | 3 | 0 |
| DEX-CZ4466 | 415457.731 | 9672204.216 | 306.126 | 18 | -90 | 13 | 1 |
| DEX-CZ4467 | 415356.337 | 9672196.999 | 298.951 | 21 | -90 | 15 | 3 |
| DEX-CZ4468 | 415402.765 | 9672143.801 | 296.512 | 22 | -90 | 12 | 6 |
| DEX-CZ4469 | 415355.056 | 9672147.887 | 289.578 | 22 | -90 | 12 | 7.7 |
| DEX-CZ4470 | 415455.236 | 9672260.708 | 302.588 | 11 | -90 | 4 | 5 |
| DEX-CZ4471 | 415403.060 | 9672264.390 | 312.000 | 17 | -90 | 14 | 1 |
| DEX-CZ4472 | 415347.438 | 9672258.959 | 301.963 | 22 | -90 | 10 | 7 |
| DEX-CZ4473 | 415453.653 | 9672312.442 | 292.564 | 13 | -90 | 6 | 5 |
| DEX-CZ4474 | 415352.720 | 9672311.131 | 302.939 | 12 | -90 | 6 | 4 |
| DEX-CZ4475 | 415460.751 | 9672357.377 | 282.371 | 5 | -90 | 2 | 1 |
| DEX-CZ4478 | 415303.101 | 9672353.691 | 288.779 | 12 | -90 | 3 | 6 |
| DEX-CZ4479 | 415256.692 | 9672347.059 | 286.021 | 13 | -90 | 9 | 2 |
| DEX-CZ4480 | 415294.114 | 9672251.309 | 277.158 | 10 | -90 | 5.55 | 0.45 |
| DEX-CZ4481 | 415257.460 | 9672253.271 | 268.604 | 12 | -90 | 3 | 4 |
| DEX-CZ4482 | 415250.343 | 9672307.900 | 281.436 | 18 | -90 | 6 | 10 |
| DEX-CZ4483 | 415500.808 | 9672050.053 | 278.835 | 16 | -90 | 9 | 3 |
| DEX-CZ4484 | 415450.981 | 9672053.846 | 278.610 | 10 | -90 | 5 | 2 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ7606 | 415206.978 | 9673063.923 | 340.574 | 16 | -90 | 10 | 6 |
| DEX-CZ7607 | 415207.179 | 9672870.877 | 324.680 | 39 | -90 | 17 | 20 |
| DEX-CZ7608 | 415158.128 | 9673164.368 | 307.170 | 25 | -90 | 14.22 | 8 |
| DEX-CZ7609 | 415158.283 | 9673117.348 | 322.253 | 20 | -90 | 12 | 5 |
| DEX-CZ7610 | 415160.512 | 9673067.840 | 332.405 | 22 | -90 | 10.38 | 10 |
| DEX-CZ7611 | 415145.753 | 9672929.773 | 324.321 | 22 | -90 | 13 | 7 |
| DEX-CZ7612 | 415163.445 | 9672881.155 | 319.033 | 44 | -90 | 21 | 21 |
| DEX-CZ7613 | 415152.788 | 9672817.166 | 305.447 | 34 | -90 | 16 | 18.25 |
| DEX-CZ7614 | 415206.393 | 9672814.049 | 313.757 | 22 | -90 | 19.32 | 1 |
| DEX-CZ7615 | 415110.673 | 9673171.407 | 303.650 | 27 | -90 | 19.27 | 6 |
| DEX-CZ7616 | 415108.205 | 9673071.596 | 322.057 | 31 | -90 | 21.25 | 10.37 |
| DEX-CZ7617 | 415102.665 | 9672865.417 | 301.574 | 29 | -90 | 20.35 | 6 |
| DEX-CZ7618 | 415053.779 | 9673175.355 | 300.406 | 21 | -90 | 17.7 | 2.5 |
| DEX-CZ7619 | 415059.107 | 9673125.697 | 308.425 | 13 | -90 | 7.68 | 2.32 |
| DEX-CZ7620 | 415054.575 | 9673066.038 | 311.353 | 24 | -90 | 11.38 | 9 |
| DEX-CZ7621 | 415057.433 | 9673019.181 | 313.141 | 20 | -90 | 14.38 | 4 |
| DEX-CZ7622 | 415056.414 | 9672966.366 | 308.269 | 20 | -90 | 13 | 5 |
| DEX-CZ7623 | 415056.397 | 9672863.239 | 295.986 | 19 | -90 | 15.3 | 2 |
| DEX-CZ7624 | 415050.147 | 9672809.760 | 291.676 | 21 | -90 | 15 | 4 |
| DEX-CZ7625 | 415009.108 | 9673163.130 | 301.300 | 11.5 | -90 | 8 | 0.5 |
| DEX-CZ7626 | 415003.481 | 9673068.758 | 313.716 | 21 | -90 | 8.35 | 6 |
| DEX-CZ7627 | 415006.473 | 9672959.601 | 299.137 | 14 | -90 | 9 | 3 |
| DEX-CZ7628 | 415008.051 | 9672864.226 | 290.016 | 22 | -90 | 16 | 4 |
| DEX-CZ7629 | 414965.494 | 9673172.080 | 297.503 | 11 | -90 | 7 | 2 |
| DEX-CZ7630 | 414950.787 | 9673108.750 | 305.558 | 15 | -90 | 8 | 5.28 |
| DEX-CZ7631 | 414957.923 | 9673067.799 | 309.361 | 14 | -90 | 6 | 6 |
| DEX-CZ7632 | 414959.497 | 9673019.843 | 304.732 | 33 | -90 | 13 | 17 |
| DEX-CZ7633 | 414957.461 | 9672965.397 | 297.442 | 18 | -90 | 13 | 2 |
| DEX-CZ7634 | 414957.267 | 9672862.691 | 289.000 | 26 | -90 | 16.6 | 6 |
| DEX-CZ7635 | 414957.856 | 9672812.063 | 289.109 | 6 | -90 | 3 | 1 |
| DEX-CZ7636 | 414903.445 | 9673163.523 | 293.043 | 15 | -90 | 3 | 5 |
| DEX-CZ7637 | 414912.451 | 9673067.096 | 301.013 | 15 | -90 | 10 | 2.75 |
| DEX-CZ7638 | 414902.622 | 9672968.194 | 304.061 | 12 | -90 | 7 | 3 |
| DEX-CZ7639 | 414856.503 | 9673166.160 | 299.852 | 14 | -90 | 11 | 1 |
| DEX-CZ7640 | 414859.872 | 9673120.484 | 296.070 | 8 | -90 | 3.5 | 0.5 |
| DEX-CZ7641 | 414862.930 | 9673062.051 | 293.164 | 12 | -90 | 4 | 3 |
| DEX-CZ7642 | 414858.078 | 9673017.932 | 299.137 | 6 | -90 | 2 | 0 |
| DEX-CZ7643 | 414858.483 | 9672969.016 | 308.252 | 9 | -90 | 2 | 5 |
| DEX-CZ7644 | 414806.620 | 9673164.584 | 314.730 | 18 | -90 | 11 | 5 |
| DEX-CZ7645 | 414807.971 | 9673116.671 | 311.403 | 16 | -90 | 3 | 9 |
| DEX-CZ7646 | 414803.677 | 9673060.516 | 296.456 | 23 | -90 | 7 | 14 |
| DEX-CZ7647 | 414806.602 | 9672976.905 | 295.258 | 19 | -90 | 9 | 5 |
| DEX-CZ7648 | 414754.908 | 9673167.150 | 322.922 | 19 | -90 | 6 | 7 |
| DEX-CZ7649 | 414757.892 | 9673117.972 | 323.804 | 12 | -90 | 6 | 3 |
| DEX-CZ7650 | 414761.770 | 9673061.928 | 306.132 | 12 | -90 | 2 | 7 |
| DEX-CZ7651 | 414756.497 | 9673019.085 | 296.272 | 24 | -90 | 4 | 15 |
| DEX-CZ7652 | 414756.039 | 9672966.260 | 290.000 | 5 | -90 | 2 | 1 |
| DEX-CZ7653 | 414708.045 | 9673166.502 | 329.541 | 19 | -90 | 10 | 4 |
| DEX-CZ7654 | 414707.798 | 9673069.145 | 314.168 | 20 | -90 | 8 | 8 |
| DEX-CZ7656 | 414659.981 | 9673165.277 | 325.038 | 13 | -90 | 6 | 5 |
| DEX-CZ7657 | 414653.631 | 9673067.489 | 306.007 | 23 | -90 | 14 | 8 |
| DEX-CZ7658 | 414655.061 | 9673111.005 | 316.219 | 17 | -90 | 13 | 1 |
| DEX-CZ7659 | 414657.776 | 9673018.304 | 297.689 | 18 | -90 | 10 | 6 |
| DEX-CZ7660 | 414659.887 | 9672960.026 | 291.315 | 17 | -90 | 9 | 4 |
| DEX-CZ7663 | 415016.851 | 9672765.274 | 290.759 | 8 | -90 | 5 | 0 |
| DEX-CZ7664 | 415054.703 | 9672764.329 | 293.819 | 10 | -90 | 6 | 1 |
| DEX-CZ7665 | 415109.869 | 9672765.461 | 297.973 | 24 | -90 | 20.6 | 2 |
| DEX-CZ7666 | 415158.180 | 9672761.708 | 302.999 | 42 | -90 | 35.55 | 5 |
| DEX-CZ7667 | 415205.319 | 9672765.313 | 311.491 | 42 | -90 | 35.47 | 5 |
| DEX-CZ7668 | 415256.880 | 9672767.148 | 323.251 | 40 | -90 | 35.3 | 2 |
| DEX-CZ7669 | 415256.984 | 9673220.009 | 315.995 | 30 | -90 | 13 | 14 |
| DEX-CZ8072 | 415895.654 | 9673223.557 | 306.410 | 8 | -90 | 5 | 1 |
| DEX-CZ8073 | 415877.382 | 9673196.160 | 305.758 | 8 | -90 | 4 | 2 |
| DEX-CZ8477 | 415729.136 | 9673217.242 | 355.876 | 17 | -90 | 8 | 7 |
| DEX-CZ8478 | 415682.476 | 9673217.418 | 366.863 | 23 | -90 | 13 | 6 |
| DEX-CZ8479 | 415533.978 | 9673221.448 | 381.583 | 27 | -90 | 21.3 | 3 |
| DEX-CZ8480 | 415482.616 | 9673217.741 | 366.601 | 17 | -90 | 7 | 6 |
| DEX-CZ8481 | 415730.642 | 9673196.495 | 345.135 | 24 | -90 | 3 | 17 |
| DEX-CZ8482 | 415705.010 | 9673191.175 | 352.386 | 20 | -90 | 9 | 6 |
| DEX-CZ8483 | 415683.986 | 9673194.691 | 357.871 | 15 | -90 | 9 | 6 |
| DEX-CZ8484 | 415532.074 | 9673193.707 | 376.356 | 33 | -90 | 18 | 9 |
| DEX-CZ8485 | 415510.341 | 9673193.124 | 372.272 | 24 | -90 | 17 | 5 |
| DEX-CZ8486 | 415484.165 | 9673193.780 | 366.010 | 31 | -90 | 19 | 8 |
| DEX-CZ8487 | 415132.954 | 9673191.201 | 304.412 | 30 | -90 | 27.3 | 1 |
| DEX-CZ8488 | 415104.402 | 9673189.299 | 303.044 | 32 | -90 | 28 | 3 |
| DEX-CZ8489 | 415079.803 | 9673187.970 | 301.609 | 26 | -90 | 22.22 | 2 |
| DEX-CZ8490 | 415054.014 | 9673195.074 | 300.490 | 23 | -90 | 15.15 | 8 |
| DEX-CZ8491 | 415034.245 | 9673191.758 | 299.627 | 18 | -90 | 15.53 | 2 |
| DEX-CZ8492 | 415534.885 | 9673170.270 | 369.705 | 38 | -90 | 9 | 24.23 |
| DEX-CZ8493 | 415482.062 | 9673168.316 | 361.919 | 31 | -90 | 25.62 | 4 |
| DEX-CZ8494 | 415134.543 | 9673170.018 | 305.360 | 35 | -90 | 29.97 | 1 |
| DEX-CZ8495 | 415085.428 | 9673168.303 | 302.426 | 32 | -90 | 27 | 3 |
| DEX-CZ8496 | 415027.699 | 9673169.231 | 300.000 | 23 | -90 | 16.22 | 1 |
| DEX-CZ8497 | 415530.360 | 9673145.860 | 362.994 | 18 | -90 | 13 | 3 |
| DEX-CZ8498 | 415505.892 | 9673143.451 | 361.518 | 27 | -90 | 13 | 10 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ4485 | 415806.033 | 9672249.718 | 373.610 | 21 | -90 | 5 | 2 |
| DEX-CZ4488 | 415880.808 | 9672305.742 | 369.813 | 7 | -90 | 4 | 0.38 |
| DEX-CZ4712 | 417602.507 | 9673601.227 | 351.999 | 22 | -90 | 22.42 | 1 |
| DEX-CZ4725 | 418705.649 | 9673901.843 | 369.091 | 40 | -90 | 18.67 | 20.34 |
| DEX-CZ4726 | 418803.982 | 9673900.258 | 363.315 | 22 | -90 | 11.8 | 8.5 |
| DEX-CZ4727 | 418901.844 | 9673899.235 | 354.949 | 48 | -90 | 37.07 | 4 |
| DEX-CZ4729 | 417605.300 | 9674003.000 | 370.863 | 29 | -90 | 7 | 19 |
| DEX-CZ4732 | 417908.351 | 9674000.496 | 360.360 | 8 | -90 | 3 | 2 |
| DEX-CZ4733 | 418312.218 | 9673999.939 | 369.000 | 8 | -90 | 2.65 | 3.35 |
| DEX-CZ4734 | 418408.037 | 9673998.795 | 363.013 | 44 | -90 | 13 | 16 |
| DEX-CZ4735 | 418700.740 | 9674001.185 | 361.501 | 31 | -90 | 18.55 | 10 |
| DEX-CZ4736 | 418805.699 | 9674000.304 | 355.288 | 15 | -90 | 10.51 | 2.75 |
| DEX-CZ4737 | 418906.810 | 9673999.241 | 340.445 | 47 | -90 | 42.05 | 4.32 |
| DEX-CZ4738 | 417505.200 | 9674104.000 | 358.338 | 25 | -90 | 5 | 6 |
| DEX-CZ4743 | 418112.461 | 9674099.449 | 354.878 | 31 | -90 | 27.78 | 3 |
| DEX-CZ4744 | 418306.185 | 9674093.994 | 358.659 | 37 | -90 | 31.14 | 7.08 |
| DEX-CZ4745 | 418407.102 | 9674102.650 | 357.511 | 56 | -90 | 29.21 | 27 |
| DEX-CZ4746 | 418503.220 | 9674099.289 | 347.724 | 9 | -90 | 3 | 4 |
| DEX-CZ4748 | 418700.732 | 9674101.521 | 351.248 | 38 | -90 | 10.21 | 28.79 |
| DEX-CZ4749 | 418804.831 | 9674101.178 | 338.709 | 19 | -90 | 4 | 9 |
| DEX-CZ4750 | 418906.226 | 9674097.339 | 349.120 | 38 | -90 | 28.36 | 12 |
| DEX-CZ4751 | 419003.112 | 9674098.114 | 347.454 | 46 | -90 | 45.47 | 2 |
| DEX-CZ4754 | 418305.213 | 9674198.712 | 342.529 | 40 | -90 | 16 | 22 |
| DEX-CZ4755 | 418400.510 | 9674199.009 | 355.000 | 40 | -90 | 8 | 31.11 |
| DEX-CZ4757 | 418610.220 | 9674197.258 | 356.885 | 10 | -90 | 5 | 3 |
| DEX-CZ4759 | 418821.353 | 9674203.984 | 336.392 | 23 | -90 | 17.19 | 5 |
| DEX-CZ4760 | 418907.462 | 9674198.066 | 354.135 | 16 | -90 | 9.28 | 5 |
| DEX-CZ4761 | 419005.539 | 9674195.834 | 352.240 | 15 | -90 | 12.9 | 1 |
| DEX-CZ4762 | 419102.005 | 9674191.330 | 335.625 | 31 | -90 | 20.46 | 10 |
| DEX-CZ4764 | 418202.827 | 9674295.865 | 339.223 | 17 | -90 | 14 | 1 |
| DEX-CZ4765 | 418306.624 | 9674301.898 | 339.337 | 24 | -90 | 17.15 | 5.28 |
| DEX-CZ4768 | 418611.212 | 9674304.508 | 335.423 | 14 | -90 | 6 | 4 |
| DEX-CZ4770 | 418805.915 | 9674299.848 | 335.360 | 17 | -90 | 7 | 3.28 |
| DEX-CZ4772 | 418207.831 | 9674403.311 | 307.000 | 17 | -90 | 7 | 5.5 |
| DEX-CZ4773 | 418304.708 | 9674398.402 | 330.267 | 46 | -90 | 18.98 | 7 |
| DEX-CZ4783 | 417899.768 | 9673898.778 | 345.094 | 60 | -90 | 49.2 | 9 |
| DEX-CZ4784 | 417999.923 | 9673901.445 | 347.849 | 26 | -90 | 20.67 | 5 |
| DEX-CZ4786 | 417998.239 | 9673799.679 | 349.381 | 60 | -90 | 62.45 | 0 |
| DEX-CZ4787 | 418102.158 | 9673801.576 | 353.485 | 32 | -90 | 28.07 | 6 |
| DEX-CZ4788 | 418199.440 | 9673796.712 | 364.436 | 24 | -90 | 14 | 5 |
| DEX-CZ4789 | 418305.087 | 9673802.402 | 369.062 | 61 | -90 | 46.63 | 16 |
| DEX-CZ4790 | 418300.745 | 9673902.793 | 365.203 | 29 | -90 | 9 | 17 |
| DEX-CZ4791 | 418100.842 | 9673896.281 | 351.796 | 19 | -90 | 12.7 | 4.3 |
| DEX-CZ4792 | 418196.023 | 9673900.247 | 358.899 | 24 | -90 | 20.96 | 5 |
| DEX-CZ4793 | 417994.440 | 9673990.100 | 372.025 | 10 | -90 | 5 | 3 |
| DEX-CZ4794 | 418101.151 | 9673999.316 | 368.621 | 24 | -90 | 16.35 | 8 |
| DEX-CZ4795 | 418202.109 | 9674003.711 | 362.650 | 19 | -90 | 17.36 | 1 |
| DEX-CZ4796 | 418397.115 | 9673905.251 | 371.932 | 36 | -90 | 18 | 12.27 |
| DEX-CZ4797 | 418497.400 | 9673900.457 | 369.460 | 53 | -90 | 23.63 | 29.63 |
| DEX-CZ4798 | 418598.814 | 9673897.505 | 367.758 | 35 | -90 | 24 | 7.35 |
| DEX-CZ4800 | 418531.747 | 9673980.921 | 359.216 | 56 | -90 | 29.42 | 25.16 |
| DEX-CZ4801 | 418606.006 | 9674003.258 | 349.650 | 14 | -90 | 6 | 5 |
| DEX-CZ4803 | 418198.097 | 9674104.431 | 348.950 | 20 | -90 | 13.81 | 5 |
| DEX-CZ4805 | 418026.195 | 9674170.968 | 351.736 | 15 | -90 | 11 | 1 |
| DEX-CZ4806 | 418098.631 | 9674193.564 | 350.931 | 36 | -90 | 20 | 17.46 |
| DEX-CZ4807 | 418196.017 | 9674203.647 | 347.630 | 12 | -90 | 8 | 2 |
| DEX-CZ5309 | 417554.310 | 9673700.073 | 354.759 | 16 | -90 | 10 | 4 |
| DEX-CZ5311 | 417257.394 | 9673649.949 | 346.135 | 45 | -90 | 45.46 | 4 |
| DEX-CZ5312 | 417352.687 | 9673648.544 | 349.518 | 29 | -90 | 27.64 | 3 |
| DEX-CZ5313 | 417405.333 | 9673649.796 | 353.262 | 31 | -90 | 27 | 2 |
| DEX-CZ5314 | 417455.585 | 9673649.668 | 354.140 | 28 | -90 | 24.37 | 2 |
| DEX-CZ5315 | 417506.319 | 9673646.602 | 356.344 | 25 | -90 | 23.6 | 0 |
| DEX-CZ5316 | 417555.030 | 9673650.443 | 351.532 | 28 | -90 | 15.2 | 11 |
| DEX-CZ5317 | 417606.534 | 9673652.808 | 351.421 | 43 | -90 | 28.87 | 13 |
| DEX-CZ5318 | 417655.599 | 9673651.032 | 353.521 | 24 | -90 | 22.67 | 0 |
| DEX-CZ5319 | 417705.703 | 9673646.876 | 355.696 | 44 | -90 | 29.71 | 13 |
| DEX-CZ5320 | 417755.644 | 9673651.954 | 359.409 | 24 | -90 | 15.69 | 6.23 |
| DEX-CZ5322 | 417305.225 | 9673647.140 | 348.969 | 35 | -90 | 34.51 | 2.23 |
| DEX-CZ5323 | 417606.332 | 9673751.620 | 360.396 | 43 | -90 | 27 | 14 |
| DEX-CZ5324 | 417655.915 | 9673750.352 | 366.204 | 19 | -90 | 15 | 2 |
| DEX-CZ5325 | 417706.512 | 9673749.645 | 370.352 | 22 | -90 | 11.43 | 8 |
| DEX-CZ5326 | 417755.878 | 9673752.132 | 372.093 | 30 | -90 | 7 | 19 |
| DEX-CZ5327 | 417805.377 | 9673746.281 | 372.170 | 22 | -90 | 11.49 | 9 |
| DEX-CZ5328 | 417552.682 | 9673788.256 | 367.041 | 21 | -90 | 9.18 | 10 |
| DEX-CZ5329 | 417453.125 | 9673800.809 | 361.052 | 18 | -90 | 12 | 5 |
| DEX-CZ5330 | 417654.772 | 9673790.070 | 369.063 | 26 | -90 | 18.72 | 7.16 |
| DEX-CZ5331 | 417353.478 | 9673696.915 | 348.273 | 37 | -90 | 33.09 | 6.29 |
| DEX-CZ5332 | 417353.164 | 9673748.658 | 348.574 | 32 | -90 | 28.79 | 7 |
| DEX-CZ5333 | 417399.918 | 9673754.187 | 350.548 | 25 | -90 | 23.43 | 3 |
| DEX-CZ5334 | 417456.228 | 9673750.511 | 360.563 | 20 | -90 | 9 | 8 |
| DEX-CZ5335 | 417502.092 | 9673750.390 | 363.276 | 37 | -90 | 14 | 4 |
| DEX-CZ5336 | 417655.998 | 9673699.275 | 359.054 | 19 | -90 | 14.87 | 3 |
| DEX-CZ5337 | 417755.236 | 9673801.262 | 375.813 | 17 | -90 | 4 | 10 |
| DEX-CZ5338 | 417755.519 | 9673700.345 | 362.628 | 28 | -90 | 14.69 | 8 |
| DEX-CZ5339 | 417456.374 | 9673696.414 | 357.262 | 25 | -90 | 14 | 8 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8499 | 415480.282 | 9673141.908 | 358.066 | 35 | -90 | 25.35 | 8 |
| DEX-CZ8500 | 415133.496 | 9673141.030 | 312.063 | 20 | -90 | 11 | 3 |
| DEX-CZ8501 | 415107.135 | 9673140.365 | 310.138 | 24 | -90 | 19.22 | 3 |
| DEX-CZ8502 | 415077.215 | 9673145.941 | 305.036 | 21 | -90 | 19.39 | 0 |
| DEX-CZ8503 | 415054.268 | 9673143.155 | 305.616 | 16 | -90 | 10 | 4 |
| DEX-CZ8504 | 415028.930 | 9673143.128 | 306.288 | 17 | -90 | 7 | 9 |
| DEX-CZ8505 | 415009.550 | 9673138.387 | 308.153 | 18 | -90 | 9 | 6 |
| DEX-CZ8506 | 414984.776 | 9673138.581 | 305.369 | 12 | -90 | 7.49 | 2.51 |
| DEX-CZ8507 | 415134.105 | 9673117.550 | 320.061 | 28 | -90 | 12 | 13 |
| DEX-CZ8508 | 415081.994 | 9673116.214 | 312.789 | 28 | -90 | 17.22 | 9 |
| DEX-CZ8509 | 415030.773 | 9673122.892 | 311.416 | 23 | -90 | 16.19 | 5 |
| DEX-CZ8510 | 414983.274 | 9673115.985 | 309.999 | 15 | -90 | 10.65 | 2.6 |
| DEX-CZ8511 | 415384.045 | 9673093.597 | 351.334 | 19 | -90 | 5 | 9 |
| DEX-CZ8512 | 415356.709 | 9673091.134 | 350.051 | 20 | -90 | 9 | 9 |
| DEX-CZ8513 | 415328.931 | 9673084.665 | 349.645 | 16 | -90 | 8 | 6 |
| DEX-CZ8514 | 415208.298 | 9673088.305 | 335.187 | 26 | -90 | 20 | 4 |
| DEX-CZ8515 | 415182.298 | 9673087.457 | 332.376 | 25 | -90 | 14 | 9 |
| DEX-CZ8516 | 415155.268 | 9673092.339 | 327.021 | 32 | -90 | 22 | 7 |
| DEX-CZ8517 | 415132.588 | 9673093.800 | 324.010 | 27 | -90 | 17 | 8 |
| DEX-CZ8518 | 415105.850 | 9673093.765 | 319.527 | 23 | -90 | 17.2 | 4 |
| DEX-CZ8519 | 415081.064 | 9673097.733 | 314.735 | 23 | -90 | 16.55 | 4.63 |
| DEX-CZ8520 | 415051.401 | 9673093.280 | 312.162 | 13 | -90 | 7 | 4 |
| DEX-CZ8521 | 415029.760 | 9673092.717 | 314.029 | 12 | -90 | 5 | 4 |
| DEX-CZ8522 | 415003.089 | 9673097.221 | 314.579 | 19 | -90 | 10.24 | 5 |
| DEX-CZ8523 | 414984.464 | 9673096.202 | 312.912 | 22 | -90 | 6 | 9 |
| DEX-CZ8524 | 415382.591 | 9673064.255 | 366.098 | 10 | -90 | 3 | 4 |
| DEX-CZ8525 | 415337.090 | 9673062.660 | 360.089 | 27 | -90 | 8 | 17 |
| DEX-CZ8526 | 415183.659 | 9673060.009 | 337.841 | 19 | -90 | 13 | 4 |
| DEX-CZ8527 | 415081.589 | 9673070.494 | 317.418 | 31 | -90 | 23.44 | 6 |
| DEX-CZ8528 | 415527.381 | 9673041.663 | 342.739 | 24 | -90 | 4 | 11 |
| DEX-CZ8529 | 415504.180 | 9673045.355 | 353.038 | 33 | -90 | 18 | 13 |
| DEX-CZ8530 | 415479.797 | 9673042.670 | 362.653 | 27 | -90 | 7 | 11 |
| DEX-CZ8531 | 415384.469 | 9673038.383 | 377.629 | 9 | -90 | 4 | 2 |
| DEX-CZ8532 | 415359.164 | 9673041.228 | 371.798 | 15 | -90 | 6 | 6.3 |
| DEX-CZ8533 | 415331.686 | 9673042.361 | 367.150 | 24 | -90 | 11.27 | 9 |
| DEX-CZ8534 | 415305.248 | 9673040.644 | 364.125 | 12 | -90 | 9.35 | 1 |
| DEX-CZ8535 | 415203.896 | 9673039.129 | 344.546 | 29 | -90 | 20.29 | 6 |
| DEX-CZ8536 | 415183.668 | 9673042.525 | 339.547 | 12 | -90 | 8 | 1 |
| DEX-CZ8537 | 415155.133 | 9673044.649 | 333.363 | 22 | -90 | 9 | 10 |
| DEX-CZ8538 | 415131.914 | 9673043.689 | 328.779 | 26 | -90 | 15 | 10 |
| DEX-CZ8539 | 415103.673 | 9673041.792 | 323.063 | 35 | -90 | 17 | 16 |
| DEX-CZ8540 | 415077.218 | 9673043.064 | 318.035 | 29 | -90 | 21.44 | 7 |
| DEX-CZ8541 | 415054.077 | 9673041.992 | 312.720 | 35 | -90 | 17.45 | 13 |
| DEX-CZ8542 | 415532.187 | 9673020.469 | 346.913 | 17 | -90 | 1 | 13 |
| DEX-CZ8543 | 415480.159 | 9673018.858 | 366.686 | 18 | -90 | 9 | 7 |
| DEX-CZ8544 | 415384.084 | 9673013.998 | 387.648 | 14 | -90 | 4 | 8 |
| DEX-CZ8545 | 415336.497 | 9673016.362 | 373.171 | 20 | -90 | 14 | 4 |
| DEX-CZ8546 | 415531.323 | 9672998.991 | 346.831 | 21 | -90 | 2 | 9 |
| DEX-CZ8547 | 415507.348 | 9673003.791 | 359.111 | 22 | -90 | 4 | 14 |
| DEX-CZ8548 | 415483.725 | 9672995.695 | 370.878 | 10 | -90 | 3 | 4 |
| DEX-CZ8549 | 415386.751 | 9672990.086 | 392.733 | 22 | -90 | 10 | 10 |
| DEX-CZ8550 | 415356.261 | 9672994.029 | 382.568 | 9 | -90 | 6 | 1 |
| DEX-CZ8551 | 415328.329 | 9672991.373 | 374.328 | 16 | -90 | 9 | 5 |
| DEX-CZ8552 | 415304.818 | 9672998.175 | 368.416 | 42 | -90 | 17 | 23 |
| DEX-CZ8553 | 415280.545 | 9672990.043 | 363.744 | 22 | -90 | 12 | 8 |
| DEX-CZ8554 | 415255.595 | 9672991.300 | 357.981 | 17 | -90 | 11 | 4 |
| DEX-CZ8555 | 415227.057 | 9672991.109 | 350.832 | 18 | -90 | 14 | 2 |
| DEX-CZ8556 | 415207.551 | 9672993.336 | 346.943 | 30 | -90 | 20 | 9 |
| DEX-CZ8557 | 415180.426 | 9672996.542 | 341.793 | 26 | -90 | 21 | 3 |
| DEX-CZ8558 | 415147.632 | 9672993.809 | 333.976 | 21 | -90 | 17 | 1 |
| DEX-CZ8559 | 415125.997 | 9672990.896 | 328.741 | 26 | -90 | 19 | 6 |
| DEX-CZ8560 | 415104.979 | 9672995.797 | 322.752 | 23 | -90 | 17.86 | 4 |
| DEX-CZ8561 | 415283.147 | 9672967.760 | 363.108 | 22 | -90 | 15 | 5 |
| DEX-CZ8562 | 415234.016 | 9672969.640 | 351.099 | 7 | -90 | 4 | 1 |
| DEX-CZ8563 | 415184.804 | 9672968.865 | 338.986 | 37 | -90 | 25 | 10 |
| DEX-CZ8564 | 415129.634 | 9672971.272 | 326.219 | 20 | -90 | 12 | 5 |
| DEX-CZ8565 | 415330.805 | 9672938.674 | 373.156 | 33 | -90 | 29.88 | 4 |
| DEX-CZ8566 | 415306.653 | 9672939.107 | 366.451 | 30 | -90 | 27.58 | 4 |
| DEX-CZ8567 | 415279.684 | 9672939.599 | 360.289 | 23 | -90 | 15.37 | 6 |
| DEX-CZ8568 | 415252.749 | 9672938.275 | 352.140 | 39 | -90 | 28.62 | 13 |
| DEX-CZ8569 | 415227.143 | 9672936.846 | 344.616 | 41 | -90 | 30.33 | 10.85 |
| DEX-CZ8570 | 415204.296 | 9672941.472 | 340.252 | 33 | -90 | 23 | 8 |
| DEX-CZ8571 | 415177.419 | 9672942.844 | 334.315 | 35 | -90 | 28.08 | 4 |
| DEX-CZ8572 | 415154.226 | 9672941.693 | 329.197 | 36 | -90 | 35.5 | 0 |
| DEX-CZ8573 | 415129.117 | 9672939.872 | 323.530 | 33 | -90 | 17 | 15 |
| DEX-CZ8574 | 415099.491 | 9672938.747 | 316.130 | 24 | -90 | 19 | 3 |
| DEX-CZ8575 | 415332.022 | 9672914.499 | 370.702 | 20 | -90 | 14.03 | 5 |
| DEX-CZ8576 | 415282.032 | 9672913.860 | 356.435 | 29 | -90 | 26.54 | 4 |
| DEX-CZ8577 | 415230.873 | 9672914.167 | 342.365 | 32 | -90 | 23 | 10 |
| DEX-CZ8578 | 415178.934 | 9672914.568 | 329.770 | 21 | -90 | 16 | 1 |
| DEX-CZ8579 | 415132.325 | 9672916.518 | 317.878 | 20 | -90 | 17.31 | 1 |
| DEX-CZ8580 | 415075.760 | 9672914.280 | 305.628 | 24 | -90 | 20.21 | 2.7 |
| DEX-CZ8581 | 415378.160 | 9672898.260 | 376.088 | 23 | -90 | 15 | 7.4 |
| DEX-CZ8582 | 415354.277 | 9672889.464 | 369.035 | 43 | -90 | 36.99 | 10.45 |
| DEX-CZ8583 | 415334.358 | 9672890.260 | 366.242 | 28 | -90 | 27.98 | 1 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5340 | 418055.897 | 9673800.561 | 351.403 | 44 | -90 | 45.22 | 3 |
| DEX-CZ5341 | 418155.252 | 9673800.496 | 358.813 | 42 | -90 | 12 | 28 |
| DEX-CZ5342 | 417448.817 | 9673845.813 | 354.918 | 12 | -90 | 8 | 4 |
| DEX-CZ5343 | 417506.390 | 9673848.398 | 369.076 | 35 | -90 | 15 | 9 |
| DEX-CZ5344 | 417554.866 | 9673847.058 | 371.000 | 22 | -90 | 12 | 1 |
| DEX-CZ5345 | 417604.283 | 9673851.690 | 372.089 | 25 | -90 | 17 | 6 |
| DEX-CZ5346 | 417652.974 | 9673847.933 | 374.176 | 28 | -90 | 20 | 5 |
| DEX-CZ5347 | 417707.148 | 9673846.478 | 368.718 | 35 | -90 | 15 | 18 |
| DEX-CZ5348 | 417758.762 | 9673850.652 | 363.983 | 20 | -90 | 9 | 7 |
| DEX-CZ5349 | 417806.284 | 9673849.615 | 354.399 | 12 | -90 | 5 | 4 |
| DEX-CZ5350 | 417855.828 | 9673850.073 | 346.822 | 51 | -90 | 42.64 | 11 |
| DEX-CZ5354 | 418055.883 | 9673849.453 | 349.275 | 30 | -90 | 28.14 | 5 |
| DEX-CZ5355 | 418105.362 | 9673849.804 | 352.000 | 36 | -90 | 19.9 | 4 |
| DEX-CZ5356 | 418155.527 | 9673849.817 | 356.172 | 24 | -90 | 18.65 | 6 |
| DEX-CZ5357 | 418204.871 | 9673850.453 | 362.647 | 31 | -90 | 7 | 17 |
| DEX-CZ5358 | 418251.866 | 9673799.385 | 367.406 | 36 | -90 | 23.38 | 14.38 |
| DEX-CZ5359 | 418256.858 | 9673849.556 | 365.614 | 35 | -90 | 15.75 | 15 |
| DEX-CZ5360 | 418301.782 | 9673851.970 | 366.266 | 28 | -90 | 18.36 | 9.61 |
| DEX-CZ5361 | 417554.229 | 9673898.919 | 371.208 | 24 | -90 | 17 | 4 |
| DEX-CZ5362 | 417655.332 | 9673899.890 | 370.677 | 23 | -90 | 17 | 2 |
| DEX-CZ5363 | 417754.373 | 9673898.392 | 353.571 | 25 | -90 | 15.97 | 8 |
| DEX-CZ5364 | 417856.235 | 9673902.123 | 345.000 | 45 | -90 | 30.53 | 14 |
| DEX-CZ5365 | 418156.747 | 9673996.994 | 363.304 | 27 | -90 | 17 | 7 |
| DEX-CZ5366 | 418355.805 | 9673849.724 | 367.996 | 18 | -90 | 12.33 | 4 |
| DEX-CZ5367 | 418406.111 | 9673851.048 | 371.433 | 38 | -90 | 9 | 24.15 |
| DEX-CZ5368 | 418456.126 | 9673849.815 | 373.000 | 34 | -90 | 14.2 | 10.23 |
| DEX-CZ5369 | 418505.538 | 9673848.229 | 372.096 | 26 | -90 | 14 | 4.4 |
| DEX-CZ5370 | 418555.609 | 9673849.424 | 372.161 | 43 | -90 | 30 | 12 |
| DEX-CZ5371 | 418604.955 | 9673850.542 | 372.297 | 55 | -90 | 26 | 19.6 |
| DEX-CZ5372 | 418654.981 | 9673851.279 | 374.011 | 35 | -90 | 20 | 8 |
| DEX-CZ5373 | 418753.504 | 9673899.266 | 367.221 | 31 | -90 | 14 | 12 |
| DEX-CZ5374 | 417454.370 | 9673891.137 | 351.221 | 19 | -90 | 14 | 3 |
| DEX-CZ5377 | 418055.544 | 9673900.713 | 350.884 | 26 | -90 | 22.37 | 3 |
| DEX-CZ5378 | 418153.823 | 9673900.327 | 358.160 | 44 | -90 | 33.02 | 12 |
| DEX-CZ5379 | 418254.284 | 9673900.862 | 362.346 | 43 | -90 | 19.82 | 14 |
| DEX-CZ5380 | 418354.724 | 9673896.773 | 368.420 | 26 | -90 | 15 | 8.5 |
| DEX-CZ5381 | 418456.988 | 9673900.640 | 373.050 | 47 | -90 | 20.31 | 10 |
| DEX-CZ5382 | 418554.987 | 9673899.533 | 368.000 | 26 | -90 | 12 | 11 |
| DEX-CZ5383 | 418455.297 | 9673949.539 | 367.426 | 17 | -90 | 12 | 6 |
| DEX-CZ5384 | 418505.046 | 9673949.763 | 361.000 | 43 | -90 | 20 | 23 |
| DEX-CZ5385 | 418656.156 | 9673899.902 | 369.011 | 42 | -90 | 13 | 20 |
| DEX-CZ5386 | 418854.308 | 9673896.837 | 357.587 | 27 | -90 | 23.4 | 0 |
| DEX-CZ5387 | 418853.309 | 9673945.983 | 351.949 | 40 | -90 | 23.2 | 10.25 |
| DEX-CZ5388 | 418902.934 | 9673946.349 | 348.995 | 39 | -90 | 30.5 | 15.04 |
| DEX-CZ5389 | 418948.736 | 9673950.997 | 347.172 | 27 | -90 | 22.96 | 5 |
| DEX-CZ539 | 416260.898 | 9673412.931 | 316.000 | 13 | -90 | 9 | 0 |
| DEX-CZ5390 | 417502.834 | 9673948.614 | 357.955 | 17 | -90 | 5 | 4 |
| DEX-CZ5391 | 417558.334 | 9673950.717 | 365.738 | 48 | -90 | 10 | 13 |
| DEX-CZ5392 | 417608.081 | 9673947.382 | 369.504 | 21 | -90 | 15 | 4 |
| DEX-CZ5393 | 417652.758 | 9673946.859 | 374.705 | 11 | -90 | 5 | 3.55 |
| DEX-CZ5394 | 417705.649 | 9673949.251 | 367.117 | 19 | -90 | 14.97 | 3 |
| DEX-CZ5395 | 417754.128 | 9673951.745 | 356.106 | 31 | -90 | 16 | 12.99 |
| DEX-CZ5396 | 417815.057 | 9673950.412 | 335.708 | 18 | -90 | 4 | 12 |
| DEX-CZ5397 | 417855.413 | 9673946.824 | 341.819 | 21 | -90 | 18 | 0 |
| DEX-CZ5400 | 418055.133 | 9673950.133 | 359.093 | 34 | -90 | 17.32 | 15.77 |
| DEX-CZ5401 | 418106.243 | 9673950.391 | 360.000 | 29 | -90 | 25.15 | 3 |
| DEX-CZ5402 | 418153.943 | 9673951.253 | 362.603 | 30 | -90 | 25.43 | 5 |
| DEX-CZ5403 | 418204.860 | 9673951.619 | 364.129 | 45 | -90 | 25.55 | 17 |
| DEX-CZ5404 | 418254.432 | 9673949.835 | 364.955 | 36 | -90 | 16.65 | 3.35 |
| DEX-CZ5405 | 418302.358 | 9673949.519 | 366.526 | 35 | -90 | 23.54 | 7 |
| DEX-CZ5406 | 418355.096 | 9673950.782 | 369.082 | 25 | -90 | 12.44 | 6 |
| DEX-CZ5407 | 418406.971 | 9673947.724 | 369.089 | 28 | -90 | 19.95 | 4 |
| DEX-CZ5408 | 418755.580 | 9673949.693 | 365.031 | 30 | -90 | 19.3 | 1.3 |
| DEX-CZ5409 | 418803.806 | 9673949.171 | 359.464 | 28 | -90 | 7 | 20 |
| DEX-CZ5410 | 418552.171 | 9673949.661 | 365.920 | 50 | -90 | 35 | 12 |
| DEX-CZ5411 | 418605.722 | 9673948.704 | 363.773 | 29 | -90 | 8 | 18 |
| DEX-CZ5412 | 418655.183 | 9673949.767 | 366.534 | 26 | -90 | 23 | 1 |
| DEX-CZ5413 | 418705.699 | 9673949.872 | 366.841 | 24 | -90 | 16 | 7 |
| DEX-CZ5415 | 417554.820 | 9674050.412 | 361.295 | 17 | -90 | 8 | 7 |
| DEX-CZ5416 | 417603.457 | 9674049.417 | 367.989 | 15 | -90 | 2 | 8.2 |
| DEX-CZ5417 | 417652.379 | 9674048.211 | 367.755 | 15 | -90 | 13 | 0 |
| DEX-CZ5418 | 417645.900 | 9673987.535 | 376.657 | 25 | -90 | 4 | 20 |
| DEX-CZ5419 | 417752.209 | 9673999.541 | 366.797 | 13 | -90 | 8 | 3 |
| DEX-CZ5420 | 417859.287 | 9674005.770 | 348.691 | 23 | -90 | 12 | 9 |
| DEX-CZ5421 | 417956.260 | 9674000.639 | 366.097 | 23 | -90 | 13 | 8 |
| DEX-CZ5422 | 418053.468 | 9674000.940 | 370.422 | 13 | -90 | 10 | 0 |
| DEX-CZ5423 | 418250.825 | 9673985.323 | 364.529 | 27 | -90 | 5 | 13 |
| DEX-CZ5424 | 418357.070 | 9673988.909 | 368.609 | 33 | -90 | 20 | 11 |
| DEX-CZ5425 | 418454.459 | 9673987.377 | 361.267 | 29 | -90 | 16.86 | 10 |
| DEX-CZ5426 | 418555.676 | 9673994.685 | 358.514 | 37 | -90 | 7 | 17 |
| DEX-CZ5427 | 418560.702 | 9674034.545 | 344.999 | 18 | -90 | 11 | 5 |
| DEX-CZ5428 | 418609.215 | 9674050.212 | 339.956 | 22 | -90 | 7 | 13 |
| DEX-CZ5429 | 418657.200 | 9674051.315 | 355.615 | 30 | -90 | 16.3 | 11.8 |
| DEX-CZ5430 | 418655.008 | 9673998.641 | 361.224 | 28 | -90 | 21 | 7 |
| DEX-CZ5431 | 418756.405 | 9673989.344 | 363.800 | 31 | -90 | 21 | 8 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8584 | 415307.429 | 9672887.966 | 359.007 | 44 | -90 | 41.49 | 4 |
| DEX-CZ8585 | 415280.651 | 9672888.169 | 350.697 | 25 | -90 | 22 | 1 |
| DEX-CZ8586 | 415258.348 | 9672892.175 | 344.865 | 9 | -90 | 5 | 1 |
| DEX-CZ8587 | 415233.219 | 9672889.158 | 336.219 | 26 | -90 | 16 | 8 |
| DEX-CZ8588 | 415207.239 | 9672884.930 | 328.668 | 32 | -90 | 32 | 1 |
| DEX-CZ8589 | 415186.699 | 9672889.118 | 324.966 | 28 | -90 | 20 | 7 |
| DEX-CZ8590 | 415155.114 | 9672886.046 | 318.480 | 28 | -90 | 24 | 2 |
| DEX-CZ8591 | 415131.767 | 9672890.613 | 311.844 | 34 | -90 | 20 | 11 |
| DEX-CZ8592 | 415102.559 | 9672886.380 | 303.426 | 23 | -90 | 15 | 5 |
| DEX-CZ8593 | 415377.752 | 9672866.994 | 364.925 | 20 | -90 | 16 | 2 |
| DEX-CZ8594 | 415327.152 | 9672870.131 | 359.921 | 20 | -90 | 13.6 | 5 |
| DEX-CZ8595 | 415283.979 | 9672865.636 | 345.454 | 34 | -90 | 29.86 | 7.34 |
| DEX-CZ8596 | 415230.543 | 9672866.553 | 327.736 | 25 | -90 | 12 | 7 |
| DEX-CZ8597 | 415179.903 | 9672868.287 | 319.772 | 26 | -90 | 23 | 1 |
| DEX-CZ8598 | 415129.978 | 9672867.490 | 306.241 | 27 | -90 | 21.88 | 4 |
| DEX-CZ8599 | 415379.936 | 9672838.868 | 355.300 | 19 | -90 | 16.44 | 1 |
| DEX-CZ8600 | 415357.781 | 9672841.845 | 353.424 | 25 | -90 | 21 | 1 |
| DEX-CZ8601 | 415328.828 | 9672843.862 | 350.529 | 22 | -90 | 17 | 3 |
| DEX-CZ8602 | 415308.902 | 9672841.572 | 345.860 | 31 | -90 | 23.27 | 5 |
| DEX-CZ8603 | 415289.032 | 9672839.794 | 339.632 | 25 | -90 | 14 | 5 |
| DEX-CZ8604 | 415261.807 | 9672838.867 | 331.594 | 25 | -90 | 14 | 5 |
| DEX-CZ8605 | 415238.506 | 9672840.408 | 324.162 | 33 | -90 | 27.35 | 4 |
| DEX-CZ8606 | 415210.945 | 9672845.120 | 320.319 | 37 | -90 | 33.3 | 5 |
| DEX-CZ8607 | 415188.927 | 9672843.900 | 317.742 | 32 | -90 | 28.19 | 2 |
| DEX-CZ8608 | 415157.908 | 9672840.638 | 308.264 | 27 | -90 | 17.59 | 9 |
| DEX-CZ8609 | 415138.771 | 9672834.252 | 304.278 | 31 | -90 | 21.27 | 7.65 |
| DEX-CZ8610 | 415386.171 | 9672814.666 | 351.091 | 25 | -90 | 21 | 2 |
| DEX-CZ8611 | 415328.143 | 9672818.720 | 342.592 | 34 | -90 | 22.21 | 10 |
| DEX-CZ8612 | 415286.939 | 9672815.830 | 334.309 | 32 | -90 | 24.77 | 6 |
| DEX-CZ8613 | 415236.359 | 9672807.819 | 322.101 | 35 | -90 | 30.7 | 4 |
| DEX-CZ8614 | 415183.319 | 9672815.349 | 312.319 | 21 | -90 | 19.83 | 2 |
| DEX-CZ8615 | 415387.082 | 9672793.699 | 347.740 | 37 | -90 | 26 | 9 |
| DEX-CZ8616 | 415358.300 | 9672787.875 | 340.187 | 60 | -90 | 38.07 | 21 |
| DEX-CZ8617 | 415334.600 | 9672791.883 | 336.388 | 24 | -90 | 19 | 3 |
| DEX-CZ8618 | 415307.661 | 9672793.555 | 333.549 | 35 | -90 | 31.13 | 3 |
| DEX-CZ8619 | 415281.344 | 9672786.861 | 329.756 | 34 | -90 | 24 | 8 |
| DEX-CZ8620 | 415252.629 | 9672792.887 | 324.474 | 30 | -90 | 22.8 | 6 |
| DEX-CZ8621 | 415233.106 | 9672792.568 | 319.133 | 33 | -90 | 27 | 4 |
| DEX-CZ8622 | 415206.775 | 9672787.456 | 311.082 | 33 | -90 | 26.85 | 4.73 |
| DEX-CZ8623 | 415181.346 | 9672787.067 | 306.780 | 30 | -90 | 29.48 | 1 |
| DEX-CZ8632 | 415774.544 | 9673451.550 | 353.056 | 32 | -90 | 27 | 3 |
| DEX-CZ8637 | 415822.670 | 9673424.275 | 355.229 | 18 | -90 | 14 | 2 |
| DEX-CZ8638 | 415800.317 | 9673426.534 | 356.000 | 22 | -90 | 19 | 1 |
| DEX-CZ8639 | 415777.712 | 9673427.677 | 353.618 | 26 | -90 | 18 | 5 |
| DEX-CZ8640 | 415747.117 | 9673430.143 | 348.479 | 26 | -90 | 19 | 4 |
| DEX-CZ8641 | 415728.209 | 9673425.775 | 344.718 | 26 | -90 | 22 | 4 |
| DEX-CZ8648 | 415226.565 | 9673429.508 | 326.302 | 12 | -90 | 5 | 5 |
| DEX-CZ8649 | 415191.680 | 9673421.312 | 313.445 | 9 | -90 | 6.64 | 0 |
| DEX-CZ8651 | 415150.061 | 9673420.908 | 314.068 | 10 | -90 | 5 | 3 |
| DEX-CZ8652 | 415126.467 | 9673426.274 | 312.349 | 6 | -90 | 3 | 1 |
| DEX-CZ8653 | 415825.588 | 9673402.028 | 351.747 | 22 | -90 | 17 | 3 |
| DEX-CZ8654 | 415773.634 | 9673401.197 | 353.010 | 37 | -90 | 34.27 | 1.73 |
| DEX-CZ8655 | 415725.173 | 9673398.571 | 346.038 | 39 | -90 | 27 | 12 |
| DEX-CZ8656 | 415679.653 | 9673397.738 | 347.350 | 23 | -90 | 18 | 3 |
| DEX-CZ8657 | 415626.455 | 9673396.751 | 345.394 | 27 | -90 | 24 | 0.41 |
| DEX-CZ8658 | 415226.987 | 9673402.037 | 330.392 | 13 | -90 | 5 | 7 |
| DEX-CZ8659 | 415175.665 | 9673402.239 | 320.358 | 13 | -90 | 5 | 5.42 |
| DEX-CZ8660 | 415125.416 | 9673401.394 | 317.136 | 19 | -90 | 6 | 12 |
| DEX-CZ8661 | 415935.013 | 9673380.770 | 324.288 | 20 | -90 | 13 | 4 |
| DEX-CZ8662 | 415899.996 | 9673375.409 | 329.109 | 23 | -90 | 8 | 13 |
| DEX-CZ8663 | 415874.408 | 9673374.099 | 335.117 | 10 | -90 | 6 | 1 |
| DEX-CZ8664 | 415850.372 | 9673376.478 | 340.914 | 17 | -90 | 8 | 7 |
| DEX-CZ8665 | 415826.362 | 9673376.191 | 345.214 | 11 | -90 | 7 | 2 |
| DEX-CZ8666 | 415802.443 | 9673377.176 | 349.044 | 36 | -90 | 22 | 13 |
| DEX-CZ8667 | 415774.669 | 9673377.971 | 349.617 | 24 | -90 | 13 | 9.3 |
| DEX-CZ8668 | 415746.790 | 9673376.382 | 345.747 | 23 | -90 | 17 | 4 |
| DEX-CZ8669 | 415720.023 | 9673373.788 | 349.112 | 38 | -90 | 34 | 1 |
| DEX-CZ8670 | 415697.531 | 9673375.544 | 352.352 | 24 | -90 | 21 | 0 |
| DEX-CZ8671 | 415675.684 | 9673377.926 | 350.713 | 28 | -90 | 22 | 4 |
| DEX-CZ8672 | 415227.798 | 9673373.095 | 341.909 | 12 | -90 | 8 | 2 |
| DEX-CZ8673 | 415201.992 | 9673369.671 | 339.755 | 13 | -90 | 9 | 2 |
| DEX-CZ8674 | 415174.986 | 9673371.841 | 334.770 | 17 | -90 | 14 | 2 |
| DEX-CZ8675 | 415151.216 | 9673373.605 | 331.377 | 14 | -90 | 7 | 5 |
| DEX-CZ8676 | 415123.996 | 9673374.810 | 322.995 | 9 | -90 | 7 | 1 |
| DEX-CZ8677 | 415102.181 | 9673376.718 | 313.017 | 10 | -90 | 8 | 0 |
| DEX-CZ8678 | 415070.717 | 9673375.560 | 301.287 | 13 | -90 | 10 | 1 |
| DEX-CZ8679 | 415052.444 | 9673376.735 | 299.728 | 11 | -90 | 3 | 5 |
| DEX-CZ8680 | 415924.078 | 9673350.259 | 321.055 | 16 | -90 | 10 | 4 |
| DEX-CZ8681 | 415874.794 | 9673349.965 | 328.224 | 18 | -90 | 9 | 7 |
| DEX-CZ8682 | 415826.508 | 9673352.030 | 336.319 | 21 | -90 | 6 | 13 |
| DEX-CZ8683 | 415772.482 | 9673350.734 | 336.824 | 15 | -90 | 12.5 | 0 |
| DEX-CZ8684 | 415725.972 | 9673351.398 | 352.451 | 28 | -90 | 18 | 10 |
| DEX-CZ8685 | 415177.732 | 9673343.417 | 340.275 | 26 | -90 | 13 | 10.25 |
| DEX-CZ8686 | 415125.073 | 9673349.870 | 327.273 | 30 | -90 | 12 | 14 |
| DEX-CZ8687 | 415076.972 | 9673346.034 | 307.161 | 11 | -90 | 6 | 3 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5432 | 418755.138 | 9674049.454 | 355.121 | 22 | -90 | 5 | 13 |
| DEX-CZ5433 | 418805.429 | 9674051.664 | 342.658 | 28 | -90 | 4 | 17.5 |
| DEX-CZ5434 | 418856.139 | 9674047.745 | 340.726 | 14 | -90 | 9 | 3 |
| DEX-CZ5435 | 418907.036 | 9674045.674 | 348.554 | 37 | -90 | 32.84 | 5.73 |
| DEX-CZ5436 | 418952.868 | 9673995.961 | 348.247 | 23 | -90 | 20.26 | 3.11 |
| DEX-CZ5437 | 418853.090 | 9673996.338 | 348.669 | 22 | -90 | 18.75 | 1.25 |
| DEX-CZ5439 | 417556.450 | 9674000.028 | 361.092 | 33 | -90 | 9 | 10.48 |
| DEX-CZ5440 | 417559.065 | 9674101.286 | 359.000 | 13 | -90 | 6 | 6 |
| DEX-CZ5441 | 417655.527 | 9674095.302 | 363.097 | 15 | -90 | 7 | 6 |
| DEX-CZ5442 | 417703.772 | 9674046.680 | 372.086 | 23 | -90 | 4 | 5 |
| DEX-CZ5443 | 417743.995 | 9674049.712 | 366.631 | 11 | -90 | 4 | 4 |
| DEX-CZ5444 | 417810.057 | 9674049.736 | 332.763 | 8 | -90 | 6 | 1 |
| DEX-CZ5445 | 417869.433 | 9674048.606 | 350.917 | 32 | -90 | 23.5 | 6 |
| DEX-CZ5446 | 417860.584 | 9674104.165 | 326.211 | 21 | -90 | 9 | 3 |
| DEX-CZ5447 | 417904.756 | 9674050.024 | 358.003 | 15 | -90 | 9 | 4 |
| DEX-CZ5448 | 417956.527 | 9674055.783 | 365.070 | 18 | -90 | 12 | 6 |
| DEX-CZ5449 | 418008.318 | 9674050.249 | 378.019 | 18 | -90 | 12 | 6 |
| DEX-CZ5450 | 418055.387 | 9674050.536 | 376.540 | 7 | -90 | 4 | 0 |
| DEX-CZ5451 | 418105.565 | 9674047.979 | 366.683 | 30 | -90 | 21 | 7 |
| DEX-CZ5452 | 418157.588 | 9674050.001 | 360.151 | 31 | -90 | 13 | 14 |
| DEX-CZ5453 | 418205.920 | 9674050.439 | 357.057 | 46 | -90 | 13 | 31 |
| DEX-CZ5454 | 418258.314 | 9674051.149 | 360.946 | 31 | -90 | 14.49 | 15.04 |
| DEX-CZ5455 | 418306.470 | 9674051.723 | 363.467 | 42 | -90 | 13.5 | 23.5 |
| DEX-CZ5456 | 418357.151 | 9674048.706 | 362.074 | 44 | -90 | 20.27 | 22 |
| DEX-CZ5457 | 418457.541 | 9674099.644 | 359.045 | 22 | -90 | 14 | 6 |
| DEX-CZ5458 | 418552.914 | 9674099.873 | 330.910 | 13 | -90 | 5 | 8 |
| DEX-CZ5459 | 418407.332 | 9674050.653 | 360.405 | 55 | -90 | 30 | 19 |
| DEX-CZ5460 | 418456.182 | 9674049.239 | 359.561 | 26 | -90 | 20 | 4 |
| DEX-CZ5461 | 418511.205 | 9674046.777 | 356.232 | 40 | -90 | 7 | 18 |
| DEX-CZ5462 | 418707.977 | 9674049.547 | 360.000 | 25 | -90 | 24.31 | 4.05 |
| DEX-CZ5463 | 418755.713 | 9674096.933 | 332.228 | 13 | -90 | 5 | 4 |
| DEX-CZ5464 | 418856.665 | 9674101.538 | 351.125 | 21 | -90 | 13 | 3.6 |
| DEX-CZ5465 | 419053.533 | 9674098.719 | 348.000 | 28 | -90 | 25.3 | 5 |
| DEX-CZ5466 | 418954.455 | 9674099.033 | 344.000 | 34 | -90 | 26.15 | 10.19 |
| DEX-CZ5467 | 418955.137 | 9674046.986 | 347.002 | 23 | -90 | 12 | 11 |
| DEX-CZ5468 | 419002.808 | 9674052.125 | 347.704 | 25 | -90 | 20.06 | 5.27 |
| DEX-CZ5470 | 417560.760 | 9674146.073 | 350.541 | 18 | -90 | 11.5 | 5 |
| DEX-CZ5471 | 417602.101 | 9674143.001 | 344.017 | 29 | -90 | 10 | 7 |
| DEX-CZ5472 | 417656.439 | 9674138.783 | 351.748 | 5 | -90 | 2 | 1 |
| DEX-CZ5473 | 417711.872 | 9674133.085 | 360.640 | 22 | -90 | 8 | 10.62 |
| DEX-CZ5474 | 417751.264 | 9674098.685 | 362.493 | 25 | -90 | 21.11 | 3.29 |
| DEX-CZ5475 | 417767.366 | 9674139.305 | 353.029 | 26 | -90 | 22.61 | 3 |
| DEX-CZ5476 | 417809.323 | 9674144.674 | 343.587 | 50 | -90 | 41.55 | 5 |
| DEX-CZ5477 | 417854.153 | 9674141.973 | 321.675 | 23 | -90 | 6 | 6 |
| DEX-CZ5478 | 417959.262 | 9674141.349 | 348.556 | 41 | -90 | 10 | 22 |
| DEX-CZ5479 | 418004.939 | 9674149.584 | 355.112 | 30 | -90 | 24.78 | 3.61 |
| DEX-CZ5480 | 418053.699 | 9674146.938 | 354.201 | 18 | -90 | 16 | 0 |
| DEX-CZ5481 | 418098.756 | 9674149.011 | 352.000 | 29 | -90 | 26.07 | 3 |
| DEX-CZ5482 | 418161.127 | 9674143.509 | 348.245 | 22 | -90 | 18.73 | 2 |
| DEX-CZ5483 | 418206.546 | 9674150.551 | 343.142 | 26 | -90 | 10 | 13 |
| DEX-CZ5484 | 418257.647 | 9674151.897 | 345.683 | 38 | -90 | 15 | 22 |
| DEX-CZ5485 | 418300.760 | 9674147.032 | 349.780 | 28 | -90 | 7 | 21 |
| DEX-CZ5486 | 418357.840 | 9674151.515 | 352.738 | 47 | -90 | 25 | 20 |
| DEX-CZ5487 | 418356.224 | 9674101.091 | 358.581 | 44 | -90 | 25.27 | 15 |
| DEX-CZ5488 | 418406.360 | 9674148.675 | 355.931 | 37 | -90 | 25 | 10 |
| DEX-CZ5489 | 418457.169 | 9674137.877 | 355.851 | 20 | -90 | 13 | 5 |
| DEX-CZ5490 | 418506.039 | 9674141.507 | 339.295 | 17 | -90 | 5 | 11 |
| DEX-CZ5491 | 418554.748 | 9674147.329 | 336.078 | 13 | -90 | 7 | 5 |
| DEX-CZ5492 | 418652.304 | 9674148.804 | 357.863 | 31 | -90 | 11 | 17 |
| DEX-CZ5493 | 418655.608 | 9674100.305 | 357.100 | 27 | -90 | 9 | 13 |
| DEX-CZ5494 | 418758.270 | 9674149.086 | 332.011 | 18 | -90 | 2 | 12 |
| DEX-CZ5495 | 418805.240 | 9674150.775 | 340.900 | 16 | -90 | 8 | 5 |
| DEX-CZ5496 | 419003.692 | 9674152.100 | 352.000 | 32 | -90 | 29.56 | 3 |
| DEX-CZ550 | 416149.985 | 9673343.069 | 317.076 | 20 | -90 | 12.88 | 7 |
| DEX-CZ5500 | 417906.099 | 9674140.834 | 327.828 | 8 | -90 | 3 | 3 |
| DEX-CZ5501 | 417954.539 | 9674098.591 | 357.781 | 25 | -90 | 13.44 | 12 |
| DEX-CZ5502 | 418054.246 | 9674104.561 | 361.447 | 12 | -90 | 8 | 4 |
| DEX-CZ5503 | 418155.904 | 9674089.583 | 354.839 | 40 | -90 | 30 | 10 |
| DEX-CZ5504 | 418247.816 | 9674088.616 | 354.122 | 25 | -90 | 15 | 6 |
| DEX-CZ5506 | 418603.355 | 9674154.265 | 355.852 | 27 | -90 | 20 | 0 |
| DEX-CZ5507 | 418702.050 | 9674152.789 | 339.841 | 15 | -90 | 4 | 7 |
| DEX-CZ5508 | 418654.313 | 9674201.863 | 357.010 | 10 | -90 | 4 | 3 |
| DEX-CZ5509 | 418756.730 | 9674199.281 | 317.118 | 14 | -90 | 2 | 9 |
| DEX-CZ551 | 416209.559 | 9673342.417 | 327.949 | 9 | -90 | 5 | 2 |
| DEX-CZ5510 | 418857.817 | 9674149.992 | 346.636 | 28 | -90 | 18.83 | 8 |
| DEX-CZ5511 | 418858.064 | 9674197.025 | 346.538 | 24 | -90 | 17.12 | 6 |
| DEX-CZ5512 | 418903.405 | 9674150.570 | 348.000 | 33 | -90 | 32.61 | 1 |
| DEX-CZ5513 | 418957.637 | 9674198.755 | 354.458 | 21 | -90 | 16.62 | 6.25 |
| DEX-CZ5514 | 419050.844 | 9674195.548 | 344.474 | 19 | -90 | 12.94 | 6.24 |
| DEX-CZ5515 | 419053.278 | 9674149.177 | 349.653 | 13 | -90 | 8 | 4 |
| DEX-CZ5516 | 419103.708 | 9674149.956 | 344.724 | 28 | -90 | 20.02 | 9 |
| DEX-CZ5517 | 418106.638 | 9674248.241 | 341.530 | 42 | -90 | 14.56 | 26 |
| DEX-CZ5518 | 418156.856 | 9674251.858 | 346.822 | 22 | -90 | 9 | 9 |
| DEX-CZ5519 | 418208.768 | 9674249.727 | 344.643 | 28 | -90 | 16.13 | 12.64 |
| DEX-CZ552 | 416273.066 | 9673348.697 | 346.452 | 17 | -90 | 3 | 11 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ8689 | 415930.123 | 9673326.797 | 316.735 | 20 | -90 | 14 | 4 |
| DEX-CZ8690 | 415903.877 | 9673325.840 | 315.000 | 8 | -90 | 3 | 3 |
| DEX-CZ8691 | 415872.243 | 9673329.136 | 322.553 | 16 | -90 | 9 | 4 |
| DEX-CZ8692 | 415843.557 | 9673313.166 | 320.706 | 22 | -90 | 9 | 12 |
| DEX-CZ8693 | 415823.551 | 9673325.016 | 325.609 | 12 | -90 | 8 | 2 |
| DEX-CZ8694 | 415799.426 | 9673327.433 | 329.640 | 21 | -90 | 14 | 4.6 |
| DEX-CZ8695 | 415779.411 | 9673325.932 | 339.408 | 25 | -90 | 21 | 2 |
| DEX-CZ8696 | 415748.052 | 9673323.484 | 350.184 | 18 | -90 | 13 | 3 |
| DEX-CZ8697 | 415725.465 | 9673325.048 | 358.079 | 19 | -90 | 15 | 3 |
| DEX-CZ8698 | 415694.666 | 9673326.666 | 363.745 | 24 | -90 | 21 | 1 |
| DEX-CZ8699 | 415672.449 | 9673326.823 | 363.965 | 24 | -90 | 19 | 3 |
| DEX-CZ8700 | 415647.480 | 9673327.928 | 367.095 | 14 | -90 | 10 | 2 |
| DEX-CZ8701 | 415629.919 | 9673317.781 | 371.676 | 20 | -90 | 17 | 1 |
| DEX-CZ8702 | 415176.032 | 9673320.913 | 338.540 | 15 | -90 | 6.19 | 4 |
| DEX-CZ8703 | 415150.477 | 9673328.148 | 333.927 | 28 | -90 | 17.67 | 11 |
| DEX-CZ8704 | 415122.971 | 9673326.163 | 328.538 | 25 | -90 | 21.52 | 1 |
| DEX-CZ8705 | 415098.610 | 9673325.077 | 323.556 | 34 | -90 | 19.25 | 10 |
| DEX-CZ8706 | 415079.430 | 9673328.696 | 315.394 | 21 | -90 | 5 | 14 |
| DEX-CZ8709 | 415870.317 | 9673303.424 | 316.054 | 28 | -90 | 5 | 21 |
| DEX-CZ8710 | 415825.951 | 9673299.489 | 327.102 | 26 | -90 | 7 | 16.82 |
| DEX-CZ8711 | 415772.865 | 9673301.616 | 347.091 | 11 | -90 | 6 | 2 |
| DEX-CZ8712 | 415722.863 | 9673300.496 | 361.525 | 39 | -90 | 20.57 | 17 |
| DEX-CZ8713 | 415673.561 | 9673300.164 | 370.459 | 25 | -90 | 22.99 | 2 |
| DEX-CZ8714 | 415624.269 | 9673296.593 | 378.893 | 13 | -90 | 7 | 4 |
| DEX-CZ8715 | 415173.062 | 9673302.366 | 334.304 | 10 | -90 | 6 | 1 |
| DEX-CZ8716 | 415127.197 | 9673300.444 | 325.690 | 34 | -90 | 10 | 18 |
| DEX-CZ8717 | 415077.924 | 9673303.735 | 320.379 | 24 | -90 | 16.3 | 5 |
| DEX-CZ8720 | 415874.916 | 9673273.586 | 324.001 | 7 | -90 | 3 | 2 |
| DEX-CZ8721 | 415851.311 | 9673274.611 | 328.876 | 16 | -90 | 3 | 2 |
| DEX-CZ8722 | 415822.035 | 9673276.040 | 337.592 | 10 | -90 | 4 | 3 |
| DEX-CZ8723 | 415799.171 | 9673277.881 | 344.080 | 17 | -90 | 3 | 11 |
| DEX-CZ8724 | 415775.081 | 9673275.767 | 353.190 | 9 | -90 | 4 | 2 |
| DEX-CZ8725 | 415749.534 | 9673273.476 | 360.749 | 31 | -90 | 9 | 19 |
| DEX-CZ8726 | 415725.107 | 9673276.468 | 364.783 | 13 | -90 | 8 | 2 |
| DEX-CZ8727 | 415699.071 | 9673276.444 | 368.958 | 29 | -90 | 16.28 | 11 |
| DEX-CZ8728 | 415674.808 | 9673273.072 | 373.422 | 20 | -90 | 15.62 | 2 |
| DEX-CZ8729 | 415647.337 | 9673271.334 | 378.012 | 29 | -90 | 18.51 | 7 |
| DEX-CZ8730 | 415624.247 | 9673273.266 | 381.536 | 27 | -90 | 14 | 10 |
| DEX-CZ8731 | 415602.606 | 9673273.161 | 386.282 | 29 | -90 | 21.81 | 5 |
| DEX-CZ8732 | 415574.934 | 9673276.623 | 388.500 | 29 | -90 | 16 | 8.44 |
| DEX-CZ8733 | 415545.826 | 9673274.019 | 384.024 | 14 | -90 | 7 | 5 |
| DEX-CZ8734 | 415523.489 | 9673275.556 | 377.676 | 20 | -90 | 3 | 5 |
| DEX-CZ8735 | 415496.465 | 9673277.583 | 366.053 | 14 | -90 | 6 | 2 |
| DEX-CZ8736 | 415477.342 | 9673274.636 | 358.907 | 15 | -90 | 12 | 1 |
| DEX-CZ8737 | 415172.985 | 9673264.513 | 324.027 | 20 | -90 | 15 | 2.5 |
| DEX-CZ8738 | 415150.845 | 9673276.092 | 325.573 | 23 | -90 | 18.33 | 3 |
| DEX-CZ8739 | 415123.771 | 9673274.778 | 322.424 | 27 | -90 | 20.73 | 4 |
| DEX-CZ8740 | 415099.972 | 9673274.943 | 317.647 | 30 | -90 | 14.53 | 11.52 |
| DEX-CZ8741 | 415077.198 | 9673278.002 | 316.495 | 28 | -90 | 20.36 | 7 |
| DEX-CZ8742 | 415824.111 | 9673254.446 | 342.681 | 9 | -90 | 2 | 4 |
| DEX-CZ8743 | 415771.081 | 9673252.055 | 359.199 | 26 | -90 | 7 | 17 |
| DEX-CZ8744 | 415724.070 | 9673250.572 | 367.722 | 39 | -90 | 15 | 22.56 |
| DEX-CZ8745 | 415676.978 | 9673248.438 | 374.641 | 30 | -90 | 13 | 15.36 |
| DEX-CZ8746 | 415622.936 | 9673252.000 | 382.810 | 27 | -90 | 22.92 | 3 |
| DEX-CZ8747 | 415572.977 | 9673252.498 | 388.725 | 36 | -90 | 21.33 | 15 |
| DEX-CZ8748 | 415524.967 | 9673252.886 | 381.644 | 22 | -90 | 5 | 5 |
| DEX-CZ8749 | 415474.186 | 9673249.930 | 361.414 | 21 | -90 | 10.22 | 9 |
| DEX-CZ9008 | 415234.319 | 9672764.062 | 319.168 | 35 | -90 | 24.8 | 11 |
| DEX-CZ9010 | 415282.717 | 9672766.286 | 326.382 | 35 | -90 | 32.14 | 2 |
| DEX-CZ9011 | 415305.500 | 9672765.105 | 327.457 | 37 | -90 | 32.34 | 1 |
| DEX-CZ9012 | 415334.591 | 9672768.454 | 333.015 | 44 | -90 | 40.07 | 2.7 |
| DEX-CZ9013 | 415354.657 | 9672768.601 | 337.665 | 54 | -90 | 42.5 | 9 |
| DEX-CZ9014 | 415235.201 | 9672741.750 | 316.304 | 42 | -90 | 36 | 2 |
| DEX-CZ9015 | 415259.803 | 9672739.327 | 319.835 | 40 | -90 | 30 | 5.7 |
| DEX-CZ9016 | 415277.055 | 9672740.006 | 322.490 | 44 | -90 | 38.7 | 4 |
| DEX-CZ9017 | 415304.499 | 9672744.227 | 326.493 | 36 | -90 | 31.52 | 4.36 |
| DEX-CZ9018 | 415331.718 | 9672742.688 | 331.731 | 34 | -90 | 31 | 1 |
| DEX-CZ9019 | 415358.320 | 9672740.264 | 339.491 | 32 | -90 | 29.72 | 1 |
| DEX-CZ9020 | 415234.869 | 9672720.857 | 317.428 | 34 | -90 | 27 | 5.7 |
| DEX-CZ9021 | 415257.594 | 9672713.499 | 321.572 | 38 | -90 | 34.85 | 3.25 |
| DEX-CZ9022 | 415277.138 | 9672714.131 | 323.983 | 56 | -90 | 17 | 32.01 |
| DEX-CZ9023 | 415333.066 | 9672720.245 | 334.261 | 30 | -90 | 28.53 | 0 |
| DEX-CZ9024 | 415352.037 | 9672712.233 | 340.649 | 27 | -90 | 23.65 | 1.7 |
| DEX-CZ9025 | 415233.460 | 9672694.470 | 318.084 | 31 | -90 | 24.38 | 5 |
| DEX-CZ9026 | 415253.889 | 9672696.964 | 320.788 | 42 | -90 | 22.8 | 19.59 |
| DEX-CZ9027 | 415281.718 | 9672693.015 | 325.894 | 31 | -90 | 25.45 | 4 |
| DEX-CZ9028 | 415306.260 | 9672698.038 | 329.492 | 25 | -90 | 22.7 | 1 |
| DEX-CZ9029 | 415330.043 | 9672691.831 | 334.694 | 25 | -90 | 22.5 | 0 |
| DEX-CZ9030 | 415353.510 | 9672697.518 | 341.046 | 20 | -90 | 16 | 3 |
| DEX-CZ9031 | 415233.042 | 9672662.948 | 318.260 | 37 | -90 | 30.58 | 5.27 |
| DEX-CZ9032 | 415233.983 | 9672631.145 | 322.281 | 41 | -90 | 23 | 15 |
| DEX-CZ9033 | 415253.907 | 9672667.316 | 321.047 | 53 | -90 | 41.15 | 11.97 |
| DEX-CZ9034 | 415258.151 | 9672638.675 | 324.922 | 40 | -90 | 30.77 | 9 |
| DEX-CZ9035 | 415282.257 | 9672645.944 | 329.544 | 28 | -90 | 20.32 | 3.8 |
| DEX-CZ9036 | 415304.695 | 9672646.672 | 336.512 | 29 | -90 | 22.66 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5520 | 418253.852 | 9674242.122 | 324.437 | 20 | -90 | 5 | 10 |
| DEX-CZ5521 | 418055.589 | 9674195.262 | 349.134 | 26 | -90 | 14.36 | 7 |
| DEX-CZ5522 | 418160.504 | 9674196.512 | 348.814 | 20 | -90 | 14.35 | 3 |
| DEX-CZ5523 | 418262.744 | 9674200.439 | 338.131 | 33 | -90 | 20 | 10 |
| DEX-CZ5524 | 418350.011 | 9674193.257 | 349.475 | 38 | -90 | 24 | 14 |
| DEX-CZ5525 | 418447.841 | 9674194.150 | 350.662 | 18 | -90 | 3 | 15 |
| DEX-CZ5526 | 418560.622 | 9674191.600 | 344.558 | 21 | -90 | 11 | 10 |
| DEX-CZ5527 | 418660.952 | 9674253.231 | 333.942 | 20 | -90 | 3 | 15 |
| DEX-CZ5528 | 418703.494 | 9674250.358 | 335.081 | 28 | -90 | 13.35 | 12.25 |
| DEX-CZ5529 | 418753.765 | 9674251.069 | 312.666 | 11 | -90 | 5 | 4 |
| DEX-CZ553 | 416303.112 | 9673346.119 | 340.527 | 29 | -90 | 4 | 18 |
| DEX-CZ5530 | 418806.554 | 9674249.056 | 336.638 | 26 | -90 | 10 | 13 |
| DEX-CZ5531 | 418857.433 | 9674248.536 | 351.894 | 9 | -90 | 3 | 3 |
| DEX-CZ5532 | 418906.446 | 9674248.855 | 358.172 | 14 | -90 | 5 | 7 |
| DEX-CZ5533 | 418954.969 | 9674247.368 | 353.611 | 16 | -90 | 10 | 6 |
| DEX-CZ554 | 416157.042 | 9673285.415 | 343.041 | 13 | -90 | 3.5 | 6.5 |
| DEX-CZ5541 | 418162.484 | 9674304.859 | 338.790 | 24 | -90 | 3 | 17 |
| DEX-CZ5542 | 418247.798 | 9674298.229 | 319.713 | 10 | -90 | 6 | 2 |
| DEX-CZ5543 | 418310.870 | 9674253.501 | 341.553 | 40 | -90 | 22 | 13 |
| DEX-CZ5544 | 418354.738 | 9674252.814 | 347.696 | 27 | -90 | 15 | 8 |
| DEX-CZ5545 | 418404.804 | 9674247.935 | 351.019 | 21 | -90 | 8 | 12 |
| DEX-CZ5546 | 418460.157 | 9674298.234 | 335.842 | 27 | -90 | 23.45 | 0 |
| DEX-CZ5547 | 418454.566 | 9674245.310 | 344.206 | 21 | -90 | 18 | 1 |
| DEX-CZ5548 | 418520.080 | 9674234.679 | 315.997 | 9 | -90 | 5 | 4 |
| DEX-CZ555 | 416053.197 | 9673300.023 | 311.006 | 11 | -90 | 10.5 | 0.24 |
| DEX-CZ5550 | 418609.306 | 9674247.225 | 351.836 | 10 | -90 | 2 | 8 |
| DEX-CZ5552 | 418353.195 | 9674300.818 | 346.577 | 18 | -90 | 6 | 9.45 |
| DEX-CZ5555 | 419149.883 | 9674196.139 | 330.002 | 33 | -90 | 9 | 23 |
| DEX-CZ5557 | 418657.179 | 9674301.044 | 324.502 | 8 | -90 | 2 | 3 |
| DEX-CZ5558 | 418757.413 | 9674301.236 | 318.306 | 20 | -90 | 2 | 13 |
| DEX-CZ5562 | 418170.153 | 9674348.483 | 331.994 | 34 | -90 | 24.44 | 6 |
| DEX-CZ5563 | 418217.807 | 9674352.290 | 317.320 | 15 | -90 | 10 | 3 |
| DEX-CZ5564 | 418265.479 | 9674343.168 | 328.218 | 23 | -90 | 12.4 | 7 |
| DEX-CZ5565 | 418303.577 | 9674351.203 | 335.826 | 34 | -90 | 24 | 7 |
| DEX-CZ5566 | 418363.538 | 9674341.967 | 339.280 | 21 | -90 | 5 | 15 |
| DEX-CZ5567 | 418405.866 | 9674344.307 | 333.923 | 28 | -90 | 12 | 2 |
| DEX-CZ5573 | 418756.193 | 9674345.516 | 317.415 | 26 | -90 | 6 | 14 |
| DEX-CZ5575 | 418162.929 | 9674400.251 | 323.271 | 21 | -90 | 11 | 8 |
| DEX-CZ5576 | 418271.175 | 9674398.139 | 328.027 | 39 | -90 | 15.23 | 21 |
| DEX-CZ5577 | 418354.666 | 9674394.602 | 328.509 | 56 | -90 | 21 | 31 |
| DEX-CZ5579 | 418661.383 | 9674340.502 | 312.341 | 34 | -90 | 8 | 17 |
| DEX-CZ5580 | 418104.746 | 9674449.070 | 300.364 | 14 | -90 | 3 | 9 |
| DEX-CZ5581 | 418154.702 | 9674449.340 | 300.298 | 25 | -90 | 3 | 14.71 |
| DEX-CZ5582 | 418198.850 | 9674456.126 | 305.099 | 30 | -90 | 3 | 13 |
| DEX-CZ5583 | 418257.677 | 9674445.138 | 316.522 | 21 | -90 | 9 | 10 |
| DEX-CZ5584 | 418303.650 | 9674444.168 | 320.523 | 18 | -90 | 9 | 5 |
| DEX-CZ5587 | 418065.321 | 9674487.344 | 289.238 | 19 | -90 | 2 | 5 |
| DEX-CZ5588 | 418093.128 | 9674545.934 | 286.363 | 27 | -90 | 18.71 | 7 |
| DEX-CZ560 | 415954.765 | 9673246.834 | 315.055 | 19 | -90 | 4.83 | 8.77 |
| DEX-CZ561 | 416003.774 | 9673256.785 | 318.100 | 20 | -90 | 8.21 | 9 |
| DEX-CZ563 | 416104.450 | 9673244.902 | 345.238 | 16 | -90 | 11.36 | 5 |
| DEX-CZ564 | 416150.120 | 9673245.361 | 356.387 | 14 | -90 | 7.45 | 4.44 |
| DEX-CZ570 | 416298.096 | 9673210.140 | 348.477 | 30 | -90 | 31.42 | 0 |
| DEX-CZ571 | 416392.555 | 9673197.549 | 357.709 | 36 | -90 | 28.16 | 8.66 |
| DEX-CZ573 | 416102.203 | 9673301.447 | 323.609 | 28 | -90 | 4 | 20.34 |
| DEX-CZ5817 | 418674.099 | 9673225.637 | 491.763 | 20 | -90 | 16.22 | 3 |
| DEX-CZ5818 | 418650.950 | 9673225.115 | 488.374 | 27 | -90 | 14 | 8 |
| DEX-CZ5819 | 418222.608 | 9673221.873 | 426.405 | 22 | -90 | 17 | 4 |
| DEX-CZ5820 | 418201.138 | 9673226.205 | 429.385 | 29 | -90 | 16 | 9 |
| DEX-CZ5821 | 418174.195 | 9673226.171 | 431.629 | 32 | -90 | 25 | 7 |
| DEX-CZ5822 | 418151.099 | 9673224.119 | 433.044 | 32 | -90 | 11 | 21 |
| DEX-CZ5823 | 418124.235 | 9673223.779 | 433.449 | 31 | -90 | 17 | 9 |
| DEX-CZ5824 | 418101.588 | 9673226.407 | 435.659 | 13 | -90 | 4 | 6 |
| DEX-CZ5825 | 418080.956 | 9673230.716 | 438.971 | 5 | -90 | 1 | 1 |
| DEX-CZ5826 | 418052.955 | 9673225.598 | 437.394 | 10 | -90 | 3 | 2 |
| DEX-CZ5827 | 418029.376 | 9673224.835 | 432.035 | 27 | -90 | 24 | 3 |
| DEX-CZ5828 | 417926.383 | 9673223.515 | 395.725 | 33 | -90 | 14.44 | 9 |
| DEX-CZ5829 | 417901.474 | 9673226.248 | 390.164 | 24 | -90 | 14.52 | 8.4 |
| DEX-CZ5830 | 417874.154 | 9673225.785 | 384.785 | 23 | -90 | 18.12 | 4 |
| DEX-CZ5834 | 417775.691 | 9673221.203 | 388.305 | 19 | -90 | 15.18 | 2 |
| DEX-CZ5835 | 417748.092 | 9673223.838 | 388.588 | 33 | -90 | 18.61 | 13 |
| DEX-CZ5836 | 417722.955 | 9673224.549 | 392.416 | 20 | -90 | 15.71 | 3 |
| DEX-CZ5837 | 417224.506 | 9673226.797 | 379.096 | 38 | -90 | 13.87 | 9 |
| DEX-CZ5838 | 417200.961 | 9673224.314 | 377.410 | 21 | -90 | 13.56 | 3 |
| DEX-CZ5839 | 417173.713 | 9673226.863 | 377.612 | 34 | -90 | 22.48 | 11 |
| DEX-CZ5840 | 417151.693 | 9673224.521 | 375.558 | 27 | -90 | 16.5 | 5.25 |
| DEX-CZ5841 | 417125.410 | 9673224.586 | 367.927 | 22 | -90 | 18.28 | 3 |
| DEX-CZ5842 | 417018.626 | 9673218.907 | 358.752 | 19 | -90 | 7.67 | 10.55 |
| DEX-CZ5843 | 417000.091 | 9673220.628 | 366.701 | 24 | -90 | 15.62 | 6 |
| DEX-CZ5844 | 416975.469 | 9673225.490 | 370.953 | 17 | -90 | 10.3 | 5.48 |
| DEX-CZ5845 | 416946.895 | 9673223.120 | 377.651 | 29 | -90 | 28.23 | 0 |
| DEX-CZ5846 | 416923.031 | 9673222.592 | 386.024 | 43 | -90 | 41.21 | 1 |
| DEX-CZ5847 | 418650.807 | 9673197.099 | 488.095 | 25 | -90 | 10 | 13 |
| DEX-CZ5848 | 418223.786 | 9673207.068 | 424.987 | 38 | -90 | 17 | 18 |
| DEX-CZ5849 | 418174.846 | 9673206.383 | 429.478 | 34 | -90 | 23 | 9 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9037 | 415331.946 | 9672642.925 | 342.661 | 25 | -90 | 17 | 6 |
| DEX-CZ9038 | 415358.803 | 9672644.415 | 345.601 | 27 | -90 | 25.14 | 1.5 |
| DEX-CZ9039 | 415280.182 | 9672670.071 | 326.132 | 47 | -90 | 44.49 | 1 |
| DEX-CZ9040 | 415308.229 | 9672672.319 | 333.886 | 23 | -90 | 18 | 2.5 |
| DEX-CZ9041 | 415330.320 | 9672670.632 | 337.762 | 22 | -90 | 16 | 3.7 |
| DEX-CZ9042 | 415354.720 | 9672665.669 | 343.540 | 35 | -90 | 27.35 | 5.94 |
| DEX-CZ9077 | 414365.608 | 9672713.463 | 284.434 | 25 | -90 | 5 | 11 |
| DEX-CZ9078 | 414309.619 | 9672721.519 | 279.984 | 8 | -90 | 5 | 1 |
| DEX-CZ9079 | 414313.115 | 9672767.663 | 272.101 | 12 | -90 | 1 | 4 |
| DEX-CZ9080 | 414303.705 | 9672858.935 | 265.034 | 20 | -90 | 2 | 8 |
| DEX-CZ9081 | 414359.225 | 9672857.604 | 274.089 | 24 | -90 | 17 | 3 |
| DEX-CZ9082 | 414458.891 | 9672862.483 | 275.763 | 14 | -90 | 9 | 3 |
| DEX-CZ9083 | 414461.303 | 9672719.012 | 290.228 | 16 | -90 | 10 | 4 |
| DEX-CZ9084 | 414464.823 | 9672670.950 | 289.000 | 16 | -90 | 10 | 3 |
| DEX-CZ9085 | 414407.705 | 9672668.252 | 287.000 | 14 | -90 | 10 | 2 |
| DEX-CZ9086 | 414364.547 | 9672667.536 | 287.000 | 15 | -90 | 10 | 2 |
| DEX-CZ9087 | 414309.872 | 9672663.517 | 281.158 | 17 | -90 | 13 | 2 |
| DEX-CZ9088 | 414460.570 | 9672768.006 | 283.784 | 18 | -90 | 13 | 2 |
| DEX-CZ9089 | 414458.762 | 9672813.014 | 279.901 | 20 | -90 | 12 | 6 |
| DEX-CZ9090 | 414366.841 | 9672814.455 | 270.186 | 10 | -90 | 4 | 4 |
| DEX-CZ9091 | 414421.943 | 9672763.845 | 283.815 | 23 | -90 | 17 | 4 |
| DEX-CZ9092 | 414358.547 | 9672755.826 | 276.430 | 16 | -90 | 12 | 2 |
| DEX-CZ9093 | 414506.620 | 9672671.420 | 290.836 | 11 | -90 | 8 | 1 |
| DEX-CZ9094 | 414556.166 | 9672666.314 | 287.000 | 13 | -90 | 9.39 | 2.61 |
| DEX-CZ9095 | 414611.832 | 9672667.744 | 283.497 | 11 | -90 | 8 | 1 |
| DEX-CZ9096 | 414656.782 | 9672663.091 | 279.957 | 10 | -90 | 6 | 1 |
| DEX-CZ9097 | 414714.998 | 9672665.806 | 282.153 | 17 | -90 | 8 | 7 |
| DEX-CZ9098 | 414760.958 | 9672658.047 | 287.668 | 35 | -90 | 13 | 20 |
| DEX-CZ9099 | 414656.557 | 9672714.554 | 277.887 | 7 | -90 | 4 | 0 |
| DEX-CZ9100 | 414705.835 | 9672712.811 | 278.291 | 8 | -90 | 5.25 | 0 |
| DEX-CZ9101 | 414746.936 | 9672707.169 | 281.148 | 15 | -90 | 5 | 7 |
| DEX-CZ9102 | 414360.028 | 9672624.560 | 278.294 | 11 | -90 | 8 | 1 |
| DEX-CZ9103 | 414453.630 | 9672615.728 | 277.913 | 14 | -90 | 8 | 4 |
| DEX-CZ9104 | 414555.779 | 9672617.281 | 285.379 | 20 | -90 | 10 | 8 |
| DEX-CZ9105 | 414660.095 | 9672616.959 | 282.120 | 23 | -90 | 16 | 5 |
| DEX-CZ9106 | 414757.095 | 9672614.112 | 292.994 | 37 | -90 | 9 | 26 |
| DEX-CZ9107 | 414365.022 | 9672567.035 | 260.962 | 10 | -90 | 4 | 4 |
| DEX-CZ9108 | 414411.116 | 9672569.801 | 263.350 | 10 | -90 | 4 | 4 |
| DEX-CZ9109 | 414465.503 | 9672563.142 | 265.185 | 8 | -90 | 5 | 0 |
| DEX-CZ9110 | 414514.268 | 9672562.903 | 274.660 | 10 | -90 | 6 | 2 |
| DEX-CZ9111 | 414559.068 | 9672568.733 | 282.125 | 20 | -90 | 15.23 | 3 |
| DEX-CZ9112 | 414611.924 | 9672568.660 | 284.433 | 21 | -90 | 15 | 4 |
| DEX-CZ9113 | 414656.967 | 9672563.713 | 286.112 | 23 | -90 | 17 | 4 |
| DEX-CZ9114 | 414713.743 | 9672574.467 | 290.273 | 30 | -90 | 18 | 9.45 |
| DEX-CZ9115 | 414754.700 | 9672555.013 | 287.933 | 21 | -90 | 16 | 1 |
| DEX-CZ9116 | 414361.582 | 9672528.113 | 248.227 | 8 | -90 | 4 | 2 |
| DEX-CZ9117 | 414411.717 | 9672508.037 | 257.281 | 15 | -90 | 5 | 8 |
| DEX-CZ9118 | 414561.863 | 9672524.781 | 280.809 | 22 | -90 | 15 | 5 |
| DEX-CZ9119 | 414659.732 | 9672518.279 | 282.438 | 14 | -90 | 9 | 3 |
| DEX-CZ9120 | 414755.614 | 9672519.872 | 284.586 | 17 | -90 | 12 | 3 |
| DEX-CZ9121 | 414363.477 | 9672473.934 | 248.377 | 12 | -90 | 7 | 3 |
| DEX-CZ9122 | 414410.825 | 9672471.440 | 258.387 | 13 | -90 | 8 | 3 |
| DEX-CZ9123 | 414452.818 | 9672462.187 | 267.775 | 13 | -90 | 9 | 2 |
| DEX-CZ9124 | 414502.472 | 9672466.024 | 274.722 | 15 | -90 | 9 | 4 |
| DEX-CZ9125 | 414555.152 | 9672462.967 | 264.148 | 12 | -90 | 10 | 0 |
| DEX-CZ9126 | 414615.546 | 9672467.907 | 262.892 | 11 | -90 | 8 | 1 |
| DEX-CZ9127 | 414656.918 | 9672464.517 | 266.291 | 8 | -90 | 5 | 1 |
| DEX-CZ9128 | 414719.419 | 9672464.705 | 270.762 | 11 | -90 | 5 | 4 |
| DEX-CZ9129 | 414754.615 | 9672457.580 | 275.546 | 12 | -90 | 5 | 4 |
| DEX-CZ9130 | 414359.979 | 9672415.406 | 245.813 | 16 | -90 | 6 | 8 |
| DEX-CZ9131 | 414461.852 | 9672415.386 | 266.307 | 14 | -90 | 7 | 5 |
| DEX-CZ9132 | 414556.556 | 9672412.351 | 254.172 | 9 | -90 | 4 | 3 |
| DEX-CZ9133 | 414661.342 | 9672424.719 | 252.362 | 9 | -90 | 5 | 2 |
| DEX-CZ9134 | 414759.987 | 9672415.469 | 267.301 | 10 | -90 | 5 | 3 |
| DEX-CZ9278 | 414754.421 | 9674122.543 | 363.704 | 27 | -90 | 13 | 11 |
| DEX-CZ9279 | 414771.957 | 9674130.054 | 365.880 | 34 | -90 | 22.23 | 10.51 |
| DEX-CZ9280 | 414801.561 | 9674123.818 | 366.270 | 31 | -90 | 11 | 17.9 |
| DEX-CZ9281 | 414824.831 | 9674121.698 | 366.665 | 25 | -90 | 20.54 | 2 |
| DEX-CZ9282 | 414723.399 | 9674099.067 | 357.581 | 23 | -90 | 12.4 | 6 |
| DEX-CZ9283 | 414784.601 | 9674095.203 | 359.561 | 26 | -90 | 22.23 | 2 |
| DEX-CZ9284 | 414822.892 | 9674106.928 | 362.858 | 20 | -90 | 17.61 | 0.6 |
| DEX-CZ9285 | 414704.785 | 9674071.562 | 354.837 | 32 | -90 | 22.4 | 7.28 |
| DEX-CZ9286 | 414727.514 | 9674075.162 | 354.717 | 38 | -90 | 24.6 | 11 |
| DEX-CZ9287 | 414756.923 | 9674077.268 | 356.479 | 31 | -90 | 24 | 5 |
| DEX-CZ9288 | 414779.594 | 9674080.037 | 356.998 | 23 | -90 | 18 | 1.5 |
| DEX-CZ9289 | 414804.451 | 9674075.598 | 356.351 | 24 | -90 | 19.57 | 2 |
| DEX-CZ9290 | 414828.358 | 9674075.280 | 355.672 | 25 | -90 | 19.6 | 4 |
| DEX-CZ9291 | 414728.235 | 9674050.715 | 353.224 | 40 | -90 | 34.99 | 5 |
| DEX-CZ9292 | 414774.549 | 9674055.919 | 353.934 | 38 | -90 | 33.02 | 3.5 |
| DEX-CZ9293 | 414826.273 | 9674051.175 | 352.096 | 25 | -90 | 20.53 | 3 |
| DEX-CZ9294 | 414696.759 | 9674023.686 | 354.808 | 43 | -90 | 30.64 | 10.3 |
| DEX-CZ9295 | 414720.307 | 9674023.180 | 352.605 | 41 | -90 | 35.51 | 4.39 |
| DEX-CZ9296 | 414752.459 | 9674015.552 | 350.969 | 42 | -90 | 38.18 | 2 |
| DEX-CZ9297 | 414781.802 | 9674031.326 | 350.991 | 37 | -90 | 36.52 | 1.35 |
| DEX-CZ9298 | 414801.150 | 9674028.483 | 349.842 | 42 | -90 | 35.54 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5850 | 418125.460 | 9673204.307 | 429.699 | 32 | -90 | 23 | 8 |
| DEX-CZ5851 | 418073.158 | 9673210.350 | 432.474 | 6 | -90 | 1 | 3 |
| DEX-CZ5852 | 418025.265 | 9673207.464 | 427.080 | 24 | -90 | 10 | 12 |
| DEX-CZ5853 | 417976.090 | 9673205.044 | 411.704 | 18 | -90 | 7 | 6 |
| DEX-CZ5854 | 417925.574 | 9673205.903 | 398.338 | 22 | -90 | 7.14 | 10 |
| DEX-CZ5855 | 417874.862 | 9673205.251 | 387.490 | 28 | -90 | 21.55 | 2 |
| DEX-CZ5856 | 417824.196 | 9673202.117 | 392.366 | 23 | -90 | 7.35 | 9 |
| DEX-CZ5857 | 417776.815 | 9673206.067 | 392.600 | 33 | -90 | 24 | 2 |
| DEX-CZ5858 | 417725.898 | 9673210.561 | 396.152 | 39 | -90 | 16.23 | 22 |
| DEX-CZ5859 | 417675.486 | 9673203.918 | 404.368 | 21 | -90 | 10.43 | 9 |
| DEX-CZ5860 | 417626.071 | 9673203.125 | 410.459 | 13 | -90 | 3 | 6 |
| DEX-CZ5861 | 417223.590 | 9673205.522 | 375.254 | 33 | -90 | 28.97 | 5 |
| DEX-CZ5862 | 417175.483 | 9673206.079 | 374.151 | 27 | -90 | 11 | 15 |
| DEX-CZ5863 | 417127.592 | 9673203.262 | 373.792 | 17 | -90 | 8 | 6 |
| DEX-CZ5864 | 417025.454 | 9673205.136 | 359.059 | 7 | -90 | 3 | 1.42 |
| DEX-CZ5865 | 416974.331 | 9673205.869 | 378.947 | 38 | -90 | 18.26 | 16 |
| DEX-CZ5866 | 416921.142 | 9673204.962 | 389.749 | 23 | -90 | 19.22 | 3 |
| DEX-CZ5867 | 418672.786 | 9673172.907 | 489.477 | 24 | -90 | 7 | 12 |
| DEX-CZ5868 | 418650.594 | 9673174.849 | 486.103 | 30 | -90 | 9 | 19.27 |
| DEX-CZ5869 | 418623.748 | 9673172.466 | 481.932 | 20 | -90 | 14.6 | 4 |
| DEX-CZ5870 | 418601.941 | 9673173.736 | 478.783 | 21 | -90 | 11 | 8 |
| DEX-CZ5871 | 418572.653 | 9673176.991 | 474.189 | 15 | -90 | 6 | 6 |
| DEX-CZ5872 | 418548.083 | 9673175.298 | 469.936 | 29 | -90 | 22.28 | 5.3 |
| DEX-CZ5873 | 418527.136 | 9673179.426 | 466.360 | 30 | -90 | 23 | 5 |
| DEX-CZ5874 | 418498.043 | 9673177.673 | 463.244 | 28 | -90 | 9 | 13 |
| DEX-CZ5875 | 418478.741 | 9673177.527 | 461.306 | 11 | -90 | 4 | 2 |
| DEX-CZ5876 | 418426.764 | 9673174.488 | 460.374 | 12 | -90 | 6 | 4 |
| DEX-CZ5877 | 418399.693 | 9673176.612 | 455.284 | 10 | -90 | 2 | 3 |
| DEX-CZ5878 | 418375.824 | 9673173.649 | 450.058 | 44 | -90 | 20 | 11 |
| DEX-CZ5879 | 418350.712 | 9673174.499 | 445.150 | 24 | -90 | 18 | 4 |
| DEX-CZ5880 | 418325.480 | 9673178.072 | 441.579 | 35 | -90 | 17.52 | 16 |
| DEX-CZ5881 | 418224.670 | 9673178.946 | 422.118 | 35 | -90 | 28.53 | 6 |
| DEX-CZ5882 | 418198.998 | 9673178.237 | 422.723 | 31 | -90 | 15 | 14 |
| DEX-CZ5883 | 418174.894 | 9673176.824 | 426.548 | 38 | -90 | 18 | 18 |
| DEX-CZ5884 | 418151.852 | 9673180.976 | 427.111 | 24 | -90 | 17.25 | 4 |
| DEX-CZ5885 | 418124.728 | 9673177.085 | 423.031 | 22 | -90 | 17 | 3 |
| DEX-CZ5886 | 418101.097 | 9673181.010 | 421.021 | 20 | -90 | 17 | 1 |
| DEX-CZ5887 | 418073.211 | 9673183.082 | 421.058 | 25 | -90 | 10 | 13 |
| DEX-CZ5888 | 418053.073 | 9673178.811 | 419.207 | 12 | -90 | 5 | 5 |
| DEX-CZ5889 | 418026.939 | 9673170.284 | 412.568 | 18 | -90 | 8.33 | 8 |
| DEX-CZ5890 | 418001.081 | 9673179.032 | 414.265 | 17 | -90 | 8 | 8 |
| DEX-CZ5891 | 417976.610 | 9673179.944 | 410.837 | 30 | -90 | 8 | 15 |
| DEX-CZ5892 | 417950.278 | 9673178.471 | 405.039 | 29 | -90 | 9 | 15 |
| DEX-CZ5893 | 417926.334 | 9673170.536 | 401.270 | 38 | -90 | 21.34 | 5 |
| DEX-CZ5894 | 417905.619 | 9673178.899 | 397.465 | 32 | -90 | 16.27 | 16 |
| DEX-CZ5895 | 417876.780 | 9673178.215 | 393.366 | 41 | -90 | 19.19 | 22 |
| DEX-CZ5896 | 417849.107 | 9673178.631 | 397.445 | 21 | -90 | 17.44 | 2 |
| DEX-CZ5897 | 417829.547 | 9673178.148 | 399.415 | 7 | -90 | 4.26 | 1 |
| DEX-CZ5898 | 417801.768 | 9673176.537 | 400.933 | 27 | -90 | 15.2 | 6 |
| DEX-CZ5899 | 417777.474 | 9673168.902 | 402.683 | 18 | -90 | 9.37 | 5 |
| DEX-CZ5900 | 417752.923 | 9673177.764 | 400.990 | 22 | -90 | 9.14 | 11 |
| DEX-CZ5901 | 417726.777 | 9673175.601 | 405.863 | 26 | -90 | 4 | 20 |
| DEX-CZ5902 | 417700.126 | 9673183.484 | 406.322 | 31 | -90 | 11.28 | 15 |
| DEX-CZ5903 | 417674.778 | 9673179.858 | 410.629 | 20 | -90 | 8.3 | 9 |
| DEX-CZ5904 | 417643.974 | 9673181.963 | 412.885 | 17 | -90 | 10 | 5 |
| DEX-CZ5905 | 417623.287 | 9673178.874 | 414.000 | 38 | -90 | 22 | 12 |
| DEX-CZ5906 | 417374.744 | 9673181.630 | 381.555 | 31 | -90 | 24 | 4 |
| DEX-CZ5907 | 417352.420 | 9673179.508 | 379.424 | 26 | -90 | 17.23 | 6 |
| DEX-CZ5908 | 417325.636 | 9673173.696 | 380.870 | 15 | -90 | 13 | 0 |
| DEX-CZ5909 | 417299.110 | 9673173.701 | 375.000 | 17 | -90 | 10 | 5 |
| DEX-CZ5910 | 417274.538 | 9673179.847 | 381.668 | 17 | -90 | 12 | 3 |
| DEX-CZ5911 | 417252.824 | 9673173.420 | 382.000 | 25 | -90 | 18.82 | 5 |
| DEX-CZ5912 | 417226.266 | 9673175.243 | 381.053 | 33 | -90 | 16.56 | 16 |
| DEX-CZ5913 | 417199.732 | 9673176.874 | 375.075 | 19 | -90 | 13.28 | 4 |
| DEX-CZ5914 | 417177.555 | 9673177.991 | 368.898 | 18 | -90 | 4 | 1 |
| DEX-CZ5915 | 417149.917 | 9673179.721 | 373.602 | 16 | -90 | 9 | 3 |
| DEX-CZ5916 | 417124.192 | 9673187.965 | 374.083 | 17 | -90 | 6 | 8 |
| DEX-CZ5917 | 417026.404 | 9673178.087 | 368.916 | 19 | -90 | 7 | 9 |
| DEX-CZ5918 | 416999.992 | 9673172.515 | 380.287 | 28 | -90 | 10.22 | 13.5 |
| DEX-CZ5919 | 416974.261 | 9673175.337 | 386.264 | 18 | -90 | 13.22 | 3.28 |
| DEX-CZ5920 | 416949.816 | 9673176.159 | 390.918 | 19 | -90 | 9 | 7.5 |
| DEX-CZ5921 | 416924.588 | 9673177.153 | 395.019 | 17 | -90 | 11.25 | 2 |
| DEX-CZ5922 | 418675.559 | 9673150.564 | 487.975 | 22 | -90 | 8 | 8 |
| DEX-CZ5923 | 418626.961 | 9673151.661 | 483.798 | 20 | -90 | 15 | 3 |
| DEX-CZ5924 | 418578.239 | 9673150.174 | 477.729 | 32 | -90 | 19.3 | 4.26 |
| DEX-CZ5925 | 418524.717 | 9673151.553 | 466.300 | 40 | -90 | 18.36 | 18 |
| DEX-CZ5926 | 418474.064 | 9673150.727 | 463.000 | 11 | -90 | 7 | 1 |
| DEX-CZ5927 | 418423.714 | 9673148.785 | 460.614 | 10 | -90 | 6 | 2 |
| DEX-CZ5928 | 418374.825 | 9673149.084 | 450.832 | 19 | -90 | 3 | 11 |
| DEX-CZ5929 | 418323.952 | 9673150.066 | 442.931 | 21 | -90 | 19.67 | 1 |
| DEX-CZ5930 | 418123.231 | 9673149.952 | 417.588 | 36 | -90 | 7 | 14 |
| DEX-CZ5931 | 418073.680 | 9673149.969 | 406.943 | 14 | -90 | 6 | 7 |
| DEX-CZ5932 | 418028.832 | 9673151.032 | 404.728 | 20 | -90 | 5.18 | 13 |
| DEX-CZ5933 | 417973.048 | 9673150.295 | 405.565 | 43 | -90 | 14.28 | 15 |
| DEX-CZ5934 | 417923.238 | 9673148.824 | 399.707 | 20 | -90 | 15.45 | 3 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9299 | 414827.706 | 9674027.777 | 349.212 | 35 | -90 | 22.45 | 11 |
| DEX-CZ9300 | 414724.142 | 9674001.156 | 352.000 | 34 | -90 | 21.74 | 10.35 |
| DEX-CZ9301 | 414781.424 | 9674006.990 | 349.881 | 41 | -90 | 36.49 | 4 |
| DEX-CZ9302 | 414827.776 | 9674000.538 | 348.048 | 31 | -90 | 24.95 | 4 |
| DEX-CZ9303 | 414700.262 | 9673978.713 | 356.471 | 23 | -90 | 9 | 11.33 |
| DEX-CZ9304 | 414723.046 | 9673973.252 | 352.974 | 27 | -90 | 14 | 10.35 |
| DEX-CZ9305 | 414747.467 | 9673978.255 | 351.000 | 28 | -90 | 20.33 | 6.27 |
| DEX-CZ9306 | 414778.024 | 9673983.680 | 349.798 | 29 | -90 | 26 | 2 |
| DEX-CZ9307 | 414802.648 | 9673970.662 | 348.000 | 35 | -90 | 32.57 | 2 |
| DEX-CZ9308 | 414827.960 | 9673979.023 | 348.000 | 32 | -90 | 27.5 | 3 |
| DEX-CZ9309 | 414724.044 | 9673951.800 | 354.033 | 32 | -90 | 11 | 19.1 |
| DEX-CZ9310 | 414770.608 | 9673958.124 | 349.539 | 29 | -90 | 23.35 | 3.38 |
| DEX-CZ9311 | 414821.679 | 9673950.692 | 347.162 | 31 | -90 | 23.3 | 5 |
| DEX-CZ9312 | 414676.131 | 9673931.535 | 364.988 | 20 | -90 | 8 | 10 |
| DEX-CZ9313 | 414698.661 | 9673921.320 | 360.111 | 30 | -90 | 5 | 14 |
| DEX-CZ9314 | 414723.454 | 9673925.529 | 356.510 | 40 | -90 | 11.32 | 22 |
| DEX-CZ9315 | 414748.971 | 9673923.856 | 351.991 | 22 | -90 | 10 | 8 |
| DEX-CZ9316 | 414782.299 | 9673927.591 | 348.863 | 28 | -90 | 17 | 9.35 |
| DEX-CZ9317 | 414803.603 | 9673924.090 | 347.000 | 36 | -90 | 25.39 | 10.7 |
| DEX-CZ9318 | 414830.357 | 9673928.768 | 346.417 | 33 | -90 | 24 | 5.31 |
| DEX-CZ9319 | 414850.989 | 9673925.324 | 346.000 | 42 | -90 | 24.59 | 15.9 |
| DEX-CZ9320 | 414873.532 | 9673928.519 | 345.492 | 38 | -90 | 27.27 | 8.72 |
| DEX-CZ9321 | 414894.432 | 9673922.761 | 344.414 | 35 | -90 | 25 | 7 |
| DEX-CZ9323 | 414955.936 | 9673931.168 | 342.265 | 37 | -90 | 33.21 | 2 |
| DEX-CZ9324 | 414972.899 | 9673933.222 | 343.000 | 39 | -90 | 32.36 | 4.85 |
| DEX-CZ9325 | 415007.772 | 9673923.692 | 341.472 | 33 | -90 | 23.36 | 8 |
| DEX-CZ9326 | 415028.201 | 9673928.567 | 341.484 | 42 | -90 | 30 | 8 |
| DEX-CZ9327 | 415050.472 | 9673928.125 | 340.465 | 32 | -90 | 20 | 5 |
| DEX-CZ9328 | 415079.567 | 9673926.539 | 339.987 | 35 | -90 | 26 | 6 |
| DEX-CZ9329 | 415101.059 | 9673920.904 | 339.375 | 37 | -90 | 26 | 6 |
| DEX-CZ9330 | 415126.420 | 9673922.982 | 338.820 | 49 | -90 | 45.43 | 1.85 |
| DEX-CZ9331 | 414714.715 | 9673890.688 | 365.438 | 14 | -90 | 3 | 7 |
| DEX-CZ9332 | 414745.509 | 9673896.337 | 359.332 | 16 | -90 | 7 | 6 |
| DEX-CZ9333 | 414777.356 | 9673901.942 | 352.925 | 30 | -90 | 28.92 | 0.58 |
| DEX-CZ9334 | 414824.591 | 9673901.187 | 346.224 | 31 | -90 | 27.82 | 2 |
| DEX-CZ9335 | 414873.460 | 9673907.452 | 344.958 | 35 | -90 | 28.76 | 4 |
| DEX-CZ9337 | 414997.933 | 9673894.329 | 339.783 | 37 | -90 | 31.93 | 1.35 |
| DEX-CZ9338 | 415080.870 | 9673903.861 | 339.357 | 40 | -90 | 31.25 | 6 |
| DEX-CZ9339 | 415126.784 | 9673901.237 | 338.845 | 51 | -90 | 47.37 | 1 |
| DEX-CZ9340 | 414740.049 | 9673863.925 | 368.407 | 15 | -90 | 3 | 10 |
| DEX-CZ9341 | 414770.161 | 9673881.515 | 358.816 | 9 | -90 | 3 | 3 |
| DEX-CZ9342 | 414793.921 | 9673874.598 | 353.084 | 24 | -90 | 15.33 | 6.6 |
| DEX-CZ9343 | 414825.371 | 9673875.326 | 346.837 | 32 | -90 | 25.96 | 3.33 |
| DEX-CZ9344 | 414845.376 | 9673875.230 | 345.000 | 41 | -90 | 28.52 | 11.26 |
| DEX-CZ9345 | 414877.191 | 9673878.056 | 344.374 | 37 | -90 | 29.24 | 7.28 |
| DEX-CZ9346 | 414901.559 | 9673878.164 | 344.000 | 36 | -90 | 29.55 | 5 |
| DEX-CZ9347 | 414924.388 | 9673872.609 | 343.788 | 35 | -90 | 30.86 | 2.6 |
| DEX-CZ9348 | 414950.022 | 9673877.225 | 343.037 | 37 | -90 | 33.35 | 1.3 |
| DEX-CZ9349 | 414967.932 | 9673875.640 | 342.239 | 34 | -90 | 29.67 | 3 |
| DEX-CZ9350 | 415029.603 | 9673873.315 | 341.121 | 37 | -90 | 28 | 7 |
| DEX-CZ9351 | 415048.843 | 9673876.828 | 340.565 | 32 | -90 | 25 | 3 |
| DEX-CZ9352 | 415071.162 | 9673875.620 | 337.133 | 28 | -90 | 17 | 8 |
| DEX-CZ9353 | 415101.983 | 9673878.016 | 338.948 | 37 | -90 | 34.2 | 1 |
| DEX-CZ9354 | 415125.970 | 9673878.047 | 338.805 | 60 | -90 | 53.37 | 3.85 |
| DEX-CZ9355 | 414521.961 | 9673854.429 | 382.942 | 10 | -90 | 5 | 1 |
| DEX-CZ9356 | 414572.891 | 9673850.051 | 401.912 | 17 | -90 | 11 | 1.85 |
| DEX-CZ9357 | 414618.865 | 9673847.942 | 404.687 | 23 | -90 | 6.5 | 13.5 |
| DEX-CZ9358 | 414666.185 | 9673844.855 | 391.099 | 12 | -90 | 3 | 2.85 |
| DEX-CZ9359 | 414750.558 | 9673847.912 | 368.381 | 17 | -90 | 6 | 9 |
| DEX-CZ9360 | 414775.773 | 9673853.868 | 362.372 | 12 | -90 | 6 | 3 |
| DEX-CZ9361 | 414796.750 | 9673840.679 | 357.937 | 10 | -90 | 4 | 2 |
| DEX-CZ9362 | 414825.503 | 9673854.829 | 347.945 | 35 | -90 | 22.37 | 5.5 |
| DEX-CZ9363 | 414870.226 | 9673848.784 | 344.000 | 40 | -90 | 26.28 | 14.28 |
| DEX-CZ9364 | 414922.343 | 9673852.045 | 343.397 | 42 | -90 | 36 | 1.55 |
| DEX-CZ9365 | 414970.273 | 9673855.364 | 342.619 | 34 | -90 | 25.24 | 6.57 |
| DEX-CZ9366 | 415018.732 | 9673853.742 | 342.000 | 41 | -90 | 32 | 5 |
| DEX-CZ9367 | 415072.787 | 9673852.715 | 340.639 | 48 | -90 | 42.84 | 3 |
| DEX-CZ9368 | 415119.695 | 9673860.707 | 338.107 | 51 | -90 | 45.77 | 4 |
| DEX-CZ9370 | 414522.798 | 9673827.825 | 392.715 | 15 | -90 | 3 | 9.85 |
| DEX-CZ9371 | 414545.852 | 9673824.143 | 403.376 | 21 | -90 | 2 | 11 |
| DEX-CZ9372 | 414572.420 | 9673818.324 | 412.521 | 12 | -90 | 4 | 5 |
| DEX-CZ9373 | 414595.179 | 9673820.489 | 412.257 | 12 | -90 | 5 | 5 |
| DEX-CZ9374 | 414625.847 | 9673826.787 | 408.801 | 21 | -90 | 11 | 7.85 |
| DEX-CZ9375 | 414644.509 | 9673828.161 | 404.422 | 23 | -90 | 13.33 | 8 |
| DEX-CZ9376 | 414666.864 | 9673825.350 | 395.481 | 12 | -90 | 2 | 5 |
| DEX-CZ9378 | 414718.145 | 9673819.506 | 380.939 | 8 | -90 | 5 | 1 |
| DEX-CZ9379 | 414745.621 | 9673819.918 | 379.197 | 6 | -90 | 3 | 1 |
| DEX-CZ9380 | 414772.790 | 9673822.361 | 370.033 | 8 | -90 | 3 | 3 |
| DEX-CZ9381 | 414797.744 | 9673825.904 | 360.197 | 10 | -90 | 3 | 5 |
| DEX-CZ9382 | 414822.675 | 9673834.012 | 351.827 | 18 | -90 | 8.5 | 7.5 |
| DEX-CZ9383 | 414845.967 | 9673824.965 | 347.772 | 30 | -90 | 23.38 | 2 |
| DEX-CZ9384 | 414872.109 | 9673825.295 | 344.482 | 53 | -90 | 33.28 | 15 |
| DEX-CZ9385 | 414898.855 | 9673827.380 | 343.000 | 45 | -90 | 36.48 | 4.85 |
| DEX-CZ9386 | 414918.399 | 9673826.345 | 343.000 | 51 | -90 | 46.55 | 2 |
| DEX-CZ9387 | 414947.566 | 9673823.337 | 343.000 | 55 | -90 | 44 | 6 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ5935 | 417875.821 | 9673150.459 | 402.440 | 25 | -90 | 17.65 | 4 |
| DEX-CZ5936 | 417821.270 | 9673145.869 | 408.950 | 20 | -90 | 8.23 | 9 |
| DEX-CZ5937 | 417770.696 | 9673147.698 | 410.601 | 25 | -90 | 4.74 | 17 |
| DEX-CZ5938 | 417724.419 | 9673149.086 | 413.196 | 24 | -90 | 2 | 16 |
| DEX-CZ5939 | 417698.456 | 9673148.780 | 415.379 | 47 | -90 | 17.85 | 20 |
| DEX-CZ5940 | 417674.670 | 9673150.103 | 416.896 | 26 | -90 | 22.49 | 2 |
| DEX-CZ5941 | 417624.197 | 9673150.431 | 414.888 | 27 | -90 | 20.11 | 1 |
| DEX-CZ5942 | 417372.784 | 9673149.631 | 390.000 | 19 | -90 | 15.2 | 1 |
| DEX-CZ5943 | 417323.716 | 9673151.238 | 386.888 | 25 | -90 | 18 | 5 |
| DEX-CZ5944 | 417261.999 | 9673153.767 | 378.589 | 16 | -90 | 6.45 | 7.55 |
| DEX-CZ5945 | 417225.374 | 9673150.389 | 381.000 | 24 | -90 | 9 | 13 |
| DEX-CZ5946 | 417179.427 | 9673152.049 | 371.449 | 16 | -90 | 7 | 3 |
| DEX-CZ5947 | 417125.477 | 9673157.389 | 366.749 | 12 | -90 | 5 | 2 |
| DEX-CZ5948 | 417097.377 | 9673152.326 | 355.836 | 10 | -90 | 6 | 1 |
| DEX-CZ5949 | 418677.036 | 9673124.161 | 486.039 | 30 | -90 | 20 | 4 |
| DEX-CZ5950 | 418651.838 | 9673124.313 | 485.000 | 34 | -90 | 19.28 | 15 |
| DEX-CZ5951 | 418626.546 | 9673122.957 | 486.000 | 10 | -90 | 6 | 2 |
| DEX-CZ5952 | 418600.412 | 9673121.599 | 483.575 | 7 | -90 | 2 | 2 |
| DEX-CZ5953 | 418577.130 | 9673125.155 | 478.276 | 17 | -90 | 5 | 11 |
| DEX-CZ5954 | 418551.214 | 9673128.403 | 472.502 | 6 | -90 | 3 | 3 |
| DEX-CZ5955 | 418525.812 | 9673124.370 | 467.639 | 12 | -90 | 7 | 4 |
| DEX-CZ5956 | 418499.294 | 9673126.161 | 464.222 | 32 | -90 | 14 | 14 |
| DEX-CZ5957 | 418474.923 | 9673128.368 | 463.000 | 27 | -90 | 16 | 8 |
| DEX-CZ5958 | 418423.533 | 9673126.796 | 457.989 | 18 | -90 | 10 | 6 |
| DEX-CZ5959 | 418400.797 | 9673125.897 | 455.775 | 7 | -90 | 3.5 | 1.5 |
| DEX-CZ5960 | 418373.115 | 9673123.609 | 450.453 | 9 | -90 | 5 | 2 |
| DEX-CZ5961 | 418350.022 | 9673123.390 | 447.669 | 30 | -90 | 8 | 12 |
| DEX-CZ5962 | 418324.298 | 9673126.978 | 444.884 | 47 | -90 | 20 | 19.37 |
| DEX-CZ5963 | 418300.178 | 9673124.409 | 442.177 | 45 | -90 | 17.2 | 20 |
| DEX-CZ5964 | 418276.191 | 9673126.224 | 436.735 | 21 | -90 | 14 | 5 |
| DEX-CZ5965 | 418250.406 | 9673125.553 | 429.086 | 36 | -90 | 13 | 16 |
| DEX-CZ5966 | 418226.090 | 9673125.690 | 423.318 | 23 | -90 | 3 | 11.35 |
| DEX-CZ5967 | 418199.518 | 9673124.669 | 418.440 | 15 | -90 | 6 | 3 |
| DEX-CZ5968 | 418172.175 | 9673125.326 | 414.426 | 19 | -90 | 16 | 1 |
| DEX-CZ5969 | 418150.941 | 9673125.085 | 412.361 | 9 | -90 | 7 | 2 |
| DEX-CZ5970 | 418125.715 | 9673126.141 | 413.259 | 23 | -90 | 16 | 5 |
| DEX-CZ5971 | 418100.816 | 9673122.129 | 405.169 | 20 | -90 | 12 | 6 |
| DEX-CZ5972 | 418074.801 | 9673126.091 | 401.986 | 32 | -90 | 13 | 18 |
| DEX-CZ5973 | 418050.510 | 9673128.580 | 399.819 | 36 | -90 | 10.15 | 24.34 |
| DEX-CZ5974 | 418024.619 | 9673126.744 | 397.910 | 37 | -90 | 21.6 | 15.15 |
| DEX-CZ5975 | 417998.985 | 9673126.926 | 398.860 | 28 | -90 | 9.42 | 16 |
| DEX-CZ5976 | 417975.847 | 9673126.554 | 399.370 | 24 | -90 | 10.42 | 14 |
| DEX-CZ5977 | 417952.483 | 9673125.050 | 399.371 | 37 | -90 | 31.01 | 6 |
| DEX-CZ5978 | 417925.917 | 9673126.678 | 398.463 | 31 | -90 | 14.42 | 17 |
| DEX-CZ5979 | 417901.801 | 9673125.664 | 404.263 | 30 | -90 | 15.25 | 12.36 |
| DEX-CZ5980 | 417875.089 | 9673124.899 | 407.250 | 28 | -90 | 10 | 18 |
| DEX-CZ5981 | 417852.980 | 9673127.341 | 408.870 | 36 | -90 | 14.85 | 15 |
| DEX-CZ5982 | 417825.809 | 9673127.704 | 411.474 | 19 | -90 | 7.64 | 9.4 |
| DEX-CZ5983 | 417802.813 | 9673120.734 | 414.786 | 38 | -90 | 8.15 | 22.27 |
| DEX-CZ5984 | 417772.566 | 9673127.602 | 416.143 | 25 | -90 | 4 | 14 |
| DEX-CZ5985 | 417747.524 | 9673119.736 | 419.572 | 16 | -90 | 12 | 1 |
| DEX-CZ5986 | 417730.626 | 9673124.090 | 419.850 | 35 | -90 | 15 | 13 |
| DEX-CZ5987 | 417699.457 | 9673127.429 | 418.168 | 24 | -90 | 11 | 3.5 |
| DEX-CZ5988 | 417676.354 | 9673123.578 | 417.587 | 22 | -90 | 15 | 5.8 |
| DEX-CZ5989 | 417648.935 | 9673124.828 | 417.025 | 12 | -90 | 10 | 0 |
| DEX-CZ5990 | 417624.938 | 9673125.058 | 414.814 | 28 | -90 | 10 | 10 |
| DEX-CZ5991 | 417599.642 | 9673125.883 | 411.377 | 18 | -90 | 11 | 4 |
| DEX-CZ5992 | 417575.928 | 9673126.662 | 404.920 | 25 | -90 | 12.22 | 9 |
| DEX-CZ5993 | 417474.859 | 9673121.527 | 402.848 | 14 | -90 | 10.56 | 2 |
| DEX-CZ5994 | 417451.822 | 9673119.618 | 401.000 | 20 | -90 | 12.26 | 6.35 |
| DEX-CZ5995 | 417424.139 | 9673123.456 | 396.694 | 23 | -90 | 19 | 1 |
| DEX-CZ5996 | 417396.893 | 9673126.536 | 392.230 | 16 | -90 | 11 | 1 |
| DEX-CZ5997 | 417374.444 | 9673125.830 | 387.682 | 20 | -90 | 15 | 2 |
| DEX-CZ5998 | 417348.685 | 9673125.530 | 385.442 | 16 | -90 | 13 | 0 |
| DEX-CZ5999 | 417323.983 | 9673127.209 | 385.132 | 17 | -90 | 14 | 1 |
| DEX-CZ6000 | 417301.771 | 9673123.568 | 383.434 | 22 | -90 | 15 | 1 |
| DEX-CZ6001 | 417276.616 | 9673122.911 | 376.460 | 17 | -90 | 14 | 1 |
| DEX-CZ6002 | 417250.845 | 9673125.606 | 373.611 | 16 | -90 | 7 | 4 |
| DEX-CZ6003 | 417225.462 | 9673125.632 | 381.000 | 36 | -90 | 26.25 | 8 |
| DEX-CZ6004 | 417200.345 | 9673126.017 | 380.000 | 28 | -90 | 19 | 7 |
| DEX-CZ6005 | 417177.275 | 9673127.472 | 375.321 | 25 | -90 | 17.92 | 3.4 |
| DEX-CZ6006 | 417151.148 | 9673122.465 | 364.739 | 22 | -90 | 8 | 1 |
| DEX-CZ6007 | 417125.941 | 9673125.618 | 357.000 | 25 | -90 | 12 | 1 |
| DEX-CZ6008 | 416950.477 | 9673126.329 | 397.738 | 10 | -90 | 6 | 2 |
| DEX-CZ6009 | 416926.872 | 9673125.504 | 398.998 | 20 | -90 | 12.27 | 5 |
| DEX-CZ6010 | 416902.051 | 9673127.156 | 397.562 | 18 | -90 | 6 | 11 |
| DEX-CZ6011 | 416877.115 | 9673128.779 | 392.843 | 13 | -90 | 6 | 5 |
| DEX-CZ6012 | 416845.611 | 9673128.923 | 396.787 | 15 | -90 | 5 | 8 |
| DEX-CZ6013 | 416823.416 | 9673132.073 | 401.139 | 11 | -90 | 4 | 4 |
| DEX-CZ6014 | 416794.015 | 9673126.255 | 403.412 | 11 | -90 | 7 | 2 |
| DEX-CZ6015 | 416772.205 | 9673122.685 | 404.852 | 17 | -90 | 5 | 3 |
| DEX-CZ6016 | 418623.367 | 9673100.642 | 482.448 | 18 | -90 | 3 | 2 |
| DEX-CZ6017 | 418573.179 | 9673100.033 | 473.113 | 32 | -90 | 7 | 20 |
| DEX-CZ6018 | 418526.447 | 9673098.285 | 466.058 | 34 | -90 | 12 | 15 |
| DEX-CZ6019 | 418475.990 | 9673100.226 | 461.128 | 24 | -90 | 16 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9388 | 414972.923 | 9673821.752 | 342.627 | 46 | -90 | 37.74 | 6 |
| DEX-CZ9389 | 414995.208 | 9673824.422 | 341.735 | 40 | -90 | 36.56 | 2 |
| DEX-CZ9390 | 415020.458 | 9673824.071 | 340.000 | 34 | -90 | 30.58 | 1.85 |
| DEX-CZ9391 | 415046.931 | 9673822.842 | 340.000 | 23 | -90 | 18.45 | 2 |
| DEX-CZ9392 | 415077.901 | 9673825.924 | 336.442 | 19 | -90 | 11 | 2 |
| DEX-CZ9393 | 415103.377 | 9673822.787 | 339.212 | 25 | -90 | 15.55 | 4 |
| DEX-CZ9394 | 415120.653 | 9673823.151 | 339.289 | 18 | -90 | 14.38 | 1 |
| DEX-CZ9395 | 415148.795 | 9673822.498 | 338.383 | 21 | -90 | 12 | 4 |
| DEX-CZ9396 | 415172.138 | 9673819.292 | 336.552 | 16 | -90 | 12 | 2 |
| DEX-CZ9397 | 414667.272 | 9673789.284 | 404.802 | 27 | -90 | 12.32 | 9 |
| DEX-CZ9398 | 414695.839 | 9673790.924 | 396.312 | 51 | -90 | 9 | 29.5 |
| DEX-CZ9399 | 414723.247 | 9673797.655 | 390.143 | 11 | -90 | 4 | 2 |
| DEX-CZ9400 | 414749.864 | 9673794.959 | 385.208 | 23 | -90 | 4 | 16 |
| DEX-CZ9401 | 414770.271 | 9673799.593 | 374.422 | 9 | -90 | 2 | 0 |
| DEX-CZ9402 | 414798.615 | 9673803.472 | 361.968 | 12 | -90 | 8 | 1 |
| DEX-CZ9403 | 414823.549 | 9673798.296 | 357.421 | 13 | -90 | 2 | 3 |
| DEX-CZ9404 | 414844.970 | 9673799.620 | 351.784 | 19 | -90 | 4 | 10 |
| DEX-CZ9405 | 414871.248 | 9673801.143 | 346.738 | 32 | -90 | 27 | 2.75 |
| DEX-CZ9406 | 414929.864 | 9673807.527 | 343.459 | 46 | -90 | 42.13 | 2.85 |
| DEX-CZ9407 | 414974.026 | 9673803.130 | 343.917 | 33 | -90 | 28.37 | 2 |
| DEX-CZ9408 | 414999.089 | 9673795.735 | 343.877 | 27 | -90 | 22.7 | 3 |
| DEX-CZ9409 | 415013.981 | 9673802.857 | 343.502 | 32 | -90 | 17.33 | 11.4 |
| DEX-CZ9410 | 415076.666 | 9673797.951 | 343.899 | 29 | -90 | 12 | 13 |
| DEX-CZ9411 | 415104.452 | 9673805.547 | 341.912 | 20 | -90 | 13 | 2 |
| DEX-CZ9412 | 415126.370 | 9673801.743 | 341.778 | 21 | -90 | 14 | 3 |
| DEX-CZ9413 | 415167.867 | 9673796.556 | 337.433 | 16 | -90 | 8 | 8 |
| DEX-CZ9414 | 414626.209 | 9673773.466 | 411.038 | 15 | -90 | 8 | 5 |
| DEX-CZ9415 | 414646.191 | 9673774.060 | 407.259 | 27 | -90 | 10.35 | 13.4 |
| DEX-CZ9416 | 414668.506 | 9673774.063 | 404.184 | 34 | -90 | 14 | 16 |
| DEX-CZ9417 | 414700.537 | 9673779.445 | 399.242 | 39 | -90 | 17.67 | 16.07 |
| DEX-CZ9418 | 414729.951 | 9673775.957 | 395.161 | 29 | -90 | 9 | 16.55 |
| DEX-CZ9419 | 414747.017 | 9673775.439 | 391.253 | 21 | -90 | 3 | 15.9 |
| DEX-CZ9420 | 414765.826 | 9673777.691 | 380.715 | 14 | -90 | 3 | 8 |
| DEX-CZ9421 | 414842.319 | 9673765.743 | 360.932 | 10 | -90 | 7 | 1 |
| DEX-CZ9422 | 414871.516 | 9673778.321 | 350.038 | 28 | -90 | 19.69 | 7 |
| DEX-CZ9423 | 414895.010 | 9673775.108 | 348.509 | 37 | -90 | 16.67 | 15.3 |
| DEX-CZ9424 | 414917.321 | 9673768.019 | 349.279 | 34 | -90 | 22.95 | 9 |
| DEX-CZ9425 | 414940.573 | 9673772.458 | 348.930 | 38 | -90 | 9 | 22.79 |
| DEX-CZ9426 | 414973.716 | 9673770.848 | 348.685 | 24 | -90 | 6 | 15 |
| DEX-CZ9427 | 415001.282 | 9673773.447 | 349.856 | 10 | -90 | 4 | 0 |
| DEX-CZ9428 | 415029.809 | 9673773.700 | 351.509 | 14 | -90 | 6 | 5 |
| DEX-CZ9429 | 415051.727 | 9673774.145 | 350.971 | 25 | -90 | 12.25 | 11 |
| DEX-CZ9430 | 415072.356 | 9673776.360 | 349.076 | 34 | -90 | 7 | 25 |
| DEX-CZ9431 | 415097.979 | 9673773.003 | 349.587 | 17 | -90 | 8 | 6 |
| DEX-CZ9432 | 415122.364 | 9673774.160 | 346.596 | 18 | -90 | 4 | 11 |
| DEX-CZ9433 | 415149.548 | 9673772.231 | 342.355 | 25 | -90 | 10 | 10 |
| DEX-CZ9434 | 415171.883 | 9673776.596 | 338.981 | 17 | -90 | 7 | 7 |
| DEX-CZ9435 | 414672.391 | 9673753.559 | 399.871 | 29 | -90 | 13 | 14 |
| DEX-CZ9436 | 414719.714 | 9673748.196 | 398.486 | 44 | -90 | 17.7 | 22.29 |
| DEX-CZ9437 | 414767.714 | 9673751.309 | 389.585 | 22 | -90 | 6 | 13 |
| DEX-CZ9438 | 415072.810 | 9673750.559 | 355.817 | 38 | -90 | 14.5 | 16 |
| DEX-CZ9439 | 415117.042 | 9673756.099 | 350.933 | 21 | -90 | 15.18 | 4 |
| DEX-CZ9440 | 415170.006 | 9673749.200 | 344.144 | 31 | -90 | 17.56 | 12 |
| DEX-CZ9441 | 414673.729 | 9673726.659 | 389.213 | 13 | -90 | 4 | 5 |
| DEX-CZ9442 | 414696.887 | 9673724.720 | 392.311 | 22 | -90 | 13 | 5 |
| DEX-CZ9443 | 414720.372 | 9673719.134 | 393.497 | 35 | -90 | 25.66 | 3 |
| DEX-CZ9444 | 414740.461 | 9673725.958 | 395.801 | 46 | -90 | 35.52 | 11.01 |
| DEX-CZ9445 | 414768.168 | 9673731.162 | 393.743 | 39 | -90 | 21.92 | 12 |
| DEX-CZ9446 | 415072.334 | 9673727.877 | 360.941 | 29 | -90 | 17.63 | 9.91 |
| DEX-CZ9447 | 415098.977 | 9673724.980 | 357.864 | 26 | -90 | 11.3 | 13 |
| DEX-CZ9448 | 415124.365 | 9673721.384 | 356.881 | 23 | -90 | 17.35 | 2 |
| DEX-CZ9449 | 415147.488 | 9673723.993 | 352.357 | 34 | -90 | 18.79 | 11 |
| DEX-CZ9450 | 415170.591 | 9673726.696 | 348.717 | 42 | -90 | 22.09 | 17 |
| DEX-CZ9451 | 415151.058 | 9673703.608 | 355.987 | 30 | -90 | 13.28 | 10.28 |
| DEX-CZ9452 | 415170.393 | 9673698.121 | 352.036 | 24 | -90 | 18.89 | 3 |
| DEX-CZ9453 | 415149.064 | 9673672.282 | 361.742 | 19 | -90 | 6 | 9 |
| DEX-CZ9454 | 415173.122 | 9673674.337 | 356.158 | 15 | -90 | 5 | 7 |
| DEX-CZ9455 | 415200.177 | 9673678.658 | 348.798 | 38 | -90 | 22 | 13.92 |
| DEX-CZ9456 | 415224.723 | 9673676.155 | 346.154 | 50 | -90 | 13 | 31 |
| DEX-CZ9457 | 415246.052 | 9673672.545 | 343.483 | 45 | -90 | 18 | 27 |
| DEX-CZ9458 | 415172.480 | 9673652.596 | 360.302 | 13 | -90 | 5 | 5 |
| DEX-CZ9459 | 415198.117 | 9673648.811 | 355.698 | 24 | -90 | 11.27 | 11 |
| DEX-CZ9460 | 415222.086 | 9673646.349 | 354.725 | 31 | -90 | 14.33 | 8 |
| DEX-CZ9461 | 415268.552 | 9673651.126 | 342.169 | 29 | -90 | 13.35 | 14 |
| DEX-CZ9462 | 415223.139 | 9673624.497 | 360.342 | 16 | -90 | 10 | 3 |
| DEX-CZ9463 | 415252.008 | 9673623.676 | 353.408 | 26 | -90 | 13 | 10 |
| DEX-CZ9464 | 415271.649 | 9673628.438 | 346.325 | 25 | -90 | 16.43 | 7 |
| DEX-CZ9465 | 415301.580 | 9673627.583 | 337.350 | 20 | -90 | 11 | 7.35 |
| DEX-CZ9466 | 415321.061 | 9673621.285 | 331.680 | 33 | -90 | 21 | 10 |
| DEX-CZ9467 | 415271.427 | 9673600.649 | 349.595 | 21 | -90 | 2 | 17 |
| DEX-CZ9468 | 415297.854 | 9673598.846 | 338.639 | 32 | -90 | 9 | 21 |
| DEX-CZ9469 | 415298.867 | 9673576.437 | 341.236 | 21 | -90 | 2 | 17 |
| DEX-CZ9470 | 415319.388 | 9673575.601 | 333.758 | 34 | -90 | 4 | 27 |
| DEX-CZ9471 | 415342.492 | 9673563.437 | 328.869 | 34 | -90 | 24 | 7 |
| DEX-CZ9472 | 415372.517 | 9673565.981 | 327.148 | 24 | -90 | 9 | 13 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6020 | 418426.653 | 9673100.431 | 457.382 | 22 | -90 | 15.35 | 3 |
| DEX-CZ6021 | 418375.199 | 9673100.761 | 452.553 | 15 | -90 | 12 | 0 |
| DEX-CZ6022 | 418324.668 | 9673098.920 | 444.958 | 20 | -90 | 11 | 1 |
| DEX-CZ6023 | 418275.922 | 9673098.161 | 434.948 | 37 | -90 | 13 | 21 |
| DEX-CZ6024 | 418229.193 | 9673107.011 | 425.565 | 16 | -90 | 12 | 2 |
| DEX-CZ6025 | 418175.865 | 9673096.640 | 420.621 | 21 | -90 | 3 | 5 |
| DEX-CZ6026 | 418075.438 | 9673099.812 | 400.687 | 33 | -90 | 18.82 | 10 |
| DEX-CZ6027 | 418024.202 | 9673100.702 | 394.841 | 33 | -90 | 31.06 | 1 |
| DEX-CZ6028 | 417974.160 | 9673099.417 | 393.097 | 32 | -90 | 10.4 | 22 |
| DEX-CZ6029 | 417925.880 | 9673101.279 | 401.163 | 31 | -90 | 24.23 | 3 |
| DEX-CZ6030 | 417876.363 | 9673101.481 | 408.866 | 31 | -90 | 16.8 | 4 |
| DEX-CZ6031 | 417825.246 | 9673102.107 | 413.830 | 52 | -90 | 11.18 | 41.9 |
| DEX-CZ6032 | 417775.410 | 9673099.372 | 420.756 | 11 | -90 | 4 | 3 |
| DEX-CZ6033 | 417724.349 | 9673102.286 | 421.457 | 32 | -90 | 13.27 | 13 |
| DEX-CZ6034 | 417624.181 | 9673103.161 | 413.282 | 7 | -90 | 3 | 2 |
| DEX-CZ6035 | 417574.388 | 9673107.361 | 403.171 | 13 | -90 | 6 | 4 |
| DEX-CZ6036 | 417478.734 | 9673102.861 | 399.597 | 27 | -90 | 11 | 7.5 |
| DEX-CZ6037 | 417424.487 | 9673100.630 | 394.047 | 28 | -90 | 17.3 | 11 |
| DEX-CZ6038 | 417375.836 | 9673102.949 | 384.973 | 21 | -90 | 18.35 | 1 |
| DEX-CZ6039 | 417324.484 | 9673099.274 | 381.000 | 33 | -90 | 17 | 11 |
| DEX-CZ6040 | 417275.616 | 9673097.682 | 379.477 | 25 | -90 | 17 | 4 |
| DEX-CZ6041 | 417224.266 | 9673099.629 | 378.379 | 32 | -90 | 19 | 0 |
| DEX-CZ6042 | 417150.978 | 9673099.720 | 362.537 | 32 | -90 | 8 | 18 |
| DEX-CZ6044 | 417052.242 | 9673095.735 | 378.547 | 35 | -90 | 20.76 | 12 |
| DEX-CZ6045 | 416928.182 | 9673105.342 | 395.349 | 17 | -90 | 9.14 | 6 |
| DEX-CZ6046 | 416876.107 | 9673097.953 | 381.298 | 11 | -90 | 3 | 7 |
| DEX-CZ6047 | 416826.799 | 9673105.843 | 387.403 | 10 | -90 | 7 | 2 |
| DEX-CZ6048 | 416774.078 | 9673104.621 | 394.557 | 11 | -90 | 2 | 7 |
| DEX-CZ6049 | 418675.551 | 9673075.492 | 483.521 | 18 | -90 | 13.38 | 2 |
| DEX-CZ6050 | 418649.470 | 9673075.278 | 479.406 | 18 | -90 | 7.67 | 8 |
| DEX-CZ6051 | 418623.422 | 9673074.250 | 475.938 | 24 | -90 | 12 | 8 |
| DEX-CZ6052 | 418598.428 | 9673073.519 | 472.962 | 31 | -90 | 17 | 11 |
| DEX-CZ6053 | 418577.886 | 9673074.645 | 470.365 | 38 | -90 | 11 | 21 |
| DEX-CZ6054 | 418550.507 | 9673073.785 | 468.007 | 27 | -90 | 16 | 0 |
| DEX-CZ6055 | 418527.318 | 9673071.696 | 464.977 | 46 | -90 | 15 | 22 |
| DEX-CZ6056 | 418499.365 | 9673074.295 | 462.499 | 36 | -90 | 17 | 17 |
| DEX-CZ6057 | 418472.772 | 9673074.233 | 460.287 | 21 | -90 | 12 | 7 |
| DEX-CZ6058 | 418424.688 | 9673073.971 | 454.755 | 20 | -90 | 13.18 | 4 |
| DEX-CZ6059 | 418400.088 | 9673074.881 | 454.136 | 19 | -90 | 9.3 | 8 |
| DEX-CZ6060 | 418376.910 | 9673076.220 | 451.602 | 21 | -90 | 10 | 9 |
| DEX-CZ6061 | 418350.425 | 9673075.051 | 448.186 | 17 | -90 | 12 | 3 |
| DEX-CZ6062 | 418326.385 | 9673075.200 | 443.691 | 22 | -90 | 17 | 0 |
| DEX-CZ6063 | 418301.728 | 9673074.170 | 438.658 | 42 | -90 | 9 | 25 |
| DEX-CZ6064 | 418280.203 | 9673074.028 | 433.578 | 40 | -90 | 12 | 18 |
| DEX-CZ6065 | 418248.746 | 9673077.619 | 433.960 | 26 | -90 | 8 | 13 |
| DEX-CZ6066 | 418230.065 | 9673076.864 | 435.616 | 25 | -90 | 6 | 12 |
| DEX-CZ6067 | 418200.741 | 9673074.697 | 431.886 | 22 | -90 | 7 | 12 |
| DEX-CZ6068 | 418175.543 | 9673074.965 | 424.195 | 18 | -90 | 6 | 8 |
| DEX-CZ6069 | 418150.299 | 9673075.706 | 413.490 | 16 | -90 | 6 | 8 |
| DEX-CZ6070 | 418124.209 | 9673075.588 | 407.640 | 20 | -90 | 9 | 9 |
| DEX-CZ6071 | 418070.492 | 9673073.513 | 402.900 | 16 | -90 | 5 | 9 |
| DEX-CZ6072 | 418048.889 | 9673075.709 | 398.361 | 16 | -90 | 9 | 6 |
| DEX-CZ6073 | 418023.959 | 9673077.675 | 394.569 | 46 | -90 | 14 | 26 |
| DEX-CZ6074 | 418000.652 | 9673074.813 | 392.345 | 33 | -90 | 30.65 | 1 |
| DEX-CZ6075 | 417973.898 | 9673075.573 | 390.646 | 35 | -90 | 25.35 | 9 |
| DEX-CZ6076 | 417949.981 | 9673075.243 | 391.644 | 24 | -90 | 18.4 | 6.4 |
| DEX-CZ6077 | 417922.266 | 9673074.993 | 397.938 | 7 | -90 | 4 | 3 |
| DEX-CZ6078 | 417901.768 | 9673078.826 | 402.559 | 20 | -90 | 4 | 14 |
| DEX-CZ6079 | 417879.436 | 9673072.655 | 407.115 | 28 | -90 | 21.3 | 4 |
| DEX-CZ6080 | 417849.566 | 9673075.675 | 411.240 | 26 | -90 | 13 | 9 |
| DEX-CZ6081 | 417825.147 | 9673077.862 | 413.131 | 40 | -90 | 32.55 | 6 |
| DEX-CZ6082 | 417801.439 | 9673076.878 | 417.407 | 30 | -90 | 13 | 12 |
| DEX-CZ6083 | 417772.365 | 9673074.445 | 422.034 | 13 | -90 | 4 | 7 |
| DEX-CZ6084 | 417752.122 | 9673077.390 | 422.609 | 19 | -90 | 9 | 8 |
| DEX-CZ6085 | 417725.350 | 9673075.941 | 420.611 | 16 | -90 | 5 | 7 |
| DEX-CZ6086 | 417624.138 | 9673080.171 | 406.285 | 8 | -90 | 5 | 1 |
| DEX-CZ6087 | 417598.856 | 9673073.478 | 400.401 | 19 | -90 | 10 | 7 |
| DEX-CZ6088 | 417574.165 | 9673076.914 | 398.816 | 28 | -90 | 23.61 | 5 |
| DEX-CZ6089 | 417469.037 | 9673072.646 | 391.126 | 31 | -90 | 21.42 | 11 |
| DEX-CZ6090 | 417450.518 | 9673076.845 | 391.528 | 25 | -90 | 15.62 | 8 |
| DEX-CZ6091 | 417428.821 | 9673078.662 | 389.370 | 25 | -90 | 23.34 | 0 |
| DEX-CZ6092 | 417400.212 | 9673075.025 | 385.381 | 23 | -90 | 14 | 9 |
| DEX-CZ6093 | 417375.620 | 9673074.283 | 382.169 | 26 | -90 | 23 | 1 |
| DEX-CZ6094 | 417351.623 | 9673075.679 | 379.252 | 19 | -90 | 16 | 0 |
| DEX-CZ6095 | 417324.676 | 9673076.917 | 379.912 | 16 | -90 | 12 | 1 |
| DEX-CZ6096 | 417299.123 | 9673075.996 | 376.781 | 21 | -90 | 15 | 0 |
| DEX-CZ6097 | 417275.585 | 9673076.812 | 377.552 | 19 | -90 | 15 | 2 |
| DEX-CZ6098 | 417249.398 | 9673074.547 | 365.755 | 20 | -90 | 8 | 0 |
| DEX-CZ6099 | 417221.881 | 9673078.243 | 371.518 | 20 | -90 | 8 | 0 |
| DEX-CZ6100 | 416950.862 | 9673083.324 | 392.137 | 17 | -90 | 10.2 | 4.37 |
| DEX-CZ6101 | 416927.830 | 9673074.567 | 383.255 | 16 | -90 | 11.65 | 3 |
| DEX-CZ6102 | 416897.097 | 9673075.463 | 380.160 | 17 | -90 | 11.27 | 6 |
| DEX-CZ6103 | 416878.212 | 9673078.259 | 376.412 | 11 | -90 | 6 | 3 |
| DEX-CZ6104 | 416845.162 | 9673083.146 | 378.068 | 14 | -90 | 5 | 7 |
| DEX-CZ6105 | 416818.850 | 9673084.194 | 376.475 | 17 | -90 | 12.91 | 2 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9473 | 415395.126 | 9673566.670 | 327.907 | 21 | -90 | 14 | 5 |
| DEX-CZ9474 | 415423.000 | 9673565.143 | 325.993 | 25 | -90 | 22.4 | 0.6 |
| DEX-CZ9475 | 415445.345 | 9673578.311 | 328.000 | 32 | -90 | 26 | 4 |
| DEX-CZ9476 | 415372.478 | 9673550.452 | 327.000 | 24 | -90 | 14 | 8 |
| DEX-CZ9477 | 415425.952 | 9673548.360 | 326.516 | 38 | -90 | 33 | 3 |
| DEX-CZ9478 | 415338.132 | 9673533.996 | 328.100 | 16 | -90 | 12 | 1 |
| DEX-CZ9479 | 415373.527 | 9673527.888 | 325.370 | 32 | -90 | 22 | 7 |
| DEX-CZ9480 | 415396.073 | 9673524.345 | 323.027 | 34 | -90 | 18 | 13 |
| DEX-CZ9481 | 415421.153 | 9673525.372 | 326.134 | 38 | -90 | 27 | 9 |
| DEX-CZ9482 | 415448.480 | 9673523.178 | 327.754 | 35 | -90 | 29 | 3 |
| DEX-CZ9484 | 415421.207 | 9673499.747 | 327.083 | 34 | -90 | 31 | 1 |
| DEX-CZ9486 | 415370.201 | 9673476.111 | 339.385 | 21 | -90 | 4 | 15 |
| DEX-CZ9487 | 415399.198 | 9673465.948 | 339.344 | 33 | -90 | 12.32 | 19 |
| DEX-CZ9488 | 415421.142 | 9673474.748 | 331.821 | 39 | -90 | 28 | 9 |
| DEX-CZ9489 | 415446.093 | 9673473.922 | 330.377 | 31 | -90 | 26 | 5 |
| DEX-CZ9490 | 415421.687 | 9673447.607 | 338.851 | 24 | -90 | 17 | 5 |
| DEX-CZ9491 | 415418.214 | 9673427.167 | 344.070 | 13 | -90 | 3 | 5 |
| DEX-CZ9492 | 415447.988 | 9673422.926 | 345.339 | 13 | -90 | 7 | 3.5 |
| DEX-CZ9493 | 415468.977 | 9673425.618 | 343.583 | 13 | -90 | 7 | 3 |
| DEX-CZ9494 | 415417.353 | 9673397.044 | 354.026 | 4 | -90 | 0 | 2 |
| DEX-CZ9495 | 415445.912 | 9673395.331 | 351.603 | 6 | -90 | 1 | 2 |
| DEX-CZ9496 | 415466.264 | 9673397.634 | 350.540 | 11 | -90 | 3 | 6 |
| DEX-CZ9497 | 415572.012 | 9673399.629 | 345.959 | 9 | -90 | 6.3 | 0.7 |
| DEX-CZ9498 | 415346.361 | 9673374.837 | 349.965 | 15 | -90 | 5 | 7 |
| DEX-CZ9499 | 415367.504 | 9673376.868 | 349.621 | 13 | -90 | 5 | 6 |
| DEX-CZ9500 | 415394.054 | 9673376.452 | 349.277 | 14 | -90 | 4 | 5 |
| DEX-CZ9501 | 415419.956 | 9673381.190 | 350.817 | 16 | -90 | 8.29 | 5 |
| DEX-CZ9502 | 415445.771 | 9673376.795 | 350.325 | 12 | -90 | 6 | 5 |
| DEX-CZ9503 | 415568.357 | 9673374.494 | 353.077 | 17 | -90 | 6 | 9 |
| DEX-CZ9504 | 415596.186 | 9673375.707 | 351.871 | 15 | -90 | 11 | 2 |
| DEX-CZ9505 | 415615.144 | 9673375.899 | 353.019 | 24 | -90 | 20 | 3 |
| DEX-CZ9506 | 415655.583 | 9673374.970 | 351.138 | 21 | -90 | 17 | 2 |
| DEX-CZ9507 | 415254.646 | 9673347.221 | 345.289 | 17 | -90 | 11.33 | 2 |
| DEX-CZ9508 | 415284.745 | 9673342.731 | 339.213 | 35 | -90 | 12.8 | 21.5 |
| DEX-CZ9509 | 415306.261 | 9673342.769 | 338.303 | 24 | -90 | 11.25 | 10.43 |
| DEX-CZ9510 | 415333.026 | 9673356.355 | 342.266 | 22 | -90 | 13.5 | 6 |
| DEX-CZ9511 | 415422.624 | 9673350.990 | 343.589 | 26 | -90 | 20.67 | 4 |
| DEX-CZ9512 | 415465.838 | 9673353.626 | 348.174 | 16 | -90 | 9 | 5 |
| DEX-CZ9513 | 415497.580 | 9673350.167 | 353.719 | 25 | -90 | 19 | 4 |
| DEX-CZ9514 | 415523.685 | 9673351.407 | 359.100 | 26 | -90 | 10 | 15 |
| DEX-CZ9515 | 415543.442 | 9673348.387 | 362.591 | 21 | -90 | 6 | 13 |
| DEX-CZ9516 | 415573.101 | 9673351.008 | 363.946 | 17 | -90 | 4 | 5 |
| DEX-CZ9517 | 415621.630 | 9673355.724 | 358.632 | 18 | -90 | 16 | 0 |
| DEX-CZ9518 | 415662.699 | 9673355.412 | 357.391 | 29 | -90 | 25 | 3 |
| DEX-CZ9519 | 415227.588 | 9673330.313 | 346.116 | 7 | -90 | 3 | 1 |
| DEX-CZ9520 | 415254.993 | 9673323.270 | 343.743 | 17 | -90 | 4 | 10 |
| DEX-CZ9521 | 415285.559 | 9673322.448 | 336.125 | 24 | -90 | 16.04 | 6 |
| DEX-CZ9522 | 415309.153 | 9673322.680 | 332.665 | 26 | -90 | 11.43 | 12 |
| DEX-CZ9523 | 415331.638 | 9673332.106 | 334.125 | 33 | -90 | 13 | 13.35 |
| DEX-CZ9524 | 415358.715 | 9673321.892 | 330.736 | 19 | -90 | 16.85 | 1 |
| DEX-CZ9525 | 415384.015 | 9673325.026 | 332.193 | 27 | -90 | 16.65 | 9 |
| DEX-CZ9526 | 415408.267 | 9673325.654 | 337.143 | 21 | -90 | 18.38 | 1 |
| DEX-CZ9527 | 415431.978 | 9673330.239 | 340.647 | 22 | -90 | 14.64 | 6 |
| DEX-CZ9528 | 415453.006 | 9673325.927 | 346.461 | 27 | -90 | 18.37 | 7 |
| DEX-CZ9529 | 415478.022 | 9673327.266 | 351.982 | 31 | -90 | 19.5 | 9.5 |
| DEX-CZ9530 | 415499.343 | 9673322.101 | 358.694 | 23 | -90 | 12 | 10 |
| DEX-CZ9531 | 415528.187 | 9673327.558 | 365.069 | 15 | -90 | 8 | 4 |
| DEX-CZ9532 | 415572.210 | 9673324.433 | 373.904 | 12 | -90 | 9 | 1 |
| DEX-CZ9533 | 415568.889 | 9673300.936 | 383.151 | 8 | -90 | 4 | 2 |
| DEX-CZ9534 | 415592.320 | 9673331.720 | 371.239 | 18 | -90 | 8 | 9 |
| DEX-CZ9535 | 415233.511 | 9673301.122 | 338.770 | 23 | -90 | 2 | 15.78 |
| DEX-CZ9536 | 415257.227 | 9673298.731 | 338.134 | 18 | -90 | 6 | 9 |
| DEX-CZ9537 | 415284.324 | 9673297.578 | 333.776 | 24 | -90 | 11.45 | 11 |
| DEX-CZ9538 | 415333.876 | 9673297.806 | 326.046 | 30 | -90 | 17.45 | 11.33 |
| DEX-CZ9539 | 415354.628 | 9673297.610 | 326.650 | 24 | -90 | 13.35 | 8.7 |
| DEX-CZ9540 | 415380.802 | 9673303.864 | 330.695 | 46 | -90 | 26.95 | 15 |
| DEX-CZ9541 | 415432.504 | 9673302.936 | 341.392 | 26 | -90 | 18 | 6 |
| DEX-CZ9542 | 415478.076 | 9673302.184 | 355.918 | 35 | -90 | 18.34 | 12.5 |
| DEX-CZ9543 | 415536.186 | 9673307.011 | 373.791 | 6 | -90 | 2 | 2 |
| DEX-CZ9544 | 415209.722 | 9673278.061 | 329.311 | 19 | -90 | 11.36 | 3 |
| DEX-CZ9545 | 415232.793 | 9673278.214 | 330.882 | 19 | -90 | 6 | 6 |
| DEX-CZ9546 | 415257.185 | 9673273.051 | 330.748 | 18 | -90 | 8.33 | 7 |
| DEX-CZ9547 | 415282.092 | 9673273.262 | 328.287 | 28 | -90 | 21.7 | 6 |
| DEX-CZ9548 | 415305.494 | 9673271.540 | 323.303 | 24 | -90 | 20.95 | 1 |
| DEX-CZ9549 | 415332.830 | 9673277.309 | 323.328 | 33 | -90 | 24.26 | 7 |
| DEX-CZ9550 | 415354.863 | 9673276.687 | 325.553 | 27 | -90 | 23.2 | 2.35 |
| DEX-CZ9551 | 415383.396 | 9673275.995 | 330.082 | 27 | -90 | 24.89 | 1 |
| DEX-CZ9552 | 415406.259 | 9673272.673 | 336.006 | 27 | -90 | 16.41 | 8.55 |
| DEX-CZ9553 | 415430.604 | 9673273.980 | 344.403 | 15 | -90 | 12 | 0 |
| DEX-CZ9554 | 415456.895 | 9673279.517 | 351.999 | 12 | -90 | 9 | 1 |
| DEX-CZ9556 | 415799.214 | 9673462.487 | 356.269 | 22 | -90 | 15 | 4 |
| DEX-CZ9557 | 415815.887 | 9673473.434 | 359.097 | 29 | -90 | 25 | 3 |
| DEX-CZ9559 | 415822.818 | 9673436.853 | 354.286 | 22 | -90 | 15 | 5 |
| DEX-CZ9560 | 414868.876 | 9673574.485 | 348.314 | 24 | -90 | 3 | 17 |
| DEX-CZ9561 | 414915.912 | 9673572.058 | 336.887 | 14 | -90 | 5 | 5 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6106 | 416794.152 | 9673077.496 | 379.599 | 11 | -90 | 5 | 4 |
| DEX-CZ6107 | 416774.935 | 9673083.553 | 382.727 | 12 | -90 | 4 | 8 |
| DEX-CZ6108 | 416973.406 | 9673077.155 | 391.967 | 23 | -90 | 18.75 | 2 |
| DEX-CZ6109 | 418676.252 | 9673052.403 | 482.730 | 18 | -90 | 13.53 | 3 |
| DEX-CZ6110 | 418625.007 | 9673050.928 | 475.444 | 39 | -90 | 21 | 6 |
| DEX-CZ6111 | 418575.428 | 9673049.404 | 467.929 | 60 | -90 | 21 | 27 |
| DEX-CZ6112 | 418527.295 | 9673051.260 | 464.685 | 26 | -90 | 13 | 6 |
| DEX-CZ6113 | 418475.201 | 9673051.405 | 459.853 | 24 | -90 | 16 | 4 |
| DEX-CZ6114 | 418174.083 | 9673050.463 | 428.672 | 28 | -90 | 10 | 16 |
| DEX-CZ6115 | 418122.732 | 9673052.120 | 413.199 | 20 | -90 | 10 | 6 |
| DEX-CZ6116 | 418075.280 | 9673050.769 | 413.026 | 24 | -90 | 18 | 3 |
| DEX-CZ6117 | 418022.835 | 9673054.011 | 397.869 | 22 | -90 | 6 | 7 |
| DEX-CZ6118 | 417974.420 | 9673050.311 | 389.214 | 36 | -90 | 29 | 5 |
| DEX-CZ6119 | 417924.789 | 9673049.539 | 391.912 | 13 | -90 | 4 | 8 |
| DEX-CZ6120 | 417875.084 | 9673054.722 | 405.229 | 31 | -90 | 11 | 20 |
| DEX-CZ6121 | 417822.754 | 9673053.013 | 411.467 | 44 | -90 | 29.65 | 12 |
| DEX-CZ6122 | 417472.751 | 9673044.382 | 384.229 | 44 | -90 | 17 | 21 |
| DEX-CZ6123 | 417425.773 | 9673052.266 | 383.833 | 26 | -90 | 23.74 | 2 |
| DEX-CZ6124 | 417375.630 | 9673049.878 | 381.763 | 16 | -90 | 14 | 0 |
| DEX-CZ6125 | 417197.579 | 9673055.706 | 360.458 | 16 | -90 | 12 | 2 |
| DEX-CZ6126 | 416973.401 | 9673053.163 | 387.599 | 16 | -90 | 13.3 | 1 |
| DEX-CZ6127 | 416916.224 | 9673058.741 | 375.262 | 10 | -90 | 5 | 1 |
| DEX-CZ6128 | 418675.096 | 9673028.572 | 480.739 | 17 | -90 | 12 | 3 |
| DEX-CZ6129 | 418647.829 | 9673024.591 | 478.426 | 16 | -90 | 9 | 5 |
| DEX-CZ6130 | 418527.037 | 9673024.098 | 464.096 | 30 | -90 | 12 | 8 |
| DEX-CZ6131 | 418499.318 | 9673024.930 | 459.000 | 49 | -90 | 19.23 | 28.79 |
| DEX-CZ6132 | 418475.117 | 9673025.302 | 456.393 | 34 | -90 | 10.65 | 21 |
| DEX-CZ6133 | 418625.822 | 9673025.740 | 477.004 | 20 | -90 | 11 | 7 |
| DEX-CZ6134 | 418603.006 | 9673025.315 | 473.424 | 33 | -90 | 23 | 6 |
| DEX-CZ6135 | 418575.197 | 9673023.355 | 468.601 | 32 | -90 | 16 | 13 |
| DEX-CZ6136 | 418374.322 | 9673024.428 | 447.516 | 14 | -90 | 11 | 0 |
| DEX-CZ6137 | 418349.383 | 9673021.778 | 448.430 | 21 | -90 | 10 | 8 |
| DEX-CZ6138 | 418321.200 | 9673023.236 | 448.617 | 22 | -90 | 8 | 9 |
| DEX-CZ6139 | 418298.179 | 9673024.776 | 447.740 | 30 | -90 | 6 | 10.43 |
| DEX-CZ6140 | 418274.442 | 9673020.397 | 445.813 | 18 | -90 | 9 | 6 |
| DEX-CZ6141 | 418249.961 | 9673025.030 | 442.454 | 19 | -90 | 14 | 4 |
| DEX-CZ6142 | 418222.638 | 9673021.622 | 438.786 | 28 | -90 | 21 | 6 |
| DEX-CZ6143 | 418199.209 | 9673029.360 | 435.077 | 42 | -90 | 18 | 22 |
| DEX-CZ6144 | 418176.136 | 9673026.448 | 431.055 | 42 | -90 | 11 | 20 |
| DEX-CZ6145 | 418150.810 | 9673024.609 | 423.910 | 24 | -90 | 10 | 10 |
| DEX-CZ6146 | 418123.862 | 9673022.023 | 419.000 | 16 | -90 | 7 | 4 |
| DEX-CZ6147 | 418074.969 | 9673023.157 | 419.042 | 16 | -90 | 6 | 8 |
| DEX-CZ6148 | 418050.597 | 9673025.311 | 412.890 | 12 | -90 | 8 | 1 |
| DEX-CZ6149 | 418025.799 | 9673026.318 | 405.499 | 14 | -90 | 6 | 5 |
| DEX-CZ6150 | 417972.869 | 9673024.251 | 389.092 | 20 | -90 | 14 | 5 |
| DEX-CZ6151 | 417949.950 | 9673024.580 | 386.238 | 26 | -90 | 20 | 4 |
| DEX-CZ6152 | 417925.107 | 9673024.704 | 386.371 | 27 | -90 | 6 | 20 |
| DEX-CZ6153 | 417898.149 | 9673025.001 | 391.514 | 9 | -90 | 6 | 0 |
| DEX-CZ6154 | 417876.433 | 9673024.180 | 396.174 | 20 | -90 | 6 | 12 |
| DEX-CZ6155 | 417849.181 | 9673023.524 | 397.850 | 32 | -90 | 22.48 | 6.25 |
| DEX-CZ6156 | 417824.423 | 9673028.068 | 406.700 | 31 | -90 | 17 | 12 |
| DEX-CZ6157 | 417574.758 | 9673026.088 | 387.736 | 31 | -90 | 13.85 | 9 |
| DEX-CZ6158 | 417554.708 | 9673025.964 | 386.711 | 45 | -90 | 25.41 | 14 |
| DEX-CZ6159 | 417530.515 | 9673022.836 | 383.722 | 19 | -90 | 10.54 | 6 |
| DEX-CZ6160 | 417503.206 | 9673017.064 | 380.000 | 30 | -90 | 28.14 | 1 |
| DEX-CZ6161 | 417474.301 | 9673025.273 | 381.732 | 24 | -90 | 16 | 7 |
| DEX-CZ6162 | 417451.504 | 9673021.672 | 378.190 | 33 | -90 | 22.52 | 8 |
| DEX-CZ6163 | 417425.879 | 9673023.172 | 378.277 | 26 | -90 | 14 | 10 |
| DEX-CZ6164 | 417399.970 | 9673023.463 | 378.411 | 21 | -90 | 17 | 1 |
| DEX-CZ6165 | 417376.959 | 9673025.040 | 377.784 | 19 | -90 | 15.7 | 1.3 |
| DEX-CZ6166 | 417276.650 | 9673025.357 | 365.164 | 14 | -90 | 6 | 1 |
| DEX-CZ6167 | 417248.066 | 9673027.559 | 362.339 | 16 | -90 | 11 | 1 |
| DEX-CZ6168 | 417223.193 | 9673027.214 | 361.323 | 28 | -90 | 21.25 | 1 |
| DEX-CZ6169 | 417174.474 | 9673023.603 | 368.792 | 31 | -90 | 11 | 16 |
| DEX-CZ6170 | 417152.207 | 9673024.547 | 373.447 | 10 | -90 | 7 | 1 |
| DEX-CZ6171 | 417125.094 | 9673024.576 | 378.001 | 12 | -90 | 7 | 3 |
| DEX-CZ6172 | 417097.639 | 9673027.556 | 382.740 | 26 | -90 | 9 | 15.26 |
| DEX-CZ6173 | 417075.499 | 9673026.567 | 389.564 | 20 | -90 | 13.3 | 7.2 |
| DEX-CZ6174 | 417048.595 | 9673028.146 | 390.844 | 23 | -90 | 14.3 | 3 |
| DEX-CZ6175 | 417023.682 | 9673022.868 | 390.000 | 31 | -90 | 20.66 | 9.53 |
| DEX-CZ6176 | 416974.880 | 9673026.079 | 382.505 | 13 | -90 | 7 | 6 |
| DEX-CZ6177 | 416948.646 | 9673023.564 | 373.000 | 12 | -90 | 7 | 3 |
| DEX-CZ6178 | 416926.997 | 9673022.817 | 376.836 | 16 | -90 | 10 | 4.35 |
| DEX-CZ6179 | 416895.200 | 9673029.873 | 379.911 | 9 | -90 | 5 | 1 |
| DEX-CZ6180 | 416874.010 | 9673026.017 | 382.919 | 8 | -90 | 5 | 0 |
| DEX-CZ6181 | 416854.327 | 9673025.070 | 381.903 | 8 | -90 | 5 | 1 |
| DEX-CZ6182 | 416827.690 | 9673024.951 | 376.912 | 9 | -90 | 4 | 3 |
| DEX-CZ6183 | 416803.651 | 9673026.261 | 369.390 | 7 | -90 | 2 | 3 |
| DEX-CZ6184 | 416777.379 | 9673027.384 | 364.304 | 9 | -90 | 3 | 3 |
| DEX-CZ6185 | 418628.124 | 9672999.577 | 475.210 | 12 | -90 | 2.35 | 5.65 |
| DEX-CZ6186 | 418575.481 | 9672997.074 | 470.004 | 37 | -90 | 16.39 | 21 |
| DEX-CZ6187 | 418375.526 | 9672998.360 | 453.372 | 26 | -90 | 17.34 | 5 |
| DEX-CZ6188 | 418325.219 | 9672998.596 | 450.872 | 27 | -90 | 17.34 | 6 |
| DEX-CZ6189 | 418274.911 | 9673001.936 | 448.009 | 30 | -90 | 21 | 4 |
| DEX-CZ6190 | 418225.719 | 9672999.890 | 440.395 | 11 | -90 | 6.65 | 1.35 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9562 | 414869.040 | 9673548.685 | 343.047 | 30 | -90 | 3 | 21 |
| DEX-CZ9563 | 414924.996 | 9673549.238 | 329.410 | 11 | -90 | 5.26 | 0.74 |
| DEX-CZ9564 | 414872.051 | 9673525.489 | 339.379 | 14 | -90 | 3 | 7 |
| DEX-CZ9565 | 414901.754 | 9673526.251 | 332.148 | 28 | -90 | 5 | 18 |
| DEX-CZ9566 | 414921.444 | 9673524.392 | 327.640 | 16 | -90 | 13 | 0 |
| DEX-CZ9567 | 414947.801 | 9673524.907 | 322.769 | 24 | -90 | 9 | 13 |
| DEX-CZ9568 | 414970.232 | 9673522.213 | 323.580 | 12 | -90 | 4 | 4 |
| DEX-CZ9569 | 414871.539 | 9673502.738 | 340.018 | 31 | -90 | 7 | 20.81 |
| DEX-CZ9570 | 414920.619 | 9673500.801 | 324.588 | 33 | -90 | 21.46 | 2 |
| DEX-CZ9571 | 414974.942 | 9673503.089 | 319.855 | 13 | -90 | 9 | 1 |
| DEX-CZ9572 | 414771.893 | 9673477.188 | 357.539 | 24 | -90 | 17.3 | 4 |
| DEX-CZ9573 | 414796.751 | 9673481.376 | 357.402 | 32 | -90 | 11 | 16 |
| DEX-CZ9574 | 414823.309 | 9673480.692 | 353.179 | 14 | -90 | 6 | 5 |
| DEX-CZ9575 | 414848.558 | 9673478.833 | 347.012 | 23 | -90 | 9 | 10 |
| DEX-CZ9576 | 414872.785 | 9673478.419 | 340.435 | 32 | -90 | 10 | 18 |
| DEX-CZ9577 | 414900.406 | 9673476.764 | 332.041 | 30 | -90 | 15.64 | 10.21 |
| DEX-CZ9578 | 414921.837 | 9673477.826 | 324.569 | 38 | -90 | 14.55 | 22 |
| DEX-CZ9579 | 414944.885 | 9673478.610 | 318.289 | 30 | -90 | 15.24 | 14 |
| DEX-CZ9580 | 414974.945 | 9673478.435 | 314.420 | 33 | -90 | 16.29 | 15 |
| DEX-CZ9581 | 414998.170 | 9673475.178 | 312.579 | 27 | -90 | 11.27 | 13 |
| DEX-CZ9582 | 415020.391 | 9673474.286 | 311.844 | 16 | -90 | 10.28 | 3 |
| DEX-CZ9583 | 414771.303 | 9673451.370 | 351.612 | 25 | -90 | 9 | 13 |
| DEX-CZ9584 | 414823.427 | 9673453.197 | 348.384 | 32 | -90 | 12 | 17 |
| DEX-CZ9585 | 414867.542 | 9673454.316 | 339.113 | 23 | -90 | 12.21 | 3 |
| DEX-CZ9586 | 414921.339 | 9673452.995 | 323.284 | 28 | -90 | 15.62 | 10.87 |
| DEX-CZ9587 | 414972.390 | 9673446.550 | 311.334 | 30 | -90 | 13.21 | 14.67 |
| DEX-CZ9588 | 415023.083 | 9673450.605 | 308.990 | 24 | -90 | 10 | 12 |
| DEX-CZ9589 | 414646.560 | 9673427.231 | 305.861 | 16 | -90 | 5 | 9 |
| DEX-CZ9590 | 414667.354 | 9673419.291 | 309.288 | 14 | -90 | 6 | 3 |
| DEX-CZ9591 | 414774.889 | 9673423.891 | 343.879 | 29 | -90 | 16.33 | 10 |
| DEX-CZ9592 | 414797.269 | 9673427.370 | 342.609 | 37 | -90 | 12.23 | 22.26 |
| DEX-CZ9593 | 414818.931 | 9673425.057 | 340.780 | 24 | -90 | 13.55 | 5 |
| DEX-CZ9594 | 414848.685 | 9673428.153 | 339.609 | 25 | -90 | 15.47 | 7 |
| DEX-CZ9595 | 414871.778 | 9673427.699 | 333.761 | 33 | -90 | 7 | 14 |
| DEX-CZ9596 | 414895.455 | 9673427.126 | 327.571 | 20 | -90 | 12 | 5 |
| DEX-CZ9597 | 414922.710 | 9673423.662 | 318.117 | 24 | -90 | 15.29 | 6 |
| DEX-CZ9598 | 414947.471 | 9673423.410 | 310.139 | 22 | -90 | 10 | 4 |
| DEX-CZ9599 | 414973.354 | 9673429.003 | 309.346 | 34 | -90 | 20.32 | 12 |
| DEX-CZ9600 | 414997.096 | 9673429.431 | 308.168 | 27 | -90 | 23.05 | 1 |
| DEX-CZ9601 | 415023.211 | 9673422.274 | 304.722 | 20 | -90 | 11 | 6.83 |
| DEX-CZ9602 | 414672.434 | 9673398.154 | 310.889 | 17 | -90 | 13 | 2 |
| DEX-CZ9603 | 414769.731 | 9673398.308 | 336.313 | 24 | -90 | 12.35 | 6 |
| DEX-CZ9604 | 414822.832 | 9673400.780 | 333.508 | 37 | -90 | 15 | 2 |
| DEX-CZ9605 | 414868.559 | 9673396.583 | 326.291 | 32 | -90 | 20 | 6 |
| DEX-CZ9606 | 414920.320 | 9673400.982 | 314.460 | 21 | -90 | 15.59 | 1.59 |
| DEX-CZ9607 | 414976.251 | 9673399.375 | 305.708 | 22 | -90 | 12.47 | 7.55 |
| DEX-CZ9608 | 415023.261 | 9673403.290 | 304.040 | 33 | -90 | 15 | 16.93 |
| DEX-CZ9609 | 415072.033 | 9673398.349 | 302.481 | 5 | -90 | 2 | 0 |
| DEX-CZ9610 | 414671.426 | 9673373.044 | 314.089 | 31 | -90 | 21 | 7 |
| DEX-CZ9611 | 414695.070 | 9673377.936 | 320.988 | 19 | -90 | 10 | 3 |
| DEX-CZ9612 | 414747.337 | 9673376.420 | 330.662 | 34 | -90 | 22.77 | 7 |
| DEX-CZ9613 | 414769.980 | 9673371.042 | 328.407 | 28 | -90 | 15.5 | 10 |
| DEX-CZ9614 | 414793.556 | 9673369.785 | 326.850 | 31 | -90 | 21 | 5 |
| DEX-CZ9615 | 414819.493 | 9673376.946 | 327.155 | 33 | -90 | 17 | 8 |
| DEX-CZ9616 | 414848.313 | 9673375.848 | 322.993 | 36 | -90 | 17.81 | 14 |
| DEX-CZ9617 | 414869.038 | 9673371.028 | 319.523 | 33 | -90 | 13 | 16 |
| DEX-CZ9618 | 414896.788 | 9673375.265 | 314.687 | 30 | -90 | 14 | 6.76 |
| DEX-CZ9619 | 414922.386 | 9673379.879 | 309.142 | 27 | -90 | 20 | 4 |
| DEX-CZ9620 | 414947.106 | 9673373.163 | 303.352 | 28 | -90 | 20.42 | 4 |
| DEX-CZ9621 | 414970.572 | 9673374.561 | 302.699 | 20 | -90 | 14.93 | 4 |
| DEX-CZ9622 | 414998.935 | 9673376.218 | 302.531 | 27 | -90 | 14.28 | 12 |
| DEX-CZ9623 | 415016.465 | 9673376.598 | 302.007 | 20 | -90 | 11 | 6 |
| DEX-CZ9624 | 414717.844 | 9673351.395 | 329.000 | 12 | -90 | 3 | 6 |
| DEX-CZ9625 | 414772.295 | 9673350.297 | 326.207 | 21 | -90 | 9 | 9 |
| DEX-CZ9626 | 414820.190 | 9673351.929 | 318.493 | 32 | -90 | 22.52 | 1 |
| DEX-CZ9627 | 414877.746 | 9673352.221 | 312.350 | 33 | -90 | 12 | 10.6 |
| DEX-CZ9628 | 414920.886 | 9673349.642 | 302.693 | 16 | -90 | 13 | 1 |
| DEX-CZ9629 | 414972.755 | 9673344.741 | 299.854 | 19 | -90 | 9 | 6.5 |
| DEX-CZ9630 | 415220.481 | 9673347.133 | 348.000 | 15 | -90 | 1 | 10 |
| DEX-CZ9631 | 414699.646 | 9673327.072 | 327.450 | 7 | -90 | 4 | 1 |
| DEX-CZ9632 | 414722.137 | 9673323.040 | 327.528 | 16 | -90 | 7 | 5 |
| DEX-CZ9633 | 414745.015 | 9673327.070 | 326.255 | 29 | -90 | 12.54 | 13 |
| DEX-CZ9634 | 414773.639 | 9673324.997 | 324.492 | 26 | -90 | 6 | 14 |
| DEX-CZ9635 | 414798.918 | 9673324.859 | 322.491 | 23 | -90 | 13 | 7 |
| DEX-CZ9636 | 414823.085 | 9673324.404 | 316.853 | 34 | -90 | 18 | 9 |
| DEX-CZ9637 | 414847.089 | 9673327.848 | 310.558 | 25 | -90 | 13.33 | 5 |
| DEX-CZ9638 | 414871.179 | 9673326.040 | 306.734 | 38 | -90 | 13.31 | 18.98 |
| DEX-CZ9639 | 414897.939 | 9673330.459 | 303.552 | 21 | -90 | 15 | 3 |
| DEX-CZ9640 | 414920.067 | 9673324.949 | 299.813 | 19 | -90 | 15 | 2 |
| DEX-CZ9641 | 414949.142 | 9673323.744 | 298.445 | 20 | -90 | 15 | 4 |
| DEX-CZ9642 | 414970.767 | 9673327.603 | 298.150 | 19 | -90 | 13.45 | 4 |
| DEX-CZ9643 | 414749.547 | 9673297.330 | 321.617 | 34 | -90 | 11 | 23 |
| DEX-CZ9644 | 414773.239 | 9673295.634 | 320.900 | 21 | -90 | 11 | 7 |
| DEX-CZ9645 | 414795.656 | 9673296.805 | 319.616 | 19 | -90 | 7 | 7 |
| DEX-CZ9646 | 414822.248 | 9673298.464 | 315.478 | 21 | -90 | 16.3 | 2 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6191 | 418174.194 | 9672998.399 | 429.030 | 34 | -90 | 19 | 9 |
| DEX-CZ6192 | 418125.908 | 9672999.078 | 415.673 | 20 | -90 | 6 | 14 |
| DEX-CZ6193 | 418073.583 | 9672999.326 | 422.407 | 24 | -90 | 6 | 12 |
| DEX-CZ6194 | 418025.351 | 9673000.447 | 411.094 | 16 | -90 | 2 | 14 |
| DEX-CZ6195 | 417974.916 | 9672999.714 | 392.183 | 15 | -90 | 8.25 | 5 |
| DEX-CZ6196 | 417927.051 | 9673000.089 | 383.869 | 33 | -90 | 20.64 | 12 |
| DEX-CZ6197 | 417872.122 | 9673002.260 | 389.455 | 11 | -90 | 8 | 1 |
| DEX-CZ6198 | 417575.689 | 9673001.109 | 382.646 | 40 | -90 | 27.76 | 12 |
| DEX-CZ6199 | 417530.326 | 9672994.831 | 378.451 | 31 | -90 | 21.14 | 9 |
| DEX-CZ6200 | 417472.305 | 9672994.247 | 376.655 | 27 | -90 | 16.31 | 8 |
| DEX-CZ6201 | 417425.724 | 9672998.606 | 374.822 | 22 | -90 | 14 | 7 |
| DEX-CZ6202 | 417374.809 | 9673001.497 | 375.246 | 30 | -90 | 23 | 4 |
| DEX-CZ6203 | 417276.585 | 9672998.519 | 362.000 | 29 | -90 | 25 | 2 |
| DEX-CZ6204 | 417222.219 | 9673001.802 | 366.148 | 43 | -90 | 19 | 22 |
| DEX-CZ6205 | 417175.148 | 9672999.285 | 378.070 | 33 | -90 | 10 | 23 |
| DEX-CZ6206 | 417125.269 | 9672998.159 | 387.659 | 12 | -90 | 10.3 | 0 |
| DEX-CZ6207 | 417075.380 | 9673000.122 | 393.898 | 25 | -90 | 17.53 | 5 |
| DEX-CZ6208 | 417022.412 | 9672998.754 | 389.616 | 24 | -90 | 15.26 | 7.55 |
| DEX-CZ6209 | 416976.193 | 9673000.282 | 378.498 | 23 | -90 | 17.52 | 5.63 |
| DEX-CZ6210 | 416922.397 | 9672994.767 | 385.008 | 19 | -90 | 17.67 | 0 |
| DEX-CZ6211 | 416879.178 | 9672997.839 | 390.447 | 13 | -90 | 5 | 5.81 |
| DEX-CZ6212 | 416826.279 | 9673000.188 | 385.408 | 22 | -90 | 11 | 8 |
| DEX-CZ6213 | 416776.692 | 9672998.449 | 374.115 | 13 | -90 | 2 | 7 |
| DEX-CZ6214 | 418623.965 | 9672977.877 | 470.468 | 8 | -90 | 4 | 3 |
| DEX-CZ6215 | 418599.476 | 9672974.417 | 466.937 | 15 | -90 | 6 | 4 |
| DEX-CZ6217 | 418374.436 | 9672974.800 | 457.919 | 33 | -90 | 23.54 | 4 |
| DEX-CZ6218 | 418352.224 | 9672976.157 | 456.323 | 17 | -90 | 6 | 8.57 |
| DEX-CZ6219 | 418326.386 | 9672975.651 | 453.328 | 23 | -90 | 6 | 13 |
| DEX-CZ6220 | 418275.264 | 9672973.585 | 449.723 | 29 | -90 | 11 | 8 |
| DEX-CZ6221 | 418249.037 | 9672975.717 | 446.243 | 29 | -90 | 11 | 11 |
| DEX-CZ6222 | 418225.601 | 9672977.000 | 441.871 | 35 | -90 | 7 | 25 |
| DEX-CZ6223 | 418199.384 | 9672974.950 | 435.426 | 29 | -90 | 13 | 14 |
| DEX-CZ6224 | 418175.041 | 9672974.055 | 427.881 | 27 | -90 | 8 | 18 |
| DEX-CZ6225 | 418151.528 | 9672976.389 | 419.315 | 22 | -90 | 7 | 14 |
| DEX-CZ6226 | 418124.319 | 9672973.702 | 410.981 | 25 | -90 | 4 | 19 |
| DEX-CZ6227 | 418100.637 | 9672977.137 | 418.331 | 8 | -90 | 3 | 3 |
| DEX-CZ6228 | 418073.804 | 9672974.814 | 422.004 | 16 | -90 | 7 | 7 |
| DEX-CZ6229 | 418050.371 | 9672973.914 | 420.275 | 33 | -90 | 12.5 | 17.8 |
| DEX-CZ6230 | 418024.945 | 9672973.396 | 414.334 | 36 | -90 | 13.51 | 17.9 |
| DEX-CZ6231 | 417996.980 | 9672975.115 | 403.671 | 8 | -90 | 5 | 0 |
| DEX-CZ6232 | 417978.218 | 9672971.402 | 395.973 | 12 | -90 | 8.32 | 2 |
| DEX-CZ6233 | 417954.498 | 9672974.623 | 388.337 | 35 | -90 | 16.13 | 16 |
| DEX-CZ6234 | 417925.822 | 9672974.579 | 382.848 | 38 | -90 | 22.75 | 14.25 |
| DEX-CZ6235 | 417899.574 | 9672977.145 | 381.977 | 39 | -90 | 27.36 | 11 |
| DEX-CZ6236 | 417876.478 | 9672975.488 | 383.900 | 27 | -90 | 24.61 | 1 |
| DEX-CZ6237 | 417851.731 | 9672975.281 | 387.671 | 20 | -90 | 9 | 10.24 |
| DEX-CZ6238 | 417824.311 | 9672970.528 | 393.315 | 29 | -90 | 18.2 | 9.2 |
| DEX-CZ6239 | 417800.210 | 9672975.135 | 399.630 | 19 | -90 | 10 | 7 |
| DEX-CZ6240 | 417772.491 | 9672974.360 | 404.596 | 10 | -90 | 3 | 4 |
| DEX-CZ6241 | 417753.011 | 9672971.984 | 403.502 | 9 | -90 | 7 | 2 |
| DEX-CZ6242 | 417722.604 | 9672973.135 | 401.990 | 14 | -90 | 10 | 1 |
| DEX-CZ6243 | 417700.281 | 9672971.377 | 398.456 | 16 | -90 | 11 | 3 |
| DEX-CZ6244 | 417678.576 | 9672974.115 | 396.735 | 22 | -90 | 14 | 4 |
| DEX-CZ6245 | 417578.584 | 9672975.230 | 379.180 | 34 | -90 | 31.74 | 1 |
| DEX-CZ6246 | 417551.027 | 9672976.291 | 376.638 | 36 | -90 | 24.83 | 11 |
| DEX-CZ6247 | 417530.064 | 9672969.411 | 373.900 | 38 | -90 | 32.12 | 6 |
| DEX-CZ6248 | 417501.974 | 9672967.426 | 373.368 | 33 | -90 | 30 | 1 |
| DEX-CZ6249 | 417478.836 | 9672967.843 | 373.045 | 40 | -90 | 22.26 | 16 |
| DEX-CZ6250 | 417458.034 | 9672973.050 | 373.192 | 36 | -90 | 31.24 | 4 |
| DEX-CZ6251 | 417425.634 | 9672978.442 | 373.016 | 28 | -90 | 15 | 10 |
| DEX-CZ6252 | 417400.177 | 9672978.420 | 368.567 | 27 | -90 | 24 | 0 |
| DEX-CZ6253 | 417375.144 | 9672974.257 | 364.637 | 24 | -90 | 20.27 | 1 |
| DEX-CZ6254 | 417329.061 | 9672971.543 | 363.383 | 25 | -90 | 22.2 | 0 |
| DEX-CZ6255 | 417300.522 | 9672971.878 | 364.827 | 33 | -90 | 29.03 | 2 |
| DEX-CZ6256 | 417274.768 | 9672974.615 | 365.968 | 23 | -90 | 17 | 4 |
| DEX-CZ6257 | 417250.249 | 9672975.183 | 369.551 | 31 | -90 | 15 | 15 |
| DEX-CZ6258 | 417223.979 | 9672973.927 | 376.219 | 18 | -90 | 15.22 | 1 |
| DEX-CZ6259 | 417174.018 | 9672974.849 | 386.498 | 27 | -90 | 21.15 | 4 |
| DEX-CZ6260 | 417153.367 | 9672971.544 | 390.765 | 15 | -90 | 12.52 | 3 |
| DEX-CZ6261 | 417122.312 | 9672976.455 | 395.009 | 53 | -90 | 11.15 | 40 |
| DEX-CZ6262 | 417099.126 | 9672976.017 | 396.382 | 19 | -90 | 7 | 10 |
| DEX-CZ6263 | 417078.441 | 9672976.225 | 396.326 | 38 | -90 | 13.3 | 26.5 |
| DEX-CZ6264 | 417047.372 | 9672974.194 | 393.359 | 25 | -90 | 8 | 15 |
| DEX-CZ6265 | 417025.735 | 9672980.295 | 388.933 | 28 | -90 | 17.19 | 10.95 |
| DEX-CZ6266 | 416996.805 | 9672976.077 | 380.645 | 26 | -90 | 19.37 | 6 |
| DEX-CZ6267 | 416976.807 | 9672968.895 | 375.000 | 13 | -90 | 10 | 1 |
| DEX-CZ6268 | 416950.058 | 9672971.073 | 381.708 | 17 | -90 | 8 | 6.55 |
| DEX-CZ6269 | 416928.939 | 9672971.585 | 386.825 | 15 | -90 | 8 | 5 |
| DEX-CZ6270 | 416899.819 | 9672972.094 | 392.097 | 21 | -90 | 15.31 | 5.29 |
| DEX-CZ6271 | 416874.922 | 9672974.539 | 393.000 | 22 | -90 | 19.88 | 2 |
| DEX-CZ6272 | 416852.186 | 9672979.418 | 391.840 | 9 | -90 | 6.36 | 0 |
| DEX-CZ6273 | 416826.654 | 9672976.276 | 388.581 | 18 | -90 | 10.26 | 6 |
| DEX-CZ6274 | 416799.460 | 9672973.891 | 382.610 | 8 | -90 | 5 | 0 |
| DEX-CZ6275 | 416773.748 | 9672973.574 | 374.972 | 12 | -90 | 6 | 5 |
| DEX-CZ6276 | 418274.324 | 9672951.857 | 449.829 | 37 | -90 | 7 | 30 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9647 | 414850.068 | 9673303.017 | 309.088 | 23 | -90 | 13 | 4.85 |
| DEX-CZ9648 | 414874.078 | 9673298.614 | 304.236 | 33 | -90 | 16 | 5.65 |
| DEX-CZ9649 | 414897.546 | 9673299.489 | 301.472 | 30 | -90 | 15.43 | 10 |
| DEX-CZ9650 | 414920.189 | 9673299.081 | 298.868 | 33 | -90 | 16.63 | 14 |
| DEX-CZ9651 | 414944.223 | 9673302.448 | 297.518 | 23 | -90 | 16.25 | 5.37 |
| DEX-CZ9652 | 414973.507 | 9673306.341 | 295.000 | 15 | -90 | 12.37 | 1 |
| DEX-CZ9653 | 415028.390 | 9673300.978 | 304.245 | 23 | -90 | 6 | 14.57 |
| DEX-CZ9654 | 414719.259 | 9673277.406 | 318.624 | 30 | -90 | 21.26 | 6 |
| DEX-CZ9655 | 414746.475 | 9673277.986 | 319.048 | 28 | -90 | 12 | 15 |
| DEX-CZ9656 | 414770.414 | 9673277.512 | 317.483 | 25 | -90 | 14 | 9 |
| DEX-CZ9657 | 414823.811 | 9673277.670 | 312.347 | 22 | -90 | 18.42 | 2 |
| DEX-CZ9658 | 414873.022 | 9673275.300 | 303.963 | 26 | -90 | 13 | 5.7 |
| DEX-CZ9659 | 414895.998 | 9673278.428 | 300.993 | 16 | -90 | 13.33 | 1 |
| DEX-CZ9660 | 414918.032 | 9673276.040 | 298.406 | 28 | -90 | 16.49 | 11.46 |
| DEX-CZ9662 | 414980.365 | 9673280.012 | 296.723 | 18 | -90 | 10 | 6 |
| DEX-CZ9663 | 414997.834 | 9673279.898 | 299.000 | 18 | -90 | 7 | 9.46 |
| DEX-CZ9664 | 415020.353 | 9673272.904 | 301.857 | 17 | -90 | 9.37 | 5.77 |
| DEX-CZ9665 | 415046.835 | 9673274.204 | 309.967 | 20 | -90 | 7 | 9.7 |
| DEX-CZ9666 | 414751.096 | 9673254.472 | 316.259 | 26 | -90 | 13.37 | 9 |
| DEX-CZ9667 | 414770.380 | 9673251.147 | 314.171 | 33 | -90 | 13 | 16 |
| DEX-CZ9668 | 414795.396 | 9673253.516 | 311.441 | 24 | -90 | 13.47 | 6 |
| DEX-CZ9669 | 414820.756 | 9673252.787 | 308.761 | 19 | -90 | 13.25 | 3 |
| DEX-CZ9670 | 414873.751 | 9673253.555 | 300.385 | 27 | -90 | 12.97 | 7.08 |
| DEX-CZ9671R | 414895.334 | 9673256.569 | 299.732 | 19 | -90 | 13 | 3 |
| DEX-CZ9672 | 414925.463 | 9673251.850 | 296.517 | 11 | -90 | 5 | 4 |
| DEX-CZ9673 | 414948.716 | 9673255.480 | 295.906 | 17 | -90 | 7 | 6.58 |
| DEX-CZ9674 | 414969.101 | 9673252.926 | 297.977 | 20 | -90 | 10.65 | 5.83 |
| DEX-CZ9675 | 414996.168 | 9673254.256 | 298.511 | 21 | -90 | 15.83 | 4.43 |
| DEX-CZ9676 | 415024.717 | 9673250.862 | 300.937 | 18 | -90 | 11 | 3 |
| DEX-CZ9677 | 415074.946 | 9673251.836 | 308.859 | 21 | -90 | 7 | 6.8 |
| DEX-CZ9678 | 415120.513 | 9673248.362 | 315.262 | 23 | -90 | 12.33 | 9.45 |
| DEX-CZ9679 | 415172.241 | 9673249.747 | 319.729 | 25 | -90 | 17.15 | 5.6 |
| DEX-CZ9680 | 415220.218 | 9673253.172 | 323.237 | 35 | -90 | 13.02 | 8 |
| DEX-CZ9681 | 415272.738 | 9673250.432 | 323.135 | 22 | -90 | 15 | 3 |
| DEX-CZ9682 | 415297.640 | 9673248.795 | 320.276 | 30 | -90 | 16.85 | 6 |
| DEX-CZ9683 | 415320.458 | 9673248.217 | 319.752 | 43 | -90 | 35.28 | 7 |
| DEX-CZ9684 | 415370.343 | 9673253.322 | 327.605 | 36 | -90 | 26.78 | 10 |
| DEX-CZ9685 | 415420.451 | 9673250.375 | 343.127 | 21 | -90 | 14.72 | 5.35 |
| DEX-CZ9686 | 414751.356 | 9673227.889 | 314.214 | 27 | -90 | 17.3 | 6 |
| DEX-CZ9687 | 414773.197 | 9673229.085 | 312.262 | 22 | -90 | 17.32 | 2 |
| DEX-CZ9688 | 414874.990 | 9673229.418 | 297.533 | 22 | -90 | 8 | 10.08 |
| DEX-CZ9689 | 414897.941 | 9673228.936 | 297.000 | 17 | -90 | 8 | 2.4 |
| DEX-CZ9691 | 414946.837 | 9673222.288 | 297.000 | 16 | -90 | 5 | 6 |
| DEX-CZ9692 | 414969.972 | 9673226.152 | 297.000 | 16 | -90 | 7.35 | 5.45 |
| DEX-CZ9693 | 414998.960 | 9673228.491 | 298.000 | 19 | -90 | 14.26 | 4 |
| DEX-CZ9694 | 415021.525 | 9673229.029 | 299.241 | 18 | -90 | 12.53 | 1.89 |
| DEX-CZ9695 | 415049.190 | 9673229.068 | 302.784 | 20 | -90 | 16.54 | 2 |
| DEX-CZ9696 | 415073.845 | 9673225.171 | 304.269 | 16 | -90 | 12.87 | 1 |
| DEX-CZ9697 | 415094.525 | 9673224.339 | 306.445 | 20 | -90 | 11.35 | 7 |
| DEX-CZ9698 | 415122.683 | 9673228.597 | 310.070 | 26 | -90 | 16.92 | 6 |
| DEX-CZ9699 | 415144.792 | 9673227.016 | 310.797 | 32 | -90 | 22.36 | 7 |
| DEX-CZ9700 | 415171.844 | 9673227.024 | 313.692 | 27 | -90 | 24.72 | 1 |
| DEX-CZ9701 | 415197.687 | 9673228.656 | 315.572 | 23 | -90 | 14.35 | 6 |
| DEX-CZ9702 | 415223.106 | 9673227.909 | 317.369 | 31 | -90 | 15.76 | 14 |
| DEX-CZ9703 | 415246.452 | 9673227.349 | 318.456 | 36 | -90 | 20.98 | 15.3 |
| DEX-CZ9704 | 415272.641 | 9673230.297 | 317.673 | 32 | -90 | 18.14 | 13.85 |
| DEX-CZ9705 | 415295.637 | 9673230.034 | 317.473 | 35 | -90 | 21.02 | 13 |
| DEX-CZ9706 | 415322.421 | 9673228.018 | 318.892 | 31 | -90 | 29.11 | 2 |
| DEX-CZ9707 | 415346.091 | 9673224.408 | 320.812 | 28 | -90 | 16.4 | 9.5 |
| DEX-CZ9708 | 415369.849 | 9673227.565 | 326.144 | 25 | -90 | 18.26 | 4 |
| DEX-CZ9709 | 415395.914 | 9673226.624 | 333.988 | 25 | -90 | 13.45 | 10 |
| DEX-CZ9710 | 415418.199 | 9673228.673 | 341.933 | 44 | -90 | 16 | 13 |
| DEX-CZ9737 | 414329.726 | 9673798.414 | 327.555 | 28 | -90 | 8 | 14 |
| DEX-CZ9738 | 414054.644 | 9673692.072 | 298.837 | 18 | -90 | 12.65 | 2.32 |
| DEX-CZ9739 | 414155.823 | 9673706.972 | 299.739 | 17 | -90 | 9 | 4 |
| DEX-CZ9740 | 414259.623 | 9673702.291 | 310.283 | 27 | -90 | 20 | 4 |
| DEX-CZ9741 | 414357.593 | 9673711.569 | 321.364 | 21 | -90 | 12.21 | 3 |
| DEX-CZ9742 | 414061.021 | 9673650.927 | 306.619 | 28 | -90 | 19.28 | 7 |
| DEX-CZ9743 | 414110.357 | 9673653.702 | 314.623 | 31 | -90 | 21.33 | 6 |
| DEX-CZ9744 | 414158.717 | 9673652.000 | 315.657 | 31 | -90 | 12 | 16 |
| DEX-CZ9745 | 414251.412 | 9673652.708 | 302.620 | 46 | -90 | 17 | 14 |
| DEX-CZ9746 | 414058.886 | 9673600.865 | 317.744 | 24 | -90 | 20.6 | 2 |
| DEX-CZ9747 | 414156.321 | 9673598.276 | 325.000 | 12 | -90 | 4 | 6 |
| DEX-CZ9748 | 414106.429 | 9673563.515 | 319.886 | 14 | -90 | 3 | 6.66 |
| DEX-CZ9749 | 414220.372 | 9673465.600 | 287.940 | 18 | -90 | 5 | 10 |
| DEX-CZ9750 | 414406.032 | 9673458.147 | 293.170 | 29 | -90 | 7 | 20.33 |
| DEX-CZ9751 | 414155.575 | 9673150.027 | 266.007 | 24 | -90 | 2 | 12.2 |
| DEX-CZ9752 | 414253.790 | 9673154.394 | 279.756 | 22 | -90 | 7 | 13 |
| DEX-CZ9753 | 414296.492 | 9673154.830 | 271.343 | 24 | -90 | 12 | 9 |
| DEX-CZ9754 | 414556.093 | 9673159.022 | 296.739 | 18 | -90 | 3 | 13 |
| DEX-CZ9755 | 414162.249 | 9673109.137 | 275.059 | 15 | -90 | 2 | 7 |
| DEX-CZ9756 | 414212.353 | 9673098.139 | 287.075 | 11 | -90 | 2 | 4 |
| DEX-CZ9757 | 414113.870 | 9673050.910 | 286.935 | 21 | -90 | 17 | 1.69 |
| DEX-CZ9758 | 414153.968 | 9673053.167 | 290.000 | 15 | -90 | 2 | 10 |
| DEX-CZ9759 | 414200.299 | 9673054.703 | 288.471 | 22 | -90 | 4 | 10 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6277 | 418226.191 | 9672957.647 | 442.839 | 15 | -90 | 10 | 4.7 |
| DEX-CZ6278 | 418174.174 | 9672950.333 | 426.192 | 30 | -90 | 11 | 13 |
| DEX-CZ6279 | 418124.320 | 9672949.875 | 406.713 | 15 | -90 | 9 | 4 |
| DEX-CZ6280 | 418075.832 | 9672950.722 | 417.990 | 39 | -90 | 4 | 30 |
| DEX-CZ6281 | 418025.214 | 9672949.760 | 412.081 | 26 | -90 | 10.12 | 13.4 |
| DEX-CZ6282 | 417967.635 | 9672949.184 | 392.862 | 33 | -90 | 10.48 | 21 |
| DEX-CZ6283 | 417924.864 | 9672949.093 | 383.317 | 41 | -90 | 26.05 | 14 |
| DEX-CZ6284 | 417874.022 | 9672951.593 | 380.922 | 38 | -90 | 26.12 | 6.22 |
| DEX-CZ6285 | 417823.714 | 9672950.925 | 388.421 | 26 | -90 | 13 | 11 |
| DEX-CZ6286 | 417777.526 | 9672952.483 | 394.469 | 12 | -90 | 7 | 2.45 |
| DEX-CZ6287 | 417722.473 | 9672948.441 | 394.714 | 39 | -90 | 34.85 | 5 |
| DEX-CZ6288 | 417675.509 | 9672947.522 | 391.201 | 23 | -90 | 14.23 | 7 |
| DEX-CZ6289 | 417575.423 | 9672945.613 | 375.467 | 26 | -90 | 24.22 | 1.48 |
| DEX-CZ6290 | 417527.660 | 9672948.021 | 371.414 | 27 | -90 | 19.45 | 6.65 |
| DEX-CZ6291 | 417473.992 | 9672948.388 | 369.397 | 21 | -90 | 19.24 | 0 |
| DEX-CZ6292 | 417425.910 | 9672951.970 | 366.060 | 39 | -90 | 19 | 14 |
| DEX-CZ6293 | 417374.073 | 9672949.381 | 364.000 | 22 | -90 | 18 | 2 |
| DEX-CZ6294 | 417326.556 | 9672950.273 | 368.119 | 31 | -90 | 28.2 | 1 |
| DEX-CZ6295 | 417274.550 | 9672948.263 | 372.616 | 44 | -90 | 19.46 | 24.55 |
| DEX-CZ6296 | 417222.708 | 9672948.299 | 385.700 | 15 | -90 | 12 | 0 |
| DEX-CZ6297 | 417173.677 | 9672946.492 | 393.231 | 23 | -90 | 13.66 | 10 |
| DEX-CZ6298 | 417125.396 | 9672947.063 | 398.512 | 30 | -90 | 12 | 16 |
| DEX-CZ6299 | 417074.265 | 9672948.120 | 397.390 | 14 | -90 | 8 | 4 |
| DEX-CZ6300 | 417027.285 | 9672949.627 | 387.457 | 33 | -90 | 12 | 18 |
| DEX-CZ6301 | 416973.919 | 9672950.122 | 379.494 | 30 | -90 | 26.97 | 2 |
| DEX-CZ6302 | 416923.461 | 9672948.457 | 391.260 | 10 | -90 | 6.5 | 1.5 |
| DEX-CZ6303 | 416875.856 | 9672950.521 | 392.550 | 15 | -90 | 7 | 4 |
| DEX-CZ6304 | 418274.848 | 9672925.488 | 446.887 | 30 | -90 | 9 | 21 |
| DEX-CZ6305 | 418251.316 | 9672926.061 | 443.441 | 33 | -90 | 10 | 22 |
| DEX-CZ6306 | 418227.004 | 9672927.008 | 437.910 | 19 | -90 | 7 | 11 |
| DEX-CZ6307 | 418199.252 | 9672926.023 | 431.054 | 16 | -90 | 13 | 1 |
| DEX-CZ6308 | 418175.783 | 9672924.403 | 422.410 | 11 | -90 | 3 | 8 |
| DEX-CZ6309 | 418148.179 | 9672924.884 | 410.716 | 21 | -90 | 11 | 4 |
| DEX-CZ6310 | 418124.413 | 9672926.078 | 402.690 | 44 | -90 | 17.3 | 23.49 |
| DEX-CZ6311 | 418105.682 | 9672925.892 | 404.210 | 27 | -90 | 4 | 10 |
| DEX-CZ6312 | 418076.325 | 9672923.015 | 411.373 | 26 | -90 | 7 | 12 |
| DEX-CZ6313 | 418052.020 | 9672922.428 | 413.311 | 36 | -90 | 10 | 21 |
| DEX-CZ6314 | 418025.072 | 9672925.007 | 409.257 | 28 | -90 | 7 | 20 |
| DEX-CZ6315 | 418001.423 | 9672925.549 | 401.566 | 26 | -90 | 9 | 15.22 |
| DEX-CZ6316 | 417974.830 | 9672924.914 | 394.015 | 22 | -90 | 7 | 12 |
| DEX-CZ6317 | 417949.518 | 9672925.932 | 388.157 | 21 | -90 | 8.23 | 11 |
| DEX-CZ6318 | 417926.441 | 9672925.267 | 384.130 | 49 | -90 | 19.71 | 26 |
| DEX-CZ6319 | 417901.011 | 9672925.012 | 380.337 | 47 | -90 | 24.46 | 22 |
| DEX-CZ6320 | 417873.519 | 9672926.116 | 378.271 | 26 | -90 | 21 | 2.4 |
| DEX-CZ6321 | 417849.037 | 9672923.615 | 377.749 | 35 | -90 | 26.22 | 5 |
| DEX-CZ6322 | 417825.010 | 9672926.816 | 381.005 | 27 | -90 | 19 | 6 |
| DEX-CZ6323 | 417801.576 | 9672925.689 | 383.161 | 20 | -90 | 14 | 4 |
| DEX-CZ6324 | 417776.312 | 9672930.580 | 386.919 | 22 | -90 | 17.53 | 4.4 |
| DEX-CZ6325 | 417751.131 | 9672927.147 | 387.382 | 33 | -90 | 16.35 | 9 |
| DEX-CZ6326 | 417720.410 | 9672925.676 | 387.931 | 25 | -90 | 20.27 | 2 |
| DEX-CZ6327 | 417701.022 | 9672926.899 | 388.365 | 32 | -90 | 27.01 | 7.35 |
| DEX-CZ6328 | 417675.285 | 9672923.117 | 385.198 | 28 | -90 | 21.4 | 5 |
| DEX-CZ6329 | 417650.134 | 9672925.235 | 382.051 | 27 | -90 | 19.58 | 6 |
| DEX-CZ6330 | 417629.796 | 9672926.935 | 380.324 | 28 | -90 | 16.28 | 10 |
| DEX-CZ6331 | 417603.911 | 9672929.670 | 378.229 | 33 | -90 | 24.57 | 7 |
| DEX-CZ6332 | 417573.900 | 9672926.433 | 374.595 | 45 | -90 | 26 | 17 |
| DEX-CZ6333 | 417549.727 | 9672926.750 | 371.699 | 24 | -90 | 14.5 | 8 |
| DEX-CZ6334 | 417527.675 | 9672926.954 | 370.906 | 26 | -90 | 23.25 | 1 |
| DEX-CZ6335 | 417499.154 | 9672924.405 | 367.471 | 33 | -90 | 31.06 | 2 |
| DEX-CZ6336 | 417477.691 | 9672922.922 | 366.500 | 23 | -90 | 14 | 6 |
| DEX-CZ6337 | 417450.541 | 9672926.198 | 365.000 | 24 | -90 | 19.98 | 3 |
| DEX-CZ6338 | 417423.314 | 9672926.899 | 364.000 | 34 | -90 | 30.58 | 3 |
| DEX-CZ6339 | 417400.270 | 9672923.722 | 366.307 | 37 | -90 | 20.06 | 16 |
| DEX-CZ6340 | 417374.200 | 9672921.664 | 373.021 | 13 | -90 | 10 | 1 |
| DEX-CZ6341 | 417325.766 | 9672927.404 | 373.226 | 21 | -90 | 16 | 3 |
| DEX-CZ6342 | 417300.662 | 9672927.980 | 377.121 | 15 | -90 | 12 | 1.25 |
| DEX-CZ6343 | 417274.379 | 9672925.642 | 379.311 | 17 | -90 | 14 | 1.35 |
| DEX-CZ6344 | 417254.493 | 9672926.609 | 383.583 | 16 | -90 | 9 | 5 |
| DEX-CZ6345 | 417229.943 | 9672925.685 | 389.318 | 32 | -90 | 24.23 | 6 |
| DEX-CZ6346 | 417198.464 | 9672924.227 | 393.612 | 27 | -90 | 8 | 17 |
| DEX-CZ6347 | 417175.114 | 9672925.761 | 396.672 | 19 | -90 | 11 | 6 |
| DEX-CZ6348 | 417145.570 | 9672925.696 | 399.664 | 24 | -90 | 17.24 | 5 |
| DEX-CZ6349 | 417126.837 | 9672921.958 | 400.121 | 36 | -90 | 22 | 11 |
| DEX-CZ6350 | 417024.949 | 9672923.583 | 379.980 | 28 | -90 | 19.83 | 8.02 |
| DEX-CZ6351 | 417004.585 | 9672926.638 | 376.000 | 23 | -90 | 13 | 9 |
| DEX-CZ6352 | 416974.784 | 9672924.763 | 384.241 | 23 | -90 | 7 | 13.75 |
| DEX-CZ6353 | 416950.718 | 9672924.994 | 387.457 | 15 | -90 | 8 | 5 |
| DEX-CZ6354 | 416924.427 | 9672923.992 | 391.133 | 18 | -90 | 7 | 9 |
| DEX-CZ6355 | 416900.728 | 9672923.646 | 391.651 | 20 | -90 | 9 | 7 |
| DEX-CZ6356 | 416877.485 | 9672926.176 | 388.431 | 25 | -90 | 12.62 | 4 |
| DEX-CZ6357 | 418074.487 | 9672899.152 | 405.558 | 17 | -90 | 10 | 5 |
| DEX-CZ6358 | 418025.951 | 9672902.762 | 408.568 | 23 | -90 | 7.27 | 13 |
| DEX-CZ6359 | 417974.852 | 9672899.359 | 395.164 | 11 | -90 | 4 | 4 |
| DEX-CZ6360 | 417923.732 | 9672901.163 | 383.352 | 26 | -90 | 21.85 | 2 |
| DEX-CZ6361 | 417876.974 | 9672899.210 | 378.251 | 32 | -90 | 25.41 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9760 | 414247.573 | 9673055.563 | 283.975 | 36 | -90 | 22.01 | 12 |
| DEX-CZ9764 | 414156.731 | 9673560.816 | 321.720 | 10 | -90 | 3 | 2 |
| DEX-CZ9765 | 414211.065 | 9673556.402 | 307.231 | 12 | -90 | 4.65 | 5.35 |
| DEX-CZ9766 | 414266.441 | 9673552.642 | 284.139 | 18 | -90 | 4 | 12 |
| DEX-CZ9767 | 414256.623 | 9673505.120 | 282.809 | 18 | -90 | 13 | 3 |
| DEX-CZ9768 | 414257.387 | 9673406.898 | 264.818 | 9 | -90 | 5 | 2 |
| DEX-CZ9769 | 414160.622 | 9673508.368 | 311.781 | 35 | -90 | 13.43 | 19 |
| DEX-CZ9771 | 414073.434 | 9673358.843 | 286.812 | 22 | -90 | 3 | 12.64 |
| DEX-CZ9772 | 414115.164 | 9673353.303 | 287.057 | 16 | -90 | 2 | 2 |
| DEX-CZ9773 | 414156.489 | 9673354.844 | 277.341 | 30 | -90 | 6 | 17 |
| DEX-CZ9774 | 414210.800 | 9673358.285 | 270.098 | 20 | -90 | 15.23 | 3.35 |
| DEX-CZ9775 | 414264.872 | 9673353.179 | 268.525 | 24 | -90 | 17 | 4.35 |
| DEX-CZ9776 | 414355.781 | 9673458.743 | 277.587 | 19 | -90 | 4 | 13 |
| DEX-CZ9777 | 414463.143 | 9673463.339 | 296.101 | 17 | -90 | 11.23 | 2.87 |
| DEX-CZ9778 | 414360.510 | 9673500.746 | 280.241 | 13 | -90 | 3 | 8 |
| DEX-CZ9779 | 414354.814 | 9673558.845 | 295.002 | 14 | -90 | 4 | 5 |
| DEX-CZ9780 | 414410.554 | 9673547.180 | 299.010 | 27 | -90 | 8 | 17 |
| DEX-CZ9781 | 414458.631 | 9673562.119 | 307.392 | 13 | -90 | 8 | 2 |
| DEX-CZ9782 | 414463.673 | 9673511.040 | 302.646 | 25 | -90 | 8 | 13 |
| DEX-CZ9783 | 414362.805 | 9673411.356 | 287.623 | 30 | -90 | 16 | 12 |
| DEX-CZ9784 | 414358.771 | 9673355.784 | 280.942 | 28 | -90 | 15.37 | 11.38 |
| DEX-CZ9785 | 414357.596 | 9673310.208 | 270.126 | 27 | -90 | 14 | 11 |
| DEX-CZ9786 | 414362.630 | 9673256.942 | 260.342 | 15 | -90 | 6 | 6 |
| DEX-CZ9787 | 414404.784 | 9673245.535 | 260.667 | 18 | -90 | 6 | 6 |
| DEX-CZ9788 | 414465.211 | 9673253.724 | 268.748 | 21 | -90 | 13 | 6 |
| DEX-CZ9789 | 414447.422 | 9673305.976 | 272.072 | 20 | -90 | 13 | 3 |
| DEX-CZ9790 | 414452.311 | 9673410.835 | 292.225 | 29 | -90 | 17.25 | 10.09 |
| DEX-CZ9791 | 414456.935 | 9673359.612 | 283.902 | 22 | -90 | 9 | 9.87 |
| DEX-CZ9792 | 414548.886 | 9673194.727 | 295.262 | 24 | -90 | 13 | 7 |
| DEX-CZ9793 | 414652.919 | 9673207.200 | 312.156 | 12 | -90 | 8 | 0 |
| DEX-CZ9794 | 414010.883 | 9673657.953 | 308.137 | 22 | -90 | 11.55 | 9.16 |
| DEX-CZ9795 | 413963.192 | 9673652.703 | 304.508 | 28 | -90 | 15.89 | 10.22 |
| DEX-CZ9796 | 413964.977 | 9673602.569 | 313.149 | 22 | -90 | 8 | 12.41 |
| DEX-CZ9798 | 414008.582 | 9673570.405 | 316.998 | 18 | -90 | 8 | 6.29 |
| DEX-CZ9799 | 414055.452 | 9673568.479 | 316.910 | 33 | -90 | 6 | 19.8 |
| DEX-CZ9800 | 414216.036 | 9673610.193 | 310.437 | 19 | -90 | 5 | 12 |
| DEX-CZ9801 | 414260.124 | 9673609.970 | 293.499 | 14 | -90 | 5 | 4 |
| DEX-CZ9802 | 414064.651 | 9673056.803 | 279.295 | 16 | -90 | 4 | 7 |
| DEX-CZ9804 | 414056.362 | 9672949.372 | 285.499 | 10 | -90 | 1.72 | 6.28 |
| DEX-CZ9805 | 414066.684 | 9672903.967 | 287.159 | 15 | -90 | 3 | 8 |
| DEX-CZ9806 | 414259.991 | 9672794.065 | 256.924 | 22 | -90 | 16 | 3 |
| DEX-CZ9807 | 414154.442 | 9673004.393 | 286.261 | 30 | -90 | 11 | 15.44 |
| DEX-CZ9808 | 414099.656 | 9672952.813 | 290.923 | 14 | -90 | 6 | 6 |
| DEX-CZ9809 | 414195.826 | 9672953.357 | 286.800 | 33 | -90 | 17 | 14 |
| DEX-CZ9810 | 414158.067 | 9672916.048 | 287.503 | 23 | -90 | 19 | 2 |
| DEX-CZ9811 | 414248.257 | 9672907.049 | 280.462 | 23 | -90 | 10 | 9 |
| DEX-CZ9812 | 414258.545 | 9672955.015 | 283.464 | 25 | -90 | 8 | 13 |
| DEX-CZ9813 | 414301.151 | 9672952.347 | 279.440 | 26 | -90 | 19 | 5 |
| DEX-CZ9814 | 414350.365 | 9672902.999 | 276.000 | 22 | -90 | 9 | 9 |
| DEX-CZ9815 | 414607.888 | 9673159.487 | 312.504 | 12 | -90 | 7 | 1 |
| DEX-CZ9816 | 414685.023 | 9673160.348 | 329.705 | 16 | -90 | 6 | 6 |
| DEX-CZ9817 | 414726.348 | 9673150.892 | 328.698 | 14 | -90 | 7 | 4 |
| DEX-CZ9818 | 414778.490 | 9673155.488 | 319.066 | 23 | -90 | 7 | 7 |
| DEX-CZ9819 | 414880.045 | 9673158.528 | 294.708 | 23 | -90 | 6 | 9 |
| DEX-CZ9820 | 414933.163 | 9673155.318 | 296.211 | 11 | -90 | 6 | 2 |
| DEX-CZ9822 | 415181.889 | 9673152.866 | 311.194 | 31 | -90 | 23.46 | 7.32 |
| DEX-CZ9823 | 415227.317 | 9673150.279 | 315.007 | 32 | -90 | 21.79 | 6.51 |
| DEX-CZ9824 | 415281.119 | 9673156.770 | 318.653 | 40 | -90 | 26.1 | 14.22 |
| DEX-CZ9825 | 415333.381 | 9673158.372 | 323.331 | 37 | -90 | 24.87 | 10.55 |
| DEX-CZ9826 | 415386.604 | 9673153.997 | 329.093 | 41 | -90 | 28.28 | 9 |
| DEX-CZ9827 | 415429.492 | 9673155.418 | 342.244 | 36 | -90 | 15.56 | 19.35 |
| DEX-CZ9828 | 414686.221 | 9673109.516 | 322.376 | 16 | -90 | 8 | 5 |
| DEX-CZ9829 | 414726.125 | 9673105.016 | 325.279 | 24 | -90 | 6 | 13 |
| DEX-CZ9830 | 415179.535 | 9673125.340 | 319.770 | 19 | -90 | 9 | 7 |
| DEX-CZ9831 | 415229.681 | 9673116.818 | 326.430 | 21 | -90 | 15 | 4 |
| DEX-CZ9832 | 415260.722 | 9673122.153 | 327.484 | 19 | -90 | 12 | 2 |
| DEX-CZ9833 | 415287.178 | 9673108.738 | 336.367 | 16 | -90 | 11 | 1 |
| DEX-CZ9834 | 415319.617 | 9673119.338 | 335.235 | 23 | -90 | 13 | 6 |
| DEX-CZ9835 | 415381.763 | 9673123.002 | 337.511 | 23 | -90 | 14 | 4.25 |
| DEX-CZ9836 | 415429.393 | 9673119.516 | 340.168 | 35 | -90 | 33.99 | 0.43 |
| DEX-CZ9837 | 415482.813 | 9673122.823 | 354.832 | 39 | -90 | 21.77 | 16.74 |
| DEX-CZ9838 | 415523.609 | 9673121.699 | 357.420 | 49 | -90 | 24.21 | 19 |
| DEX-CZ9840 | 414682.241 | 9673058.145 | 308.792 | 27 | -90 | 16.15 | 6.96 |
| DEX-CZ9841 | 414930.801 | 9673074.050 | 304.853 | 19 | -90 | 7 | 6.75 |
| DEX-CZ9842 | 414982.211 | 9673063.215 | 311.743 | 22 | -90 | 4 | 11 |
| DEX-CZ9843 | 415232.589 | 9673061.487 | 344.375 | 32 | -90 | 15 | 10 |
| DEX-CZ9844 | 415278.261 | 9673064.376 | 350.338 | 11 | -90 | 6 | 2 |
| DEX-CZ9845 | 414937.137 | 9673028.210 | 306.041 | 21 | -90 | 15.42 | 2 |
| DEX-CZ9846 | 414991.154 | 9673025.405 | 308.036 | 26 | -90 | 11 | 8 |
| DEX-CZ9847 | 415036.525 | 9673024.601 | 307.697 | 32 | -90 | 15 | 13 |
| DEX-CZ9848 | 415081.148 | 9673017.321 | 318.033 | 24 | -90 | 19.91 | 2.59 |
| DEX-CZ9849 | 415116.730 | 9673017.910 | 327.294 | 32 | -90 | 28.83 | 2.3 |
| DEX-CZ9850 | 415133.741 | 9673022.723 | 330.694 | 25 | -90 | 15.98 | 8.52 |
| DEX-CZ9851 | 415160.283 | 9673020.577 | 337.119 | 22 | -90 | 16.31 | 5.41 |
| DEX-CZ9852 | 415179.391 | 9673018.455 | 341.178 | 22 | -90 | 13.32 | 4.68 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6362 | 417822.462 | 9672900.347 | 376.429 | 39 | -90 | 27.82 | 11 |
| DEX-CZ6363 | 417673.925 | 9672896.072 | 378.548 | 35 | -90 | 23.14 | 11 |
| DEX-CZ6364 | 417623.497 | 9672902.078 | 375.030 | 30 | -90 | 14.97 | 14 |
| DEX-CZ6365 | 417579.639 | 9672899.798 | 373.082 | 33 | -90 | 28.53 | 3 |
| DEX-CZ6366 | 417276.594 | 9672898.074 | 390.053 | 23 | -90 | 13 | 9 |
| DEX-CZ6367 | 417225.979 | 9672899.477 | 395.800 | 19 | -90 | 17.9 | 1 |
| DEX-CZ6368 | 417174.391 | 9672896.354 | 400.719 | 20 | -90 | 11 | 8 |
| DEX-CZ6369 | 417126.241 | 9672895.461 | 400.548 | 25 | -90 | 17 | 6 |
| DEX-CZ6370 | 417423.646 | 9672898.106 | 368.927 | 42 | -90 | 19.05 | 20.3 |
| DEX-CZ6371 | 417371.620 | 9672901.032 | 379.543 | 28 | -90 | 19 | 7 |
| DEX-CZ6372 | 418174.594 | 9672875.108 | 408.431 | 32 | -90 | 20.48 | 8 |
| DEX-CZ6373 | 418153.989 | 9672873.901 | 400.576 | 27 | -90 | 18 | 7 |
| DEX-CZ6374 | 418125.850 | 9672876.066 | 391.887 | 20 | -90 | 12 | 8 |
| DEX-CZ6375 | 418102.556 | 9672876.102 | 392.714 | 6 | -90 | 4 | 0 |
| DEX-CZ6376 | 418074.740 | 9672874.237 | 401.568 | 22 | -90 | 4 | 11 |
| DEX-CZ6377 | 418050.444 | 9672875.777 | 407.142 | 25 | -90 | 10 | 12.57 |
| DEX-CZ6378 | 418023.192 | 9672875.233 | 406.103 | 21 | -90 | 15 | 1 |
| DEX-CZ6379 | 417999.231 | 9672875.989 | 403.196 | 12 | -90 | 5 | 5 |
| DEX-CZ6380 | 417974.558 | 9672875.754 | 395.543 | 17 | -90 | 6 | 11 |
| DEX-CZ6381 | 417952.828 | 9672874.526 | 389.361 | 22 | -90 | 10 | 6 |
| DEX-CZ6382 | 417924.288 | 9672874.807 | 382.721 | 16 | -90 | 9 | 6 |
| DEX-CZ6383 | 417901.696 | 9672875.485 | 379.670 | 43 | -90 | 17.56 | 23 |
| DEX-CZ6384 | 417875.111 | 9672875.841 | 377.288 | 34 | -90 | 21.4 | 12 |
| DEX-CZ6385 | 417852.451 | 9672872.501 | 375.458 | 36 | -90 | 25.79 | 13 |
| DEX-CZ6386 | 417827.063 | 9672874.111 | 374.594 | 39 | -90 | 31.14 | 8 |
| DEX-CZ6387 | 417798.910 | 9672876.082 | 373.442 | 26 | -90 | 19.95 | 5 |
| DEX-CZ6388 | 417773.401 | 9672873.675 | 373.129 | 42 | -90 | 23.87 | 17 |
| DEX-CZ6389 | 417749.064 | 9672874.461 | 374.802 | 40 | -90 | 25.28 | 14 |
| DEX-CZ6390 | 417725.985 | 9672873.254 | 374.171 | 44 | -90 | 33.15 | 6 |
| DEX-CZ6391 | 417700.636 | 9672874.619 | 374.271 | 40 | -90 | 38.69 | 1.6 |
| DEX-CZ6392 | 417677.089 | 9672874.007 | 374.296 | 60 | -90 | 58.88 | 3 |
| DEX-CZ6393 | 417652.761 | 9672874.290 | 371.893 | 33 | -90 | 29.78 | 3.4 |
| DEX-CZ6394 | 417620.685 | 9672877.687 | 371.160 | 29 | -90 | 17.3 | 10 |
| DEX-CZ6395 | 417598.978 | 9672877.362 | 370.299 | 42 | -90 | 40.33 | 1.6 |
| DEX-CZ6396 | 417572.139 | 9672871.289 | 366.005 | 39 | -90 | 17 | 20.88 |
| DEX-CZ6397 | 417549.882 | 9672875.847 | 366.152 | 30 | -90 | 20 | 8 |
| DEX-CZ6398 | 417523.779 | 9672876.607 | 367.321 | 34 | -90 | 20 | 12 |
| DEX-CZ6399 | 417423.481 | 9672874.368 | 377.268 | 14 | -90 | 11 | 1 |
| DEX-CZ6400 | 417402.221 | 9672872.937 | 381.944 | 27 | -90 | 20.2 | 6.2 |
| DEX-CZ6401 | 417374.857 | 9672874.026 | 386.035 | 25 | -90 | 15 | 8 |
| DEX-CZ6402 | 417272.752 | 9672874.529 | 396.141 | 10 | -90 | 6 | 1 |
| DEX-CZ6403 | 417253.662 | 9672874.708 | 398.450 | 21 | -90 | 17.35 | 2.2 |
| DEX-CZ6404 | 417226.685 | 9672872.420 | 401.441 | 20 | -90 | 8 | 10 |
| DEX-CZ6405 | 417205.032 | 9672868.080 | 403.241 | 24 | -90 | 20.2 | 2 |
| DEX-CZ6406 | 417178.086 | 9672870.925 | 402.904 | 43 | -90 | 26 | 13 |
| DEX-CZ6407 | 417148.866 | 9672875.450 | 402.000 | 26 | -90 | 14 | 10 |
| DEX-CZ6408 | 417126.766 | 9672873.156 | 399.867 | 20 | -90 | 12 | 6 |
| DEX-CZ6409 | 417100.419 | 9672876.154 | 394.715 | 27 | -90 | 24 | 2 |
| DEX-CZ6410 | 417078.232 | 9672874.167 | 389.587 | 19 | -90 | 17 | 2 |
| DEX-CZ6411 | 417052.262 | 9672871.268 | 382.314 | 37 | -90 | 30 | 1 |
| DEX-CZ6412 | 417030.078 | 9672876.139 | 378.831 | 17 | -90 | 14 | 1 |
| DEX-CZ6413 | 416998.038 | 9672873.728 | 387.162 | 22 | -90 | 18 | 0 |
| DEX-CZ6414 | 416974.299 | 9672874.517 | 389.132 | 8 | -90 | 4 | 2 |
| DEX-CZ6415 | 416951.381 | 9672879.763 | 390.000 | 9 | -90 | 7 | 0 |
| DEX-CZ6416 | 416927.695 | 9672877.584 | 389.504 | 14 | -90 | 5 | 4 |
| DEX-CZ6417 | 418173.275 | 9672849.510 | 407.146 | 17 | -90 | 9 | 5 |
| DEX-CZ6418 | 418123.452 | 9672849.260 | 385.170 | 30 | -90 | 11 | 17 |
| DEX-CZ6419 | 418073.904 | 9672851.041 | 397.801 | 8 | -90 | 4 | 4 |
| DEX-CZ6420 | 418018.498 | 9672848.079 | 404.529 | 17 | -90 | 9 | 9 |
| DEX-CZ6421 | 417971.955 | 9672852.907 | 394.170 | 34 | -90 | 17.52 | 11 |
| DEX-CZ6422 | 417926.208 | 9672849.167 | 384.268 | 36 | -90 | 17.51 | 17 |
| DEX-CZ6423 | 417877.166 | 9672850.862 | 378.000 | 23 | -90 | 18.47 | 4 |
| DEX-CZ6424 | 417825.978 | 9672846.871 | 375.324 | 30 | -90 | 19.84 | 9 |
| DEX-CZ6425 | 417774.902 | 9672846.952 | 372.000 | 31 | -90 | 29.18 | 0 |
| DEX-CZ6426 | 417723.983 | 9672852.478 | 372.081 | 32 | -90 | 27.21 | 4 |
| DEX-CZ6427 | 417671.490 | 9672850.520 | 370.132 | 39 | -90 | 35.14 | 7 |
| DEX-CZ6428 | 417627.909 | 9672849.781 | 367.000 | 33 | -90 | 30.95 | 0 |
| DEX-CZ6429 | 417575.664 | 9672850.283 | 366.000 | 30 | -90 | 25 | 3 |
| DEX-CZ6430 | 417523.725 | 9672848.588 | 369.830 | 33 | -90 | 29 | 1.28 |
| DEX-CZ6431 | 417423.327 | 9672852.626 | 382.433 | 22 | -90 | 20.5 | 0 |
| DEX-CZ6432 | 417374.620 | 9672849.684 | 391.943 | 39 | -90 | 28 | 9 |
| DEX-CZ6433 | 417124.522 | 9672850.511 | 397.060 | 22 | -90 | 18 | 2 |
| DEX-CZ6434 | 417076.559 | 9672853.926 | 384.652 | 41 | -90 | 37 | 2 |
| DEX-CZ6435 | 417022.688 | 9672845.850 | 388.705 | 24 | -90 | 21 | 1 |
| DEX-CZ6436 | 416980.041 | 9672852.207 | 391.609 | 20 | -90 | 7 | 11 |
| DEX-CZ6437 | 416925.376 | 9672850.379 | 382.850 | 18 | -90 | 13 | 5 |
| DEX-CZ6438 | 418175.089 | 9672828.363 | 404.884 | 17 | -90 | 3 | 8 |
| DEX-CZ6439 | 418150.602 | 9672824.065 | 392.402 | 7 | -90 | 4 | 2 |
| DEX-CZ6440 | 418121.928 | 9672826.514 | 380.295 | 31 | -90 | 13 | 18 |
| DEX-CZ6441 | 418101.699 | 9672828.051 | 382.754 | 19 | -90 | 4 | 15 |
| DEX-CZ6442 | 418073.762 | 9672827.075 | 391.121 | 8 | -90 | 4 | 4 |
| DEX-CZ6443 | 418048.249 | 9672825.666 | 399.056 | 21 | -90 | 17 | 1.42 |
| DEX-CZ6444 | 418024.755 | 9672825.656 | 402.628 | 20 | -90 | 12 | 8 |
| DEX-CZ6445 | 417998.627 | 9672825.737 | 399.519 | 32 | -90 | 14 | 17.1 |
| DEX-CZ6446 | 417974.038 | 9672824.328 | 394.239 | 34 | -90 | 18.5 | 15 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ9853 | 415009.255 | 9672986.296 | 301.266 | 27 | -90 | 22 | 3.23 |
| DEX-CZ9854 | 415031.701 | 9672985.499 | 304.401 | 28 | -90 | 24.49 | 3 |
| DEX-CZ9855 | 415051.945 | 9672982.822 | 309.354 | 29 | -90 | 15 | 12 |
| DEX-CZ9856 | 415082.388 | 9672991.005 | 316.299 | 31 | -90 | 22.69 | 7.5 |
| DEX-CZ9857 | 415032.487 | 9672963.733 | 303.121 | 22 | -90 | 19.35 | 1 |
| DEX-CZ9858 | 415082.075 | 9672963.818 | 314.464 | 34 | -90 | 21.66 | 8 |
| DEX-CZ9859 | 415098.268 | 9672961.707 | 318.339 | 35 | -90 | 23.11 | 9 |
| DEX-CZ9860 | 415157.915 | 9672971.777 | 333.530 | 26 | -90 | 10 | 13 |
| DEX-CZ9861 | 415203.546 | 9672980.760 | 345.030 | 35 | -90 | 18.36 | 16 |
| DEX-CZ9862 | 415389.271 | 9672712.878 | 348.797 | 33 | -90 | 20 | 10 |
| DEX-CZ9863 | 415439.512 | 9672708.010 | 356.773 | 38 | -90 | 19 | 15 |
| DEX-CZ9909 | 414254.335 | 9673454.993 | 275.810 | 16 | -90 | 2 | 7 |
| DEX-CZ9910 | 414164.963 | 9673474.318 | 305.351 | 25 | -90 | 16.44 | 4 |
| DEX-CZ9912 | 414114.069 | 9673461.625 | 303.220 | 11 | -90 | 2 | 4.88 |
| DEX-CZ075 | 415210.775 | 9674000.554 | 345.097 | 36 | -90 | 31.06 | 7 |
| DEX-CZ3318 | 415378.323 | 9673821.110 | 346.076 | 19 | -90 | 14.14 | 7 |
| DEX-CZ4540 | 417299.500 | 9674750.000 | 375.283 | 20 | -90 | 9 | 9 |
| DEX-CZ4562 | 417150.700 | 9674901.000 | 406.056 | 32 | -90 | 14.22 | 17.93 |
| DEX-CZ4579 | 417100.900 | 9674502.000 | 416.211 | 21 | -90 | 11.22 | 8 |
| DEX-CZ4598 | 416947.200 | 9674551.000 | 443.982 | 16 | -90 | 4.73 | 8.02 |
| DEX-CZ4601 | 416998.400 | 9674550.000 | 440.708 | 24 | -90 | 5 | 16 |
| DEX-CZ4630 | 417104.300 | 9674357.000 | 398.982 | 20 | -90 | 3 | 11 |
| DEX-CZ467 | 416456.493 | 9673856.781 | 383.863 | 19 | -90 | 16.76 | 2.57 |
| DEX-CZ4687 | 417254.900 | 9673799.000 | 352.605 | 29 | -90 | 20.7 | 7 |
| DEX-CZ4820 | 417178.900 | 9673720.000 | 352.454 | 36 | -90 | 28.21 | 6 |
| DEX-CZ4860 | 417128.800 | 9673899.000 | 386.200 | 25 | -90 | 9.19 | 15 |
| DEX-CZ4866 | 417432.700 | 9673929.000 | 351.450 | 16 | -90 | 8 | 6 |
| DEX-CZ4875 | 417384.600 | 9673950.000 | 357.239 | 34 | -90 | 22.9 | 10 |
| DEX-CZ5016 | 416925.400 | 9674480.000 | 430.154 | 32 | -90 | 18 | 12 |
| DEX-CZ5260 | 417179.200 | 9674899.000 | 401.385 | 21 | -90 | 9 | 9 |
| DEX-CZ5300 | 417456.900 | 9673931.000 | 350.972 | 21 | -90 | 17.64 | 2 |
| DEX-CZ5596 | 415641.800 | 9673299.000 | 374.797 | 34 | -90 | 36.07 | 4.19 |
| DEX-CZ5600 | 415496.200 | 9673245.000 | 369.709 | 19 | -90 | 5 | 10 |
| DEX-CZ5617 | 415694.900 | 9673340.000 | 360.786 | 36 | -90 | 25 | 7 |
| DEX-CZ565 | 416299.638 | 9673699.974 | 391.533 | 26 | -90 | 22.97 | 2 |
| DEX-CZ5738 | 415248.300 | 9673340.000 | 345.910 | 15 | -90 | 6 | 7 |
| DEX-CZ741 | 416642.887 | 9674050.521 | 368.625 | 20 | -90 | 17.23 | 5.29 |
| DEX-CZ746 | 416755.572 | 9674102.534 | 384.048 | 22 | -90 | 16.38 | 7.5 |
| BB_STH-1098 | 414701.650 | 9673520.125 | 332.422 | 7 | -90 | 3 | 2 |
| DEX-CZ052 | 414992.825 | 9674000.621 | 348.851 | 25 | -90 | 24.94 | 0 |
| DEX-CZ400 | 415965.912 | 9674205.596 | 392.631 | 22 | -90 | 15.92 | 7 |
| DEX-CZ410 | 416406.702 | 9674160.749 | 379.434 | 25 | -90 | 11.72 | 12 |
| DEX-CZ445 | 416299.451 | 9673951.463 | 412.079 | 27 | -90 | 26.12 | 6 |
| DEX-CZ4547 | 417249.700 | 9674801.000 | 385.640 | 24 | -90 | 12.96 | 8.5 |
| DEX-CZ4554 | 417100.300 | 9674853.000 | 419.027 | 25 | -90 | 16.79 | 5 |
| DEX-CZ4575 | 416999.100 | 9674506.000 | 438.385 | 25 | -90 | 12.54 | 10.09 |
| DEX-CZ4600 | 416953.900 | 9674503.000 | 437.990 | 20 | -90 | 9.29 | 9 |
| DEX-CZ4701 | 417311.200 | 9673755.000 | 348.361 | 45 | -90 | 32.36 | 6.23 |
| DEX-CZ480 | 416306.244 | 9673754.475 | 401.550 | 24 | -90 | 19.27 | 6.02 |
| DEX-CZ4813 | 417256.300 | 9673771.000 | 350.009 | 20 | -90 | 16.22 | 2 |
| DEX-CZ4817 | 417178.400 | 9673691.000 | 349.274 | 33 | -90 | 25.75 | 5 |
| DEX-CZ4865 | 417408.700 | 9673932.000 | 352.910 | 26 | -90 | 22.23 | 1 |
| DEX-CZ5036 | 416901.100 | 9674530.000 | 437.393 | 22 | -90 | 10 | 8 |
| DEX-CZ5050 | 416875.500 | 9674551.000 | 433.921 | 19 | -90 | 3 | 13.6 |
| DEX-CZ5102 | 416875.400 | 9674680.000 | 424.865 | 28 | -90 | 14.03 | 13.46 |
| DEX-CZ5218 | 417258.400 | 9674834.000 | 391.272 | 19 | -90 | 13 | 5 |
| DEX-CZ5232 | 417223.900 | 9674849.000 | 395.185 | 29 | -90 | 14.95 | 13 |
| DEX-CZ5240 | 416976.900 | 9674881.000 | 424.651 | 46 | -90 | 43.4 | 3 |
| DEX-CZ5592 | 415799.100 | 9673251.000 | 351.457 | 22 | -90 | 2 | 13 |
| DEX-CZ5593 | 415749.200 | 9673247.000 | 363.098 | 32 | -90 | 8 | 22 |
| DEX-CZ708 | 416649.223 | 9673749.558 | 346.872 | 18 | -90 | 7.89 | 8.37 |
| DEX-CZ721 | 416642.768 | 9673850.998 | 355.889 | 19 | -90 | 5.2 | 11 |
| DEX-CZ742 | 416699.621 | 9674051.730 | 377.679 | 17 | -90 | 10.87 | 2.57 |
| DEX-CZ170 | 415889.181 | 9673993.993 | 400.527 | 25 | -90 | 8.26 | 15 |
| DEX-CZ179 | 415992.153 | 9673795.585 | 373.290 | 22 | -90 | 21.66 | 1 |
| DEX-CZ204 | 416394.567 | 9674386.782 | 395.347 | 22 | -90 | 16.78 | 1.85 |
| DEX-CZ397 | 416244.821 | 9674189.283 | 408.379 | 17 | -90 | 15.45 | 0 |
| DEX-CZ4505 | 416846.600 | 9674602.000 | 427.001 | 24 | -90 | 14 | 8 |
| DEX-CZ4513 | 416850.600 | 9674650.000 | 426.013 | 37 | -90 | 7 | 26.51 |
| DEX-CZ4529 | 417251.600 | 9674704.000 | 376.317 | 19 | -90 | 3 | 15 |
| DEX-CZ4570 | 417198.200 | 9674947.000 | 396.116 | 21 | -90 | 10 | 9 |
| DEX-CZ4571 | 417246.400 | 9674946.000 | 386.437 | 22 | -90 | 13.47 | 6 |
| DEX-CZ4815 | 417282.700 | 9673768.000 | 347.611 | 57 | -90 | 54.91 | 2 |
| DEX-CZ4828 | 417153.300 | 9673767.000 | 359.955 | 30 | -90 | 24.23 | 4 |
| DEX-CZ486 | 416536.049 | 9673697.819 | 356.545 | 28 | -90 | 4.35 | 16.28 |
| DEX-CZ502 | 416499.087 | 9673670.615 | 372.841 | 13 | -90 | 6.25 | 4.3 |
| DEX-CZ5125 | 416977.600 | 9674708.000 | 418.529 | 38 | -90 | 10 | 25.45 |
| DEX-CZ5143 | 417130.800 | 9674718.000 | 391.477 | 15 | -90 | 4 | 9 |
| DEX-CZ5199 | 417229.400 | 9674801.000 | 387.378 | 38 | -90 | 14.74 | 21.69 |
| DEX-CZ521 | 416482.117 | 9673573.740 | 366.224 | 10 | -90 | 2.29 | 3 |
| DEX-CZ522 | 416446.991 | 9673497.752 | 339.201 | 14 | -90 | 4 | 6.32 |
| DEX-CZ5301 | 417080.400 | 9674798.000 | 420.508 | 27 | -90 | 18.9 | 8.36 |
| DEX-CZ5604 | 415343.800 | 9673289.000 | 325.041 | 33 | -90 | 26.77 | 5 |
| DEX-CZ115 | 415485.191 | 9674400.472 | 440.233 | 28 | -90 | 12.11 | 16.68 |
| DEX-CZ401 | 415955.018 | 9674170.623 | 382.691 | 9 | -90 | 6 | 0 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6447 | 417949.390 | 9672823.424 | 388.999 | 30 | -90 | 20.45 | 3 |
| DEX-CZ6448 | 417924.642 | 9672823.076 | 384.000 | 40 | -90 | 23.55 | 7 |
| DEX-CZ6449 | 417900.137 | 9672825.564 | 379.995 | 40 | -90 | 8 | 27 |
| DEX-CZ6450 | 417877.746 | 9672822.633 | 376.934 | 32 | -90 | 13.03 | 10.3 |
| DEX-CZ6451 | 417849.977 | 9672820.552 | 375.000 | 26 | -90 | 24.29 | 0 |
| DEX-CZ6452 | 417825.289 | 9672825.029 | 374.431 | 30 | -90 | 25.15 | 4 |
| DEX-CZ6453 | 417803.878 | 9672825.855 | 373.075 | 30 | -90 | 21.36 | 8.9 |
| DEX-CZ6454 | 417776.003 | 9672825.253 | 372.049 | 49 | -90 | 45.18 | 3 |
| DEX-CZ6455 | 417749.491 | 9672825.417 | 370.095 | 43 | -90 | 42.14 | 6 |
| DEX-CZ6456 | 417726.632 | 9672827.371 | 369.922 | 38 | -90 | 24 | 12 |
| DEX-CZ6457 | 417701.919 | 9672825.750 | 370.281 | 33 | -90 | 25.59 | 6 |
| DEX-CZ6458 | 417674.428 | 9672826.271 | 370.311 | 51 | -90 | 35.79 | 18 |
| DEX-CZ6459 | 417654.832 | 9672819.084 | 367.000 | 60 | -90 | 48.95 | 16 |
| DEX-CZ6460 | 417627.420 | 9672824.420 | 368.264 | 40 | -90 | 33.34 | 6 |
| DEX-CZ6461 | 417602.333 | 9672826.410 | 370.287 | 31 | -90 | 30.81 | 1.53 |
| DEX-CZ6462 | 417571.639 | 9672823.184 | 372.869 | 36 | -90 | 24 | 10 |
| DEX-CZ6463 | 417549.537 | 9672824.357 | 373.579 | 35 | -90 | 34.46 | 1 |
| DEX-CZ6464 | 417524.991 | 9672826.237 | 372.059 | 27 | -90 | 24.3 | 0 |
| DEX-CZ6465 | 417499.255 | 9672824.386 | 373.061 | 29 | -90 | 26 | 1 |
| DEX-CZ6466 | 417475.221 | 9672826.498 | 375.448 | 28 | -90 | 16 | 10 |
| DEX-CZ6467 | 417425.646 | 9672825.951 | 384.192 | 28 | -90 | 13.25 | 13 |
| DEX-CZ6468 | 417399.293 | 9672828.098 | 390.117 | 40 | -90 | 22 | 11 |
| DEX-CZ6469 | 417375.939 | 9672823.752 | 396.861 | 29 | -90 | 19 | 8 |
| DEX-CZ6470 | 417273.542 | 9672823.375 | 409.541 | 31 | -90 | 24 | 1 |
| DEX-CZ6471 | 417248.368 | 9672823.809 | 409.851 | 30 | -90 | 12 | 16 |
| DEX-CZ6472 | 417224.375 | 9672826.798 | 408.807 | 26 | -90 | 20 | 4 |
| DEX-CZ6473 | 417202.088 | 9672822.035 | 407.279 | 33 | -90 | 23.3 | 8.33 |
| DEX-CZ6474 | 417173.440 | 9672824.679 | 402.511 | 49 | -90 | 44.88 | 3 |
| DEX-CZ6475 | 417148.081 | 9672824.459 | 396.810 | 32 | -90 | 27.27 | 4 |
| DEX-CZ6476 | 417125.457 | 9672826.430 | 392.499 | 29 | -90 | 23 | 4 |
| DEX-CZ6477 | 417101.661 | 9672824.221 | 382.613 | 21 | -90 | 14 | 4 |
| DEX-CZ6478 | 417076.062 | 9672823.445 | 381.000 | 30 | -90 | 27 | 0 |
| DEX-CZ6479 | 417047.763 | 9672824.924 | 386.705 | 29 | -90 | 19 | 9 |
| DEX-CZ6480 | 417023.762 | 9672823.673 | 391.231 | 21 | -90 | 18 | 3 |
| DEX-CZ6481 | 416998.372 | 9672827.281 | 393.504 | 32 | -90 | 26 | 5 |
| DEX-CZ6482 | 416976.332 | 9672826.683 | 393.723 | 38 | -90 | 18 | 17 |
| DEX-CZ6483 | 416953.251 | 9672827.261 | 391.375 | 8 | -90 | 5 | 1 |
| DEX-CZ6484 | 416918.990 | 9672823.664 | 379.000 | 14 | -90 | 5 | 9 |
| DEX-CZ6485 | 418024.770 | 9672801.500 | 401.466 | 28 | -90 | 10 | 16 |
| DEX-CZ6486 | 417974.885 | 9672800.264 | 396.064 | 31 | -90 | 14 | 9 |
| DEX-CZ6487 | 417926.692 | 9672805.973 | 384.424 | 28 | -90 | 12 | 9 |
| DEX-CZ6488 | 417877.004 | 9672798.751 | 375.684 | 48 | -90 | 11.32 | 29.48 |
| DEX-CZ6489 | 417824.924 | 9672797.286 | 372.438 | 26 | -90 | 20.61 | 4 |
| DEX-CZ6490 | 417776.671 | 9672801.430 | 369.000 | 44 | -90 | 34.23 | 9 |
| DEX-CZ6491 | 417726.701 | 9672801.518 | 369.000 | 26 | -90 | 21.08 | 1.28 |
| DEX-CZ6492 | 417678.354 | 9672799.998 | 367.000 | 43 | -90 | 34.95 | 8 |
| DEX-CZ6493 | 417624.719 | 9672802.478 | 368.730 | 42 | -90 | 36 | 3.57 |
| DEX-CZ6494 | 417571.888 | 9672801.006 | 372.538 | 41 | -90 | 39.95 | 3 |
| DEX-CZ6495 | 417525.756 | 9672804.294 | 374.602 | 30 | -90 | 24 | 4 |
| DEX-CZ6496 | 417476.989 | 9672800.669 | 378.656 | 48 | -90 | 18 | 27.51 |
| DEX-CZ6497 | 417274.352 | 9672799.176 | 412.674 | 24 | -90 | 14 | 6 |
| DEX-CZ6498 | 417225.212 | 9672793.539 | 410.828 | 44 | -90 | 38.59 | 2 |
| DEX-CZ6499 | 417173.600 | 9672802.011 | 401.077 | 29 | -90 | 25.3 | 2 |
| DEX-CZ6500 | 417123.002 | 9672800.571 | 386.910 | 20 | -90 | 17 | 0 |
| DEX-CZ6501 | 417070.455 | 9672803.232 | 384.828 | 21 | -90 | 16 | 3 |
| DEX-CZ6502 | 417026.149 | 9672800.611 | 393.526 | 21 | -90 | 16 | 5 |
| DEX-CZ6503 | 416977.109 | 9672800.002 | 395.977 | 37 | -90 | 17 | 18 |
| DEX-CZ6504 | 416925.799 | 9672800.379 | 381.000 | 16 | -90 | 13 | 1 |
| DEX-CZ6505 | 418024.903 | 9672774.419 | 402.560 | 39 | -90 | 21.31 | 16 |
| DEX-CZ6506 | 417999.921 | 9672775.101 | 401.906 | 22 | -90 | 15 | 7 |
| DEX-CZ6507 | 417975.217 | 9672773.782 | 397.110 | 21 | -90 | 18 | 2 |
| DEX-CZ6508 | 417952.933 | 9672775.551 | 390.617 | 29 | -90 | 23 | 5 |
| DEX-CZ6509 | 417924.467 | 9672774.416 | 383.334 | 51 | -90 | 27.48 | 6 |
| DEX-CZ6510 | 417899.074 | 9672775.226 | 379.301 | 20 | -90 | 12.23 | 5 |
| DEX-CZ6511 | 417874.707 | 9672774.436 | 375.585 | 29 | -90 | 25.87 | 1 |
| DEX-CZ6512 | 417851.447 | 9672775.123 | 373.965 | 26 | -90 | 21.39 | 3 |
| DEX-CZ6513 | 417827.694 | 9672775.225 | 372.410 | 31 | -90 | 23.9 | 4 |
| DEX-CZ6514 | 417800.371 | 9672774.273 | 370.942 | 27 | -90 | 22.35 | 3 |
| DEX-CZ6515 | 417775.205 | 9672773.876 | 371.078 | 38 | -90 | 33.96 | 5 |
| DEX-CZ6516 | 417750.242 | 9672771.654 | 370.789 | 46 | -90 | 36.89 | 8 |
| DEX-CZ6517 | 417724.350 | 9672774.062 | 369.013 | 52 | -90 | 43.71 | 7 |
| DEX-CZ6518 | 417699.365 | 9672774.465 | 368.184 | 41 | -90 | 35 | 5 |
| DEX-CZ6519 | 417671.966 | 9672777.861 | 370.085 | 32 | -90 | 27.6 | 3 |
| DEX-CZ6520 | 417649.107 | 9672775.986 | 370.601 | 43 | -90 | 40.97 | 0 |
| DEX-CZ6521 | 417624.060 | 9672774.756 | 370.997 | 40 | -90 | 31.35 | 6.87 |
| DEX-CZ6522 | 417600.676 | 9672775.180 | 371.539 | 43 | -90 | 37.55 | 4 |
| DEX-CZ6523 | 417577.199 | 9672775.993 | 372.588 | 43 | -90 | 40 | 1.2 |
| DEX-CZ6524 | 417549.347 | 9672774.727 | 374.801 | 30 | -90 | 25.75 | 2.25 |
| DEX-CZ6525 | 417524.560 | 9672769.456 | 377.664 | 42 | -90 | 21 | 14 |
| DEX-CZ6526 | 417499.464 | 9672773.995 | 379.545 | 34 | -90 | 24 | 8.23 |
| DEX-CZ6527 | 417476.206 | 9672777.331 | 382.364 | 47 | -90 | 24.59 | 22 |
| DEX-CZ6528 | 417272.299 | 9672775.485 | 413.938 | 31 | -90 | 20 | 6 |
| DEX-CZ6529 | 417250.823 | 9672770.788 | 412.249 | 18 | -90 | 3 | 12 |
| DEX-CZ6530 | 417223.467 | 9672773.569 | 409.368 | 33 | -90 | 21 | 8 |
| DEX-CZ6531 | 417202.368 | 9672773.059 | 405.645 | 26 | -90 | 20.66 | 3.68 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ406 | 416207.117 | 9674147.184 | 420.301 | 23 | -90 | 21.77 | 4 |
| DEX-CZ4546 | 417150.500 | 9674799.000 | 402.199 | 20 | -90 | 3.45 | 12.28 |
| DEX-CZ4605 | 417151.700 | 9674491.000 | 400.499 | 19 | -90 | 13.64 | 2.65 |
| DEX-CZ4621 | 417098.200 | 9674460.000 | 414.309 | 41 | -90 | 10.28 | 25 |
| DEX-CZ4694 | 417255.200 | 9673752.000 | 348.400 | 24 | -90 | 21.77 | 1 |
| DEX-CZ4846 | 417356.600 | 9673878.000 | 355.389 | 25 | -90 | 16.37 | 6 |
| DEX-CZ5614 | 415647.400 | 9673448.000 | 336.606 | 44 | -90 | 35.73 | 9 |
| DEX-CZ5736 | 415145.700 | 9673338.000 | 333.072 | 36 | -90 | 19.8 | 14.31 |
| BB_STH-1078 | 415197.702 | 9673590.080 | 371.894 | 7 | -90 | 0 | 7 |
| DEX-CZ376 | 416341.694 | 9674359.571 | 387.589 | 18 | -90 | 3 | 11 |
| DEX-CZ411 | 416467.160 | 9674144.769 | 361.931 | 13 | -90 | 5.31 | 6 |
| DEX-CZ413 | 416453.124 | 9674086.403 | 379.196 | 12 | -90 | 5 | 5 |
| DEX-CZ419 | 415948.326 | 9674048.703 | 413.421 | 25 | -90 | 21.94 | 5.32 |
| DEX-CZ425 | 416251.774 | 9674054.687 | 419.208 | 28 | -90 | 16.83 | 9.9 |
| DEX-CZ4539 | 417250.300 | 9674752.000 | 381.101 | 17 | -90 | 5 | 9 |
| DEX-CZ4561 | 417049.600 | 9674900.000 | 420.722 | 24 | -90 | 12 | 10.79 |
| DEX-CZ4620 | 417046.300 | 9674455.000 | 425.917 | 33 | -90 | 24.94 | 5.19 |
| DEX-CZ4637 | 417152.400 | 9674403.000 | 392.165 | 22 | -90 | 9 | 12 |
| DEX-CZ4834 | 417231.500 | 9673819.000 | 357.037 | 26 | -90 | 22.7 | 2 |
| DEX-CZ5110 | 417079.100 | 9674680.000 | 392.129 | 24 | -90 | 9 | 12 |
| DEX-CZ5258 | 417050.100 | 9674927.000 | 416.595 | 29 | -90 | 15.46 | 13 |
| DEX-CZ5289 | 417400.300 | 9673877.000 | 349.827 | 23 | -90 | 12.19 | 8 |
| DEX-CZ5606 | 415551.600 | 9673295.000 | 381.785 | 5 | -90 | 1.67 | 1.33 |
| DEX-CZ5607 | 415441.700 | 9673337.000 | 343.068 | 19 | -90 | 13.83 | 4.55 |
| DEX-CZ5620 | 415447.500 | 9673447.000 | 337.893 | 29 | -90 | 15 | 13 |
| DEX-CZ5730 | 415203.800 | 9673250.000 | 320.806 | 17 | -90 | 12.23 | 3 |
| DEX-CZ716 | 416647.961 | 9673797.667 | 340.087 | 15 | -90 | 1 | 9 |
| BB_STH-1091 | 414797.972 | 9673495.991 | 359.534 | 21 | -90 | 5 | 12.88 |
| DEX-CZ145 | 415598.395 | 9673604.329 | 351.687 | 17 | -90 | 11.02 | 7.72 |
| DEX-CZ172 | 415888.361 | 9673802.209 | 377.713 | 23 | -90 | 27.47 | 1 |
| DEX-CZ5601 | 415451.700 | 9673246.000 | 353.730 | 17 | -90 | 6 | 8.5 |
| DEX-CZ751 | 416752.451 | 9674147.863 | 380.939 | 27 | -90 | 21.97 | 5.5 |
| DEX-CZ378 | 416444.083 | 9674299.914 | 382.000 | 9 | -90 | 6.08 | 2 |
| DEX-CZ409 | 416350.890 | 9674162.216 | 388.074 | 25 | -90 | 19.93 | 6.72 |
| DEX-CZ499 | 416337.805 | 9673669.006 | 378.509 | 25 | -90 | 10.89 | 12.28 |
| DEX-CZ5014 | 416876.400 | 9674479.000 | 426.200 | 31 | -90 | 13.64 | 19.2 |
| DEX-CZ744 | 416805.169 | 9674047.577 | 388.991 | 25 | -90 | 26.37 | 0 |
| DEX-CZ747 | 416559.986 | 9674159.190 | 356.223 | 23 | -90 | 3 | 11 |
| BB_STH-1070 | 414707.422 | 9673789.567 | 395.311 | 18 | -90 | 6 | 10 |
| DEX-CZ095 | 415289.514 | 9674118.143 | 361.402 | 31 | -90 | 17.68 | 12.25 |
| DEX-CZ1120 | 416546.237 | 9673548.319 | 327.493 | 18 | -90 | 9.13 | 5.55 |
| DEX-CZ186 | 416095.796 | 9674304.337 | 413.988 | 28 | -90 | 17.97 | 4.15 |
| DEX-CZ205 | 416506.825 | 9674104.315 | 355.497 | 12 | -90 | 7.33 | 3.15 |
| DEX-CZ434 | 416242.447 | 9674001.483 | 422.200 | 19 | -90 | 10.73 | 8.18 |
| DEX-CZ5104 | 416923.900 | 9674680.000 | 422.601 | 33 | -90 | 6 | 24 |
| DEX-CZ5610 | 415649.500 | 9673392.000 | 345.780 | 39 | -90 | 18 | 18 |
| DEX-CZ384 | 415948.652 | 9674241.920 | 406.220 | 28 | -90 | 15.86 | 12.61 |
| DEX-CZ4617 | 416901.500 | 9674472.000 | 427.670 | 28 | -90 | 16.53 | 9 |
| DEX-CZ5731 | 415245.800 | 9673236.000 | 320.661 | 20 | -90 | 15.26 | 3 |
| DEX-CZ737 | 416657.786 | 9673997.806 | 357.572 | 7 | -90 | 3 | 2 |
| BB_STH-1083 | 414993.740 | 9673697.409 | 369.294 | 10 | -90 | 2 | 5.91 |
| DEX-CZ029 | 414800.068 | 9674113.959 | 364.014 | 25 | -90 | 15.82 | 9 |
| DEX-CZ429 | 416450.374 | 9674056.438 | 383.577 | 10 | -90 | 5.34 | 3 |
| DEX-CZ4870 | 417128.700 | 9673930.000 | 395.483 | 9 | -90 | 4 | 2 |
| DEX-CZ5752 | 415247.900 | 9673292.000 | 336.606 | 13 | -90 | 8 | 3 |
| DEX-CZ709 | 416704.579 | 9673752.558 | 364.270 | 24 | -90 | 14.03 | 8.95 |
| DEX-CZ732 | 416645.211 | 9673951.652 | 363.809 | 17 | -90 | 14.97 | 4 |
| BB_STH-1080 | 415096.668 | 9673496.814 | 325.000 | 10 | -90 | 2 | 7 |
| DEX-CZ096 | 415294.114 | 9673991.994 | 354.858 | 37 | -90 | 28.91 | 9.49 |
| DEX-CZ392 | 416401.941 | 9674254.880 | 369.366 | 11 | -90 | 4 | 5.14 |
| DEX-CZ415 | 416251.693 | 9674093.477 | 414.647 | 19 | -90 | 14.69 | 6.13 |
| DEX-CZ423 | 416157.168 | 9674053.100 | 432.211 | 22 | -90 | 15.29 | 8.19 |
| DEX-CZ470 | 416531.225 | 9673792.449 | 364.320 | 11 | -90 | 9.52 | 0 |
| DEX-CZ5735 | 415103.700 | 9673335.000 | 323.698 | 27 | -90 | 13.5 | 12.5 |
| DEX-CZ715 | 416606.491 | 9673817.177 | 337.571 | 11 | -90 | 2 | 4 |
| DEX-CZ498 | 416305.891 | 9673653.939 | 376.076 | 32 | -90 | 17.32 | 15.86 |
| BB_STH-1074 | 415115.876 | 9673786.922 | 345.013 | 21 | -90 | 8.22 | 10 |
| DEX-CZ157 | 415799.123 | 9673792.936 | 367.576 | 17 | -90 | 7.04 | 9 |
| DEX-CZ5176 | 416999.100 | 9674770.000 | 420.823 | 45 | -90 | 24.29 | 19.71 |
| DEX-CZ752 | 416552.168 | 9674197.683 | 352.132 | 8 | -90 | 3.52 | 1.39 |
| DEX-CZ767 | 416535.329 | 9674398.025 | 389.100 | 24 | -90 | 16.74 | 5 |
| BB_STH-1072 | 414898.487 | 9673810.962 | 343.635 | 36 | -90 | 36.78 | 1 |
| BB_STH-1100 | 414604.528 | 9673600.513 | 330.220 | 6 | -90 | 1 | 1 |
| DEX-CZ073 | 415094.140 | 9674099.810 | 377.350 | 35 | -90 | 27.87 | 11.15 |
| DEX-CZ129 | 415589.808 | 9674603.850 | 417.281 | 25 | -90 | 26.82 | 2 |
| DEX-CZ174 | 415911.047 | 9673603.193 | 380.667 | 11 | -90 | 7 | 0.93 |
| DEX-CZ370 | 416038.878 | 9674341.749 | 410.856 | 26 | -90 | 18.38 | 11.48 |
| DEX-CZ381 | 416149.162 | 9674307.824 | 407.968 | 29 | -90 | 25.32 | 5 |
| DEX-CZ443 | 416203.439 | 9673949.470 | 422.897 | 32 | -90 | 30 | 4.15 |
| DEX-CZ5140 | 417078.800 | 9674751.000 | 410.034 | 25 | -90 | 15 | 7 |
| DEX-CZ5612 | 415606.200 | 9673340.000 | 367.424 | 22 | -90 | 12 | 9.85 |
| DEX-CZ710 | 416752.291 | 9673742.772 | 362.235 | 35 | -90 | 19.27 | 12.5 |
| DEX-CZ758 | 416601.797 | 9674237.651 | 357.445 | 51 | -90 | 29.46 | 26.18 |
| DEX-CZ196 | 416310.557 | 9674299.177 | 377.939 | 17 | -90 | 10.73 | 5 |
| DEX-CZ640 | 416201.849 | 9674401.628 | 400.006 | 29 | -90 | 14.97 | 15.58 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6532 | 417174.280 | 9672774.035 | 399.164 | 25 | -90 | 22.3 | 0 |
| DEX-CZ6533 | 417152.153 | 9672775.719 | 393.271 | 19 | -90 | 11 | 6 |
| DEX-CZ6534 | 417124.948 | 9672775.115 | 383.574 | 23 | -90 | 21 | 1 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ417 | 416049.315 | 9674096.097 | 425.649 | 26 | -90 | 24.96 | 1 |
| DEX-CZ4871 | 417152.400 | 9673927.000 | 389.153 | 27 | -90 | 4 | 17 |
| DEX-CZ651 | 416242.116 | 9674242.452 | 401.774 | 37 | -90 | 18.17 | 17 |

# DRILLHOLE DATABASE

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ6535 | 417024.632 | 9672776.235 | 396.982 | 27 | -90 | 9 | 16 |
| DEX-CZ6536 | 417001.616 | 9672772.642 | 397.422 | 29 | -90 | 23 | 6 |
| DEX-CZ6537 | 416976.482 | 9672775.615 | 396.189 | 21 | -90 | 17 | 3 |
| DEX-CZ6538 | 416941.854 | 9672780.299 | 383.000 | 16 | -90 | 8 | 8 |
| DEX-CZ6539 | 416925.338 | 9672771.148 | 388.126 | 7 | -90 | 4 | 0 |
| DEX-CZ6540 | 417978.380 | 9672748.284 | 397.706 | 31 | -90 | 16 | 11 |
| DEX-CZ6541 | 417925.311 | 9672748.807 | 382.959 | 47 | -90 | 23.22 | 23 |
| DEX-CZ6542 | 417876.191 | 9672750.425 | 376.659 | 41 | -90 | 30.61 | 10 |
| DEX-CZ6543 | 417826.237 | 9672748.770 | 374.729 | 41 | -90 | 30 | 9 |
| DEX-CZ6544 | 417776.175 | 9672754.863 | 371.740 | 50 | -90 | 36.74 | 11 |
| DEX-CZ6545 | 417724.436 | 9672750.832 | 370.467 | 46 | -90 | 38.29 | 2 |
| DEX-CZ6546 | 417701.812 | 9672748.560 | 370.728 | 43 | -90 | 33.35 | 2 |
| DEX-CZ6547 | 417673.957 | 9672745.344 | 373.620 | 41 | -90 | 26.23 | 13 |
| DEX-CZ6548 | 417624.186 | 9672747.399 | 375.325 | 41 | -90 | 28.27 | 5 |
| DEX-CZ6549 | 417576.476 | 9672746.390 | 374.857 | 35 | -90 | 31 | 4 |
| DEX-CZ655 | 416244.131 | 9673249.837 | 361.234 | 26 | -90 | 20.93 | 2 |
| DEX-CZ6550 | 417523.575 | 9672748.977 | 379.420 | 34 | -90 | 29.25 | 0 |
| DEX-CZ6551 | 417276.095 | 9672749.047 | 414.106 | 25 | -90 | 5 | 17 |
| DEX-CZ6552 | 417224.230 | 9672749.890 | 406.840 | 22 | -90 | 15 | 4 |
| DEX-CZ6553 | 417177.286 | 9672750.691 | 395.869 | 38 | -90 | 17 | 14 |
| DEX-CZ6554 | 417124.051 | 9672748.104 | 384.882 | 21 | -90 | 14 | 5 |
| DEX-CZ6555 | 417024.672 | 9672754.128 | 397.946 | 25 | -90 | 13 | 12 |
| DEX-CZ6556 | 416975.519 | 9672750.050 | 395.057 | 27 | -90 | 18 | 6 |
| DEX-CZ6557 | 416919.961 | 9672747.852 | 389.916 | 18 | -90 | 14 | 2 |
| DEX-CZ6558 | 417976.591 | 9672725.383 | 401.010 | 16 | -90 | 11 | 5 |
| DEX-CZ6559 | 417952.540 | 9672724.880 | 393.441 | 25 | -90 | 12.55 | 6.45 |
| DEX-CZ6560 | 417926.314 | 9672723.570 | 386.522 | 34 | -90 | 24.54 | 4 |
| DEX-CZ6561 | 417900.585 | 9672724.603 | 382.014 | 32 | -90 | 28.84 | 2 |
| DEX-CZ6562 | 417876.915 | 9672724.533 | 379.177 | 28 | -90 | 24 | 2 |
| DEX-CZ6563 | 417850.207 | 9672724.084 | 378.150 | 33 | -90 | 28 | 2 |
| DEX-CZ6564 | 417827.882 | 9672722.198 | 376.672 | 24 | -90 | 21.39 | 0.2 |
| DEX-CZ6565 | 417799.359 | 9672724.846 | 375.401 | 35 | -90 | 30 | 2.77 |
| DEX-CZ6566 | 417775.812 | 9672724.980 | 374.770 | 30 | -90 | 27 | 0 |
| DEX-CZ6567 | 417670.720 | 9672723.945 | 377.674 | 41 | -90 | 24.6 | 13 |
| DEX-CZ6568 | 417648.049 | 9672724.290 | 378.315 | 31 | -90 | 25 | 4 |
| DEX-CZ6569 | 417626.988 | 9672726.851 | 378.753 | 45 | -90 | 20.88 | 19.4 |
| DEX-CZ6570 | 417597.922 | 9672723.000 | 378.500 | 34 | -90 | 25.3 | 9 |
| DEX-CZ6571 | 417581.078 | 9672722.584 | 377.328 | 28 | -90 | 19 | 9 |
| DEX-CZ6572 | 417548.389 | 9672721.914 | 379.158 | 36 | -90 | 24 | 8 |
| DEX-CZ6573 | 417525.095 | 9672720.075 | 384.524 | 25 | -90 | 12 | 8 |
| DEX-CZ6574 | 417273.574 | 9672726.412 | 413.170 | 11 | -90 | 5 | 4 |
| DEX-CZ6575 | 417251.199 | 9672727.137 | 410.288 | 16 | -90 | 5 | 9 |
| DEX-CZ6576 | 417226.226 | 9672725.302 | 405.676 | 32 | -90 | 26.71 | 6 |
| DEX-CZ6577 | 417201.705 | 9672724.835 | 401.013 | 20 | -90 | 14 | 3.47 |
| DEX-CZ6578 | 417174.345 | 9672731.180 | 390.561 | 36 | -90 | 30 | 6 |
| DEX-CZ6579 | 417151.074 | 9672725.000 | 385.909 | 34 | -90 | 32.63 | 3 |
| DEX-CZ6580 | 417124.908 | 9672726.860 | 389.334 | 16 | -90 | 7 | 9 |
| DEX-CZ6581 | 417100.017 | 9672723.133 | 396.616 | 38 | -90 | 32 | 4 |
| DEX-CZ6582 | 417070.576 | 9672718.411 | 401.003 | 28 | -90 | 13 | 16 |
| DEX-CZ6583 | 417026.917 | 9672725.654 | 401.219 | 32 | -90 | 18 | 10 |
| DEX-CZ6584 | 417003.552 | 9672725.552 | 400.489 | 34 | -90 | 21 | 9 |
| DEX-CZ6585 | 416969.308 | 9672720.403 | 389.548 | 21 | -90 | 10 | 11.27 |
| DEX-CZ6586 | 416946.090 | 9672725.751 | 392.803 | 20 | -90 | 11.21 | 7 |
| DEX-CZ6587 | 416925.177 | 9672720.795 | 399.304 | 19 | -90 | 10 | 7 |
| DEX-CZ6588 | 417976.357 | 9672698.376 | 407.000 | 7 | -90 | 4 | 2 |
| DEX-CZ6589 | 417926.591 | 9672699.705 | 392.103 | 27 | -90 | 13 | 5 |
| DEX-CZ6590 | 417877.927 | 9672701.558 | 382.900 | 19 | -90 | 16.25 | 0 |
| DEX-CZ6591 | 417823.605 | 9672699.988 | 381.751 | 20 | -90 | 17 | 0.2 |
| DEX-CZ6592 | 417773.656 | 9672702.141 | 379.691 | 28 | -90 | 25.54 | 1 |
| DEX-CZ6593 | 417576.053 | 9672699.205 | 379.778 | 31 | -90 | 24.28 | 5 |
| DEX-CZ6594 | 417523.946 | 9672699.758 | 387.982 | 21 | -90 | 12 | 6.62 |
| DEX-CZ6595 | 417124.676 | 9672698.127 | 390.701 | 31 | -90 | 7 | 21 |
| DEX-CZ6596 | 417071.976 | 9672700.382 | 403.000 | 31 | -90 | 23 | 5 |
| DEX-CZ6597 | 417023.556 | 9672699.849 | 404.409 | 24 | -90 | 18 | 6 |
| DEX-CZ6598 | 416975.927 | 9672691.298 | 393.646 | 23 | -90 | 16.44 | 6 |
| DEX-CZ6600 | 418003.815 | 9672674.259 | 419.290 | 9 | -90 | 1.35 | 5.25 |
| DEX-CZ6601 | 417974.233 | 9672677.160 | 411.643 | 21 | -90 | 8 | 13 |
| DEX-CZ6602 | 417948.653 | 9672676.598 | 403.321 | 21 | -90 | 9 | 2 |
| DEX-CZ6603 | 417928.599 | 9672674.642 | 398.682 | 15 | -90 | 7 | 5 |
| DEX-CZ6604 | 417901.938 | 9672672.783 | 393.950 | 11 | -90 | 7 | 2 |
| DEX-CZ6605 | 417875.243 | 9672674.024 | 387.613 | 9 | -90 | 6 | 1 |
| DEX-CZ6606 | 417825.922 | 9672674.316 | 387.329 | 24 | -90 | 14.12 | 10.23 |
| DEX-CZ6607 | 417798.881 | 9672673.893 | 386.974 | 25 | -90 | 15 | 6 |
| DEX-CZ6608 | 417773.415 | 9672673.384 | 386.823 | 21 | -90 | 15 | 3 |
| DEX-CZ6609 | 417574.883 | 9672677.836 | 382.213 | 23 | -90 | 12.31 | 7 |
| DEX-CZ6610 | 417552.680 | 9672674.921 | 383.582 | 24 | -90 | 6 | 18 |
| DEX-CZ6611 | 417523.990 | 9672673.321 | 390.923 | 15 | -90 | 7 | 8 |
| DEX-CZ6612 | 417123.780 | 9672673.908 | 398.278 | 35 | -90 | 12 | 12.27 |
| DEX-CZ6613 | 417098.393 | 9672677.247 | 402.072 | 25 | -90 | 16.6 | 8 |
| DEX-CZ6614 | 417072.863 | 9672675.773 | 405.675 | 31 | -90 | 15 | 11 |
| DEX-CZ6615 | 417025.854 | 9672675.527 | 407.555 | 14 | -90 | 8 | 4 |
| DEX-CZ6616 | 416995.816 | 9672665.449 | 396.567 | 22 | -90 | 7 | 13 |
| DEX-CZ6617 | 416980.322 | 9672672.352 | 395.457 | 27 | -90 | 13 | 12 |
| DEX-CZ6618 | 416944.574 | 9672670.873 | 411.437 | 32 | -90 | 21.43 | 6 |

| Hole Id | Easting | Northing | Elevation | Total Depth | Dip | Limonite Thickness | Saprolite Thickness |
|---|---|---|---|---|---|---|---|
| DEX-CZ740 | 416607.526 | 9674045.951 | 360.571 | 19 | -90 | 11.68 | 8.49 |
| BB_STH-1101 | 414747.207 | 9673620.555 | 390.576 | 16 | -90 | 2 | 6 |
| DEX-CZ355 | 415947.208 | 9674498.181 | 426.169 | 38 | -90 | 17.26 | 23.12 |
| DEX-CZ5618 | 415744.100 | 9673350.000 | 347.712 | 40 | -90 | 31 | 7 |
| BB_STH-1092 | 414806.351 | 9673394.367 | 331.999 | 17 | -90 | 12 | 3.14 |
| DEX-CZ136 | 415709.539 | 9674300.200 | 375.802 | 15 | -90 | 10.97 | 2 |
| DEX-CZ139 | 415696.979 | 9673994.147 | 365.729 | 26 | -90 | 11.54 | 14.36 |
| DEX-CZ416 | 416146.896 | 9674084.169 | 432.850 | 20 | -90 | 16.39 | 2 |
| DEX-CZ688 | 416159.868 | 9674390.774 | 403.224 | 26 | -90 | 18.6 | 9.23 |
| DEX-CZ735 | 416801.172 | 9673950.727 | 377.694 | 26 | -90 | 16.48 | 11.81 |
| DEX-CZ175 | 415902.691 | 9673504.588 | 368.038 | 13 | -90 | 6.42 | 5 |
| DEX-CZ197 | 416299.887 | 9673900.719 | 408.590 | 18 | -90 | 17.43 | 0 |
| DEX-CZ738 | 416751.267 | 9673998.390 | 380.160 | 19 | -90 | 15.19 | 4.95 |
| DEX-CZ113 | 415491.000 | 9674612.251 | 420.284 | 28 | -90 | 28.05 | 3 |
| DEX-CZ203 | 416399.451 | 9674302.533 | 387.012 | 20 | -90 | 5 | 12.53 |
| DEX-CZ385 | 415998.516 | 9674259.000 | 415.463 | 40 | -90 | 26.81 | 15.57 |
| DEX-CZ202 | 416402.462 | 9674101.113 | 378.713 | 17 | -90 | 8 | 5 |
| DEX-CZ615 | 416501.139 | 9674198.856 | 353.542 | 20 | -90 | 6.94 | 11 |
| DEX-CZ166 | 415895.074 | 9674491.470 | 418.301 | 21 | -90 | 18.85 | 1 |
| DEX-CZ390 | 416299.533 | 9674253.903 | 383.041 | 17 | -90 | 9.72 | 6.33 |
| DEX-CZ639 | 416198.242 | 9674299.292 | 401.017 | 33 | -90 | 32.83 | 3 |
| DEX-CZ750 | 416697.813 | 9674152.905 | 376.775 | 29 | -90 | 12.46 | 12 |
| DEX-CZ165 | 415909.396 | 9674600.877 | 419.351 | 29 | -90 | 23.19 | 10 |
| DEX-CZ167 | 415907.911 | 9674394.101 | 417.475 | 34 | -90 | 26.04 | 9 |
| DEX-CZ199 | 416302.789 | 9673497.888 | 351.236 | 15 | -90 | 5.5 | 8 |
| DEX-CZ712 | 416841.340 | 9673751.793 | 354.200 | 34 | -90 | 19.63 | 14.15 |
| DEX-CZ393 | 416456.908 | 9674251.297 | 364.075 | 9 | -90 | 3.22 | 4.14 |
| DEX-CZ180 | 415986.398 | 9673898.037 | 410.414 | 24 | -90 | 11.61 | 11.36 |
| DEX-CZ386 | 416049.323 | 9674250.472 | 421.615 | 26 | -90 | 21.8 | 6.88 |
| DEX-CZ611 | 416397.954 | 9674195.566 | 383.627 | 17 | -90 | 5.41 | 11 |
| DEX-CZ134 | 415697.279 | 9674490.962 | 394.130 | 23 | -90 | 16.77 | 6 |
| DEX-CZ403 | 416052.184 | 9674154.074 | 422.100 | 22 | -90 | 19.95 | 2 |
| DEX-CZ754 | 416652.411 | 9674195.613 | 371.051 | 19 | -90 | 11.76 | 7.39 |
| DEX-CZ765 | 416581.003 | 9674352.500 | 386.802 | 39 | -90 | 4 | 27.75 |
| DEX-CZ133 | 415692.672 | 9674601.706 | 404.159 | 43 | -90 | 20.42 | 26.17 |
| DEX-CZ649 | 416554.094 | 9674059.783 | 348.590 | 19 | -90 | 4.47 | 13.75 |
| DEX-CZ144 | 415608.398 | 9673482.827 | 334.132 | 28 | -90 | 26.44 | 4.82 |
| DEX-CZ1529 | 416798.044 | 9673824.766 | 369.148 | 28 | -90 | 30.43 | 0.65 |
| DEX-CZ159 | 415808.201 | 9674411.510 | 406.187 | 37 | -90 | 39.34 | 2.21 |
| DEX-CZ375 | 416305.622 | 9674362.112 | 374.919 | 17 | -90 | 15.76 | 1 |
| DEX-CZ106 | 415387.855 | 9674606.177 | 438.926 | 28 | -90 | 12.88 | 14.33 |
| DEX-CZ053 | 414990.362 | 9674103.936 | 363.003 | 28 | -90 | 31.69 | 1 |
| DEX-CZ472 | 416347.391 | 9673792.229 | 405.468 | 23 | -90 | 13.55 | 6 |
| DEX-CZ153 | 415798.947 | 9673402.563 | 354.930 | 24 | -90 | 13.36 | 12.73 |
| DEX-CZ071 | 415099.698 | 9674299.950 | 441.123 | 15 | -90 | 6 | 7 |
| DEX-CZ382 | 416055.593 | 9674304.664 | 416.074 | 29 | -90 | 31.08 | 1 |
| DEX-CZ763 | 416506.649 | 9674350.014 | 382.320 | 16 | -90 | 7.19 | 8.02 |
| DEX-CZ155 | 415801.226 | 9673611.658 | 348.754 | 23 | -90 | 4 | 15.13 |
| DEX-CZ2526 | 415600.483 | 9673949.160 | 360.343 | 22 | -90 | 5 | 16 |
| DEX-CZ395 | 416464.845 | 9674200.943 | 366.774 | 22 | -90 | 16.14 | 5 |
| DEX-CZ101 | 415412.336 | 9674093.419 | 397.184 | 24 | -90 | 20.58 | 4.1 |
| DEX-CZ147 | 415703.561 | 9673897.446 | 364.978 | 6 | -90 | 2 | 1.67 |
| DEX-CZ713 | 416902.309 | 9673751.698 | 352.671 | 21 | -90 | 14.77 | 5 |
| DEX-CZ206 | 416498.967 | 9673991.827 | 362.669 | 17 | -90 | 4.15 | 4 |
| DEX-CZ412 | 416501.378 | 9674151.269 | 354.966 | 22 | -90 | 9.85 | 11 |
| DEX-CZ135 | 415685.163 | 9674411.616 | 383.778 | 12 | -90 | 9.11 | 2 |
| DEX-CZ2525 | 415597.986 | 9673906.734 | 361.420 | 7 | -90 | 4 | 3 |
| DEX-CZ726 | 416903.106 | 9673851.786 | 369.637 | 43 | -90 | 13.04 | 26.82 |
| DEX-CZ364 | 416357.629 | 9674392.374 | 392.654 | 15 | -90 | 6 | 7.25 |
| DEX-CZ161 | 415814.393 | 9674617.099 | 405.609 | 18 | -90 | 14.52 | 3 |
| DEX-CZ168 | 415902.257 | 9674302.319 | 414.090 | 22 | -90 | 23.45 | 0 |
| DEX-CZ099 | 415400.403 | 9673899.130 | 357.734 | 27 | -90 | 24.71 | 6.2 |
| DEX-CZ396 | 416357.850 | 9674195.077 | 387.937 | 14 | -90 | 12.46 | 1.29 |
| DEX-CZ074 | 415089.870 | 9673999.595 | 348.019 | 25 | -90 | 20.44 | 4 |
| DEX-CZ1973 | 416149.042 | 9674225.775 | 420.464 | 25 | -90 | 24.79 | 1 |
| DEX-CZ1533 | 416827.889 | 9673846.035 | 369.955 | 34 | -90 | 18.46 | 8 |
| DEX-CZ171 | 415899.108 | 9673915.270 | 404.900 | 24 | -90 | 19.29 | 3.44 |
| DEX-CZ2362 | 415700.096 | 9674148.245 | 400.033 | 15 | -90 | 8 | 3.23 |
| DEX-CZ2349 | 415547.731 | 9673849.871 | 362.374 | 24 | -90 | 13.09 | 8.32 |
| DEX-CZ2517 | 415594.713 | 9673814.015 | 338.947 | 20 | -90 | 2 | 15 |
| DEX-CZ2363 | 415701.143 | 9674248.195 | 391.166 | 27 | -90 | 8.23 | 12.28 |
| DEX-CZ2357 | 415499.735 | 9673950.181 | 375.580 | 14 | -90 | 10.9 | 2 |
| DEX-CZ1172 | 416293.220 | 9674200.273 | 396.000 | 22 | -90 | 17.94 | 3.3 |
| DEX-CZ2523 | 415597.036 | 9673847.791 | 345.768 | 7 | -90 | 2 | 3 |
| DEX-CZ2352 | 415547.529 | 9673898.349 | 371.379 | 17 | -90 | 10.47 | 7 |
| DEX-CZ2356 | 415449.983 | 9673952.451 | 379.304 | 22 | -90 | 15.51 | 2.24 |
| DEX-CZ357 | 416001.533 | 9674451.574 | 422.233 | 21 | -90 | 14.84 | 3 |
| DEX-CZ2376 | 415548.936 | 9674000.167 | 378.497 | 29 | -90 | 27.75 | 5.4 |
| DEX-CZ2358 | 415551.573 | 9673959.775 | 372.744 | 24 | -90 | 20.35 | 6 |
| DEX-CZ2404 | 415401.291 | 9674048.883 | 390.234 | 28 | -90 | 7.19 | 19.62 |
| DEX-CZ2355 | 415401.064 | 9673952.872 | 372.631 | 33 | -90 | 22.71 | 9 |
| DEX-CZ2368 | 415452.137 | 9673999.981 | 387.367 | 22 | -90 | 15.76 | 6 |
| DEX-CZ2345 | 415550.021 | 9673804.537 | 352.237 | 8 | -90 | 4 | 4 |