



REPORT

OceanaGold Waihi North Project

Geotechnical Assessment Underground Mine and Tunnels

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Submitted to:

OceanaGold (New Zealand) Limited

22 MacLaggan Street, Dunedin 9016, New Zealand

Submitted by:

WSP New Zealand Limited

12 Moorhouse Avenue, Addington, Christchurch 8011, New Zealand

+64 3 363 5400

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TECHNICAL REPORT

WAIHI NORTH PROJECT – PRELIMINARY GEOTECHNICAL
ASSESSMENT UNDERGROUND MINE AND TUNNELS

GENERAL AREA 000



Record of Issue

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Summary

Preliminary geotechnical investigations were undertaken to support a preliminary engineering assessment and consent application for the tunnelling and underground mine design of the Wharekirauponga underground mine (WUG). The project will include the development of an underground mine targeting the EG vein and T-Stream vein that are part of the Wharekirauponga ore body. Access to the underground mine site will be achieved by tunnelling from near Waihi, and the mine will be located within a Department of Conservation (DoC) administered reserve. Several tunnel phases will be required: the Willows Access Tunnel decline from the Surface Facilities Area to Ventilation Shaft 1, Dual Access Tunnels from Ventilation Shaft 1 to the Wharekirauponga ore body and a single tunnel (Waihi Access Tunnel) between Ventilation Shaft 1 and the process plant at Waihi.

A revised project description was issued by OceanaGold in July 2024 incorporating a staged programme including additional proposed exploration and geotechnical investigations as described below.

Stage One: Being activities required to:

- Establish / drill the Willows Access Tunnel decline;
- Establish / install infrastructure associated with the Willows Access Tunnel decline, including the portal, the Willows Surface Facilities Area (SFA), and a Services Trench (linking the existing processing plant to the Willows SFA); and
- Upgrade the existing Water Treatment Plant (WTP), and the discharge of treated water from the WTP; and
- Support Wharekirauponga ore body resource investigation and exploration progression.

Stage Two: Being activities associated with the wider mining and production activities of the Waihi North Project; and

Stage Three: Being two-years of mine remediation and closure activities.

The available information includes extensive fully cored exploration drillholes at the Wharekirauponga ore body, a number of fully cored boreholes at the Willows site and exploration drillholes from the vicinity of Waihi. The drillholes at Willows were specifically undertaken to provide geotechnical information to assess the tunnel and shafts in that area. However, limited geotechnical characterisation of the rock mass at the WUG orebody and Dual Access Tunnels has been completed to date due to limited access within the DoC reserve. A 400 m deep drillhole (WKP-P05D), located on the eastern side of the WUG orebody, has provided information about the geotechnical and hydrogeological characteristics in that area. Geotechnical assessment of the Waihi Access Tunnel has been based on regional geological information, exploration drilling near the proposed alignment and geotechnical investigations carried out near the plant site.

Key findings of the investigations include the following:

- Extensive investigation drilling along the Willows Access Tunnel alignment encountered a combination of weak, highly weathered andesite or tuff and strong to very strong andesite. Given the low strength of some of the rock, significant support requirements are anticipated

for about 50 % of this tunnel length. No specific design of tunnel support has been completed as part of this study.

- No subsurface investigations have been completed between the Mataura Stream and WKP-P05D on the eastern side of the WUG orebody. Four geotechnical drillholes are proposed for Stage One of the project to collect additional information to support design of the Dual Access Tunnels. Design of tunnel support and groundwater inflow control will also rely on investigation drilling ahead of the tunnel face.
- Groundwater levels have been measured at shallow depths in the boreholes, while piezometric measurements in boreholes suggest a general downward groundwater gradient. Rock mass permeability, inferred by hydrogeological consultants WWLA, is generally low (typically 1×10^{-7} to 1×10^{-8} m/s). Zones of higher permeability are inferred in highly fractured brittle units, around faults and the contacts between volcanic rock units.
- Rock strength encountered in a borehole close to the location of Ventilation Shaft 1 ranges from very weak to strong. WSP infers that substantial support will be required for the upper portions with a supported upper construction method combined with raiseboring for the lower portion the preferred methodology.

Recommendations

WSP recommends that the following points be addressed as part of developing the design:

- Targeted subsurface investigations, such as the boreholes at shaft locations and at discrete locations along the tunnel alignment planned during Stage 1, are recommended to supplement the currently available geotechnical information between Willows and the Wharekirauponga ore body. In addition, drilling ahead of the tunnel face from underground will be important for predicting ground conditions ahead of the face for tunnel support and design of groundwater management, as well as geological exploratory information.
- Further investigation of in situ stress as part of detailed design of the WUG and access tunnels.
- Consideration should be given to the management of groundwater with potentially elevated temperatures if encountered during underground works. Hydrothermal alteration has widely affected the rock mass at the site, including placement of the WUG orebody. WSP is not aware of any evidence of on-going hydrothermal processes affecting the area; however, some inflows of hot groundwater are possible.
- Consideration should be given to the potential effect on design of the generally low strength rock mass, groundwater conditions and stress conditions. It is anticipated that squeezing ground may be present in areas of very weak ground.
- Measures should be developed to ensure that the Willows Access Tunnel portal remains serviceable for the duration of the project. Such measures should include management of surface water and shallow groundwater. Local support measures may be required, such as shotcrete and bolts or a mass gravity wall.

Consideration should be given to the potential adverse effect of acidic water on ground support and underground infrastructure.

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Report Limitations

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Geotechnical Logs for Willows Road Access Tunnel

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1.0 INTRODUCTION

Oceana Gold (New Zealand) Limited (OGNZL) engaged Golder Associates (NZ) Limited (Golder) [now WSP New Zealand Limited (WSP)] to provide preliminary geotechnical assessment for various elements of the proposed Wharekirauponga Underground Mine (WUG), which is located north of the township of Waihi, New Zealand.

This report summarises the findings of the preliminary geotechnical assessment of the access tunnels and underground mine. The objective of the study is to evaluate the available geotechnical information to support a prefeasibility study (PFS) and consent application for the Waihi North Project (WNP), to assess the geotechnical issues affecting the project and to identify any potential issues affecting the viability of the project.

1.1 Project Outline

The Waihi North Project (WNP) includes development of an underground mine in an epithermal gold deposit in the upper catchment of the Wharekirauponga Stream on the Coromandel Peninsula as one of its components. The Wharekirauponga deposit is located approximately 10 km north of Waihi and will be accessed by tunnelling from a surface mine infrastructure site located at the Willows property, approximately 3 km north of Waihi. A 2022 project description describes twin parallel tunnels to provide access from the Willows development to the WUG ore body.

A revised project description was issued by OceanaGold in July 2024 incorporating a staged programme including additional proposed exploration and geotechnical investigations as described below.

Stage One: Being activities required to:

- Establish / drill the Willows Access Tunnel decline;
- Establish / install infrastructure associated with the Willows Access Tunnel, including the Willows Portal, the Willows Surface Facilities Area (SFA), and a Services Trench (linking the existing processing plant to the Willows SFA; and
- Upgrade the existing Water Treatment Plant (WTP), and the discharge of treated water from the WTP; and
- Support Wharekirauponga ore body resource investigation and exploration progression.

Stage Two: Being activities associated with the wider mining and production activities of the WNP; and

Stage Three: Being two-years of mine remediation and closure activities.

This report includes the amendments to the earlier 2022 project description and is intended to support an application under the Fast-Track Approvals Act.

1.2 Project Elements Assessed as Part of this Report

This preliminary geotechnical assessment includes the following project elements:

- Willows Access Tunnel decline and portal
- Ventilation Shaft 1
- Waihi Access Tunnel and portal
- Dual Access Tunnels from Ventilation Shaft 1 to Wharekirauponga underground mine
- Wharekirauponga underground mine design

1.3 Scope of Work

WSP undertook the following scope of work to characterise tunnelling conditions:

- Data compilation and review of available geotechnical information, aerial imagery and LiDAR.
- Geomorphological mapping, subsurface investigations, in situ and laboratory testing within Willows. All field investigations have been supervised by OGNZL personnel, in consultation with WSP. The results of the field investigations have been used by WSP to complete this assessment.
- A geotechnical assessment report for the access tunnels and underground mine that includes the information from the above points (i.e., this report).

For the underground mine WSP's agreed scope was to:

- Conduct the geotechnical review and gap analysis of the current design for the underground mine prepared by others.
- Make recommendations regarding the suitability of the current design and any additional work that needs to be completed for the next stages of mine design.

The following tasks were carried out:

- 1) Review the available reports:
 - a. SRK (2019): Wharekirauponga Mining Study. OGC008_WUG Scoping Study_Rev0. April 2019
 - b. Wharekirauponga underground mine PEA - Geotechnical Section. PEX-000-PLN-046-A. Prepared by OGC Studies Group. undated.
- 2) Gap analysis.
- 3) Additional work for the next stage of the design.

1.4 Site Visits

A site visit to the Willows was completed by Tim McMorran (WSP Principal Engineering Geologist) on 20 July 2020. Tim accompanied Dan Calderwood (OGNZL), Fergus McArthur (OGNZL) and Holly Janssen (GHD) on the visit and observed rock and soil outcrops and geomorphology visible from farm tracks around the proposed portal site, rock stack site, silt pond and other infrastructure. Tim visited the site a second time on 22 September 2020 accompanied by Sue Bonham-Carter (WSP Principal Mining Engineer) and Holly Janssen and on 20 September 2021, accompanied by Rory McNeill (for OGNZL).

Rock mass permeability testing was completed in various bore holes at the Wharekirauponga deposit during several site visits by Logan McLean (WSP Hydrogeologist) and Florian Buech (WSP Senior Engineering Geologist).

1.5 Co-ordinate System and Units of Measure

Various reduced levels are used throughout this report:

- NZGD2000 – current New Zealand coordinate system.
- NZGD1949 – previously applied coordinate system, the datum of which is around 0.5m lower than NZVD2000.
- Mine datum – which is set at 1000m below a pre-1949 geodetic datum. The current datum at NZVD2000 is about 1,002m above mine datum.

Each applicable datum is referenced in a footnote.

All measurements are metric.

2.0 RELIANCE ON OTHER EXPERTS

WSP reviewed available information about the site geology and geomorphology including logs and core photographs and aerial imagery provided by OGNZL.

Geological mapping and an assessment of regional geology has been completed by OGNZL exploration geologists and is presented in OGC (2020).

GHD has undertaken an assessment of water management and geochemistry (GHD 2025).

Groundwater effects have been evaluated by WWLA (2025a,b).

Description of the underground mine design and available geotechnical information has been undertaken by OGNZL (presented in Figure 1) and SRK (2019) and used by WSP to evaluate the appropriateness of the current mine design.

3.0 PROPERTY DESCRIPTION AND LOCATION

The Wharekirauponga (WUG) resource is located approximately 10 km north of the township of Waihi. The resource and parts of the proposed tunnels lie beneath DoC administered land within the WUG Minerals Mining Permit (60541) area (OGC, 2020). The various project elements described in this report are illustrated in Figure 1.

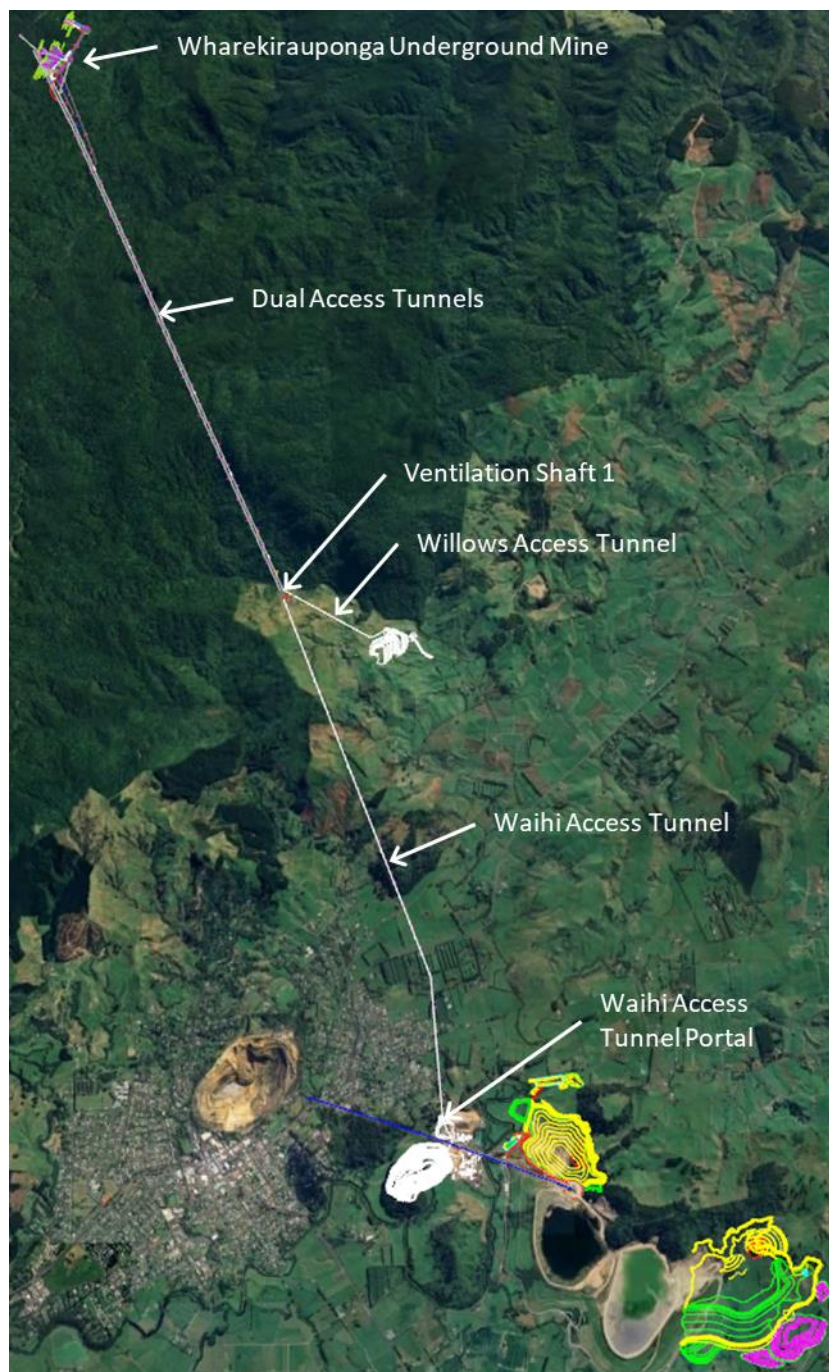


Figure 1: Layout of the WNP project showing various elements referred to in this report.

4.0 SETTING

4.1 Geology

The Coromandel Peninsula, south as far as Te Aroha, and including the area around and north of Waihi, is dominated by volcanic rocks of the Coromandel Group comprising andesite, dacite and rhyolite of Miocene Age¹ (Edbrooke 2001, Braithwaite, Christie 1996) (Figure 2). Flow banded rhyolite that hosts the ore body has been assigned to the Maratoto Rhyolite and the associated lithic lapilli tuffs have been referred to the Edmonds Formation (Rhys 2019). These orebody host rock units overlie the older andesite, tuff, breccia and dacite of the Waipupu Formation and Whitiroa Andesite within which the various access tunnels will be constructed. Younger ignimbrite, locally up to about 100 m in thickness, is present between the Waihi processing plant and Willows and volcanic ash materials are inferred to be present throughout the area as surficial soils. Basement rock in the area comprises Jurassic Age Manaia Hill Group sandstone, siltstone and conglomerate at more than 1000 m depth. The Coromandel Peninsula is located on the western side of the Taupo Volcanic Zone, which is an extensional tectonic domain dominated by northeast trending normal faults of low activity.

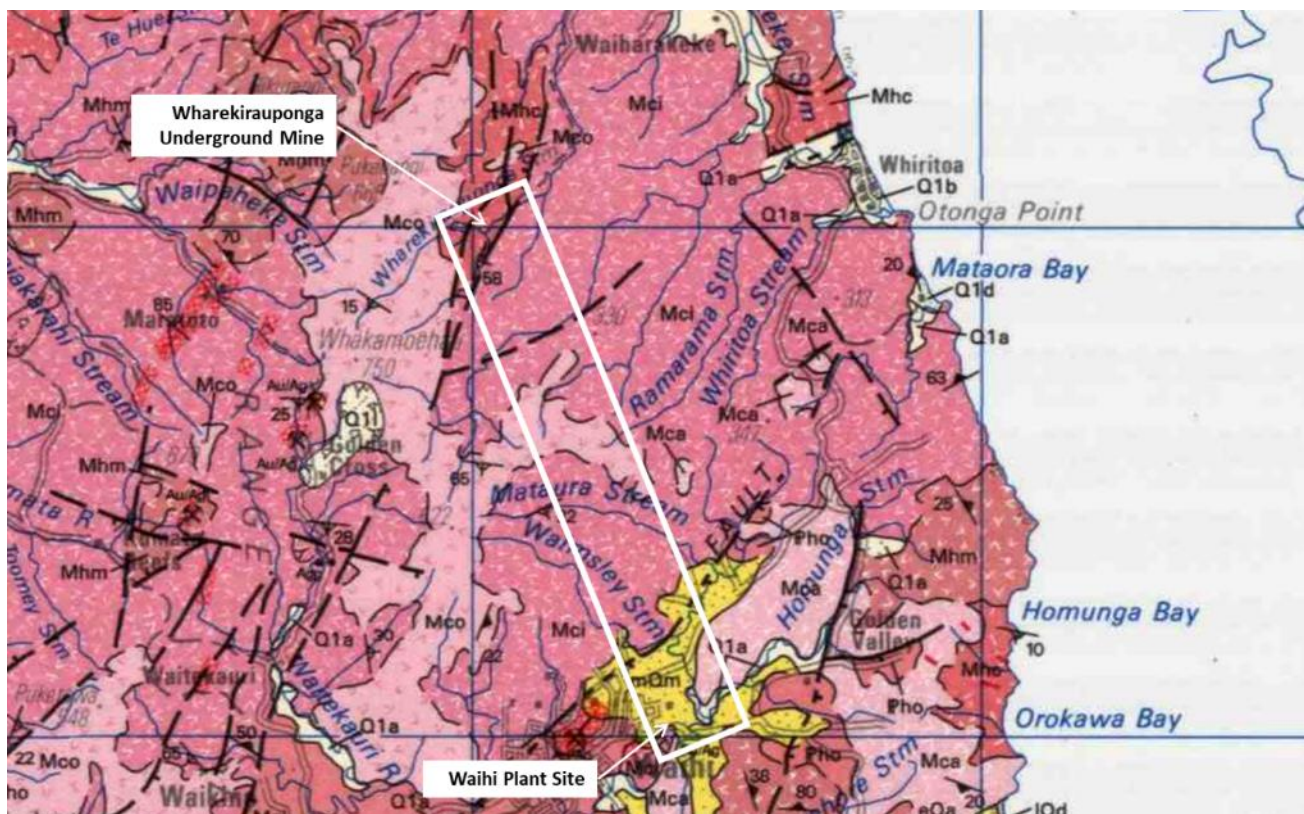
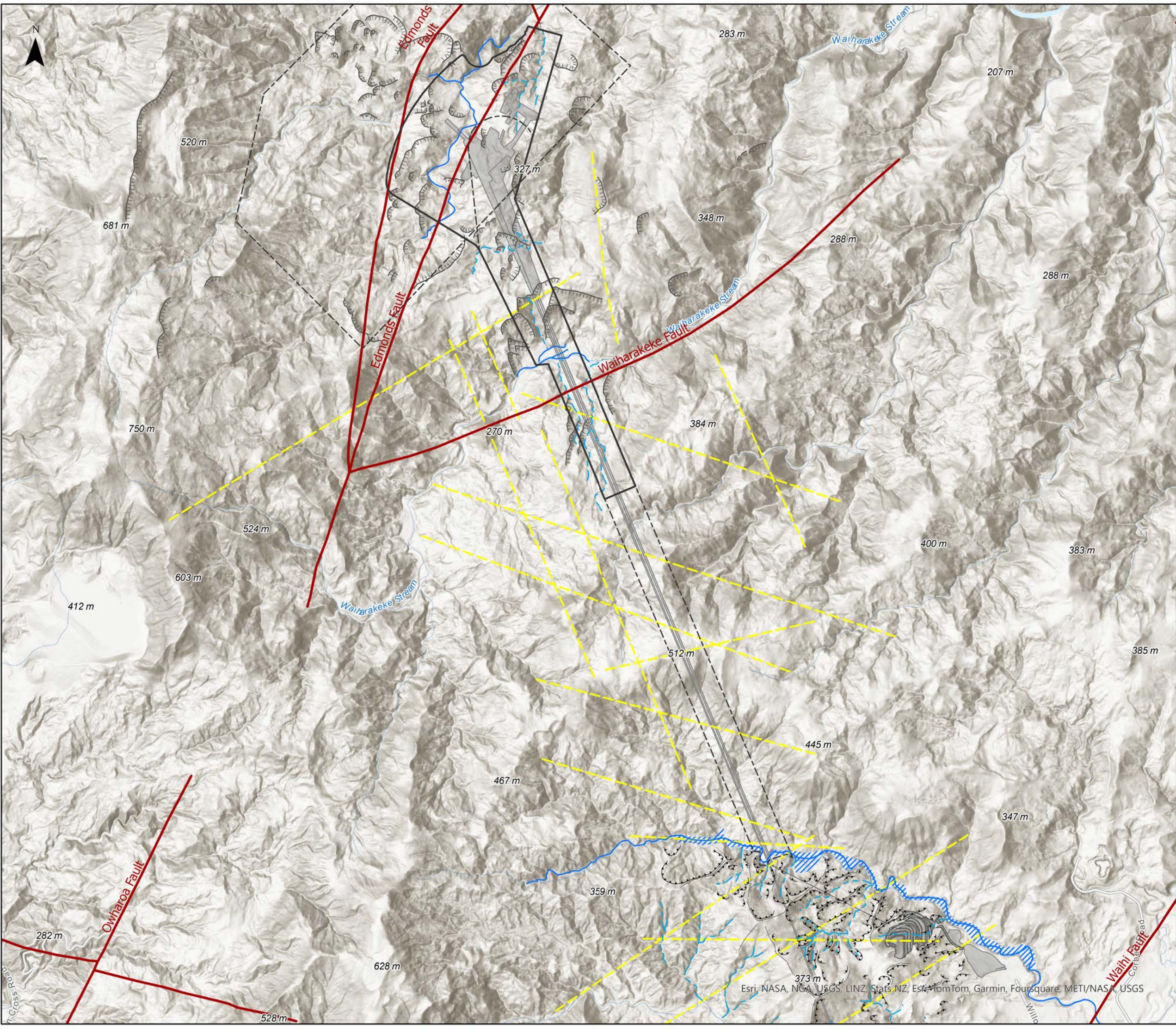


Figure 2: Geological map showing distribution of main lithologies (Edbrooke 2001). The pink units 'Mci', 'Mco' and 'Mhc' comprise the various Miocene and Pliocene volcanic rock types encountered by the access tunnels. The yellow unit 'mQm' comprises younger alluvium. The general project corridor (ref Figure 1) is within the white rectangle.

¹ ANDESITE is a fine grained extrusive volcanic rock; RHYOLITE is highly silica rich volcanic rock; DACITE is a porphyritic (contains various grain sizes) intrusive volcanic rock of intermediate composition between andesite and rhyolite; TUFF is a rock comprising pyroclastic volcanic ash that mainly comprises sand size or finer material; LAPILLI TUFF is a tuff that contains up to 50 % of rock fragments greater than sand size; TUFF BRECCIA is a pyroclastic rock that comprises more than 50 % of angular rock fragments in a tuffaceous matrix.

A conceptual geological model for the Dual Access Tunnels between Willows and Wharekirauponga (GHD 2020) has been prepared using regional geological mapping information and interpretation of surface topographic models (Figure 3).



LEGEND

- Watercourse
- Drainage Channel
- Alluvium
- Faults (GNS 250k)
- Lineaments
- Landslides (inferred)
- Scarp
- Ridgeline
- Proposed Infrastructure
- Fast Track (Vent Site Extent)

REFERENCES

1. Aerial: LINZ and Eagle Technology, CC-BY-3.0-NZ.
2. Map image: © OpenStreetMap (and) contributors, CC-BY-SA Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. Schematic only, not to be interpreted as an engineering design or construction drawing.

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CLIENT

OCEANA GOLD (NEW ZEALAND) LIMITED

PROJECT

WAIHI NORTH PROJECT - GEOTECHNICAL ASSESSMENT

TITLE

GEOMORPHOLOGICAL LAYOUT

CONSULTANT



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2025-02-04

PREPARED BY

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FIGURE

03

Esri, NASA, NOAA, USGS, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

4.2 Geomorphology

The proposed project lies at the southern end of the Coromandel Range. The Wharekirauponga ore body is located beneath the upper catchment of the Wharekirauponga Stream catchment, which flows east to the coast via the Otahu River. The catchment comprises heavily bush covered terrain with northeast trending ridges rising to between 300 m and 500 m elevation above sea level that are separated by incised northeast flowing streams. Resulting slopes are typically steep.

The Willows property lies on the south side of Mataura Stream, which flows east into Ohinemuri River. The Ohinemuri River occupies a wide flat valley south east of Willows.

Figure 3 depicts the key geomorphological features of the project corridor. This includes geomorphic features that may be landslides and lineaments that could represent faults or prominent discontinuity sets.

4.3 Groundwater

The assessment of groundwater effects for the project (WWLA 2025a,b) estimates the typical rock mass hydraulic conductivity is approximately 1×10^{-7} to 1×10^{-8} m/s and more fractured rock mass zones are indicated to have hydraulic conductivity of approximately 1.0×10^{-6} to 1×10^{-7} m/s.

Rock mass permeability testing has been completed in boreholes at the Wharekirauponga deposit and vibrating wire piezometers have been installed at various elevations. The results of this work are presented in a separate report (Golder 2021).

Numerical modelling of the potential effects of the tunnels and underground mine on the groundwater system has been undertaken by others (FloSolutions 2024a,b).

4.4 In-situ Stress Conditions

In situ stress measurements were conducted in about 2010 for OGNZL by the West Australian School of Mines (WASM) using the Acoustic Emission (AE) method and the results were provided to WSP.

Results from two drillholes at Trio Underground Mine at Waihi were broadly in agreement and are presented in Table 1.

Table 1: Summary of in situ stress measurements at Trio Underground Mine at Waihi (provided to WSP by OGNZL).

Vertical depth (m)	Sample location Rock type	Stress component	Magnitude (MPa)	Bearing (degrees)	Plunge (degrees)
174	FU 163 Feldspar Andesite	σ_1	12	018	03
		σ_2	8	287	07
		σ_3	5	133	82
420	FU 178 Quartz Andesite	σ_1	23	019	00
		σ_2	15	109	05
		σ_3	11	285	85

The results in Table 1 are reported in mine grid north and their poles are plotted in Figure 4 and stress gradients are plotted in Figure 5.

The results from the measurements of in situ stress at Waihi are useful for preliminary design of the proposed tunnels. The results appear to be consistent with the regional tectonic setting on the western margin of the Taupo Volcanic Zone and with the world stress map (www.worldstressmap.org). Further investigation of in situ stress would be advisable as part of detailed design of the tunnels.

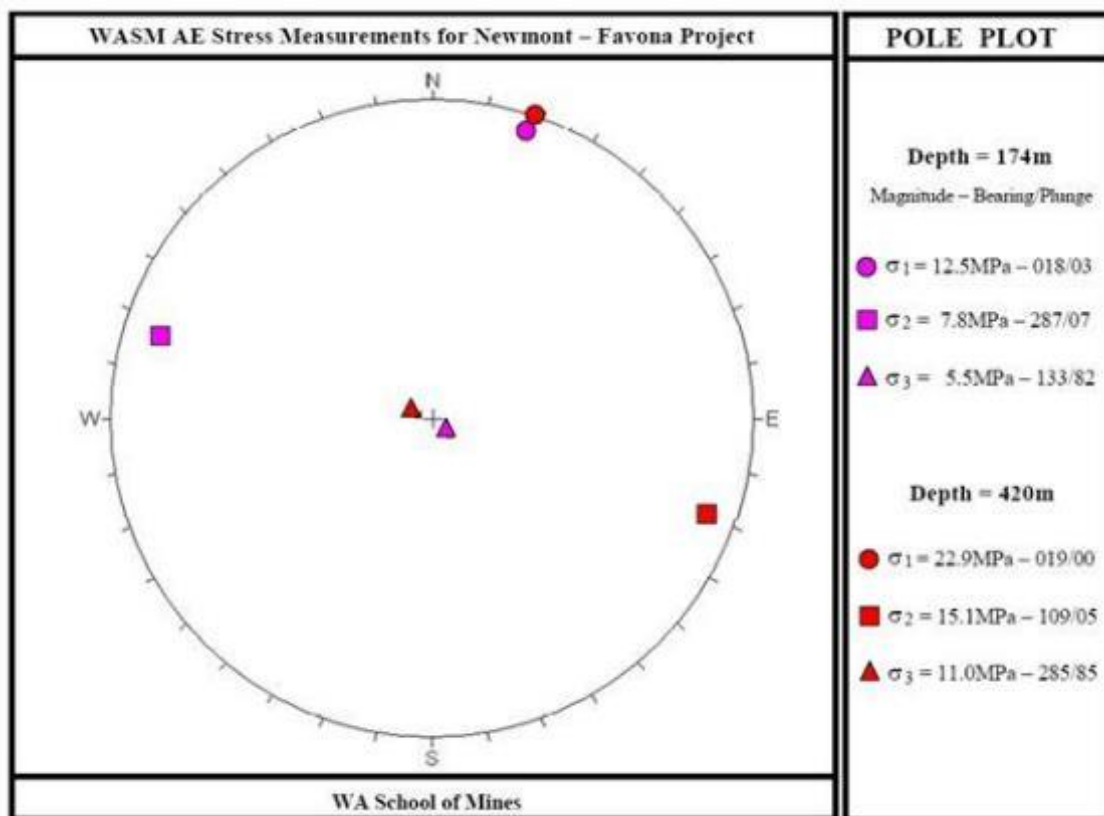


Figure 4: Principal stress orientations for Trio underground at Waihi (OGNZL).

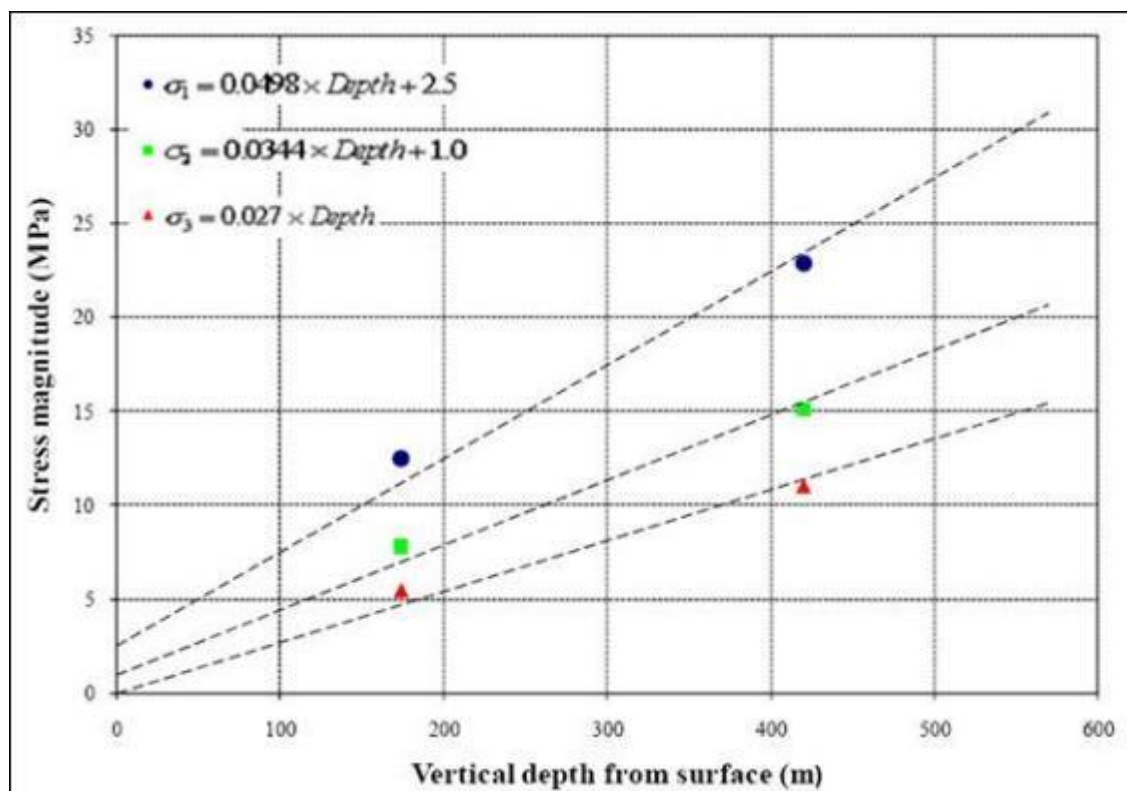


Figure 5: Stress gradients determined for major, intermediate, minor and vertical stress components (OGNZL).

5.0 ACCESS TUNNEL OVERVIEW

The planned access to the Wharekirauponga resource will be via tunnels from Waihi and from Willows. From where these tunnels intersect, Dual Access Tunnels will reach from the base of Ventilation Shaft 1 on the Willows property to Wharekirauponga underground mine, a distance of about 6 km. Initial access to the base of Ventilation Shaft 1 will be via the Willows Access Tunnel decline, a 1.3 km long decline from a portal near to the proposed waste rock stockpile. Both Ventilation Shaft 1 and the Willows Access Tunnel decline will be completed in Stage 1 of the project. Following completion of the Dual Access Tunnels to WUG, an additional 5 km long access tunnel (the Waihi Access Tunnel) will be constructed from the base of Ventilation Shaft 1 to the plant site at Waihi. This tunnel will enable ore to be transported directly from the underground mine to the plant site without using public roads. The Dual Access Tunnels and Waihi Access Tunnel, as well as all mine development, will be completed in Stage 2 of the project.

Ventilation shafts

Up to five ventilation shafts are proposed along the access tunnels and at the mine site (refer to Figure 6):

- Ventilation Shaft 1 - 250 m deep shaft at the north western margin of Willows (refer to Section 6.4).
- Up to four ventilation shafts at the WUG orebody, including an emergency egress, fresh air raise (FAR) to supply fresh air and return air raise (RAR) to exhaust air from the mine.

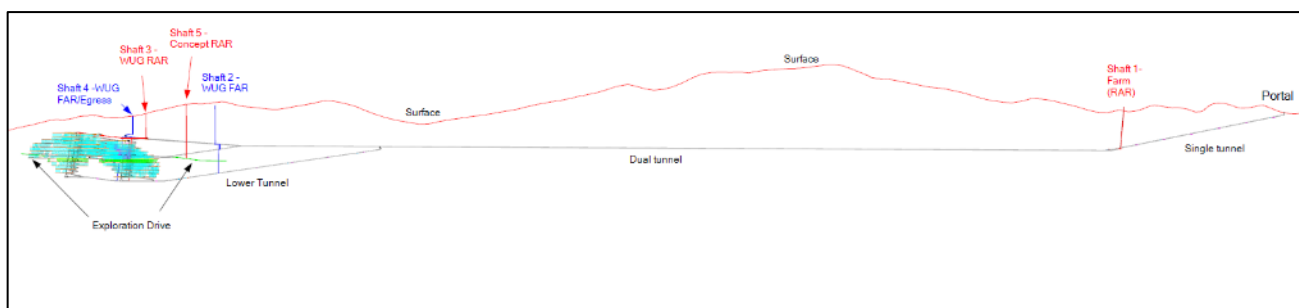


Figure 6: Schematic long section along WUG Access Tunnel (OGNZL).

The tunnel design dimensions are nominally 5.8 m wide by 6.0 m high and the dual tunnel arrangement will be as presented in Figure 7.

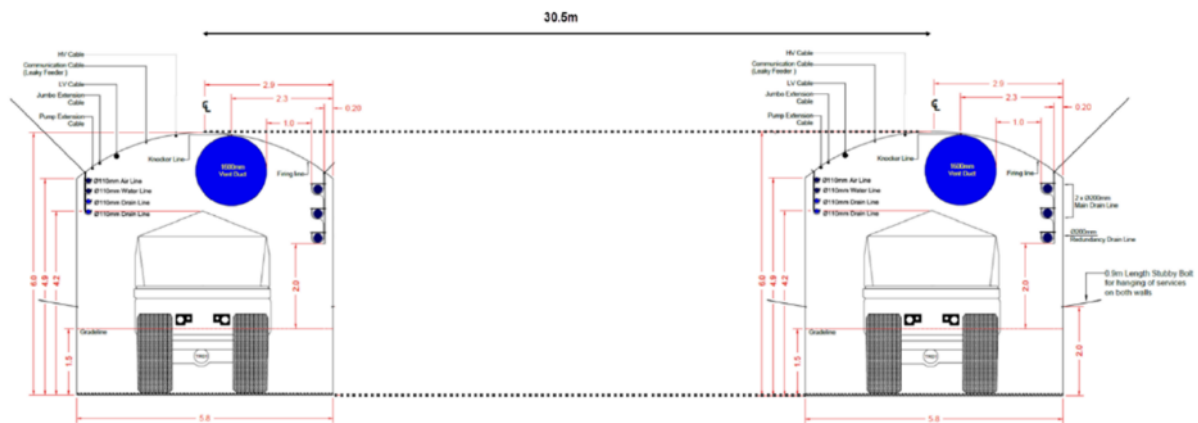


Figure 7: Conceptual layout cross section of twin tunnels.

Section 6.0 describes the geotechnical investigations and implications for the Willows Access Tunnel. Section 7.0 describes the available geotechnical information for the Dual Access Tunnels. Section 8.0 describes the available geotechnical information for the Waihi Access Tunnel.

6.0 WILLOWS ACCESS TUNNEL AND VENTILATION SHAFT 1

6.1 Geotechnical Investigations

6.1.1 Field mapping

Key geomorphological features of Willows were identified by WSP using analysis of available aerial imagery and topographic information. This assessment utilised high-quality LiDAR survey data and aerial imagery supplied by OGNZL, and Google Earth satellite imagery. The identified geomorphological features of the Willows site are summarised in Figure 3.

6.1.2 Boreholes

Fully cored boreholes were completed at various locations to investigate key elements of the tunnel and surface infrastructure. The borehole details are presented in Table 2 and locations of all site investigations are presented in Figure 8.

Table 2: Summary of boreholes completed for Willows Access Tunnel.

Name	Depth (m)	Direction	Easting	Northing	Collar RL	Purpose
WFBH010	7.40	Vertical	2763258.00	6423876.49	220.25	Tunnel alignment between portal and Ventilation Shaft 1
WFBH011	15.08	Vertical	2762897.70	6423934.45	233.18	Tunnel alignment between portal and Ventilation Shaft 1
WFBH012	18.3	Vertical	2762718.66	6424155.79	246.49	Tunnel alignment between portal and Ventilation Shaft 1
WFBH013	16.85	Vertical	2762593.67	6424370.63	205.20	Tunnel alignment between portal and Ventilation Shaft 1
WNDD007	231.7	Vertical	2762468.97	6424304.13	237.63	Approximately 50 m from Ventilation Shaft 1
WNDD008	1043.50	20° inclined (trend ~300°)	2763401.77	6423550.34	235.57	Approximately parallel to access tunnel

Geotechnical logs prepared by GHD are reproduced in Appendix C. Additional boreholes, test pits and cone penetration tests (CPTs) were undertaken at Willows to evaluate geotechnical considerations affecting proposed surface mine infrastructure including a rock stack for temporary tunnel spoil storage (refer to WSP 2022 and WSP 2023). Those additional investigations are not repeated in this report.

6.1.3 Laboratory testing

A range of laboratory tests was undertaken on samples collected from boreholes WNDD007 and WNDD008 on the Willows site. Unconfined compressive strength (UCS), density and moisture content test results are summarised in Table 3.



LEGEND

- Drillhole Locations
- Drillhole Direction/Extent
- Proposed Infrastructure

REFERENCES

1. Aerial: LINZ and Eagle Technology, CC-BY-3.0-NZ.
2. Map image: © OpenStreetMap (and) contributors, CC-BY-SA Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. Schematic only, not to be interpreted as an engineering design or construction drawing.

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CLIENT

OCEANA GOLD (NEW ZEALAND) LIMITED

PROJECT

WAIHI NORTH PROJECT - GEOTECHNICAL ASSESSMENT

TITLE

BOREHOLE LOCATIONS

CONSULTANT

YYYY-MM-DD

2025-02-04

PREPARED BY

RP

REVIEWED

TM

APPROVED

TM

PROJECT NO.

21464271

PHASE

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FIGURE

08

Table 3: Summary of rock sample test results.

	Bulk Density (t/m ³)	Dry Density (t/m ³)	Water content (%)	UCS (MPa)
Waipupu Formation (13 samples from WNDD007)				
Mean	2.50	2.36	5.98	19.9
Minimum	2.43	2.25	2.70	11.0
Maximum	2.59	2.50	8.10	49.0
Whitiroa Andesite (23 samples from WNDD008)				
Mean	2.12	1.83	16.74	14.3
Minimum	1.91	1.45	3.00	2.6
Maximum	2.48	2.40	31.50	61.0

6.1.4 Summary of geotechnical characteristics of Willows

Logs from test pits and boreholes undertaken on the Willows site describe fine grained soils up to several metres thick overlying highly weathered volcanic rock. Volcanic rock comprises andesite flows, tuffs and breccias of the Whitiroa Andesite and Waipupu Formation ranging from very weak rock to strong rock. The overlying fine grained soils comprise weathered volcanic ash, residual weathered volcanic rock and associated colluvium.

Alluvial soils were encountered beneath the terraces adjacent to Mataura Stream and these included gravels, sands and silts, often containing boulders of volcanic rock.

6.2 Willows Access Tunnel Portal

The proposed tunnel portal site is located on a ridge on the north side of the proposed Willows Rock Stack (WRS) footprint. Description of the ground conditions and preliminary design of the portal and associated boxcut are presented in PSM (2024).

6.3 Ventilation Shaft 1

A 250 m deep vertical ventilation shaft ('Ventilation Shaft 1') is planned to be located on the Willows, property immediately to the south of the DoC boundary along the tunnel alignment.

Geotechnical drill hole WNDD007 was advanced to a total depth of 231.7 m near the proposed vent shaft site in August 2020. Drill hole photos and logs have been prepared by GHD and the geotechnical conditions summarised in Table 4.

Table 4: Summary of geotechnical conditions from log of WNDD007 (Ventilation Shaft 1 site).

Drillhole interval (m)	Geological description	Geotechnical characteristics	Comments
0 – 7.2	Sandy SILT	Low plasticity	Pedolith (residual Waipupu Fm)
7.2 – 32.0	Porphyritic ANDESITE	Highly weathered, weak – very weak rock	
32.0 – 42.0	Porphyritic ANDESITE	Moderately weathered, moderately strong rock	Multiple crush zones
42.0 – 66.7	Porphyritic ANDESITE	Highly weathered, weak rock	
66.7 – 78.2	Porphyritic ANDESITE	Moderately weathered, very strong rock	
78.2 – 129.5	Autoclastic-breccia ANDESITE	Moderately weathered, moderately strong rock	102.8 – 104.1 m Heavy clay alteration
129.5 – 146.2	Porphyritic ANDESITE	Slightly weathered, strong rock	
146.2 – 151.6	CLAY	Highly weathered, weak soil	5 m zone of clay
151.6 – 231.7 (EOH)	Autoclastic breccia ANDESITE	Moderately- slightly weathered, strong rock	Varying thicknesses of breccia/porphyritic lava flows interceded by highly hydrothermally altered clays. 1 m zone of clay at 162 m 3 m of clay at 166 m 3 m of clay at 203 m 0.6 m fault gouge breccia and clay at 212.2m

6.3.1 Ground conditions

Predominantly volcanoclastic tuff breccias (Figure 9), and flow andesite (Figure 10) were encountered in borehole WNDD007, with zones of clay altered material (Figure 11). The core appears to have a gently inclined, east dipping, weakly developed fabric. The typical thickness of volcanic units in the core ranges from metres to tens of metres. Unconfined compressive strength of selected intact WNDD007 core samples typically range between 11 MPa and 49 MPa, which is consistent with a weak to moderately strong rock. Much of the core, by contrast is logged as a strong rock. The upper 50 m of the ground profile mainly comprises very weak andesite including a highly weathered profile, with andesite strength generally increasing with depth. Multiple crush

zones were encountered between 42 m and 65 m BGL. Crush zones are between 0.1 m and 1.3 m thick. There is a total of 5.1 m of crushed rock over a 20 m length of core.

Groundwater was encountered at about 10 m BGL and hydraulic testing indicates a relatively low permeability rock mass. The extent of weathering appears to correlate strongly with rock mass strength. Tuff breccias and lapilli tuffs that were present in WNDD008 (refer to Table 7) are not encountered in WNDD007.



Figure 9: Autoclastic breccia andesite recovered from WNDD007.



Figure 10: Porphyritic andesite recovered from WNDD007.



Figure 11: Clay altered sample from WNDD007.

6.3.2 Discontinuity characteristics

A downhole geophysical survey of WNDD007 was completed by RDCL using an acoustic televiwer tool. Data was collected between 27.0 m and 204.6 m below ground level, below which a collapse of the borehole prevented the tool from surveying the lower part of the hole.

Raw data was provided to WSP for interpretation of discontinuity orientation and condition, which was completed using WELLCAD software.

The stereoplot of faults, shears and crushed zones (Figure 12) indicates three dominant orientations:

- Striking northeast and dipping 60° to the northwest. This discontinuity set is approximately parallel to a prominent regional lineament set.
- Striking approximately northwest and dipping about 65° to the southeast.
- Striking approximately north and dipping about 30° to 50° to the east.

The stereoplot of joints (Figure 12) shows a prominent joint set that ranges between horizontal and dipping approximately 40° to the east.

Additional characteristics of the discontinuities in WNDD007 include:

- Half of the measured joint orientations in WNDD007 have an inclination of less than 30°, a further 20 % of joints dip between 70° to 80°.
- Vein orientations generally show markedly steeper orientations, with none below 10° and a significant grouping between 70° - 80°.
- Most unconformities can be classed as undulating, rough, and tight to very narrow with calcite infill. Discontinuities are predominantly widely spaced (2 m – 600 mm), although sections of closely spaced (200 mm – 60 mm) discontinuities occur, typically over 2 m sections of core and in the porphyritic andesite units.

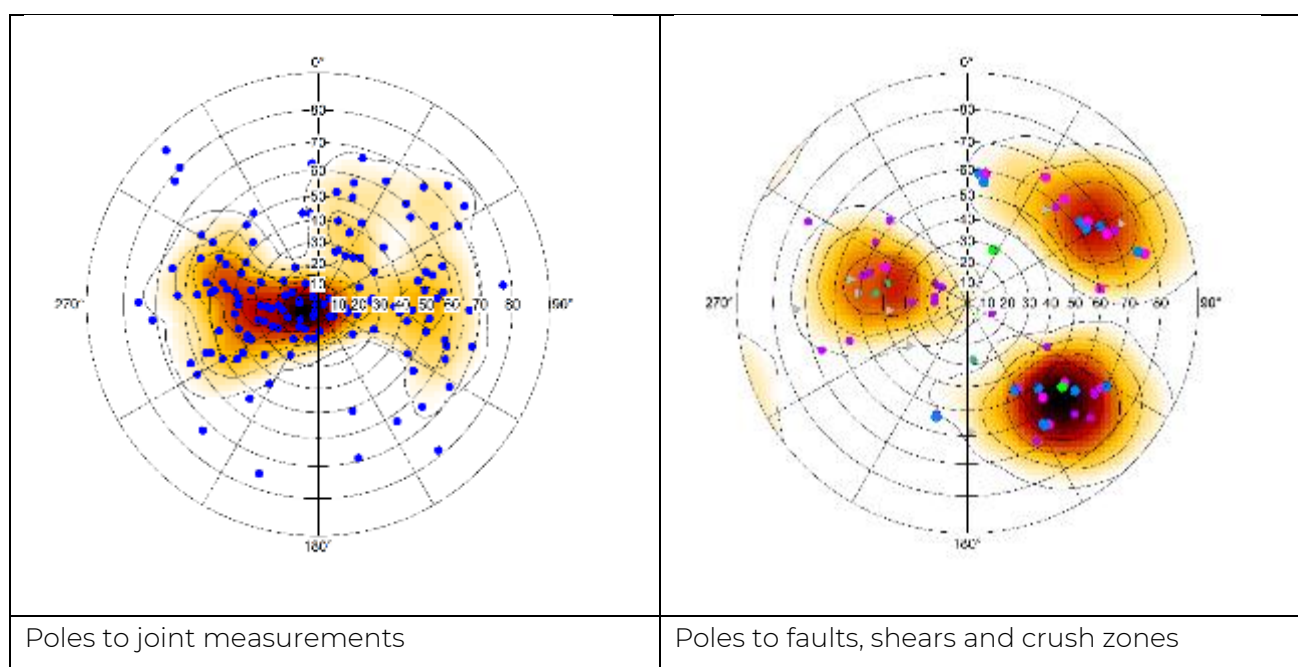


Figure 12: Wellcad interpretation of discontinuities from WNDD007 between depths 32.79 m and 204.58 m (n=206).

Typical discontinuity spacing in WNDD007 is in the range of 0.1 m to 5.0 m. Faults and shear zones up to 2 m in thickness are also indicated by the geophysical data. Discontinuities appear to be concentrated in the more competent porphyritic andesite layers of the log.

6.3.3 Groundwater

GHD conducted packer tests and falling head tests within WNDD007 and installed VWP's at three elevations. Permeability test results are presented in Table 5 and piezometer data is presented in Table 6.

Table 5: Hydraulic conductivity test results for Ventilation Shaft 1 (WNDD007) (after GWS 2020).

Test	Test Zone (m BGL)		Hydraulic conductivity (m/s)
Falling head tests			
Test 1	6.3	12.2	6.7×10^{-7}
Test 2	15.3	16.8	4.0×10^{-6}
Test 3	15.3	21.3	7.3×10^{-7}
Test 4	104.0	117.0	8.3×10^{-7}
Test 5	197.3	204.3	3.3×10^{-7}
Packer tests			
Packer 1	34.5	37.9	1.5×10^{-8}
Packer 2	64.6	74.8	2.4×10^{-8}
Packer 3	107.3	117.3	5.0×10^{-7}
Packer 4	151.6	151.6	2.0×10^{-8}
Packer 5	222.7	231.7	1.3×10^{-8}

Table 6: Results from VW piezometers in WNDD007 (GWS 2020).

VW Piezometer tip depth (m BGL)	Depth to groundwater (m BGL)	Groundwater elevation (m RL)
49.1	11.2	220.8
141.8	22.6	209.4
217.6	27.9	204.1

6.3.4 Key geotechnical issues

Geotechnical considerations that will be relevant to construction of the Ventilation Shaft 1 include:

- The generally weak to moderately strong volcanic rock, with strong rock below about 130 m BGL should be readily excavatable using standard construction techniques.
- High groundwater elevations are present at the site of Ventilation Shaft 1, though no high permeability zones were identified. This could indicate that inflows will be relatively low.
- The proposed collar site for Ventilation Shaft 1 is not affected by deep-seated slope instability, based on a review of aerial imagery and a site visit.

- Discontinuities interpreted from WNDD007 include a prominent sub-horizontal to gently east dipping set and three moderately inclined sets. Discontinuity spacing is variable, typically between 0.1 m to 5.0 m.
- The collapse in WNDD007 at about 204 m BGL may indicate relatively low rock mass strength at that depth compared to the in-situ stress field.
- It is anticipated that squeezing ground conditions could affect the construction and support requirements of Ventilation Shaft 1 in zones of very weak, soil-like material.
- A supported construction methodology such as strip and line will be required for the upper portion of Ventilation Shaft 1. A fully supported shaft will be required through the weaker material with potential for raise boring through the harder more competent material. Detailed construction methodology will be developed through the next stages of project studies.

6.4 Tunnelling Issues

6.4.1 Ground conditions

The 1300 m long Willows Access Tunnel decline between the tunnel portal and the base of Ventilation Shaft 1 will have approximate dimensions of 5.8 mW by 6.0 mH and a gradient of 7H:1V. Ground conditions were investigated using borehole WNDD008 (1043 m long), which is approximately parallel to the proposed Willows Access Tunnel. This has been used to provide geotechnical interpretation, in addition to surface geological mapping by OGNZL. WNDD008 was logged by an engineering geologist from GHD and a summary of the geotechnical characteristics from the log is presented in Table 7.

Table 7: Summary of findings from WNDD008 summarised from the GHD bore log.

Drillhole interval (m)	Geological description	Geotechnical characteristics	Comments
0.0 to 16.7	Sandy SILT	Firm-stiff soil, low plasticity	
16.7 to 41.5	TUFF	Completely weathered, very weak rock	
41.5 to 65.7	Porphyritic ANDESITE	Highly - moderately weathered, weak rock	
65.7 to 74.5	DACITE	Moderately weathered, very weak to weak rock	Possible fault gouge at 68.5 to 70.2 m
74.5 to 448.0	LAPILLI TUFF, TUFF breccia	Moderately weathered, weak rock	Andesite dykes/flows at 81.5 m (6 m core length), 102.0 m, (2 m core length), 113.5 m, (3 m core length), 120.5 m (7 m core length), 227.1 m (1 m core length)

Drillhole interval (m)	Geological description	Geotechnical characteristics	Comments
448.0 to 519.0	Porphyritic ANDESITE	Slightly weathered, Strong to very strong rock	8.0 m of completely weathered and very weak andesite for between 448.0 – 456.0 m
519.0 to 622.5	Porphyritic ANDESITE	Moderately strong, moderately weathered rock	14.25 m of completely weathered very weak andesite between 608.25 – 622.5 m
622.5 to 724.6	Porphyritic ANDESITE	Slightly weathered, Strong to very strong rock	14 m of highly weathered, very weak andesite between 710.6 – 724.6 m
724.6 to 785.0	LAPILLI TUFF	Moderately weathered, moderately strong rock	Andesite dyke/flow at 735.5 m (4 m core length)
785.0 to 820.15	Porphyritic ANDESITE	Highly variable rock	Made up of 6 andesite flows of varying weathering and rock mass strength
820.15 to 990.4	Lapilli TUFF	Moderately weathered, weak rock	33.8 m of TUFF breccia between 95.6 – 990.4 m
990.4 to 1043.5 (EOH)	Porphyritic ANDESITE	Moderately weathered, weak-moderately strong rock	Slightly weathered, very strong from 1026.8 – 1043.0 m

WNDD008 encountered predominantly volcanoclastic tuff breccias (Figure 13) and flow andesite (Figure 14), with major lithological units typically in the range of hundreds of metres in core length (for definitions of rock types refer to Section 4.1). Unit thickness in the core is interpreted to be exaggerated and does not represent true thickness as WNDD008 was drilled at an inclination of about 20°, which is inferred to be at a low angle compared to the orientation of unit boundaries. Andesite lava flows show relatively thin (metres thick) zones of highly weathered material near contacts with tuffaceous material. Tuffaceous units show low strength and a high degree of weathering. Lapilli tuff material was retrieved as gravels (e.g., 380 m - 450 m) (Figure 15) which may be an indication of weak matrix strength.

Joint orientations within WNDD008 show a dominant northwest strike, steeply dipping to the north east at approximately 70° - 80° (inferred by the logger using oriented core techniques). This orientation is concordant with regional structural trends. Shallow dipping (less than 20°) discontinuities are rare in the core logs, which is consistent with a low angle hole orientation, which would likely not intercept near-horizontal joint sets. WNDD008 does not show the shallow east dipping orientated joint set of WNDD007 trend. Discontinuities tend to be widely spaced (600 mm – 2 m), although up to 10 m-long closely spaced jointed (60 mm – 200 mm) sections

occur within the porphyritic andesites. Discontinuities within the lapilli tuffs and tuff breccias are widely spaced (600 mm – 2 m). There are no recorded joints in a 50 m section of core between 370 m and 430 m.



Figure 13: Lapilli tuff recovered from WNDD008.



Figure 14: Porphyritic andesite recovered from WNDD008.



Figure 15: Lapilli tuff recovered as gravel from WNDD008.

6.4.2 Key geotechnical characteristics

The following geotechnical characteristics are expected for the Willows Access Tunnel decline:

- Cover thickness above the decline is typically in the range of 120 m to 220 m.
- The decline is inferred to mainly encounter Whiritoa Andesite (comprising phyrlic andesite and dacite flows and domes with tuff breccias and lithic crystal tuff). However, the contact with the underlying Waipupu Formation andesite (comprising andesite flows, dacite, locally with quartz phenocrysts; minor tuff breccia, crystal tuff and lacustrine sediments) is interpreted to dip about 20° to the east and cross the decline a few hundred metres from Ventilation Shaft 1. Waipupu Formation was not identified in WNDD008.
- Geological conditions encountered in WNDD008 are summarised in Table 7.
- A number of lineaments inferred from topographic expression cross the decline, with a prominent northeast trend, though these have not correlated with observations of faulting in the core of WNDD008.
- Core from WNDD008 suggests that about half of the length of the Willows Access Tunnel decline will encounter very weak, soil-like material ('poor rock') and half will be moderately strong rock or better ('good rock').
- Artesian groundwater conditions were encountered in WNDD008 and significant groundwater inflows are expected to occur in some intervals of the decline. In particular, the inflows are anticipated to be significant from within strong, fracture rock units, faults and from permeable unit boundaries.
- It is anticipated that the Willows Access Tunnel decline will be excavated using drill and blast techniques.

7.0 MAIN DUAL ACCESS TUNNELS

7.1 Geotechnical Investigations

Geotechnical investigations focussed on the main Dual Access Tunnels have included fully cored drill holes near each end of the alignment. Lack of land access has prevented further geotechnical investigations along the alignment. Interpretation of ground conditions based on regional geological mapping information is presented in Section 7.1.1.

7.1.1 Regional geological model

A conceptual geological model (GHD 2020 presented as Appendix B) summarises the findings of regional geological mapping from public sources and from OGNZL exploration mapping. The model identifies several volcanic formations that the alignment will encounter and infers the distribution along the alignment. However, given the lack of subsurface information, this model should be considered to have low precision and lacks geotechnical characterisation of the materials.

The main Dual Access Tunnels between Ventilation Shaft 1 and Wharekirauponga underground mine have the following characteristics, with the distribution of geological units interpreted by GHD (2020):

- Cover thickness above the tunnels is locally up to nearly 500 m, with a minimum cover of 120 m beneath Waiharakeke Stream at approximate Ch 5200 m. The cover beneath Mataura Stream is about 225 m.
- The tunnels are expected to encounter Whitiroa Andesite from Ch 1300 m to approximately Ch 4400 m where a gently north dipping contact with overlying Waipupu Formation is inferred. The position of the contact between Waipupu Formation and the host rhyolite dome is unknown but inferred to be close to the orebody. Waiharakeke Dacite locally overlies Whitiroa Andesite and Waipupu Formation between Ch 2800 m and Ch 4200 m, several hundred metres above the tunnels.
- The tunnels are inferred to intersect the ENE trending Waiharakeke Fault at about Ch 5100 m, where there is about 250 m of cover. The Waiharakeke Fault is interpreted to be a north-dipping normal fault, with an associated zone of alteration.
- A zone of silicification is inferred between Chainage 6500 m and the end of the tunnels.

7.1.2 Subsurface investigations

WNDD011 was a 700 m long fully cored borehole drilled from Willows close to Mataura Stream and approximately parallel to the twin access tunnels (bearing of 301° and an inclination of 20° below horizontal). The position of WNDD011 is shown in Figure 8 and the log provides an indication of the expected ground conditions in this area.

As described in Table 8, WNDD011 encountered alluvium and residual volcanic soils for the first 26 m beneath the Mataura Stream, then intervals of strong andesite, weak clay altered andesite and minor weak andesite breccia of the Waipupu Formation.

Table 8: Summary of geological conditions encountered in WNDD011.

Drillhole interval (m)	Geological description	Geotechnical characteristics	Comments
0 – 26.2	Holocene soils and residual volcanic soils	Clay, silt, peat and gravel soils	Combination of residual weathered andesite, colluvium and alluvium
26.2 – 32.0	Porphyritic ANDESITE	Highly weathered, weak – very weak rock	Waipupu Formation
32.0 – 706.8	Porphyritic ANDESITE	Strong, slightly weathered rock and weak or moderately strong altered rock, weak breccia from 406 m to 420 m, fault zone at 661 m to 665 m,	Waipupu Formation

WKP-P05D was drilled vertically, fully cored, to a depth of 400 m from Drill Site 6 on the eastern side of the Wharekirauponga ore body (refer to Figure 16 for location). This depth approximately equates to the maximum depth of mining activity. The Dual Access Tunnel depth at this location will be approximately 200 m below surface. WKP-P05D presented an opportunity to investigate the footwall side of the ore body and characterise the ground conditions in the vicinity of the various mine development elements in that location, including the western end of the twin tunnels. General ground conditions are described in Table 9.

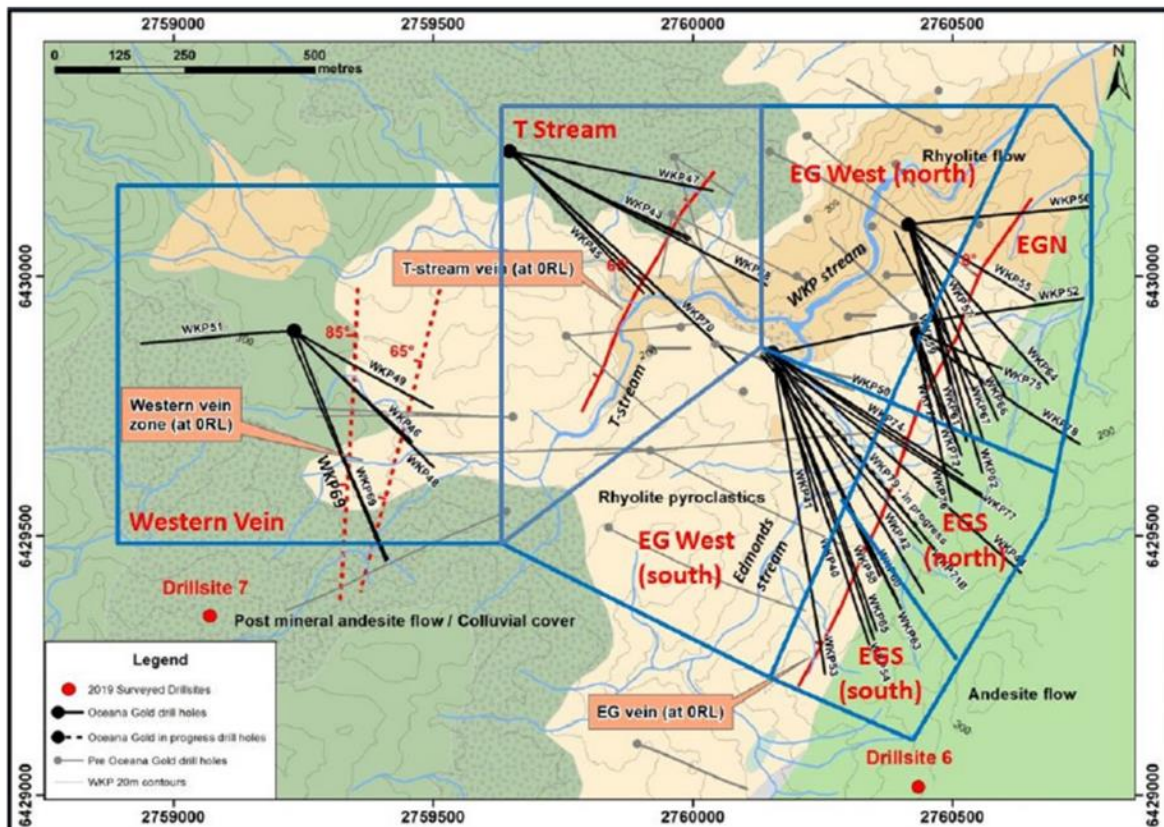


Figure 16: Geological plan of Wharekirauponga deposit showing relative position of WKP-P05D at the location of Drillsite 6 (bottom right on figure).

Table 9: Summary of geological conditions encountered in WKP-P05D.

Drillhole interval (m)	Geological description	Geotechnical characteristics	Comments
0 – 15.0	Silt sand and gravel	Low to moderate plasticity soil	Andesite derived colluvium
15.0 – 146.6	Porphyritic ANDESITE	Moderately weathered to unweathered, strong to very strong rock with closely spaced joints	Weaker and more weathered above 60 m Whakamoehau Andesite (after Rhys (2019))
146.6 - 220.3	Volcaniclastic and epiclastic ANDESITE	Weak to moderately strong rock with variable fracture spacing	Weak contact zone between rhyolite dome and overlying andesite
220.3 – 400.2	RHYOLITE	Moderately weathered, moderately strong to very strong rock with moderately widely spaced fractures	Weaker above 250 m Local weak altered zones throughout Maratoto Rhyolite (after Rhys 2019)

A total of 22 core samples were sent to EPrecision geotechnical laboratory in Perth for a range of tests to characterise some of the geomechanical properties of the rock encountered by WKP-P05D. Test results are summarised in Table 10.

Table 10: Summary of laboratory testing carried out on samples from WKP-P05D.

Rock type	Bulk Density* (t/m ³)	UCS* (MPa)	Young's modulus* (GPa)	Poisson's ratio*	Cerchar Abrasivity Index
Porphyritic Andesite	2.60	95 [60 to 127]	52.0	0.27	2.21
Epiclastic Andesite / Rhyolite	2.00	7 [3 to 15]	3.0	0.32	
Flow banded Rhyolite	2.40	63 [2 to 98]	34.0	0.27	0.76

Notes: *denotes mean values with range in square brackets.

The results corroborate the descriptions in the bore hole log and describe strong porphyritic andesite, underlain by weak epiclastic units, which in turn are underlain by the moderately strong rhyolite host material. The Cerchar Abrasivity Index test results imply that the porphyritic andesite is 'very abrasive' and the rhyolite is 'slightly abrasive'.

7.1.3 Key geotechnical characteristics

The following outlines key geotechnical characteristics that affect the design and construction of the twin access tunnels.

7.1.3.1 Tunnel geology

- The geological information that is currently available indicates that the tunnel alignment will encounter a range of volcanic rocks including flows, tuffs, breccias or pyroclastic materials and potentially minor sedimentary deposits. Based on the available drill core reviewed as part of this assessment, the layers appear to be in the order of tens to hundreds of metres in thickness and oriented sub-horizontal or gently inclined. The materials are typically strong rock or weak altered rock based on available drill core; however, very weak materials are anticipated within fault zones.
- Mapped faults and lineaments, inferred to be faults, cross the tunnel alignment at various locations. The faults are likely to be normal (extensional) faults associated with the local tectonic setting. Ground conditions in these zones are likely to include brecciated zones tens to hundreds of metres in width with local highly sheared clay gouge zones.
- A fault has been inferred to cross the tunnel alignment near to Ventilation shaft 1 based on geophysical investigations by OGNZL. This fault was not identified during logging of boreholes in the vicinity.

7.1.3.2 Groundwater

- WWLA (2025a,b) indicates that typical rock mass permeability is relatively low (1×10^{-7} to 1×10^{-8} m/s) based on preliminary investigations. Higher permeability zones are anticipated to be present within fault zones and some subhorizontal to gently inclined volcanic layers. Consequently, minor groundwater inflows are expected in most of the tunnel length, with high inflows in localised zones. Mitigation of high inflows will be by grouting and lining, although estimating the length of treatment is not possible due to the lack of exploratory information. Inflows in low inflow zones will be collected at sumps and pumped to the surface for treatment at the existing water treatment plant. It is anticipated that exploratory drilling ahead of the tunnel face will be required to identify inflow rates along the alignment.
- Consideration should be given to potential elevated groundwater temperatures affecting the underground works. Hydrothermal alteration has widely affected the rock mass at the site, including placement of the WUG orebody. WSP is not aware of any evidence of on-going hydrothermal processes affecting the area; however, some inflows of hot groundwater are possible.
- Consideration should also be given to water quality adversely affecting ground support and underground infrastructure. GHD (2025) has identified that there is a high probability of the rock mass generating acidic groundwater, which could degrade steel support.

7.1.3.3 Tunnelling conditions

The geological conditions described above will likely lead to mixed face conditions in some zones along the tunnels. This will likely occur where the tunnel face transitions between different volcanic rock units bounded by subhorizontal contacts parallel to the tunnel direction. The position of contacts that could lead to mixed face conditions are currently unknown and the tunnelling methodology will need to take this into account.

Additional boreholes proposed along the Dual Access Tunnel alignment during Stage 1 of the project will provide valuable geotechnical information to assist in detailed design. This will include rock strength data, discontinuity orientation, spacing and condition data and characterisation of groundwater conditions.

The detailed design stage will need to consider the generally low strength of the rock mass, high groundwater inflow and stress conditions. Squeezing ground may be present in areas of very weak ground. It is anticipated that tunnel support will mainly comprise pattern rock bolting and shotcrete installed shortly after excavation. Heavier, full shotcrete lining, with mesh and bolts will likely be required for areas of weak or highly fractured ground.

Given the lack of subsurface information along much of the tunnel alignment, drilling ahead of the tunnel face will be important for predicting ground conditions ahead of the tunnel face for support and design of groundwater management, as well as providing geological exploratory information. Drilling ahead of the tunnel face is a common method to provide supplemental geotechnical information during tunnelling.

8.0 WAIHI ACCESS TUNNEL

The Waihi access tunnel provides underground access from the plant site at Waihi to the end of the twin tunnels at ventilation shaft 1, a distance of about 5 km. The purpose of the Waihi access tunnel is to provide a direct underground route for ore between the Wharekirauponga underground mine and the ore processing plant.

8.1 Proposed Portal

The proposed portal location for the Waihi Access Tunnel (Figure 17) is a new, as yet unformed, cutback north of the proposed Gladstone Pit. The proposed cutback will create a level platform at about RL1,110 m with cut slopes formed on the north and west side of the platform. The cutback slopes will be up to about 30 m in height with an overall slope angle of about 1V:3H.

Available geological information indicates that the cutback will encounter weathered andesite in the floor and lower part of the cuts, overlain by ignimbrite in the upper part of the cuts. The tunnel portal at the base of the cut slope is expected to be cut in weak to moderately strong andesite rock.

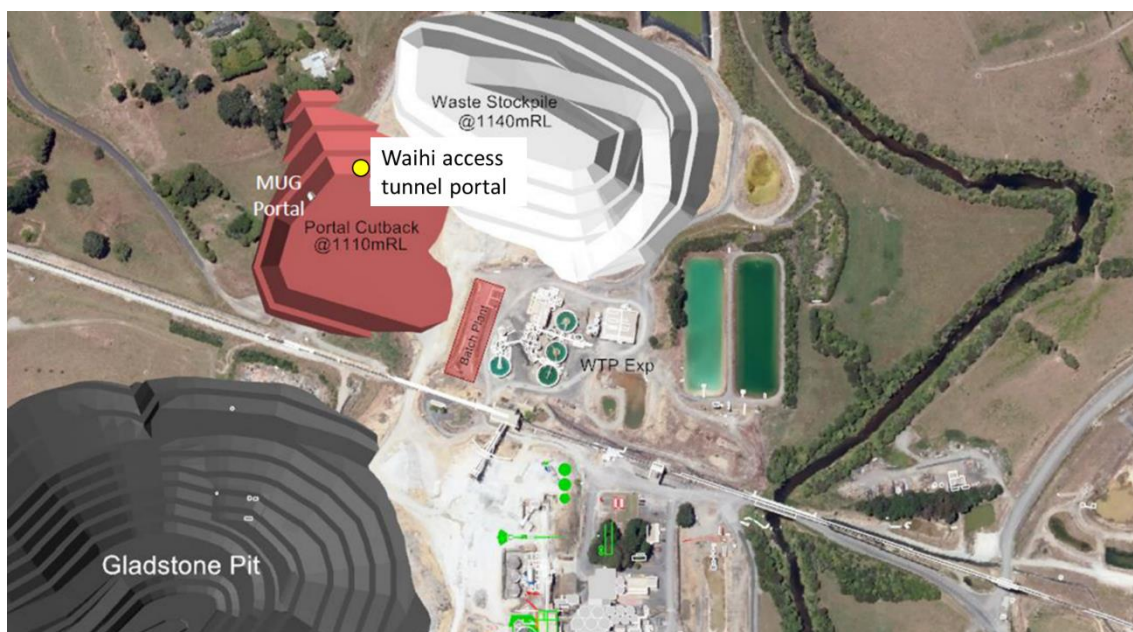


Figure 17: Proposed cutback and Waihi Access Tunnel portal location (OGNZL). The yellow circle shows the proposed Waihi Access Tunnel portal location.

8.2 Alignment Options

OGNZL provided WSP with several potential tunnel alignment options for the Waihi Access Tunnel within the corridor shown in Figure 18. The total length of the Waihi Access Tunnel is about 5 km. The options have been chosen to take into consideration planned MUG Portal development, Favona capital development, to utilise existing surface air shafts and remain within OGNZL land as far as possible. WSP has evaluated the geological and geotechnical conditions of tunnel alignment within the corridor with a focus on Option 2 and Option 4, which represent the proposed western-most and eastern-most alignments respectively.

Note that the corridor presented in Figure 18 includes a 50 m buffer outside the tunnel alignments.

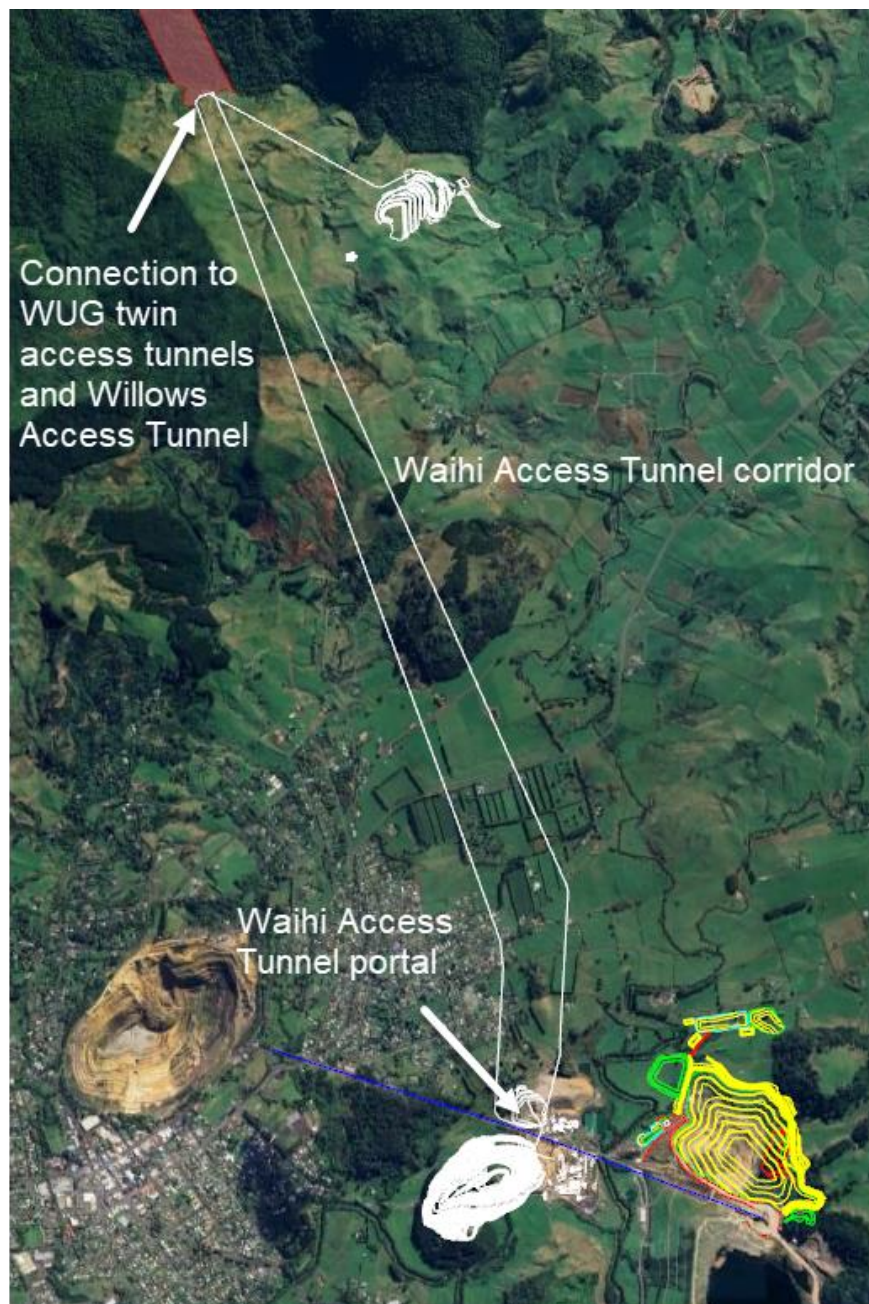


Figure 18: Proposed tunnel alignment corridor for the Waihi Access Tunnel (supplied by OGNZL).

8.3 Available Geological Data

8.3.1 Geological setting

The proposed Waihi Access Tunnel alignment will pass through volcanic rocks of the Coromandel Group comprising andesite, dacite and rhyolite of Miocene Age (Braithwaite RL, Christie AB, 1996) (refer Figure 19). The proposed portal and northern end of the Waihi Access Tunnel are located in the Waipupu Formation, which is a phyrlic andesite and dacite with minor tuff breccia, crystal tuff and lacustrine sediments, extensively hydrothermally altered. The alignment options pass below valley floor alluvium consisting of pumiceous, rhyolitic and andesite sand, gravel and silts up to the Waihi Fault. The alignment may also encounter the Whiritoa Andesite, which is lithologically similar to the Waipupu Formation, but is not extensively hydrothermally altered. Basement rock in the area comprises Jurassic Age Manaia Hill Group sandstone, siltstone and conglomerate at more than 1,000 m depth below the tunnel alignment options.

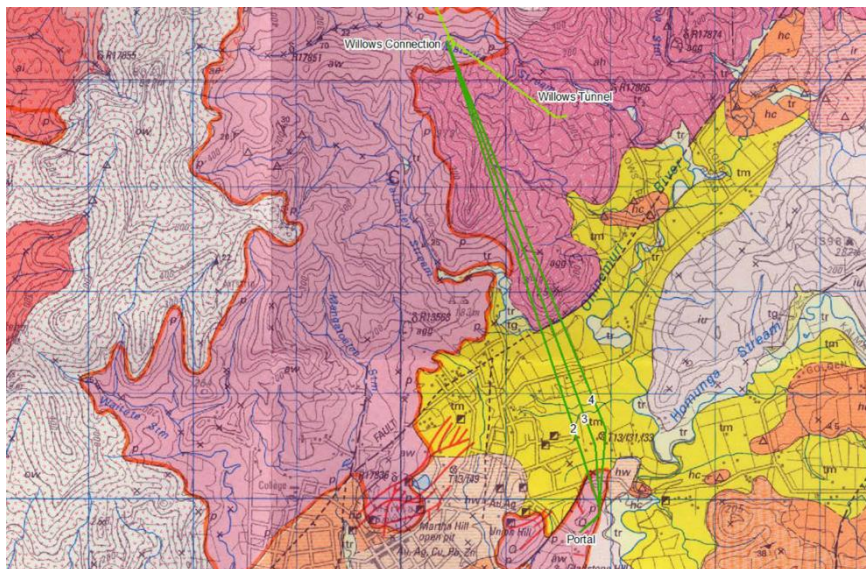


Figure 19: Geological map showing the proposed alignment options for Waihi Access Tunnel. aw (lighter pink) = Waipupu Formation, ah (darker pink) = Whiritoa Andesite and tm (yellow) = alluvium, red lines = extensive hydrothermal alteration (Braithwaite RL, Christie AB, 1996).

8.3.2 Geomorphology

Most of the Waihi Access Tunnel corridor north of the Waihi Fault (Figure 19) underlies steep farmland and heavily bush covered terrain. Topographic highs reach to 300 to 500 m above sea level separated by incised streams. The corridor south of the Waihi Fault underlies gently sloping farmland. The portal at Waihi (refer Section 8.1) will be situated in a topographic high formed from Waipupu Formation andesite at approximately 140 m above sea level (asl). The alignment then follows beneath the terrace alluvium of the Ohinemuri River at approximately 100 to 120 m asl, then under the steep hilly terrain west of the Ohinemuri River valley, ranging between 300 and 500 m above the terraces.

8.3.3 Information provided by OceanaGold

OGNZL provided WSP with all the currently available subsurface geological data within the area of the proposed tunnel alignments. This included core logs, core photos, drilling information, imagery of the borehole locations and land parcel boundaries that the proposed tunnel alignment options will encounter (refer Figure 20).

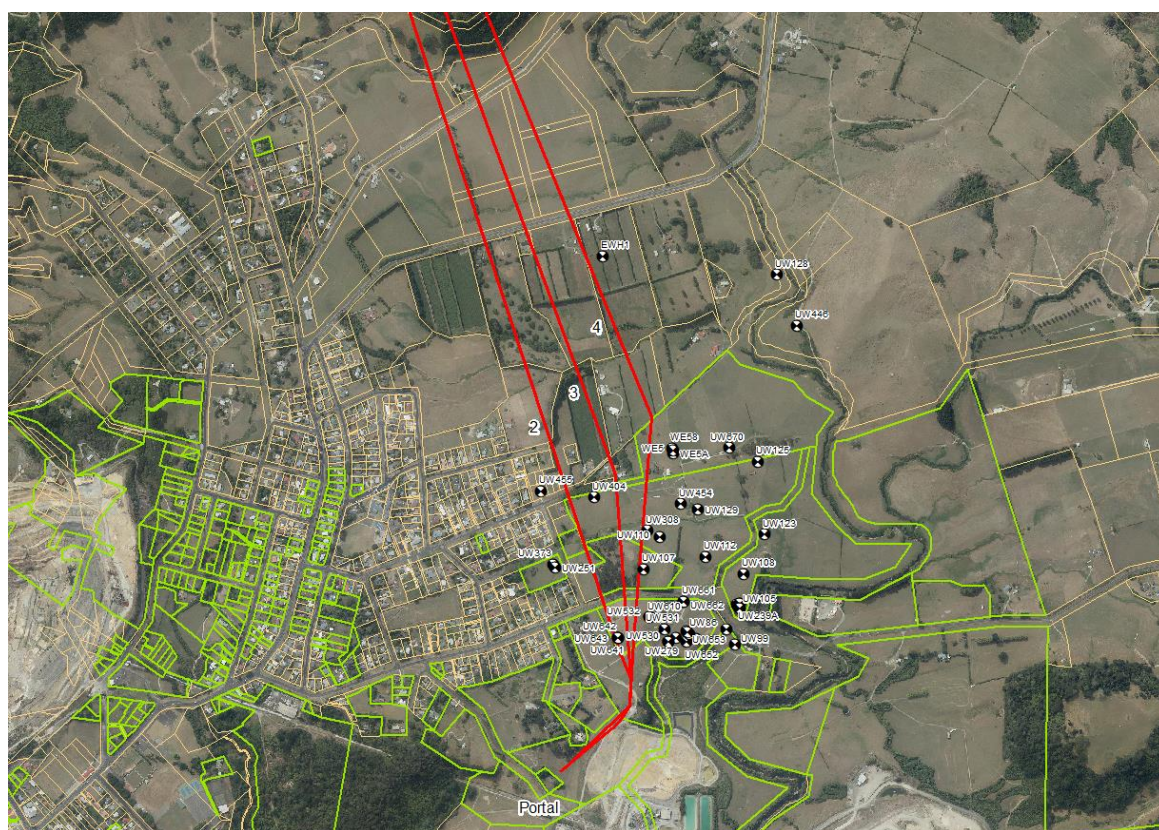
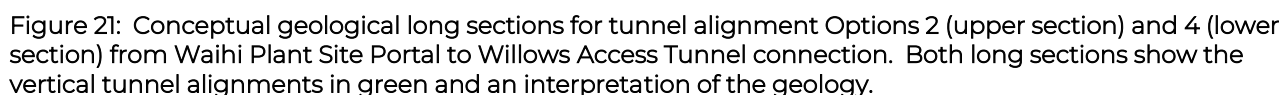


Figure 20: OGNZL supplied borehole locations. The red lines show the proposed tunnel alignment options; yellow lines indicate residential land parcels and green lines indicate land parcels owned by OGNZL. Many of the properties are farm land rather than residential land.

OGNZL has undertaken airborne geophysical investigations of the area of the proposed Waihi Access Tunnel using aeromagnetic techniques. The aeromagnetic information has been interpreted by OGNZL geologists to identify areas of hydrothermal alteration. A significant lineament in the aeromagnetic model has been inferred to indicate the presence of a fault of at least several kilometres length trending close to the proposed tunnel alignment.

Conceptual geological long sections for the proposed tunnel Options 2 and 4 are presented in Figure 21.



- The geology at the Waihi Plant Site portal consists of andesite and ignimbrite as described in Section 8.1.
- The tunnel alignments are inferred to encounter moderately strong to strong andesite overlain by ignimbrite and young alluvium. It is possible that the alignment will cross the contact between the andesite and ignimbrite, such as within an old alluvial channel.

However, WSP has seen no evidence that the contact reaches as low as the proposed tunnel alignment.

- At about 2200 m the tunnel has the potential to encounter the Waihi Fault, which may comprise a zone of highly sheared, weak ground. The presence of the Waihi Fault is uncertain with some evidence showing it will not be present. Future studies will need to investigate ground conditions along the access tunnel including the presence of the Waihi Fault.

Many of the logs do not provide detailed geotechnical characteristics of the materials that will be encountered by the tunnel. However, relevant data is available from Willows to characterise the ground conditions at the north end of the Waihi Access Tunnel where the alignment will mainly encounter andesite and associated volcanic lithologies (refer to Section 6.0).

8.5 Key Geotechnical Considerations

The geological information that is currently available indicates that the Waihi Access Tunnel alignment will encounter a suite of volcanic rocks including flows, breccias or pyroclastic materials. Based on the available drill core reviewed as part of this assessment, the flows appear to be in the order of tens to hundreds of metres thick and are oriented sub-horizontal or gently inclined. The strength of the material is difficult to determine based on the available drill core information provided by OGNZL near the portal. WSP has inferred that the andesite encountered at Willows end will be either the Whiritoa Andesite or the Waipupu Formation andesite, which are inferred to comprise geotechnically similar materials. The material in WNDD007 had a UCS of 11 MPa to 49 MPa, which is consistent with a weak to moderately strong rock. Limited information reviewed from the portal area appears to describe similar strength rock.

The Waihi Fault is likely to be an east dipping normal (extensional) fault associated with local tectonic setting. Ground conditions in the vicinity of the Waihi Fault may include weak materials and brecciated zones tens to hundreds of metres in width with local highly sheared clay gouge zones. However, there is little information to confirm the geotechnical characteristics of Waihi Fault, which may present in the tunnel as a wider zone of less intense deformation rather than a narrow fault zone.

Design of tunnel support is beyond the scope of this assessment. It is anticipated that tunnel support will mainly comprise pattern rock bolting and shotcrete installed as soon as practical after short excavations. Heavier support, including full shotcrete lining, with mesh and bolts will likely be required for areas of weak or highly fractured ground. As the tunnel extends deeper into the andesite it is anticipated that the tunnel support requirements will reduce.

WSP anticipates that weak, high permeability zones may also be present within fault zones and on some subhorizontal to gently inclined layers of the suite of volcanic rocks.

If ignimbrite is encountered by the tunnel, WSP anticipates this will comprise a weak material associated with high groundwater inflows.

Further geotechnical investigations will be required to develop detailed design of the tunnel. These will need to address uncertainty in the geomechanical properties and the groundwater conditions of the materials that will affect the tunnel.

9.0 WHAREKIRAUPONGA UNDERGROUND MINE

9.1 Background

WSP has completed a review of the Preliminary Economic Analysis (PEA)) for the proposed Wharekirauponga underground mine, completed by SRK Consulting (Australasia) Pty Ltd (SRK) and by OGNZL staff. This section describes the proposed mining design and the results of WSP's review. The geotechnical section of the PEA prepared by OceanaGold is reproduced in Appendix D.

9.2 Proposed Underground Mine Development

The Wharekirauponga deposit comprises a number of epithermal veins within host rhyolite domes. The rhyolite domes are overlain by pyroclastic units and post mineralisation andesite, though various streams at the site have eroded through the cover rocks to expose the underlying rhyolite. The EG and T-Stream veins that are the target of the underground mine dip to the west at between 60° and 80° (refer Figure 22) with a strike length of about 1000 m. An additional vein structure (the 'Western Vein') has also been identified west of the T-Stream vein. The EG and T-Stream veins are typically several metres in width and additional stringer vein sets are also present within the hanging wall and footwall of the veins. The host rhyolite has been separated into two distinct units: the Eastern Rhyolite Flow and the Northern Rhyolite Flow.

The nominal depth of stoping ranges between 100 m and 325 m below surface. The PEA study indicates that the underground mining method will be a combination of Longhole Open Stoping (LHOS) with cemented rock fill (CRF) and Modified Avoca and that mining will follow a bottom-up sequence. Stopes will be progressively backfilled, using cemented rockfill in some locations. The typical stope dimensions are 2 m to 12 m wide and 15 m along strike; with wider zones, potentially up to 20 m in width. Figure 23 shows a conceptual mine layout prepared by OGNZL. Key elements shown in Figure 23 include the main Dual Access Tunnel (on the left), ore body access declines, stope panels (in grey), spiral declines and various ventilation shafts. It is envisaged that up to four ventilation shafts will be incorporated into the mine: two fresh air shafts, one of which will also allow emergency egress from the mine, and a return air shaft.

Ore will be trucked back to the processing plant at Waihi via the main Dual Access Tunnels. Backfill for the stopes will be carted back from the WRS at Willows, then from the rock stack near the process plant if necessary.

A key consideration in mine design will be to avoid surface disruption that could lead to significant surface water flows into the underground mine and associated adverse environmental effects. Exploratory drilling drives will be incorporated into the mine layout to allow detailed mine planning and geotechnical and hydrogeological characterisation of the ore bodies. This will enable OGNZL to more accurately predict rock mass behaviour during mining and minimise the likelihood of excessive dilation or deformation and adverse environmental outcomes. This is discussed in detail by others and is not considered in this report.

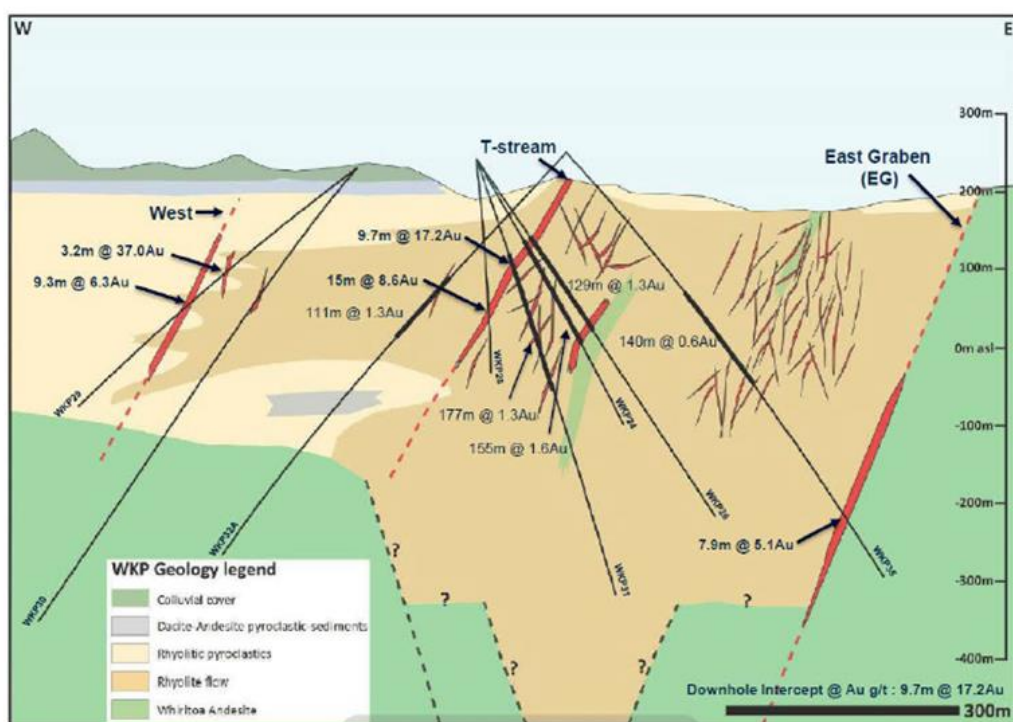


Figure 22: Geological cross section through the Wharekirauponga deposit showing the relationship between the target EG vein and T-Stream vein. Tunnel access to the mine will be from the footwall side (right in this view) (source OGNZL).

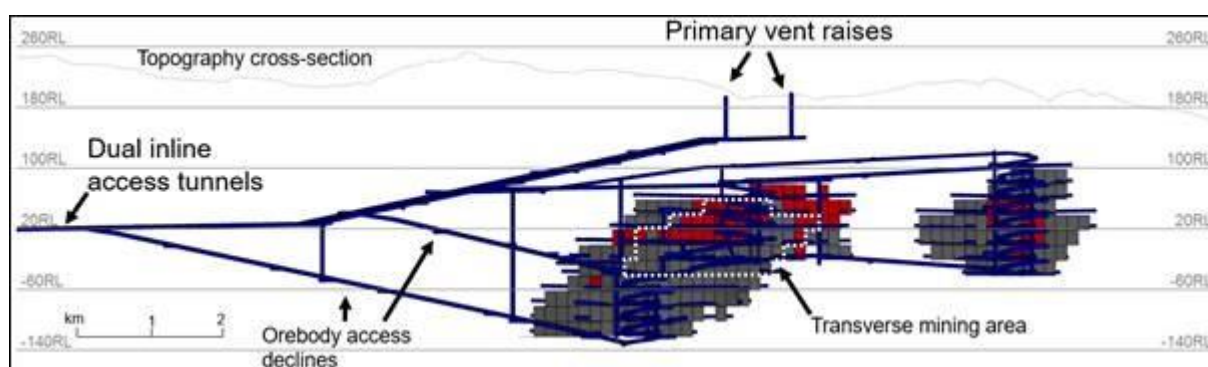


Figure 23: Conceptual underground mine design showing key elements of the mine (supplied by OGNZL).

9.3 Review of the Geotechnical Assessment

The OGNZL carried out the geotechnical assessment for the PEA to establish the underground mine's geotechnical characteristics and design elements. The assessment (Appendix D) entailed the following:

- Understanding the geological setting of the gold deposit(s).
- Creation and population of an interpretable geotechnical property database based on the available geotechnical core logging available at the time of this study.
- Collection and recording of suitable core samples for rock property testing in a laboratory, supported by field estimates (point loads) of rock strengths.
- Graphical representation and interpretation of recorded data, culminating in compilation of a written report that qualifies the geotechnical environment.
- Transformation of data into Barton's Q' value.
- Transformation of data into N' -values for assessing slope dimensions using the Stability Graph Method proposed by Matthew et al. (1981) and modified by Potvin et al. (1989).
- Numerical stress modelling of various slope sequences and layouts using MAP3D.

9.3.1 Data available for PEA design

A total of 77 cored drill holes from the Wharekirauponga deposit were available to develop a geological model and for rock mass characterisation. Geotechnical information was captured during logging including lithology, estimated rock strength, oriented discontinuity data and RQD (rock quality designation). A 3D geological model and geotechnical database was developed from the drill hole data including the distribution of identified lithological units and major structural features (as illustrated in Figure 16 and Figure 22).

9.3.2 Discontinuities

Characteristics of discontinuities in the rock mass have been evaluated during logging and data contributed into a geotechnical database. The database includes a large number of discontinuity orientations measured by oriented core techniques. A dominant discontinuity orientation parallel to the major vein systems has been identified from the database (refer to Appendix D).

9.3.3 Laboratory test results

Rock strength within the ore body has been measured using 11 unconfined compressive strength (UCS) tests on core recovered from exploratory drill holes. Tests were completed on host rhyolite and the overlying andesite. The UCS results characterise each lithological unit: andesite 47 to 123 MPa; Northern Rhyolite Flow 138 to 191 MPa; and Eastern Rhyolite Flow 15 to 238 MPa. However, this is a small dataset and additional rock strength testing will need to be completed during development of the design. Note that the UCS test results available for PFS design did not include the tests undertaken on core from WKP-P05D described in Section 7.1.2, which are broadly consistent with the UCS results described above. In addition to the UCS tests, five tensile strength tests, ten Young's modulus and Poisson's ratio tests and three triaxial strength tests were also undertaken.

9.3.4 Rock mass characterisation

Geotechnical characterisation of the rock mass was undertaken using the Barton's Q' system with the parameters RQD, Jn, Ja and Jr estimated from the logs and core photographs. Geological strength index (GSI) values were calculated from the Q' values using an empirical relationship. A total of 516 values of Q' and GSI were estimated from the geotechnical database for intervals within vein material, hanging wall or footwall zones. Statistical distribution of the Q' and GSI values were then used to characterise the rock mass for use in the PFS mine design (Figure 24).

Parameter	Hangingwall	Footwall	Vein	All Data
Sample Population	231	165	120	516
Metres Logged	921	617	372	1910
GSI weighted average	65	65	60	64
GSI 2nd quartile (median)	64	62	61	63
GSI 1st quartile	55	56	52	54
Q' weighted average	9.8	10.5	6.1	9.2
Q' 2nd quartile (median)	9.1	7.3	6.7	8.2
Q' 1st quartile	3.4	3.6	2.5	3.2

Figure 24: Summary of Q' and GSI values calculated from the available geotechnical data (from OGC PFS study – Appendix D).

9.4 Assessment of Proposed Mining Methodology

The proposed mining methodology for the Wharekirauponga underground mine is a combination of LHOS and modified Avoca method. The potential dimensions of the stopes have been evaluated by OGNZL using empirical methods and numerical modelling. The empirical methods incorporate rock mass characteristics from the geotechnical assessment described in Section 9.3 and commonly adopted studies of the historical performance of a large number of underground mines. Conservative rock mass characteristics have been used in the assessment, which is typical of the current stage of mine design. The empirical methods have been used to evaluate the size of unsupported voids that can be adopted by the design. Numerical modelling of proposed mine was undertaken using MAP3 software to evaluate the likely behaviour of the surrounding rock mass in response to mining, particularly the potential damage zone above the mine and the interaction between closely separated voids. The modelling concludes that no severe stress damage will occur to the crown pillar (the zone between the mine and the ground surface) provided the stopes are tightly backfilled.

The following summarises the results of WSP's review of the PEA:

- The geotechnical assessment follows current industry practice for a PEA based on limited available geotechnical information. Therefore, the interpreted geotechnical properties and the result of the geotechnical assessment are considered as preliminary and will require additional rock mass characterisation data and analysis as the design progresses.

- The documented input parameters for the slope design are appropriate based on the available geotechnical information to date and interpretation of the data. The assessment is based on the method proposed by Matthew et al. (1981) and modified by Potvin et al. (1989) and considered as an industry-standard practice. The stability of the end slope faces should also be evaluated as design progresses.

The following assessments that are not available in the current geotechnical assessment will be required as a part of the next design stages:

- Ground support regime.
- Vertical opening stability.
- Strength of the slope backfill options including cemented rock fill.
- Proposed geotechnical monitoring instrumentation during mining.

WSP suggests the following approach be undertaken as part of the future geotechnical assessment:

- The geotechnical domains should be divided into the following two categories based on geotechnical logged data:
 - Specific information for empirical slope design calculations, in this case, the domains are divided into hanging wall and footwall (with a 20 m offset from the slope) and Ore Backs-Ends (vein).
 - A separate category, based on the interpreted lithology units, adjacent to the proposed WUG deposit (slope and underground mining infrastructure) for the mine scale numerical modelling.
- Composite the logged information into 1 m intervals to calculate the statistical parameters and their distribution for each geotechnical domain.
- Re-visit the structural information to estimate the likelihood of additional structural sets due to bias from the borehole orientation.
- The Map3D numerical modelling (elastic numerical analysis) uses the Factor of Safety (FoS) criteria to indicate the high-stress concentration and potential future instability, due to mine induced stress to the pillar, main underground infrastructures, and final crown stability (approximately 100 m below the surface). WSP suggests:
 - Carry out sensitivity analysis due to considerable variation of the available rockmass parameters and the assumed In-Situ stress regime.
 - Consider applying the ubiquitous joint model for the condition of the main structure sets.

9.5 Recommended Additional Work for the Next Design Stages

WSP recommends the following additional work for the next stage of the mine design to address information gaps and increase the confidence level of the geotechnical assessment:

1. Review spatial distribution of the available geotechnical information in relation to the geological interpretation and the proposed WUG mine design for strategically planning additional geotechnical data collection for the following:
 - a. In-situ stress measurements.
 - b. Quantity and location of the required geotechnical laboratory tests.
 - c. Detail geotechnical logging to increase knowledge of the rock mass quality and structural discontinuity sets.
2. QA/QC on the collected geotechnical information (i.e., geotechnical core logging, Point Load Test (PLT) and laboratory test results), if those were not done in the past.
3. Increase the geotechnical knowledge of the project site by carrying out televiewer logging of drillholes to get basic geotechnical data such as discontinuity orientation, Rock Quality Designation (RQD) and fracture frequency.
4. The next stage of the geotechnical assessment will be carried out once the necessary access has been provided, and include items listed below:
 - Rock mass characterisation.
 - Rock mass quality and their statistical output.
 - Interpretation of the laboratory test results.
 - In-situ stress interpretation.
 - Rock mass strength envelope.
 - Empirical stope design and potential dilution.
 - Rock mass Mode of failures.
 - Ground support assessment.
 - Kinematic analysis.
 - Geotechnical numerical modelling to re-assess the final crown pillar, pillar behaviour and high-stress concentration due to mining.
 - Vertical opening stability.
 - Strength of the cemented rock fill.
 - Geotechnical instrumentation.
 - Risk assessment.

9.6 Ventilation Shaft Closure at Completion of Mining

Given the location of ventilation shafts in the Coromandel Forest Park, WSP has reviewed the options for permanent closure of the shafts following completion of mining. The options considered include construction of a structural cap on the shafts or backfilling the shafts with cement stabilised fill. These options are considered feasible and are described in Appendix D.

10.0 CONCLUSIONS

Willows Access Tunnel

- Ground conditions encountered by the tunnel will comprise a sequence of volcanic rock units including andesites, dacites and rhyolites, deposited as flows, tuffs and breccias. These units are inferred to be arranged as layers with contacts that are horizontal or gently inclined. Rock strength is interpreted to be variable and ranges from strong to very weak. Joint spacing is interpreted to be in the range of highly fractured to moderately widely spaced.
- Given the inferred variability of the ground, tunnelling conditions are expected to include mixed face conditions, spalling and swelling ground.
- While the measured mass permeability is relatively low, groundwater inflows into the tunnel are anticipated to be high in fault zones or within brecciated zones.
- The Willows portal site appears to be viable for a tunnel portal. The slope above the portal is affected by shallow slope instability and will require measures to ensure that portal security is maintained. Such measures should include management of surface water and shallow groundwater and local support measures such as shotcrete and bolts or a mass gravity wall.
- Tunnelling will utilise drill and blast methods.
- Tunnel support requirements are expected to be variable but will generally include pattern rock bolts and shotcrete, with zones of full shotcrete support in poor ground. The relative proportions of ground types cannot yet be confirmed given the lack of subsurface information throughout the tunnel alignment.

Ventilation Shaft 1

- Ventilation Shaft 1 will be up to 250 m deep and located near the boundary between Willows Road farm and DOC reserve. Based on borehole WNDD007, Ventilation Shaft 1 will be constructed in andesite rock with strength ranging from very weak to strong.
- Discontinuities interpreted from bore logs and downhole geophysics comprise a number of prominent sets, including a gently east dipping fabric and moderately steeply dipping discontinuities dipping to the northwest and southwest.
- Groundwater is inferred to be located at a depth of about 10 m BGL and the ground is interpreted to have a rock mass permeability of about 10^{-7} m.s⁻¹.
- Ground conditions are inferred to be unsuitable for raise bore construction. WSP interprets that a construction methodology that allows suitable support to be progressively installed during construction for the upper weaker portions, combined with raiseboring for lower sections where ground conditions allow for.

Main Dual Access Tunnel

- There is currently no subsurface information available for the main access tunnel alignment between Willows and the Wharekirauponga ore body. The distribution of geological units has been inferred based on surface geological mapping.
- Tunnelling conditions can be reasonably inferred from geotechnical investigations at Willows and Wharekirauponga ore body, recognising that this information does not provide a complete assessment for tunnel design.
- Tunnelling will rely on support design and groundwater management based on geotechnical investigations completed in Stage 1 (four proposed bore holes along the tunnel alignment) and drill ahead investigations during tunnelling, a method that is commonly used in tunnelling.

Wharekirauponga Underground Mine

- The proposed mine design and mining methodology is believed appropriate for the Wharekirauponga deposit given the current design stage.
- Based on current knowledge of the ground conditions the crown pillar should not suffer significant stress damage provided the stopes are tightly backfilled.
- Geotechnical investigations have been limited to date given the difficult site access for drilling. Efforts to date have largely focussed on exploring the deposit and evaluating the grade.
- The geotechnical assessment for the mine follows industry practice for the current project stage.
- Recommendations for areas of future investigation and assessment effort include better characterisation of the geomechanical properties and distribution of the various rock units. This will allow more reliable analysis of the behaviour of the rock mass during mining on which to base the mine design.
- Feasible options for decommissioning the ventilation shafts are available.

11.0 RECOMMENDATIONS

- Targeted subsurface investigations, such as boreholes at shaft locations and along the Dual Access Tunnel alignment, are recommended to supplement the currently available geotechnical information between Willows and Wharekirauponga ore body. In addition, drilling ahead of the tunnel face will be important for predicting ground conditions ahead of the tunnel face for support and design of groundwater management, as well as geological exploratory information.
- Further investigation of in situ stress as part of detailed design of the tunnel.
- Consider potential elevated groundwater temperatures affecting the underground works. Hydrothermal alteration has widely affected the rock mass at the site, including placement of the Wharekirauponga orebody. WSP is not aware of any evidence of on-going hydrothermal processes affecting the area; however, some inflows of hot groundwater are possible.
- Consider the potential effect on design of generally low strength of the rock mass, groundwater conditions and stress conditions. It is anticipated that squeezing ground may be present in areas of very weak ground.
- Develop measures to ensure that portal security is maintained. Such measures should include management of surface water and shallow groundwater and local support measures such as shotcrete and bolts or a mass gravity wall.
- Consider the potential adverse effect of acidic water quality on ground support and underground infrastructure.

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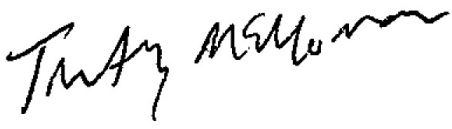
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WSP New Zealand Limited

A handwritten signature in black ink, appearing to read 'Tim McMorran', written in a cursive style.

Tim McMorran
Principal Engineering Geologist
CMENGNZ (PENGGEOL) 176867

APPENDIX A

Report Limitations

Report Limitations

The following Clarification of the Golder company status is provided:

In April 2021 Golder Associates Inc. and its subsidiaries and affiliated companies, including Golder Associates (NZ) Limited ('the Company') was acquired by Canadian listed company, WSP Global Inc. As part of that acquisition, in January 2022 the Company amalgamated with WSP New Zealand Limited (ultimately owned by WSP Global Inc.) under Part XIII of the Companies Act 1993. On 1 January 2022 the Company changed its legal name to "WSP New Zealand Limited".

This report ('**Report**') has been prepared by WSP exclusively for OceanaGold Corporation ('**Client**') in relation to Wharekirauponga Underground Mine (WUG) ('**Purpose**'). The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('**Client Data**') provided by or on behalf of the Client. Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable in relation to incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

APPENDIX B

Conceptual Geological Model
Data Report (GHD 2020)



19 August 2020

Rory McNeil
Project Manager
OceanaGold Limited

Our ref: 125/336/58

Your ref:

Dear Rory

**WKP Exploration Tunnel - Water Assessment
Conceptual Geological Model Data Report: August 2020**

1 Introduction

1.1 General

GHD Limited have been commissioned by OceanaGold New Zealand Limited (OGL) to provide a preliminary Conceptual Geological Site Model (CSM) for the proposed underground exploration tunnel from a tunnel portal located on the Willows Farm block directly north of Waihi township, extending northward for approximately 7 km to terminate underground in the vicinity of the Wharekirauponga (WKP) Stream (referred to as the WKP Tunnel). The development of a CSM is required to provide an initial interpretation of the ground conditions along the alignment of the tunnel to support both the surface water and groundwater assessments of effects associated with the proposed WKP Tunnel.

1.2 Scope of Conceptual Geological Site Model

The scope of the CSM was to develop a high level geological model. Due to a limited amount of engineering geological subsurface data, no interpretation of engineering geological conditions has been completed at this time. The model has been developed for the following end-use requirements:

- To support high level 2D groundwater modelling by others (GWS): along tunnel alignment
- To support high level surface water and surface water geochemistry modelling

As such, the following features have been given focus:

- Significant faults / lineaments that are identifiable from surface mapping – likely to locally effect subsurface permeability's and hydrothermal alteration/mineralisation
- Known rock-water hydrothermal alteration zones, with focus given to those that have an effect of groundwater permeability values (argillite sequences and silicification/quartz replacement).

1.3 Data Sources

1.3.1 Used data

The development of the ground model has made use of the following data sources:

- 1:50,000 GNS Geological Map “Geology of the Waihi Area, map 21, 1996”
- Historical Aerial Photographs (1940's and 1960's, 1:16,000 set (GHD Sourced)
- LiDAR generated Digital Elevation Model, 0.1 m vertical resolution (OGL sourced)
 - Rendering of hill shade and topographic contour sets by GHD
- Geochemical surface field mapping shape files, corresponding alteration halos (OGL sourced)
 - Simplification of data into broader regions of alteration by GHD
- Proposed route alignment (OGL supplied)

1.3.2 Unused Data

Data made available to GHD that has not been used for the development of the CSM is as follows:

- Window Sample 005 and 006 boreholes (OGL supplied)
 - Referred to for general interpretation of ground conditions. To be included within future developments of geological model when made into a 3D dataset.
- CSMAT survey lines (OGL Supplied)
 - Referred to for general interpretation of ground conditions and presence of faulting however seen as being located too far west, south and east of the proposed site to be extrapolated reliably.

1.4 Datum and Scale

1.4.1 Datum

The data supplied to GHD from OGL has been recorded to the following projection and datum. GHD has produced the CSM to the same datum and projection:

- Map Projection: New Zealand Map Grid (NZMG)
- Datum: New Zealand 1949

1.4.2 Scale

Surface Maps

The topographic scale shown on the maps (see section 1.6 below) is 1:8,000.

The lithological data shown on the maps is based off the 1:50,000 scale mapping undertaken by GNS (see section 1.3.1 for map reference).

Tunnel Long Section

The scale on the tunnel long-section (see section 1.6) is 1:2,500.

1.5 Assumptions and Interpretations

The following geological assumptions and interpretations have been made during the development of the CSM:

- Mapped structural features (faults, lineaments) have been classified per the orientation of their trend line.

- North-east orientated faults or lineaments represent extensional/normal displacements (where displacement is inferred) and generally dip to the north-northwest. This inference is made based on general knowledge of the structural relationships of the region, as well as various anecdotal level conversations with the OGL and supporting consultants.
 - Dip has been set at 60°
- South-east, east-west and north-north-west (i.e. south-south-east) orientated lineaments have been inferred to dip vertically/ near vertically. This is under the presumption that the local stress field within the region would see these orientations typically comprising more strike-slip displacement as opposed to extensional displacement.
- Faults or lineaments with surface exposures that project further than several hundred meters across the ground have been inferred to extend to significant depths and therefore have been extrapolated to the boundaries of the long-section. Where this is not the case, the lineaments have been extended a nominal 200 – 250 m depth below ground.
- Lithologies shown on the CSM are taken directly from the 1:50,000 GNS Waihi area map with the following simplifications made:
 - Tauranga Group and Whitianga Group Deposits that outcrop at the southern end of the map series have been grouped into a single unit
 - Ryolite and tuff eruptive sequences outcropping at the northern end of the map series have been grouped into a single unit, “Coroglen Subgroup”
- Standard relative stratigraphical relationships have been observed for the lithology shown, based on the ageing data for the various units presented by the 1:50,000 GNS Waihi area map
- Geochemical surface mapping data supplied by OGI has been simplified to show only the significant argillic alteration zones, and zones where strong quartz replacement (silicification) has been recorded.
 - The relatively large halos of smectite alteration have been assumed to represent predominantly surficial weathering processes however this is unconfirmed. As such, the projection of this zone within the long-section remains shallow.
 - Illite-smectite and silification mapped zones have been inferred to be more directly controlled by subsurface hydrothermal upwelling's (based on typical hydrothermal epithermal mineral assemblages known for the Waihi region), and as such to be fault-controlled. Accordingly, they have been projected below ground to be orientated to the dominant structural fabric (NE orientated, NW dipping).
 - Some extrapolation and inclusion of geochemical alteration zones has been made by GHD based on interpretation of surface features identifiable from review of historical aerial photographs).
- The lithological contact and distinction between Waipupu Formation Andesite and Whiritoa Andesite has been extended from the interpretation of these units per the mapped 1:50,000 GNS Waihi geology. In reality, we expect these two units to be largely monolithic.

1.6 Output

The CSM is given is presented in the following outputs:

- Surface 1:8000 scale Geological Map Series
- 1:2500 scale 2D tunnel long-section (project looking west)

GHD is able to provide, on request and at the permission of OGL, the following supporting data:

- Shape files and map files associated with all geological features shown on the above outputs

1.7 Limitations

This report has been prepared by GHD Limited for OceanaGold New Zealand Limited and may only be used and relied on by For OceanaGold New Zealand Limited for the purpose agreed between GHD and For OceanaGold New Zealand Limited as set out in Section 1.0 of this report.

GHD otherwise disclaims responsibility to any person other than for OceanaGold New Zealand Limited arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The development the CSM has been based on interpretations and processing of the data provided to GHD by OGL, and supplementary data sourced directly by GHD (see section 1.3). A brief walkover of the Willows Farm site where the portal is located was made. No site specific field mapping or subsurface investigations have been conducted to support the development of the CSM, at this time. The interpretations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

GHD has prepared this report on the basis of information provided by OceanaGold New Zealand Limited and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

An understanding of the geological site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure specific and some experienced based. Hence this report should not be altered, amended, abbreviated, or issued in part in any way without prior written approval by GHD. GHD does not accept liability in connection with the issuing of an unapproved or modified version of this report.

The interpretations made in this report and attached CSM are intended to support high level groundwater and surface water modelling. The level of technical detail shown is correspondingly low. As such, reliance of the CSM in its current form should not be relied on for tasks that extend beyond the above stated.

Sincerely
GHD Limited

Nick Burke
Senior Engineering Geologist

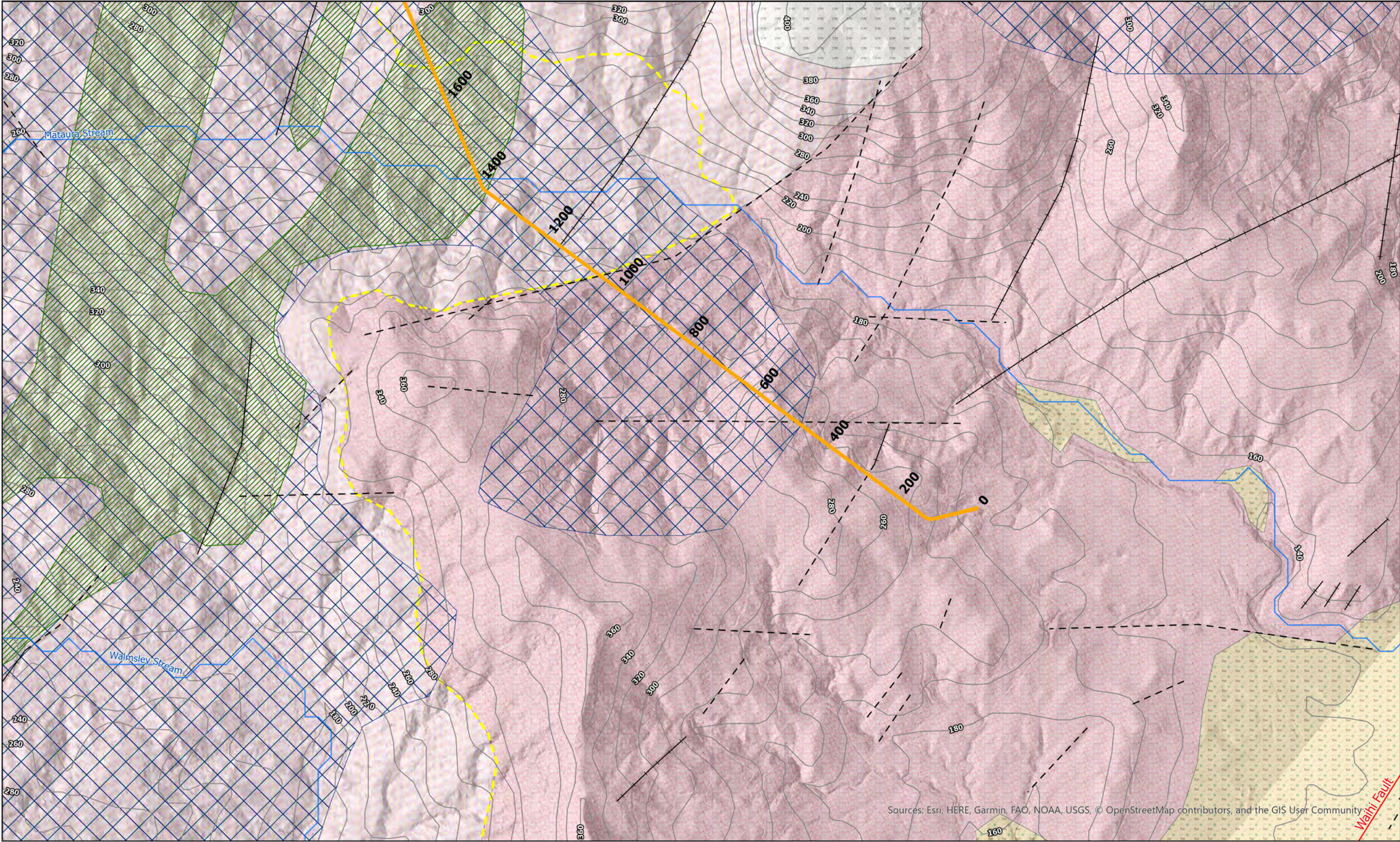


Nick Eldred
Principal Engineering Geologist



Attachments:

- **Geological Map Series**
- **Geological Long-Section (Tunnel)**



Paper Size A3

0 50 100 200 300

Metres

Map Projection: New Zealand Map Grid
Horizontal Datum: New Zealand 1949
Grid: GD 1949 New Zealand Map Grid

N

LEGEND
GNS 1:50k geological lithological units

Tauranga Group and Whitianga Group	Whakamoehau Andesite: Andesite and dacite with minor quartz phenocrysts. Andesite tuff breccias	Whiritoa Andesite : Phryic andesite and dacite flows and domes with tuff-breccias and lithic crystal tuff	Waipupu Formation : Andesite and dacite, locally with quartz phenocrysts. Minor tuff breccia, crystal tuff and lacustrine sediments
Ratarua Ignimbrite: Welded, dacitic ignimbrite			

Geologic features

Inferred liniament	GNS-mapped hydrothermal alteration zone	Watercourse
Liniament	OGL tunnel centreline	

OGL-mapped and GHD-inferred surface hydrothermal alteration

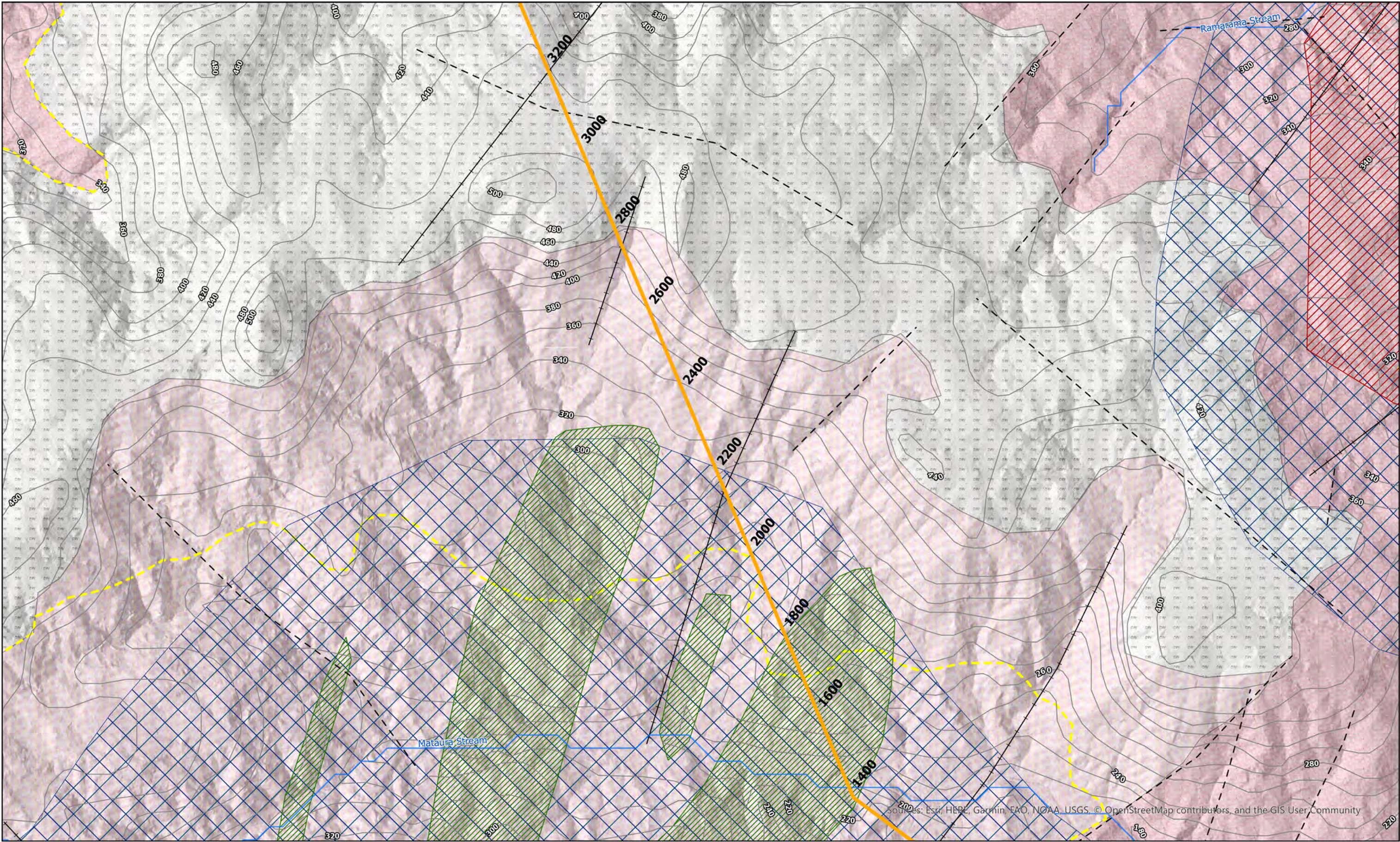
Argillite Alt - Illite / Illite, Smectite	Argillite Alt - Smectite	Quartz Alt / Silicification
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Oceana Gold
WKP Exploration Tunnel -
Water Assessment

Conceptual Engineering Geological Model

Job Number 125336958
Revision 0
Date 19 Aug 2020

Figure 1
Page 1 of 5



Paper Size A3

0 50 100 200 300

Metres

Map Projection: New Zealand Map Grid
Horizontal Datum: New Zealand 1949
Grid: GD 1949 New Zealand Map Grid

N

LEGEND
GNS 1:50k geological lithological units

Whakamoehau Andesite: Andesite and dacite with minor quartz phenocrysts, Andesite tuff breccias

Whiritoa Andesite: Phryic andesite and dacite flows and domes with tuff-breccias and lithic crystal tuff

Waipupu Formation: Andesite and dacite, locally with quartz phenocrysts. Minor tuff breccia, crystal tuff and lacustrine sediments

Geologic features

— — Inferred liniament

— — Liniament

— — GNS-mapped hydrothermal alteration zone

— — Watercourse

— — OGL tunnel centreline

OGL-mapped and GHD-inferred surface hydrothermal alteration

Argillite Alt - Illite / Illite, Smectite

Argillite Alt - Smectite Surficial

Quartz Alt / Silicification

GHD

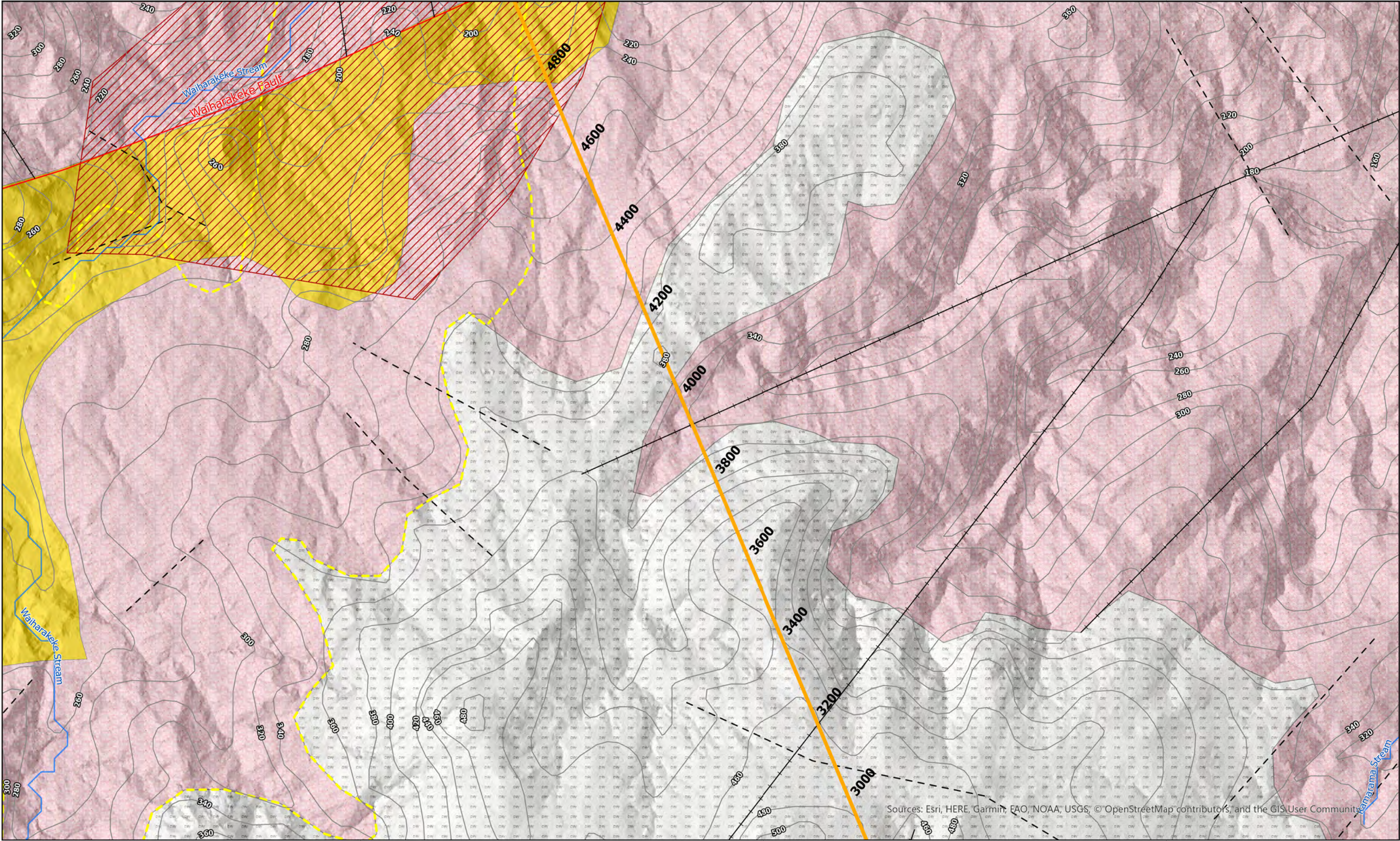
OCEANA GOLD

Oceana Gold
WKP Exploration Tunnel -
Water Assessment

**Conceptual Engineering
Geological Model**

Job Number | 125336958
Revision | 0
Date | 19 Aug 2020

Figure 1
Page 2 of 5



Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Paper Size A3

0 50 100 200 300

Metres

Map Projection: New Zealand Map Grid

Horizontal Datum: New Zealand 1949

Grid: GD 1949 New Zealand Map Grid

N

LEGEND

GNS 1:50k geological lithological units

Whakamoehau Andesite: Andesite and dacite with minor quartz phenocrysts. Andesite tuff breccias

Whiritoa Andesite : Phryic andesite and dacite flows and domes with tuff-breccias and lithic crystal tuff

Waiharakeke Dacite : Dacite flows, tuff breccia and minor tuff. Local intercalated rhyolite flows and tuffs

Geologic features

— Fault

— Inferred lineament

— Lineament

— GNS-mapped hydrothermal alteration zone

— Watercourse

— OGL tunnel centreline

OGL-mapped and GHD-inferred surface hydrothermal alteration

Argillite Alt - Illite / Illite, Smeectite

Argillite Alt - Smeectite Surficial

Quartz Alt / Silicification

Oceana Gold

WKP Exploration Tunnel - Water Assessment

Conceptual Engineering Geological Model

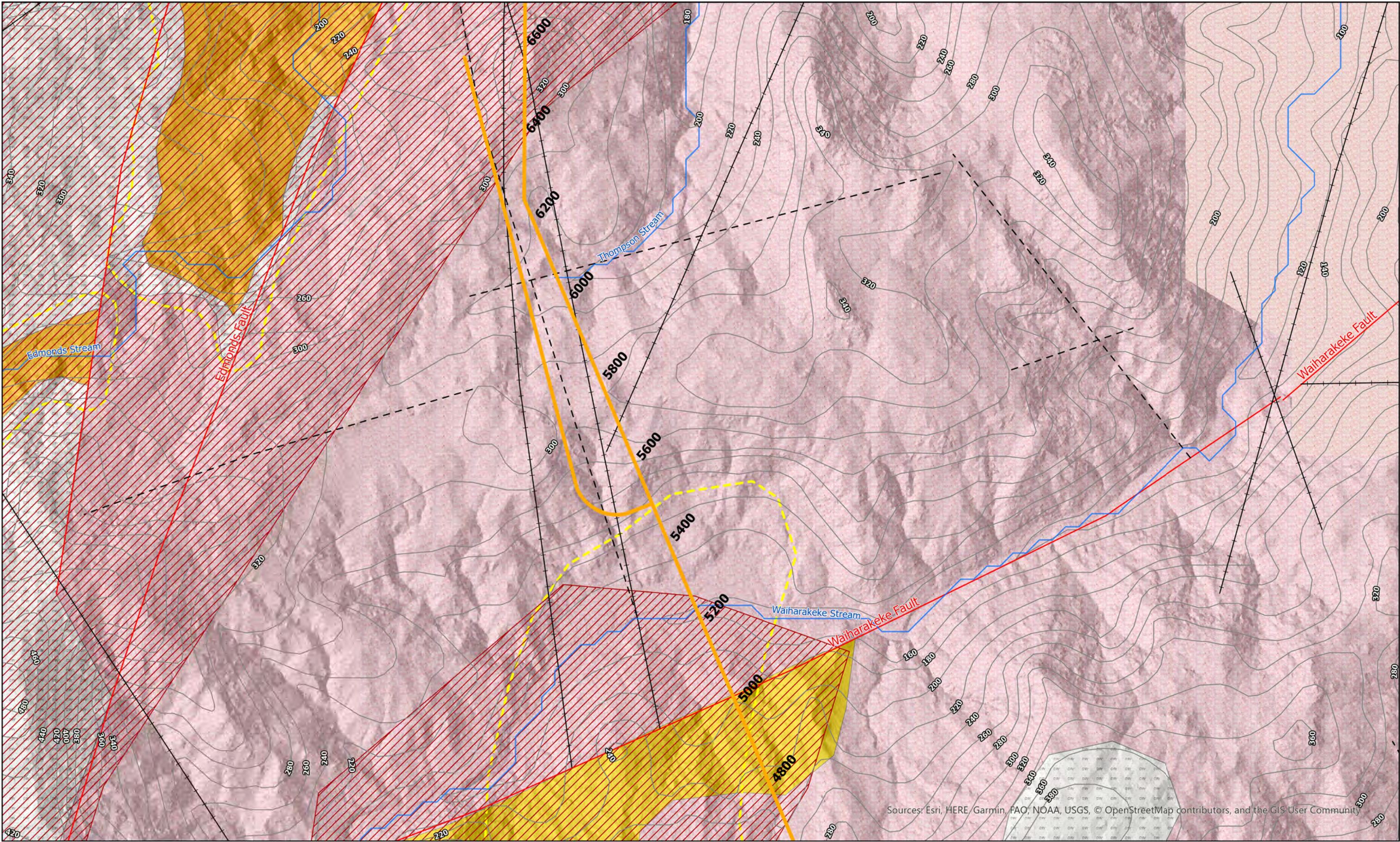
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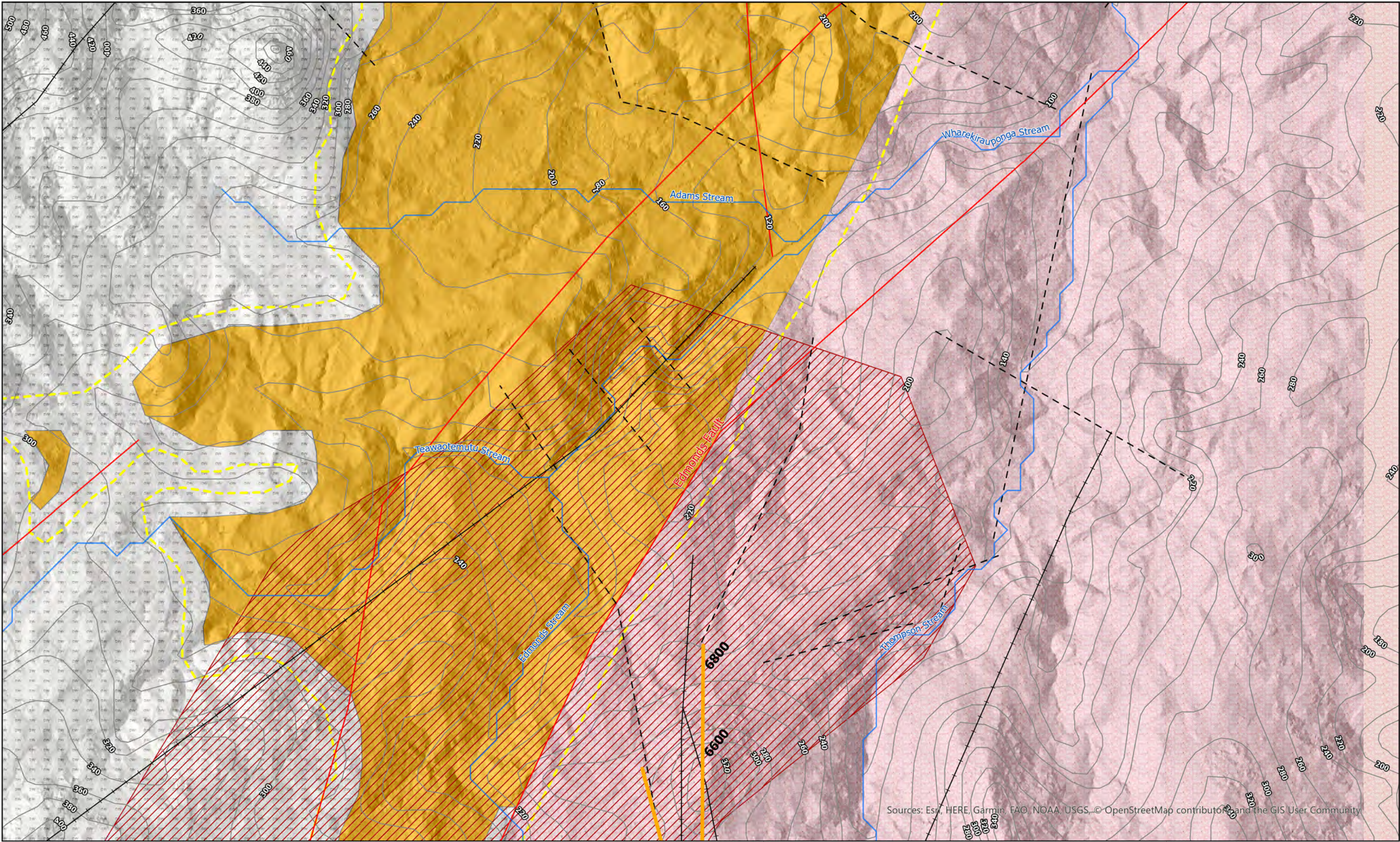
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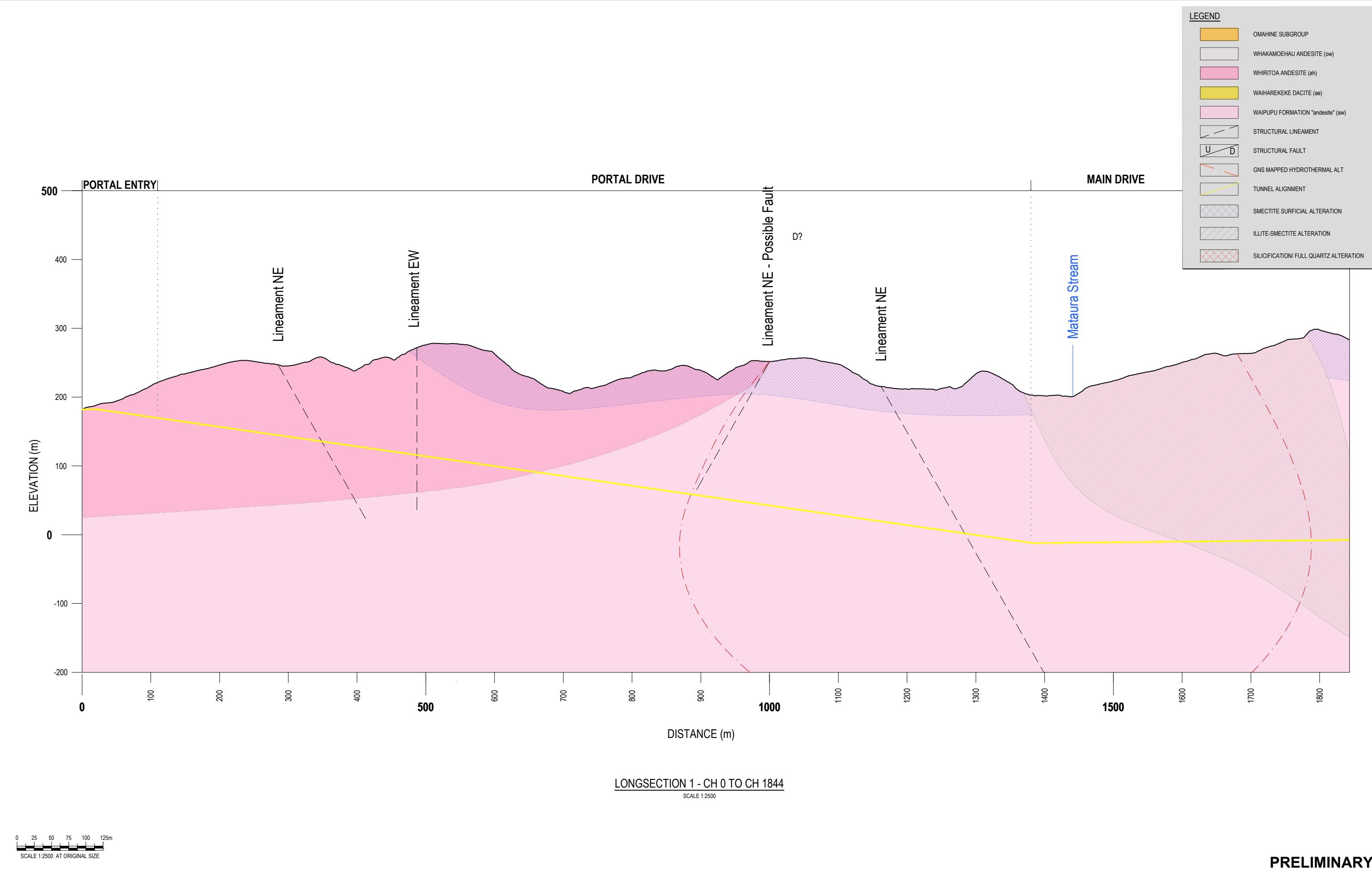
Date 19 Aug 2020

Figure 1

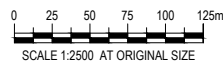
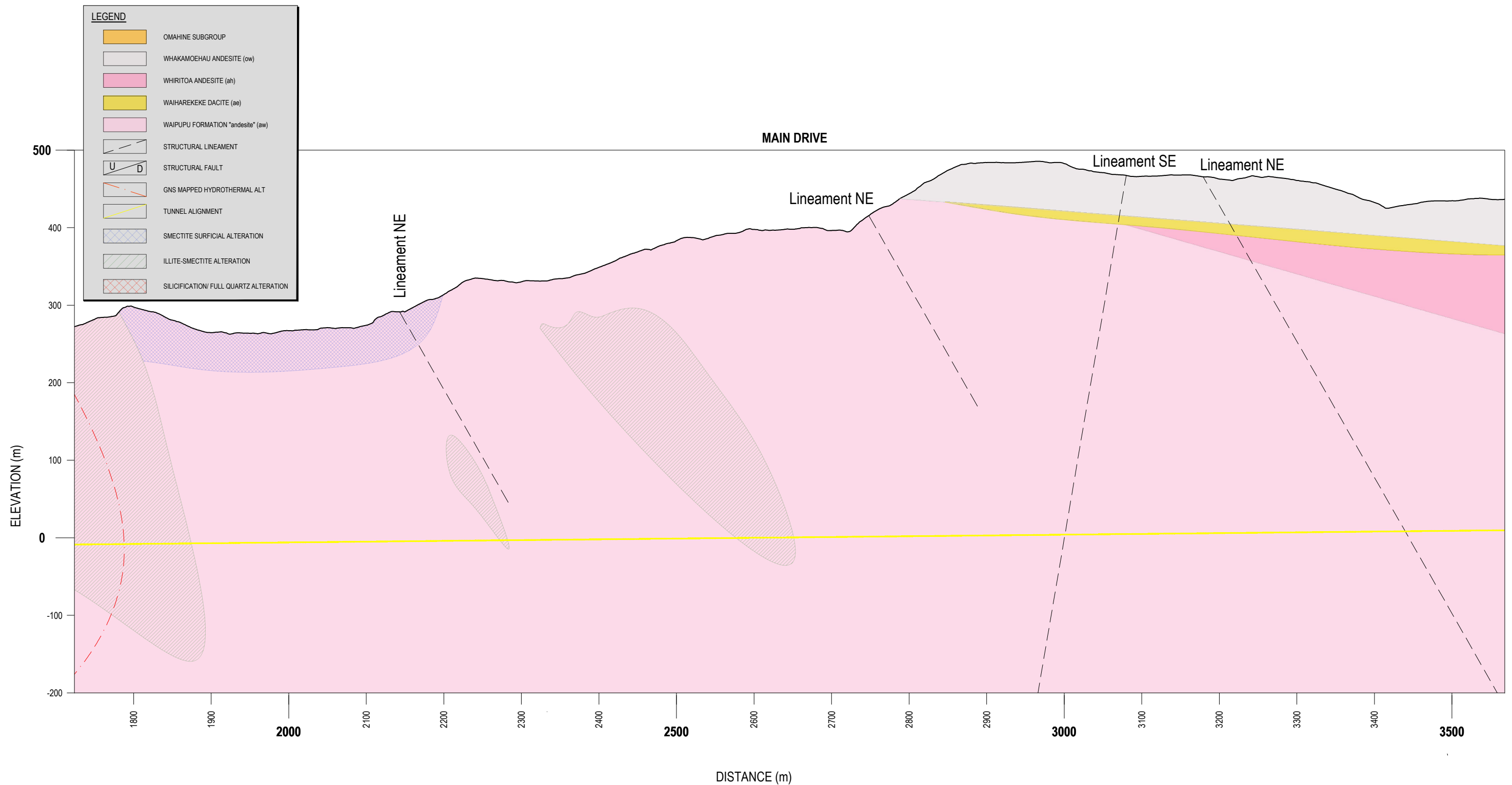
Page 3 of 5





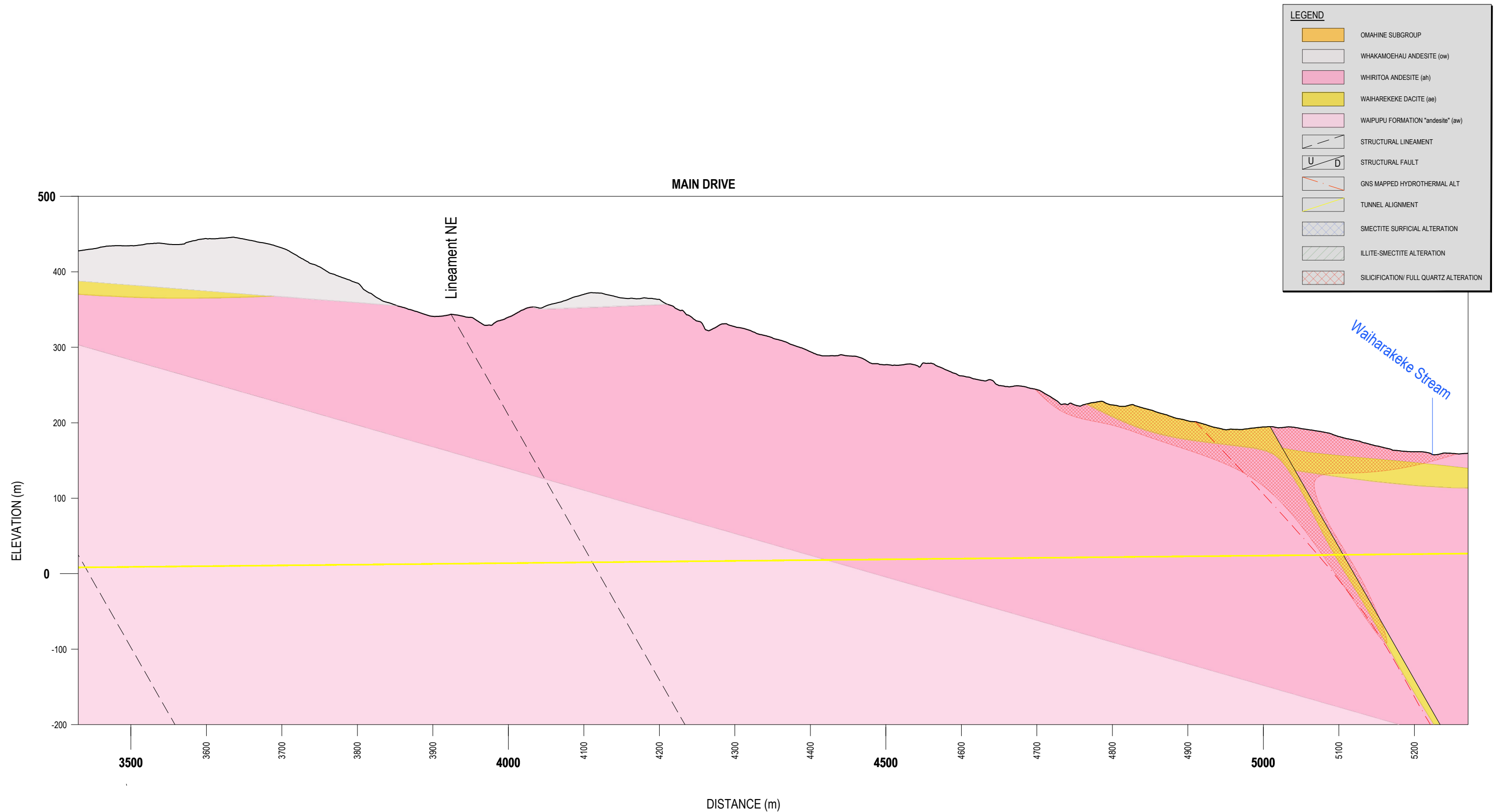


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								Approved NE (Project Director) Date 17082020		Title CONCEPTUAL GEOLOGICAL LONGSECTION DRAFT 17082020		
								Scale 1:2500 @ A1	This Drawing must not be used for Construction unless signed as Approved	Original Size A1 Drawing No: Q001		
A	CONCEPTUAL		NB	TM	NE	082020Y						Rev: A
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date						



PRELIMINARY

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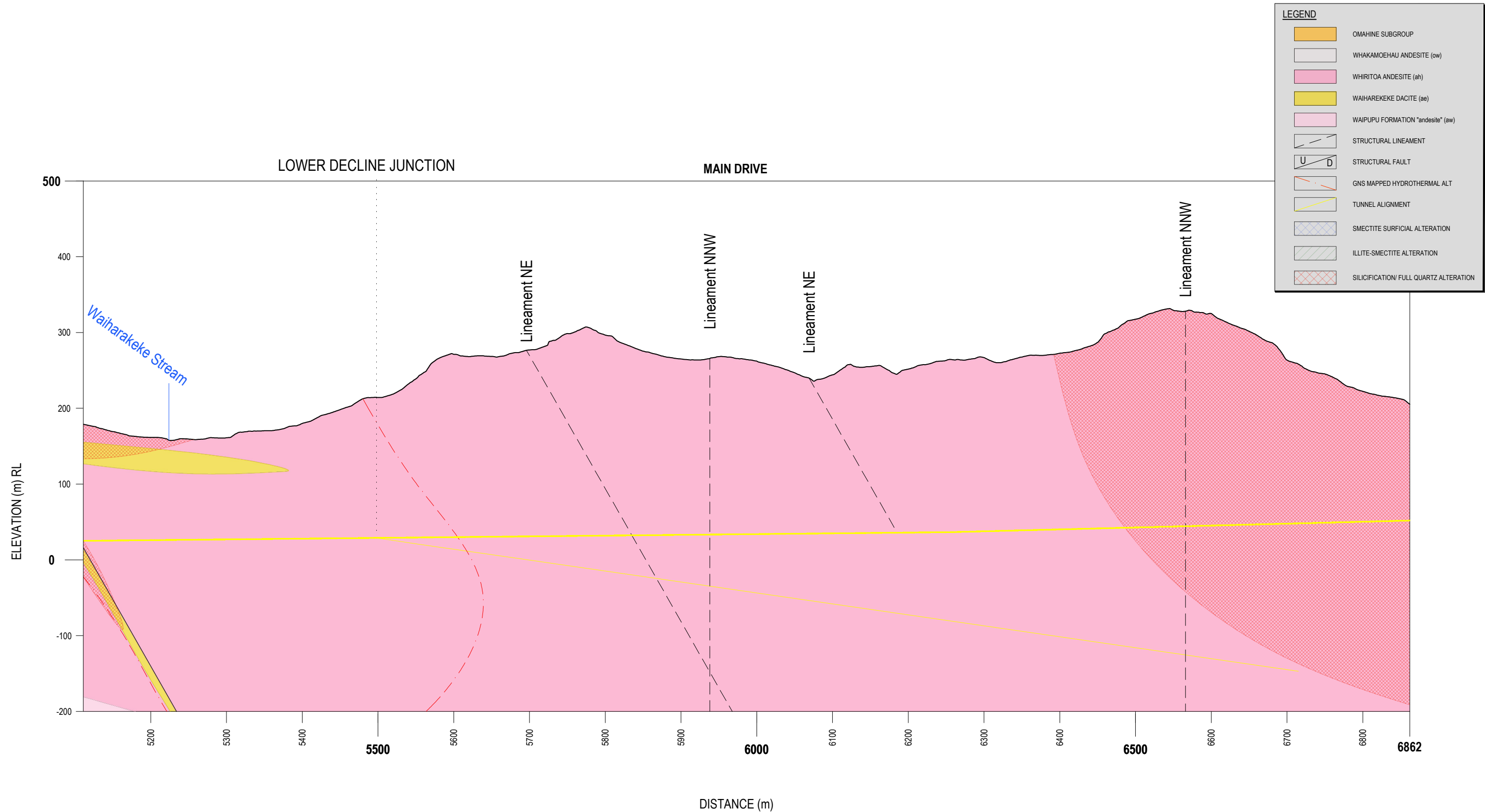


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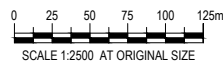


PRELIMINARY

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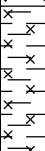
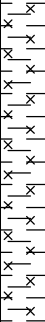
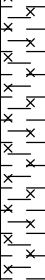


PRELIMINARY

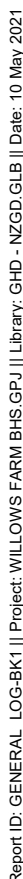
						 11/F Alphaland Southgate Tower 2258 Chino Roces Ave corner EDSA Makati City 1232 Philippines T 63 2 479 5600 F 63 2 479 5601 E mnlmail@ghd.com W www.ghd.com	DO NOT SCALE		Drawn NICK BURKE	Designer NICK BURKE	Client	OCEANA GOLD LIMITED WKP EXPLORATION TUNNEL - WATER ASSESSMENT CONCEPTUAL GEOLOGICAL LONGSECTION DRAFT 17082020	
							GHD Pty Ltd Conditions of Use. This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.	Drafting DM	Design NE	Project			
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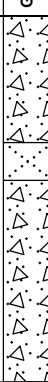
APPENDIX C

Geotechnical Logs for
Willows Road Access Tunnel

 Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 2/09/2020 Completed: 4/09/2020										Hole No. : WFBH001-D Sheet : 1 of 2 Hole Length : 18.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																															
Easting: 2763724.071 RL: 170.455 m					Northing: 6423735.338 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY																															
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level																								
							Number / Type	Result																																	
170	0		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL) CORE LOSS	TOPSOIL	M	VS																																			
	0.3																																								
	0.7																																								
1	1		Sandy silty CLAY; orangish brown. Soft; moist; high plasticity; sand, fine (RESIDUAL SOIL - ALLOPHANE)		M	S								TCR: 64																											
	1.7													TCR: 100																											
2	2		Silty CLAY with some sand and gravel; reddish brown speckled grey and black. Soft; moist; high plasticity, sand, fine to coarse; gravel, fine		M	S		SPT 0/0 1/1 1/0 N = 3																																	
	2													TCR: 100																											
	3							SPT 0/1 1/0 0/1 N = 2						TCR: 150																											
	4													TCR: 145																											
4	4		Silty CLAY with minor sand and gravel; red speckled grey and black. Soft; moist; high plasticity; sand, fine to coarse; gravel, fine	RESIDUAL SOIL - ALLOPHANE	M	S		SPT 1/1 0/1 1/1 N = 3						TCR: 150																											
	5													TCR: 155																											
	6		6.00 Becomes firm					SPT 1/0 1/1 1/1 N = 4						TCR: 130																											
	7													TCR: 100																											
	8							SPT 1/1 2/2 1/1 N = 6						TCR: 112																											
	9													TCR: 100																											
	10							SPT 3/3 2/2 2/2 N = 8						TCR: 133																											
	11													TCR: 86																											
Notes and Comments: End of Hole @ 18.45m Wasterock stack option 1 0% water return for all of drilling Hole drilled dry to 6.0m Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: Vertical Orientation: Contractor: Alton Drilling Ltd Equipment: Tractor Rig, (Rig 83)				Ground Water Level <table><thead><tr><th>Date</th><th>Time</th><th>Reading (mbgl)</th><th>Hole depth (mbgl)</th></tr></thead><tbody><tr><td>03/09/20</td><td>17:00</td><td>2.08</td><td>13.95</td></tr><tr><td>04/09/20</td><td>08:00</td><td>6.68</td><td>13.95</td></tr><tr><td>04/09/20</td><td>12:00</td><td>5.2</td><td>18.45</td></tr><tr><td>07/09/20</td><td>00:00</td><td>11.72</td><td>18.45</td></tr><tr><td>23/09/20</td><td>00:00</td><td>14.14</td><td>18.45</td></tr></tbody></table>				Date	Time	Reading (mbgl)	Hole depth (mbgl)	03/09/20	17:00	2.08	13.95	04/09/20	08:00	6.68	13.95	04/09/20	12:00	5.2	18.45	07/09/20	00:00	11.72	18.45	23/09/20	00:00	14.14	18.45
Date	Time	Reading (mbgl)	Hole depth (mbgl)																																						
03/09/20	17:00	2.08	13.95																																						
04/09/20	08:00	6.68	13.95																																						
04/09/20	12:00	5.2	18.45																																						
07/09/20	00:00	11.72	18.45																																						
23/09/20	00:00	14.14	18.45																																						
										SPT ETR: 81%																															

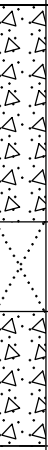
 Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 2/09/2020 Completed: 4/09/2020										Hole No. : WFBH001-D Sheet : 2 of 2 Hole Length : 18.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : 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Easting: 2763724.071 RL: 170.455 m										Northing: 6423735.338 Datum: NZVD2016										System: NZMG 1949 Method: SURVEY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Silty CLAY with some gravel; reddish brown speckled black. Firm; moist; high plasticity; gravel, fine (continued from layer starting at 8.0m)										RESIDUAL SOIL - ALLOPHANE										M										F																				SPT 1/0 2/1 2/3 N = 8																				SPT 1/1 1/1 2/2 N = 6																				SPT 2/1 1/2 2/3 N = 8																				SPT 3/5 4/5 5/6 N = 20																				SPT 3/3 1/3 6/7 N = 17																				SPT 2/4 6/6 6/6 N = 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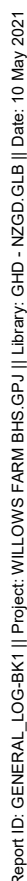
		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 7/09/2020 Completed: 7/09/2020						Hole No. : WFBH002 Sheet : 2 of 2 Hole Length : 12.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																															
		Easting: 2763719.184 Northing: 6423833.114 System: NZMG 1949 RL: 158.228 m Datum: NZVD2016 Method: SURVEY																																					
RL (m) 148 147 146 145 144 143 142 141 140 139	Depth (m) 11 12 13 14 15 16 17 18 19 20	Graphic 	Material Description Completely weathered; pale brown speckled black and orange welded TUFF; fine fabric; extremely weak; recovered partially as gravel sized fragments(WHIRITOA ANDESITE) (continued from layer starting at 9.8m) CORE LOSS Completely weathered; pale brown speckled black and orange welded TUFF; fine fabric; extremely weak; recovered partially as gravel sized fragments	Geological Unit WHIRITOA ANDESITE	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQR (%)	Defect Spacing (mm)	Instrumentation Installation	Water level																						
							Number / Type	Result																															
								SPT 4/3 2/2 3/4 N = 11		HQTT SPT HQTT SPT				TCR: 100 TCR: 78																									
			End of Hole @ 12.45m, Target Depth					SPT 2/3 4/8 11/15 N = 38																															
Notes and Comments: End of Hole @ 12.45m Silt Pond Area No water return information Field soil descriptions have been adjusted to reflect lab test results were applicable Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical Orientation:				Contractor: Alton Drilling Ltd Equipment: Tractor Rig, (Rig 83)				Ground Water Level																											
												<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Reading (mbgl)</th> <th>Hole depth (mbgl)</th> </tr> </thead> <tbody> <tr> <td>07/09/20</td> <td>10:00</td> <td>1.78</td> <td>3</td> </tr> <tr> <td>07/09/20</td> <td>12:00</td> <td>2.95</td> <td>6</td> </tr> <tr> <td>07/09/20</td> <td>14:00</td> <td>2.22</td> <td>9</td> </tr> <tr> <td>07/09/20</td> <td>17:00</td> <td>2.74</td> <td>12.45</td> </tr> <tr> <td>23/09/20</td> <td>00:00</td> <td>5.98</td> <td>6.7</td> </tr> </tbody> </table>				Date	Time	Reading (mbgl)	Hole depth (mbgl)	07/09/20	10:00	1.78	3	07/09/20	12:00	2.95	6	07/09/20	14:00	2.22	9	07/09/20	17:00	2.74	12.45	23/09/20	00:00	5.98	6.7
Date	Time	Reading (mbgl)	Hole depth (mbgl)																																				
07/09/20	10:00	1.78	3																																				
07/09/20	12:00	2.95	6																																				
07/09/20	14:00	2.22	9																																				
07/09/20	17:00	2.74	12.45																																				
23/09/20	00:00	5.98	6.7																																				
				SPT ETR: 81%																																			

		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 24/08/2020 Completed: 27/08/2020				Hole No. : WFBH003 Sheet : 1 of 3 Hole Length : 22.95 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS											
Easting: 2763752.035 RL: 163.112 m		Northing: 6423791.265 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level
							Number / Type	Result									
163.112	0		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL)	TOPSOIL	M	VS											
	0.25		Sandy silty CLAY; orangish brown. Very soft; moist; high plasticity; trace rootlets; sand, fine (RIVER TERRACE DEPOSITS)		M	VS				OB				TCR: 100			
	0.6				M	S		SPT 1/0 1/1 1/1 N = 4		SPT							
162	1		Silty CLAY with some sand and clay; brown. Soft; moist; high plasticity; sand, fine														
	1.50		Becomes firm			F				HQTT				TCR: 100			
	2							SPT 1/0 1/1 1/2 N = 5		SPT							
161	2			RIVER TERRACE DEPOSITS													
	2.55		CORE LOSS														
	2.95		Sandy CLAY with some gravel; redish brown. Firm; moist; high plasticity; sand, fine to coarse; gravel, fine to medium, sub rounded completely weathered andesite		M	F		SPT 1/1 1/2 1/2 N = 6		SPT				TCR: 82			
160	3																
	3.45		CORE LOSS														
	3.95		Silty CLAY; orangish brown mottled grey. Firm; moist; high plasticity		M	F				HQTT				TCR: 48			
159	4																
	4.5		Silty clayey GRAVEL with some sand and cobbles; orangish brown. Medium dense; moist; sand, fine to coarse; gravel, angular to sub angular, highly weathered andesite and welded tuff; iron staining at gravel edges (COLLUVIUM)		M	MD		SPT 1/2 4/5 8/8 N = 25		SPT							
	5.15		CORE LOSS														
158	5																
	5.45		Silty clayey GRAVEL with some sand and cobbles; orangish brown. Medium dense; moist; sand, fine to coarse; gravel, angular to sub angular, highly weathered andesite and welded tuff; rare slightly weathered, strong coarse gravel of porphyritic andesite; iron staining at gravel edges (COLLUVIUM)					SPT 2/3 3/0 27 for 75mm bouncing @ 375 mm		SPT							
	6.00		Becomes very dense	COLLUVIUM		VD											
	6.7																
157	6																
	7.1		Completely weathered; brownish red; massive welded TUFF; extremely weak (WHIRITOA ANDESITE)					SPT 2/3 3/3 3/4 N = 13		SPT				TCR: 100			
156	7																
	8.20		Recovered as gravel sized fragments	WHIRITOA ANDESITE													
155	8													TCR: 100			
	9							SPT 2/2 3/3 3/3 N = 12		SPT							
154	9													TCR: 100			
Notes and Comments: End of Hole @ 22.95m Silt Pond Area No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level				Date	Time	Reading (mbgl)	Hole depth (mbgl)		
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)						27/08/20	17:00	12.5	22.95		
												23/09/20	11:45	13.57	15		

		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 24/08/2020 Completed: 27/08/2020						Hole No. : WFBH003 Sheet : 2 of 3 Hole Length : 22.95 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS										
Easting: 2763752.035 RL: 163.112 m		Northing: 6423791.265 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY														
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level	
							Number / Type	Result										
152	11		9.95 - 10.40 Recovered as silty gravel sized fragments Completely weathered; brownish red; massive welded TUFF; extremely weak (WHIRITOA ANDESITE) (continued from layer starting at 7.1m)	WHIRITOA ANDESITE				SPT 2/2 3/2 3/2 N = 10		HQTT				TCR: 100				
152	11		10.95 - 11.20 Recovered as silty gravel sized fragments								HQTT				TCR: 100			
151	12							SPT 1/3 3/2 3/2 N = 10			SPT							
151	12																	
150	13		CORE LOSS Completely weathered; pale brown speckled black and white; massive welded TUFF; extremely weak; some iron oxidization staining present								HQTT				TCR: 90			
149	14							SPT 2/3 3/4 5/7 N = 19			SPT							
149	14																	
148	15		CORE LOSS								HQTT				TCR: 43			
148	15		Completely weathered; pale brown speckled black and white; massive welded TUFF; extremely weak; some iron oxidization staining present					SPT 2/1 3/3 4/1 N = 11			SPT							
147	16										HQTT				TCR: 100			
146	17							SPT 3/3 4/5 3/5 N = 17			SPT							
146	17										HQTT				TCR: 100			
145	18							SPT 3/3 3/4 4/5 N = 16			SPT							
145	18										HQTT							
144	19							SPT 3/5 7/7 8/7 N = 29			SPT							
144	19										HQTT				TCR: 100			
Notes and Comments: End of Hole @ 22.95m Silt Pond Area No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level				Date	Time	Reading (mbgl)	Hole depth (mbgl)			
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)						27/08/20	17:00	12.5	22.95			
				SPT ETR: 81%								23/09/20	11:45	13.57	15			

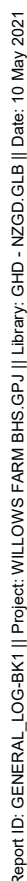
		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 24/08/2020 Completed: 27/08/2020						Hole No. : WFBH003 Sheet : 3 of 3 Hole Length : 22.95 Scale @ A4 : 1:50																		
		Easting: 2763752.035 Northing: 6423791.265 System: NZMG 1949 RL: 163.112 m Datum: NZVD2016 Method: SURVEY						Logged : HJ Processed : HJ Checked : JHS																		
RL (m) 143 142 141 140 139 138 137 136 135 134	Depth (m) 20 21 22 23 24 25 26 27 28 29 30	Graphic 	Material Description Completely weathered; pale redish grey speckled black and white; massive welded TUFF; extremely weak; some iron oxidization staining present CORE LOSS Completely weathered; pale redish grey speckled black and white; massive welded TUFF; extremely weak; some iron oxidization staining present	Geological Unit WHIRITOA ANDESITE	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering CW	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level									
							Number / Type SPT 4/5 5/5 5/7 N = 22	Result SPT 1/3 6/7 6/6 N = 25																		
End of Hole @ 22.95m, Target Depth																										
Notes and Comments: End of Hole @ 22.95m Silt Pond Area No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.			Inclination: Vertical Orientation: Contractor: Alton Drilling Ltd Equipment: Tractor Rig, (Rig 83) SPT ETR: 81%						Ground Water Level <table border="1"> <tr> <th>Date</th> <th>Time</th> <th>Reading (mbgl)</th> <th>Hole depth (mbgl)</th> </tr> <tr> <td>27/08/20</td> <td>17:00</td> <td>12.5</td> <td>22.95</td> </tr> <tr> <td>23/09/20</td> <td>11:45</td> <td>13.57</td> <td>15</td> </tr> </table>						Date	Time	Reading (mbgl)	Hole depth (mbgl)	27/08/20	17:00	12.5	22.95	23/09/20	11:45	13.57	15
Date	Time	Reading (mbgl)	Hole depth (mbgl)																							
27/08/20	17:00	12.5	22.95																							
23/09/20	11:45	13.57	15																							

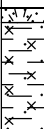
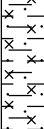
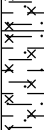
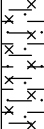
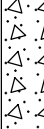
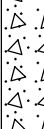
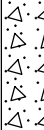
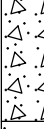
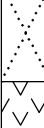
			Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 8/09/2020 Completed: 8/09/2020						Hole No. : WFBH004 Sheet : 1 of 2 Hole Length : 15 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS											
Easting: 2763689.493 Northing: 6423889.712 System: NZMG 1949 RL: 161.242 m Datum: NZVD2016 Method: SURVEY																				
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level			
							Number / Type	Result												
161.0	0.0		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL)	TOPSOIL	M	VS											0			
	0.5		Sandy silty CLAY; brown. Very soft; moist; high plasticity; sand, fine to medium (RESIDUAL SOIL - ALLOPHANE)		M	VS				HQTT				TCR: 70						
160.9	1.0		CORE LOSS																	
	1.0		Silty CLAY with some sand; orangish brown mottled grey. Soft; moist; extremely high plasticity; sand, fine to medium	RESIDUAL SOIL - ALLOPHANE	M	S	D-B1	1.20			HQTT			TCR: 81			1			
	1.6																			
160.7	1.6		Silty CLAY; with minor sand; pale grey. Soft; moist; high plasticity; sand, fine to medium. 1.80 XRD lab test results: major: quartz; minor: halloysite, tridymite, cristobalite; trace: gibbsite, smectite	RESIDUAL SOIL - ALLOPHANE	M	S	D-D2	2.00			HQTT			TCR: 119			2			
	2.85													TCR: 100						
160.3	3.0		Gravelly COBBLES with some boulders and silt; grey. Moist; very dense; clast supported; gravel, fine to coarse, sub angular to subrounded; cobbles and boulders, sub rounded, slightly weathered, strong porphyritic andesite; iron oxidation on clast boundaries (possible COLLUVIUM)		M	'VD'				HQTT			TCR: 100			3				
	4.45			COLLUVIUM							HQTT			TCR: 96			4			
160.0	4.5		CORE LOSS																	
	4.9										HQTT			TCR: 47			5			
159.9	5.0		Gravelly COBBLES with some boulders and silt; grey. Moist; very dense; clast supported; gravel, fine to coarse, sub angular to subrounded; cobbles and boulders, sub rounded, slightly weathered, strong porphyritic andesite; iron oxidation on clast boundaries								HQTT			TCR: 95			6			
	6.4																			
159.5	6.4		Completely weathered; greyish brown speckled white and orange; massive welded TUFF; recovered as gravel sized fragments (WHIRITOA ANDESITE)								HQTT			TCR: 100			7			
	6.9		CORE LOSS																	
159.2	7.5		Completely weathered; greyish brown speckled white and orange; massive welded TUFF; recovered as gravel sized fragments	WHIRITOA ANDESITE							HQTT			TCR: 33			8			
	7.5													TCR: 100			9			
159.0	8.0																			
	9.2		Moderately weathered; grey; porphyritic ANDESITE; magnetic (possible bedrock or colluvium - unconfirmed)								HQTT			TCR: 90			10			
158.8	9.2													TCR: 100						
Notes and Comments: End of Hole @ 15m Silt Pond Area, No SPTs undertaken due to faulty equipment No water return information Field soil descriptions have been adjusted to reflect lab test results were applicable Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical Orientation:				Ground Water Level												
				Contractor: Alton Drilling Ltd																
				Equipment: Tractor Rig, (Rig 83)																
								Date	Time	Reading (mbgl)	Hole depth (mbgl)									
								08/09/20	12:00	2.06	5.3									
								08/09/20	14:00	2.26	7.8									
								08/09/20	17:00	2.2	15									
								23/09/20	11:10	6.84	6.2									



 Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 2/09/2020 Completed: 2/09/2020										Hole No. : WFBH005 Sheet : 1 of 1 Hole Length : 9.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																																							
Easting: 2763826.49 Northing: 6423868.607 System: NZMG 1949 RL: 149.973 m Datum: NZVD2016 Method: SURVEY																																																	
RL (m) Depth (m) Graphic SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL) CORE LOSS Sandy silty CLAY; brown. Very soft, moist, high plasticity, trace rootlets (RIVER TERRACE DEPOSITS) GRAVEL with some sand, cobbles and boulders; grey. Dense; moist; gravel, fine to coarse sub angular to sub rounded, slightly weathered, porphyritic andesite; iron oxidation at clast boundaries. Possible fine matrix - washed out during drilling. 2.00 becomes medium dense CORE LOSS (inferred soft ground) Sandy SILT with some gravel; reddish brown mottled black. Firm; moist; high plasticity; sand, fine to coarse; gravel, fine, sub angular to sub rounded (RESIDUAL SOIL - ALLOPHANE) Completely weathered; pale whitish brown speckled black and locally stained orange; massive welded TUFF; extremely weak; partially recovered as gravel sized fragments (WHIRITOA ANDESITE) CORE LOSS (inferred soft ground) Completely weathered; pale whitish brown speckled black and locally stained orange; massive welded TUFF; extremely weak; partially recovered as gravel sized fragments End of Hole @ 9.45m, Target Depth <td colspan="2">Geological Unit</td> <td colspan="2">Moisture condition</td> <td colspan="2">Consistency / Relative Density</td> <td colspan="2">Sample</td> <td colspan="2">Casing</td> <td colspan="2">Method</td> <td colspan="2">Flush Return (%)</td> <td colspan="2">Weathering</td> <td colspan="2">Estimated Strength (MPa)</td> <td colspan="2">TCR SCR RQD (%)</td> <td colspan="2">Defect Spacing (mm)</td> <td colspan="2">Instrumentation Installation</td> <td colspan="2">Water level</td>										Geological Unit		Moisture condition		Consistency / Relative Density		Sample		Casing		Method		Flush Return (%)		Weathering		Estimated Strength (MPa)		TCR SCR RQD (%)		Defect Spacing (mm)		Instrumentation Installation		Water level															
										TOPSOIL		M		VS						HQTT								TCR: 60																					
RIVER TERRACE DEPOSITS		M		VS				SPT 3/2 7/18 7/12 N = 44		SPT		HQTT						TCR: 200																															
		M		D				SPT 6/3 4/2 5/10 N = 21		SPT		HQTT						TCR: 133																															
RESIDUAL SOIL				F				SPT 1/0 1/1 1/2 N = 5		SPT		HQTT						TCR: 64																															
WHIRITOA ANDESITE								SPT 2/1 2/2 2/3 N = 9		SPT		HQTT						TCR: 123																															
								SPT 2/3 2/3 2/2 N = 9		SPT		HQTT						TCR: 137																															
								SPT 2/3 4/4 4/4 N = 16		SPT		HQTT						TCR: 95																															
								SPT 3/4 3/5 6/9 N = 23		SPT		HQTT						TCR: 48																															
										SPT		HQTT						TCR: 100																															
Notes and Comments: End of Hole @ 9.45m Silt Pond Dam Area No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: Vertical Orientation: Contractor: Alton Drilling Ltd Equipment: Tractor Rig, (Rig 83) SPT ETR: 81%										Ground Water Level <table><thead><tr><th>Date</th><th>Time</th><th>Reading (mbgl)</th><th>Hole depth (mbgl)</th></tr></thead><tbody><tr><td>02/09/20</td><td>10:00</td><td>0.75</td><td>2.45</td></tr><tr><td>02/09/20</td><td>12:00</td><td>1.7</td><td>3.45</td></tr><tr><td>02/09/20</td><td>14:00</td><td>1.55</td><td>4.95</td></tr><tr><td>23/09/20</td><td>10:45</td><td>2.8</td><td>1.39</td></tr></tbody></table>										Date	Time	Reading (mbgl)	Hole depth (mbgl)	02/09/20	10:00	0.75	2.45	02/09/20	12:00	1.7	3.45	02/09/20	14:00	1.55	4.95	23/09/20	10:45	2.8	1.39
Date	Time	Reading (mbgl)	Hole depth (mbgl)																																														
02/09/20	10:00	0.75	2.45																																														
02/09/20	12:00	1.7	3.45																																														
02/09/20	14:00	1.55	4.95																																														
23/09/20	10:45	2.8	1.39																																														

			Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 1/09/2020 Completed: 1/09/2020						Hole No. : WFBH006-D Sheet : 1 of 1 Hole Length : 7.95 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS								
Easting: 2763792.346 RL: 151.013 m			Northing: 6423908.639 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY											
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level
							Number / Type	Result									
150	0		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL)	TOPSOIL	M	VS											
	0.5		Sandy SILT; brown. Very soft; moist; high plasticity; trace rootlets (RIVER TERRACE DEPOSITS)		M	VS				HQTT				TCR: 56			
	1		CORE LOSS														
	1.5		GRAVEL with cobbles and boulders; grey. Moist; dense; gravel, fine to coarse, sub angular to sub rounded; cobbles and boulders, slightly weathered, strong, porphyritic andesite. Fine matrix possibly washed out during drilling.	RIVER TERRACE DEPOSITS	M	D		SPT 2/2 6/12 11/18 N = 37		SPT					TCR: 100		
	2		2.00 becomes medium dense					SPT 2/4 5/5 4/5 N = 19		HQTT							
	2.5		CORE LOSS							SPT							
	3		Completely weathered; pale whitish brown speckled black locally stained orange; massive welded TUFF; extremely weak; partially recovered as gravel sized fragments (WHIRITOA ANDESITE)					SPT 2/4 5/4 4/6 N = 19		HQTT				TCR: 73			
	3.5		CORE LOSS							SPT							
	4		Completely weathered; pale whitish brown speckled black locally stained orange; massive welded TUFF; extremely weak; partially recovered as gravel sized fragments							HQTT				TCR: 57			
	5		CORE LOSS (inferred soft ground)	WHIRITOA ANDESITE				SPT 1/4 5/5 4/7 N = 17		SPT							
	5.5		Completely weathered; pale whitish brown speckled black locally stained orange; massive welded TUFF; extremely weak; partially recovered as gravel sized fragments							HQTT				TCR: 71			
	6		CORE LOSS					SPT 2/1 4/4 5/5 N = 18		SPT				TCR: 100			
	6.5		Completely weathered; pale whitish brown speckled black locally stained orange; massive welded TUFF; extremely weak; partially recovered as gravel sized fragments							HQTT				TCR: 79			
	7		CORE LOSS					SPT 2/1 4/3 4/5 N = 16		SPT							
	8		End of Hole @ 7.95m, TD														
Notes and Comments: End of Hole @ 7.95m Silt Pond Dam Area Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level									
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)		Date	Time	Reading (mbgl)	Hole depth (mbgl)						
								01/09/20	09:00	1.58	3.45						
								01/09/20	11:00	1.78	6.45						
								01/09/20	12:00	1.62	7.95						
				23/09/20	10:38	2.69	7.95										
				SPT ETR: 81%													



		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 9/11/2020 Completed: 9/11/2020					Hole No. : WFBH008 Sheet : 1 of 1 Hole Length : 9.6 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS										
Easting: 2763442.597 RL: 229.71 m		Northing: 6423517.155 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level
							Number / Type	Result									
229.71	0.14		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL) Sandy silty CLAY; brown. Firm; moist; high plasticity; sand, fine (RESIDUAL SOIL - ALLOPHANE) 0.50 becomes orangish brown	TOPSOIL	M	VS	D-D1	1.35	SPT 1/0 2/2 2/3 N = 9	HQTT				TCR: 100			
228.71	1		1.80 becomes stiff	RESIDUAL SOIL	M	St											
227.71	2		CLAY with some sand and silt; orange brown. Stiff; moist; high plasticity; sand, fine	RESIDUAL SOIL	M	St		SPT 1/1 3/3 2/2 N = 10	SPT	HQTT				TCR: 100			
226.71	3							SPT 1/4 4/4 6/4 N = 18	SPT	HQTT				TCR: 100			
225.71	4		Completely weathered; grey speckled orange and white; locally stained black; massive welded TUFF; extremely weak (WHIRITOA ANDESITE)	WHIRITOA ANDESITE				SPT 4/7 8/10 10/18 N = 41	SPT	HQTT				TCR: 100			
224.71	5							SPT 3/8 9/17 24 for 75mm N > 50	SPT	HQTT				TCR: 100			
223.71	6							SPT 1/5 16/34 for 75mm N > 50	SPT	HQTT				TCR: 100			
222.71	7		7.50 becomes very weak											TCR: 36			
221.71	8		CORE LOSS														
220.71	9		Completely weathered; grey speckled orange and white; locally stained black; massive welded TUFF; very weak														
220.71	9.6		End of Hole @ 9.6m, TD														
Notes and Comments: End of Hole @ 9.6m Magazine Compound Area Lost water return at 6.3m Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level									
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)		Date	Time	Reading (mbgl)	Hole depth (mbgl)						
								10/11/20	07:00	5.7	9.6						

			Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 10/09/2020					Hole No. : WFBH009 Sheet : 1 of 1 Hole Length : 9.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2763604.373 RL: 180.613 m			Northing: 6423700.722 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level
							Number / Type	Result									
180	0		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL)	TOPSOIL	M	VS											
	0.3		Sandy silty CLAY; orangish brown. Very soft; moist; high plasticity; sand, fine to medium (RESIDUAL SOIL - ALLOPHANE)		M	VS				HQTT				TCR: 64			
1	0.8		CORE LOSS														
	1.1		Sandy silty CLAY; orangish brown. Soft; moist; high plasticity; sand, fine to medium		M	S				HQTT				TCR: 125			
	1.5		Silty CLAY with some sand; brown. Firm; moist; high plasticity; sand, fine to medium		M	F		SPT 1/0 1/1 1/2 N = 5		SPT							
2	2.0695		CORE LOSS														
	2.95		Silty CLAY with some sand; brown. Firm; moist; high plasticity; sand, fine to medium		M	F				HQTT				TCR: 86			
3	2.95		Silty CLAY with some sand; reddish brown. Firm; moist; very high plasticity; sand, fine to coarse 3.00 XRD lab test results: major: halloysite, cristobalite, tridymite; minor: quartz		M	F		SPT-D1 3.00 3.45		SPT							
	4.05		Silty GRAVEL with some cobbles. 'Medium dense'; moist; matrix supported; gravel, fine to coarse sub angular to sub rounded slightly weathered, moderately strong, porphyritic andesite (possible COLLUVIUM)	COLLUVIUM	M	'MD'				HQTT				TCR: 90			
	4.5		Silty CLAY; reddish brown speckled mottled white and black. Stiff; moist; high plasticity (RESIDUAL SOIL - WHIRITOA ANDESITE)		M	St		SPT 1/2 2/2 2/2 N = 8		SPT							
5	4.5									HQTT				TCR: 86			
6	4.5							SPT 1/2 2/3 3/4 N = 12		SPT							
	7.5		7.20 - 7.50 recovered as gravel sized fragments							HQTT				TCR: 100			
	7.5		Silty CLAY; reddish brown speckled white and grey. Stiff; moist; high plasticity		M	St		SPT 1/2 2/2 4/4 N = 12		SPT				TCR: 100			
8	7.5									HQTT							
9	7.5		9.00 becomes firm			F		SPT 0/1 1/1 2/3 N = 7		SPT							
	9.45		End of Hole @ 9.45m, Target Depth														
Notes and Comments: End of Hole @ 9.45m Wasterock Stack Area/Portal Entrance Invert Elevation - Piezo No water return information Field soil descriptions have been adjusted to reflect lab test results were applicable Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level									
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)		Date	Time	Reading (mbgl)	Hole depth (mbgl)						
								10/09/20	10:00	1.56	3						
								10/09/20	12:00	2.65	6						
								10/09/20	14:00	1.62	9.45						
								23/09/20	11:37	7.22	9.45						
				SPT ETR: 81%													



Project : WKP Exploration Tunnel - Ground Investigation
Client : Oceana Gold Corporation / GWS / Golder
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 27/10/2020

Completed: 28/10/2020

Hole No. : WFBH010

Sheet : 1 of 1

Hole Length : 7.4

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2763258.002

Northing: 6423876.493

System: NZMG 1949

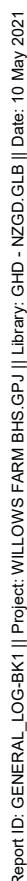
RL: 220.25 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
220	0.0		Sandy SILT; brown. Very soft; moist; low plasticity (TOPSOIL)	TOPSOIL				HQTT			TCR: 83					
	0.5		Highly weathered; grey; massive; porphyritic ANDESITE; weak; recovered gravel sized fragments (WHIRITOA ANDESITE)	HW				HQTT			RQD: 67					
	1.2							HQTT			TCR: 86					
	1.5							HQTT			RQD: 86					
	2.0		Moderately weathered; grey; massive; porphyritic ANDESITE; weak; recovered gravel sized fragments	MW				HQTT			TCR: 100			1.50 JT, 70°, st, r, VN, Mn, trace Fe		
	2.5							SPT			RQD: 87			1.62 JT, 15°, u, r, VN, Mn, trace Fe		
	2.8							HQTT			TCR: 100			1.71 JT, 18°, st, r, VN, Mn, trace Fe		
	3.0							HQTT			RQD: 100			1.95 JT, 16°, u, r, VN, Mn, trace Fe		
	3.5							HQTT			TCR: 100					
	3.8							HQTT			RQD: 91			2.44 JT, 30°, u, r, VN, Mn, trace Fe		
	4.0							HQTT			TCR: 100			2.48 JT, 35°, u, r, VN, Mn, trace Fe		
	4.2							HQTT			RQD: 81			2.80 JT, 25°, st, r, VN, Mn, trace Fe		
	4.5							HQTT			TCR: 100			3.12 JT, 18°, u, r, VN, Mn, trace Fe		
	4.8							HQTT			RQD: 81			3.30 JT, 16°, st, r, VN, Mn, trace Fe		
	5.0							HQTT			TCR: 100			3.60 JT, 10°, u, r, VN, Mn, trace Fe		
	5.2							HQTT			RQD: 50			3.70 JT, 76°, u, r, VN, Fe, trace Mn		
	5.5							HQTT			TCR: 100			3.72 JT, 21°, u, r, VN, Mn, trace Fe		
	5.8							HQTT			RQD: 100			4.00 JT, 60°, u, r, VN, Mn, trace Fe		
	6.0							HQTT			TCR: 100					
	6.2							HQTT			RQD: 100			4.55 JT, 75°, st, r, VN, Mn, trace Fe		
	6.5							HQTT			TCR: 100			4.60 JT, 70°, u, r, VN, Mn, trace Fe		
	6.8							HQTT			RQD: 100			4.72 JT, 60°, u, r, VN, Mn, trace Fe		
	7.0							HQTT			TCR: 100			4.95 JT, 62°, u, sm, VN, Mn, trace Fe		
	7.2							HQTT			RQD: 100					
	7.5							HQTT			TCR: 100			5.32 JT, 45°, u, r, VN, Mn, trace Fe		
	7.8							HQTT			RQD: 100			5.60 JT, 58°, st, r, VN, Mn, trace Fe		
	8.0							HQTT			TCR: 100			5.77 JT, 43°, st, r, VN, Mn, trace Fe		
	8.2							HQTT			RQD: 100			5.78 JT, 43°, u, r, VN, Mn, trace Fe		
	8.5							HQTT			TCR: 100			5.79 JT, 52°, u, r, VN, Mn, trace Fe		
	8.8							HQTT			RQD: 100			5.80 JT, 55°, u, sm, VN, Mn, trace Fe		
	9.0							HQTT			TCR: 100			5.92 JT, 80°, u, sm, VN, Mn, trace Fe		
	9.2							HQTT			RQD: 100			5.99 JT, 76°, u, sm, VN, Mn, trace Fe		
	9.5							HQTT			TCR: 100			6.14 JT, 30°, u, r, VN, Mn, trace Fe		
	9.8							HQTT			RQD: 100			6.15 JT, 32°, u, r, VN, Mn, trace Fe		
	10.0							HQTT			TCR: 100			6.21 JT, 33°, u, r, VN, Mn, trace Fe		
	10.2							HQTT			RQD: 58			6.30 JT, 58°, u, sm, VN, Mn, trace Fe		
	10.5							HQTT			TCR: 100			6.35 JT, 40°, u, r, VN, Mn, trace Fe		
	10.8							HQTT			RQD: 100			6.42 JT, 28°, u, r, VN, Mn, trace Fe		
	11.0							HQTT			TCR: 100			6.70 JT, 40°, u, r, VN, Mn, trace Fe		
	11.2							HQTT			RQD: 100			6.82 JT, 61°, st, r, VN, Mn, trace Fe		
	11.5							HQTT			TCR: 100			6.90 JT, 32°, u, r, VN, Mn, trace Fe		
	11.8							HQTT			RQD: 100			6.92 JT, 37°, st, sm, VN, Mn, trace Fe		
	12.0							HQTT			TCR: 100			7.08 JT, 21°, u, r, VN, Mn, trace Fe		
	12.2							HQTT			RQD: 89			7.20 JT, 17°, st, r, VN, Mn, trace Fe		
	12.5							HQTT			TCR: 100			7.30 JT, 75°, u, sm, VN, Mn, trace Fe		
	12.8							HQTT			RQD: 89					
	13.0							HQTT			TCR: 100					
	13.2							HQTT			RQD: 89					
	13.5							HQTT			TCR: 100					
	13.8							HQTT			RQD: 89					
	14.0							HQTT			TCR: 100					
	14.2							HQTT			RQD: 89					
	14.5							HQTT			TCR: 100					
	14.8							HQTT			RQD: 89					
	15.0							HQTT			TCR: 100					
	15.2							HQTT			RQD: 89					
	15.5							HQTT			TCR: 100					
	15.8							HQTT			RQD: 89					
	16.0							HQTT			TCR: 100					
	16.2							HQTT			RQD: 89					
	16.5							HQTT			TCR: 100					
	16.8							HQTT			RQD: 89					
	17.0							HQTT			TCR: 100					
	17.2							HQTT			RQD: 89					
	17.5							HQTT			TCR: 100					
	17.8							HQTT			RQD: 89					
	18.0							HQTT			TCR: 100					
	18.2							HQTT			RQD: 89					
	18.5							HQTT			TCR: 100					
	18.8							HQTT			RQD: 89					
	19.0							HQTT			TCR: 100					
	19.2							HQTT			RQD: 89					
	19.5							HQTT			TCR: 100					
	19.8							HQTT			RQD: 89					
	20.0							HQTT			TCR: 100					
	20.2							HQTT			RQD: 89					
	20.5							HQTT			TCR: 100					
	20.8							HQTT			RQD: 89					
	21.0							HQTT			TCR: 100					
	21.2							HQTT			RQD: 89					
	21.5							HQTT			TCR: 100					
	21.8							HQTT			RQD: 89					
	22.0							HQTT			TCR: 100					
	22.2							HQTT			RQD: 89					
	22.5							HQTT			TCR: 100					
	22.8							HQTT			RQD: 89					
	23.0							HQTT			TCR: 100					
	23.2							HQTT			RQD: 89					
	23.5							HQTT			TCR: 100					
	23.8							HQTT			RQD: 89					
	24.0							HQTT			TCR: 100					
	24.2							HQTT			RQD: 89					
	24.5							HQTT			TCR: 100					
	24.8							HQTT			RQD: 89					
	25.0							HQTT			TCR: 100					
	25.2							HQTT			RQD: 89					
	25.5							HQTT			TCR: 100					
	25.8							HQTT			RQD: 89					
	26.0							HQTT			TCR: 100					
	26.2							HQTT			RQD: 89					
	26.5							HQTT			TCR: 100					
	26.8							HQTT			RQD: 89					
	27.0							HQTT			TCR: 100					
	27.2							HQTT			RQD: 89					
	27.5							HQTT			TCR: 100					
	27.8							HQTT			RQD: 89					
	28.0							HQTT			TCR: 100					
	28.2							HQTT			RQD: 89					
	28.5							HQTT			TCR: 100					
	28.8							HQTT			RQD: 89					

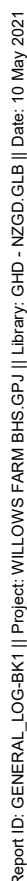
		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 15/09/2020 Completed: 16/09/2020					Hole No. : WFBH011 Sheet : 1 of 2 Hole Length : 15.08 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS										
Easting: 2762897.705 RL: 233.18 m		Northing: 6423934.452 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level
							Number / Type	Result									
233	0		SILT with some sand; dark brown. Very soft; moist; low plasticity; trace rootlets; sand, fine to medium (TOPSOIL)	TOPSOIL	M	VS				HQTT				TCR: 69			
	0.2		Sandy silty CLAY; orangish brown. Very soft; moist; high plasticity; sand, fine (RESIDUAL SOIL - ALLOPHANE)		M	VS											
	0.55		CORE LOSS														
	0.8		Silty CLAY; orangish brown. Very soft; moist; high plasticity		M	VS				HQTT				TCR: 86			
	1.1		CORE LOSS														
	1.4		Sandy silty CLAY with some gravel; reddish brown. Very soft; moist; high plasticity; gravel, fine to medium, sub angular to sub rounded, grey completely weathered, extremely weak, andesite		M	VS		SPT 1/0 0/1 0/1 N = 2		SPT							
	1.7									HQTT							
	2.0									HQTT				TCR: 100			
	2.3									HQTT				TCR: 100			
	2.6		Silty CLAY with trace sand and gravel; orangish brown mottled grey. Firm; moist; high plasticity; sand, fine to medium; gravel, fine, sub angular to sub rounded, completely weathered, extremely weak andesite	RESIDUAL SOIL - ALLOPHANE	M	F		SPT 0/1 0/2 3/2 N = 7		SPT							
	2.9									HQTT							
	3.2		Sandy silty CLAY; orangish brown. Firm; moist; high plasticity; sand, fine		M	F				HQTT				TCR: 100			
	3.5									HQTT							
	3.8		4.50 becomes stiff			St		SPT 1/2 2/3 3/3 N = 11		SPT							
	4.1									HQTT							
	4.4									HQTT				TCR: 90			
	4.7									SPT							
	5.0									HQTT							
	5.3		Completely weathered; orangish brown; massive welded TUFF; extremely weak; locally stained orange and black; recovered as gravel sized fragments (WHIRITOA ANDESITE - COLLUVIUM/SLIP)					SPT 3/1 8/4 4/4 N = 20		SPT			CW		TCR: 100		
	5.6		CORE LOSS														
	5.9		Silty sandy GRAVEL with cobbles and boulders; grey and brown. 'Dense'; moist; gravel, fine to coarse, sub angular to sub rounded, slightly weathered to highly weathered, weak to strong porphyritic andesite; iron and manganese staining across clast boundaries; sand, fine to coarse; brown. Silt matrix possibly washed out during drilling	WHIRITOA ANDESITE - COLLUVIUM/SLIP	M	'D'		SPT 2/2 2/3 4/4 N = 13		SPT				TCR: 100 RQD: 12			
	6.2									HQTT							
	6.5									SPT							
	6.8									HQTT				TCR: 100 RQD: 11			
	7.1									SPT							
	7.4									HQTT							
	7.7									SPT							
	8.0									HQTT							
	8.3									SPT							
	8.6									HQTT							
	8.9		Slightly weathered; grey; massive; porphyritic ANDESITE; strong; unaltered; magnetic iron staining along defects (WHIRITOA ANDESITE)	WHIRITOA ANDESITE				SPT 50 for 15mm N > 50		HQTT			SW		TCR: 100 RQD: 100		
	9.2		9.15 JT, 60°, u, r, VN, Fe, trace clay														
	9.5		9.40 JT, 30°, u, r, VN, Fe, trace clay														
Notes and Comments: End of Hole @ 15.08m Tunnel Alignment - Gully Crossing Piezo Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level				Date	Time	Reading (mbgl)	Hole depth (mbgl)		
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)						15/09/20	10:00	2.36	4.8		
												15/09/20	17:00	3.16	9		
												16/09/20	12:00	8.96	12		
												16/09/20	17:00	8.04	15		
								</									



		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 20/10/2020 Completed: 22/10/2020					Hole No. : WFBH012-D Sheet : 1 of 2 Hole Length : 18.3 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS												
Easting: 2762718.664 RL: 246.49 m		Northing: 6424155.793 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY															
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level		
							Number / Type	Result											
246	0.30		SILT; brown. Very soft; moist; low plasticity; rootlets (TOPSOIL)	TOPSOIL	M	VS	D-D1	0.80			HQTT			TCR: 73					
			CORE LOSS		M	VS													
1	1.1		Silty CLAY with some sand; orange. Very soft; moist; high plasticity; sand, fine to medium (RESIDUAL SOIL - ALLOPHANE)	ALLOPHANE	M	VS													
	1.4		CORE LOSS																
2	2.45		Sandy CLAY; orange. Very soft; moist; high plasticity; sand, fine to medium.	ALLOPHANE	M	VS								TCR: 56					
244	2.82		Silty fine to medium GRAVEL; grey. Very loose; moist; low plasticity; subangular to subrounded moderately weathered andesite (RESIDUAL SOIL of WAIPUPU FORMATION)	RESIDUAL SOIL of WAIPUPU FORMATION	M	VL	D-D1	0.80	SPT 0/0 0/0 0/1 N = 1		SPT			TCR: 100					
			Silty CLAY with some sand and gravel; brownish grey mottled orange. Very soft; moist; high plasticity; sand, fine to medium; gravel; fine subrounded andesite		M	S												HQTT	
			Gravelly coarse SAND; grey. Medium dense; moist; gravel, fine, subangular to subrounded (possible drilling induced damage to core)		M	MD												HQTT	
3	4.4		Sandy silty CLAY with some gravel; brownish grey. Hard; moist; high plasticity; sand, fine to medium; gravel, fine, subangular to subrounded andesite (core re-drilled)	RESIDUAL SOIL of WAIPUPU FORMATION	M	H								TCR: 57					
243	6.3		Completely weathered; grey; massive LAPILLI TUFF (andesite); extremely weak; recovered as gravel sized fragments (WAIPUPU FORMATION)	WAIPUPU FORMATION			D-D1	0.80	SPT 1/2 3/3 4/7 N = 14		SPT			TCR: 100					
			CORE LOSS															HQTT	
			Completely weathered; grey; massive LAPILLI TUFF (andesite); extremely weak; recovered as gravel sized fragments, subangular to subrounded															HQTT	
242	7.2			WAIPUPU FORMATION										TCR: 100					
241	7.95			WAIPUPU FORMATION										TCR: 100					
240	9.15		9.15 - 9.35 Recovered as solid core	WAIPUPU FORMATION										TCR: 100					
239	9.35			WAIPUPU FORMATION										TCR: 100					
238	9.65			WAIPUPU FORMATION										TCR: 100					
237	9.95			WAIPUPU FORMATION										TCR: 100					
	10.15			WAIPUPU FORMATION										TCR: 100					
	10.35			WAIPUPU FORMATION										TCR: 100					
	10.55			WAIPUPU FORMATION										TCR: 100					
	10.75			WAIPUPU FORMATION										TCR: 100					
	10.95			WAIPUPU FORMATION										TCR: 100					
	11.15			WAIPUPU FORMATION										TCR: 100					
	11.35			WAIPUPU FORMATION										TCR: 100					
	11.55			WAIPUPU FORMATION										TCR: 100					
	11.75			WAIPUPU FORMATION										TCR: 100					
	11.95			WAIPUPU FORMATION										TCR: 100					
	12.15			WAIPUPU FORMATION										TCR: 100					
	12.35			WAIPUPU FORMATION										TCR: 100					
	12.55			WAIPUPU FORMATION										TCR: 100					
	12.75			WAIPUPU FORMATION										TCR: 100					
	12.95			WAIPUPU FORMATION										TCR: 100					
	13.15			WAIPUPU FORMATION										TCR: 100					
	13.35			WAIPUPU FORMATION										TCR: 100					
	13.55			WAIPUPU FORMATION										TCR: 100					
	13.75			WAIPUPU FORMATION										TCR: 100					
	13.95			WAIPUPU FORMATION										TCR: 100					
	14.15			WAIPUPU FORMATION										TCR: 100					
	14.35			WAIPUPU FORMATION										TCR: 100					
	14.55			WAIPUPU FORMATION										TCR: 100					
	14.75			WAIPUPU FORMATION										TCR: 100					
	14.95			WAIPUPU FORMATION										TCR: 100					
	15.15			WAIPUPU FORMATION										TCR: 100					
	15.35			WAIPUPU FORMATION										TCR: 100					
	15.55			WAIPUPU FORMATION										TCR: 100					
	15.75			WAIPUPU FORMATION										TCR: 100					
	15.95			WAIPUPU FORMATION										TCR: 100					
	16.15			WAIPUPU FORMATION										TCR: 100					
	16.35			WAIPUPU FORMATION										TCR: 100					
	16.55			WAIPUPU FORMATION										TCR: 100					
	16.75			WAIPUPU FORMATION										TCR: 100					
	16.95			WAIPUPU FORMATION										TCR: 100					
	17.15			WAIPUPU FORMATION										TCR: 100					
	17.35			WAIPUPU FORMATION										TCR: 100					
	17.55			WAIPUPU FORMATION										TCR: 100					
	17.75			WAIPUPU FORMATION										TCR: 100					
	17.95			WAIPUPU FORMATION										TCR: 100					
	18.15			WAIPUPU FORMATION										TCR: 100					
	18.35			WAIPUPU FORMATION										TCR: 100					
	18.55			WAIPUPU FORMATION										TCR: 100					
	18.75			WAIPUPU FORMATION										TCR: 100					
	18.95			WAIPUPU FORMATION										TCR: 100					
	19.15			WAIPUPU FORMATION										TCR: 100					
	19.35			WAIPUPU FORMATION										TCR: 100					
	19.55			WAIPUPU FORMATION										TCR: 100					
	19.75			WAIPUPU FORMATION										TCR: 100					
	19.95			WAIPUPU FORMATION										TCR: 100					
	20.15			WAIPUPU FORMATION										TCR: 100					
	20.35			WAIPUPU FORMATION										TCR: 100					
	20.55			WAIPUPU FORMATION										TCR: 100					
	20.75			WAIPUPU FORMATION										TCR: 100					
	20.95			WAIPUPU FORMATION										TCR: 100					
	21.15			WAIPUPU FORMATION										TCR: 100					
	21.35			WAIPUPU FORMATION										TCR: 100					
	21.55			WAIPUPU FORMATION										TCR: 100					
	21.75			WAIPUPU FORMATION										TCR: 100					
	21.95			WAIPUPU FORMATION										TCR: 100					
	22.15			WAIPUPU FORMATION										TCR: 100					
	22.35			WAIPUPU FORMATION										TCR: 100					
	22.55			WAIPUPU FORMATION										TCR: 100					
	22.75			WAIPUPU FORMATION										TCR: 100					
	22.95			WAIPUPU FORMATION										TCR: 100					
	23.15			WAIPUPU FORMATION										TCR: 100					
	23.35			WAIPUPU FORMATION										TCR: 100					
	23.55			WAIPUPU FORMATION										TCR: 100					
	23.75			WAIPUPU FORMATION										TCR: 100					
	23.95			WAIPUPU FORMATION										TCR: 100					
	24.15			WAIPUPU FORMATION										TCR: 100					
	24.35			WAIPUPU FORMATION										TCR: 100					
	24.55			WAIPUPU FORMATION										TCR: 100					
	24.75			WAIPUPU FORMATION										TCR: 100					
	24.95			WAIPUPU FORMATION										TCR: 100					
	25.15			WAIPUPU FORMATION										TCR: 100					
	25.35			WAIPUPU FORMATION										TCR: 100					
	25.55																		

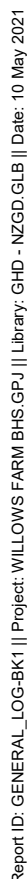
			Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 20/10/2020 Completed: 22/10/2020						Hole No. : WFBH012-D Sheet : 2 of 2 Hole Length : 18.3 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																												
Easting: 2762718.664 RL: 246.49 m			Northing: 6424155.793 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY																															
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Number / Type	Result	Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level																				
236	10.4		Moderately weathered; grey; massive LAPILLI TUFF (andesite); weak; mono clastic; matrix supported; clay, pyrite; possible argilic alteration; very closely spaced, randomly orientated, very narrow calcite veins (often around clast boundaries); some boulders or intermittent flows of slightly weathered; strong; porphyritic andesite	WAIPIPU FORMATION						HQTT		CW		RQD: 0 TCR: 67																							
235	11		11.35 JT, 62°, u, r, VN, CA, trace pyrite								HQTT		MW		RQD: 0 TCR: 100																						
234	12		11.65 JT, 15°, u, r, VN, CA, partial joint								HQTT		MW		RQD: 0 TCR: 100																						
233	13		12.30 JT, 70°, u, r, VN, CA 12.30 - 12.80 Slightly weathered; strong porphyritic andesite								HQTT		SW		RQD: 37 TCR: 100																						
232	14		12.35 JT, 30°, u, r, VN, CA 12.40 JT, 88°, u, r, VN, CA 12.50 JT, 70°, u, r, VN, CA 12.55 JT, 70°, u, r, VN, CLAY								HQTT		MW		RQD: 0 TCR: 100																						
231	15		13.65 JT, 60°, st, r, VN, CA 14.50 - 15.10 Slightly weathered; strong porphyritic andesite								HQTT		SW		RQD: 79 TCR: 100																						
230	16		CORE LOSS Moderately weathered; grey; massive LAPILLI TUFF (andesite); weak; mono clastic; matrix supported; clay, pyrite; possible argilic alteration; very closely spaced, randomly orientated, very narrow calcite veins (often around clast boundaries); some boulders or intermittent flows of slightly weathered; strong; porphyritic andesite								HQTT		MW		RQD: 0 TCR: 100																						
229	17		15.55 JT, 50°, u, r, VN, CA 15.95 JT, 50°, u, r, VN, CA 16.15 JT, 80°, u, r, VN, CA, trace clay								HQTT		MW		RQD: 0 TCR: 100																						
228	18		16.20 JT, 43°, u, r, VN, CA 17.20 - 18.30 Recovered as gravel sized fragments								HQTT				RQD: 40 TCR: 100																						
227	19		End of Hole @ 18.3m, Target Depth												RQD: 47 TCR: 100																						
Notes and Comments: End of Hole @ 18.3m Tunnel Alignment - Gully Crossing Piezo No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.					Inclination: Vertical Orientation: Contractor: Alton Drilling Ltd Equipment: Fly Rig (Rig #33)						Ground Water Level <table><thead><tr><th>Date</th><th>Time</th><th>Reading (mbgl)</th><th>Hole depth (mbgl)</th></tr></thead><tbody><tr><td>20/10/20</td><td>10:00</td><td>1.9</td><td>2.45</td></tr><tr><td>20/10/20</td><td>17:00</td><td>2.5</td><td>5.45</td></tr><tr><td>21/10/20</td><td>07:00</td><td>2</td><td>5.45</td></tr><tr><td>22/10/20</td><td>17:00</td><td>2.4</td><td>18.3</td></tr></tbody></table>								Date	Time	Reading (mbgl)	Hole depth (mbgl)	20/10/20	10:00	1.9	2.45	20/10/20	17:00	2.5	5.45	21/10/20	07:00	2	5.45	22/10/20	17:00	2.4
Date	Time	Reading (mbgl)	Hole depth (mbgl)																																		
20/10/20	10:00	1.9	2.45																																		
20/10/20	17:00	2.5	5.45																																		
21/10/20	07:00	2	5.45																																		
22/10/20	17:00	2.4	18.3																																		

		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 11/09/2020 Completed: 15/09/2020				Hole No. : WFBH013 Sheet : 1 of 2 Hole Length : 16.85 Scale @ A4 : 1:50												
Easting: 2762593.666 RL: 205.2 m		Northing: 6424370.633 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY		Logged : HJ Processed : HJ Checked : JHS												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample Number / Type	Result	Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level	
205	0		SILT, some sand; dark brown. Very soft, moist, low plasticity, trace rootlets. Sand: fine to medium. (TOPSOIL)	TOPSOIL	M	VS											0	
	0.2		Silty CLAY with some sand; orangish brown mottled grey and black. Very soft; moist; high plasticity; sand, fine to medium (RESIDUAL SOIL OF WAIPUPU FORMATION)		M	VS				HQTT				TCR: 100				
	0.9		CORE LOSS															
204	1		Silty CLAY with some sand; orangish brown mottled grey and black. Soft; moist; high plasticity; sand, fine to medium	M	VS					HQTT				TCR: 83			1	
	1.5		CORE LOSS															
	1.9		Silty CLAY with some sand; orangish brown mottled grey and black. Soft; moist; high plasticity; sand, fine to medium	M	S			SPT 1/1 1/1 1/1 N = 4		SPT								
203	2		CORE LOSS															
	2.5		CLAY with some silt and sand; orangish brown mottled grey and black. Soft; moist; high plasticity; sand fine to medium	M	S					HQTT				TCR: 52			2	
	3		Sandy CLAY with some gravel; grey. Very soft; moist; high plasticity; some organics; sand, fine to coarse; gravel, fine, subangular to subrounded	M	VS			SPT 1/0 0/0 0/0 N = 0		SPT							3	
202	3			RESIDUAL SOIL OF WAIPUPU FORMATION														
	4		4.50 - 4.60 Peat; black; firm; fibrous		M	VS			SPT 1/1 0/1 0/0 N = 1		SPT				TCR: 100			4
	4.6		Silty CLAY with minor sand; grey. Very soft; moist; high plasticity; some organics; sand, fine to medium								HQTT				TCR: 100			5
201	5		Silty CLAY with some sand; grey. Very soft; moist; high plasticity; sand, fine to medium	M	VS			SPT 0/1 1/0 0/0 N = 1		SPT							6	
	6		6.45 - 6.70 Peat; black; firm; fibrous							HQTT				TCR: 100			7	
199	7		Sandy silty CLAY; grey. Soft; moist; moderate plasticity; trace organics; sand, fine to coarse	M	S					SPT							8	
	7.4		Silty GRAVEL with some cobbles; grey and brown. Medium dense; moist; gravel, fine to coarse, sub angular to sub rounded moderately to slightly weathered, moderately strong, porphyritic andesite. Silt matrix possibly washed out during drilling (possible COLLUVIUM)	COLLUVIUM	M	MD		SPT 2/1 5/4 4/7 N = 20		SPT								
	8.0		CORE LOSS								HQTT			TCR: 61				
	8.5		Silty GRAVEL with some cobbles; grey and brown. Medium dense; wet; gravel, fine to coarse, subangular to subrounded moderately weathered andesite; matrix supported		W	MD				SPT							9	
196	9		Completely weathered; grey; massive; porphyritic ANDESITE; extremely weak with clay altered phenocrysts; argillic alteration; calcite, pyrite and hematite alteration (WAIPUPU FORMATION)					SPT 6/8 5/6 7/7 N = 25		SPT				TCR: 100			10	
	9.5									HQTT								
Notes and Comments: End of Hole @ 16.85m Mataura Stream Piezo No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level				Date	Time	Reading (mbgl)	Hole depth (mbgl)			
				Contractor: Alton Drilling Ltd		Equipment: Tractor Rig, (Rig 83)						03/09/20	08:00	3.12	16.85			
				SPT ETR: 81%														

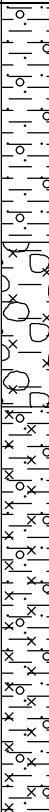
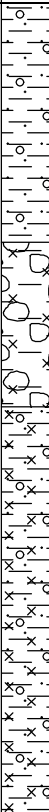
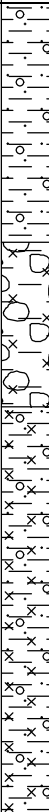
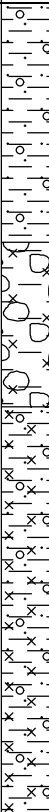
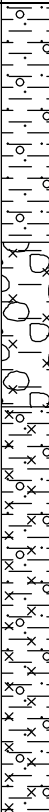


		Project : WKP Exploration Tunnel - Ground Investigation				Hole No. : WFBH014											
		Client : Oceana Gold Corporation / GWS / Golder				Sheet : 1 of 4											
		Site : Willows Farm, Waihi North,				Hole Length : 32											
		Job Number: 12533958				Scale @ A4 : 1:50											
		Commenced: 29/10/2020				Logged : HJ											
Easting: 2763515.665		Northing: 6423696.752		System: NZMG 1949		Processed : HJ											
RL: 200.02 m		Datum: NZVD2016		Method: SURVEY		Checked : JHS											
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level
							Number / Type	Result									
			SILT, some sand; dark brown. Very soft, moist, low plasticity, trace rootlets. Sand: fine to medium. (TOPSOIL)	Topsoil	M	VS											
			Silty CLAY with some sand and gravel; brown. Very soft; moist; high plasticity; sand, fine to coarse; gravel, fine to coarse; sub angular to sub rounded (RESIDUAL SOIL)	RESIDUAL SOIL	M	VS				HQTT				TCR: 75			
			CORE LOSS							HQTT				TCR: 25			
			Silty CLAY with some sand and gravel; brown. Very soft; moist; high plasticity; sand, fine to coarse; gravel, fine to coarse; sub angular to sub rounded		M	F				SPT							
			Sandy silty CLAY; reddish purple speckled white. Stiff; moist; high plasticity		M	St		SPT 1/1 2/3 4/2 N = 11		HQTT				TCR: 100			
			Completely weathered; purple speckled black, white and orange, welded TUFF (andesite); fine fabric; extremely weak with orange/black staining on defects (WHIRITOA ANDESITE)	WHIRITOA ANDESITE				SPT 2/5 5/5 4/3 N = 17		HQTT				TCR: 86			
								SPT 0/1 2/1 3/2 N = 8		HQTT				RQD: 21			
								SPT 0/1 2/1 3/2 N = 8		HQTT				TCR: 86			
								SPT 0/1 2/1 3/2 N = 8		HQTT				RQD: 0			
								SPT 0/1 2/1 3/2 N = 8		HQTT				TCR: 100			
								SPT 0/1 2/1 3/2 N = 8		HQTT				RQD: 50			
								SPT 0/1 2/1 3/2 N = 8		HQTT				TCR: 100			
								SPT 0/1 2/1 3/2 N = 8		HQTT				RQD: 0			
								SPT 0/1 2/1 3/2 N = 8		HQTT				TCR: 100			
								SPT 0/1 2/1 3/2 N = 8		HQTT				RQD: 0			
			Completely weathered; grey; welded TUFF (andesite); fine fabric; extremely weak				SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 86				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 50				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 91				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
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							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
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							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
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							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				
							SPT 1/2 4/6 5/7 N = 22		HQTT				TCR: 100				
							SPT 1/2 4/6 5/7 N = 22		HQTT				RQD: 0				

		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/10/2020 Completed: 2/11/2020					Hole No. : WFBH014 Sheet : 2 of 4 Hole Length : 32 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Easting: 2763515.665 RL: 200.02 m		Northing: 6423696.752 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
			Completely weathered; grey; welded TUFF (andesite); fine fabric; extremely weak (continued from layer starting at 5.6m) 10.50 JT, 60°, u, r, VN, CN 10.60 JT, 60°, u, sl, VN, CN 10.75 JT, 80°, u, r, VN, CLAY Highly weathered; pale greenish grey speckled black, white and orange; welded TUFF (andesite); fine fabric; extremely weak 11.40 JT, 60°, u, r, VN, CN 11.45 JT, 60°, u, r, VN, CN 11.75 JT, 60°, u, r, VN, CN 11.80 JT, 60°, u, r, VN, CN 12.12 JT, 58°, u, sm, VN, CN 12.78 JT, 35°, u, r, VN, CLAY 13.40 JT, 20°, u, r, VN, Fe, trace Mn 13.55 JT, 10°, u, r, VN, Fe, trace Mn 13.80 CS, 50°, u, r, VN, Fe, rock fragments, trace Mn Moderately weathered; reddish purple; welded TUFF (andesite); fine fabric; weak; some medium to coarse sized inclusions of grey tuff 14.16 JT, 30°, st, r, VN, CN 14.57 JT, 25°, u, r, VN, CN, trace Mn 14.65 JS □, 40°, u, r, VN, CN 14.83 JS □, 40°, u, r, VN, CN 14.95 JS □, 40°, u, r, VN, CN 15.05 JT, 65°, u, r, VN, CN 15.87 CS, 51°, u, r, VN, CLAY, rock fragments 16.05 JS □, 35°, u, r, VN, CN 16.17 JS □, 45°, u, r, VN, CN 16.60 JT, 35°, u, r, VN, CN 18.30 JT, 10°, u, r, VN, CN 18.30 - 19.70 Boulder/intermittent flow of slightly weathered; reddish grey; andesite; strong 19.40 JT, 50°, u, sl, VN, CLAY	WHIRITOA ANDESITE								HQTT		CW		TCR: 80 RQD: 0/ TCR: 100 RQD: 50/ TCR: 100 RQD: 0/ TCR: 100 RQD: 53 TCR: 100 RQD: 38 TCR: 100 RQD: 69 TCR: 100 RQD: 87 TCR: 100 RQD: 100 TCR: 100 RQD: 100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	



 Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 3/11/2020 Completed: 5/11/2020										Hole No. : WFBH015 Sheet : 1 of 2 Hole Length : 15.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2763793.36 RL: 165.86 m Northing: 6423716.988 Datum: NZVD2016 System: NZMG 1949 Method: SURVEY																			
Material Description										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
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Number / Type										Sample									
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Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
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Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
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Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
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Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
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Moisture condition										Consistency / Relative Density									
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Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
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Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
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TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
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Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number / Type										Sample									
Result										Casing									
Method										Flush Return (%)									
Weathering										Estimated Strength (MPa)									
TCR SCR RQD (%)										Defect Spacing (mm)									
Instrumentation Installation										Water level									
RL (m)										Depth (m)									
Graphic										Geological Unit									
Moisture condition										Consistency / Relative Density									
Number																			

			Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 3/11/2020 Completed: 5/11/2020						Hole No. : WFBH015 Sheet : 2 of 2 Hole Length : 15.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2763793.36 RL: 165.86 m			Northing: 6423716.988 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Number / Type	Result	Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level	
155	11		CLAY some sand and gravel; brownish red mottled grey. Very stiff; moist; high plasticity; sand, fine to coarse; gravel, fine, subangular to subrounded (<i>continued from layer starting at 9.7m</i>) 10.80 becomes very stiff	RESIDUAL SOIL - ALLOPHANE				SPT 0/3 2/7 4/4 N = 17		HQTT				TCR: 100				
154	12		Silty GRAVEL with some boulders; brownish grey. Medium dense; moist; gravel, fine to coarse, subangular to subrounded; boulders, slightly weathered, strong porphyritic andesite (possible colluvium)		M	MD		SPT 2/1 4/5 5/4 N = 18		HQTT				TCR: 100				
153	13		Silty CLAY some sand and minor gravel; greyish brown mottled orange. Very stiff; moist; high plasticity; sand, fine; gravel, fine, subangular to subrounded andesite		M	VSt		SPT 2/3 3/5 5/6 N = 19		HQTT				TCR: 100				
152	14							SPT 2/2 4/4 5/5 N = 18		SPT				TCR: 100				
151	15																	
150	16		End of Hole @ 15.45m, Target Depth															
149	17																	
148	18																	
147	19																	
146	20																	
Notes and Comments: End of Hole @ 15.45m Hardstand Area No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: Vertical		Orientation:		Ground Water Level										
				Contractor: Alton Drilling Limited						Date	Time	Reading (mbgl)	Hole depth (mbgl)					
				Equipment: Tractor Rig (83)						04/11/20	07:00	2	4.8					
										05/11/20	07:00	5	12.3					
										05/11/20	14:00	5.7	15.45					

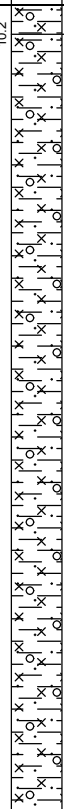
		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 6/11/2020 Completed: 9/11/2020				Hole No. : WFBH016 Sheet : 1 of 2 Hole Length : 15.45 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS												
Easting: 2763862.286 RL: 166.16 m		Northing: 6423642.974 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY														
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect	Spacing (mm)	Instrumentation	Water level
							Number / Type	Result										
166	0		SILT, some sand; dark brown. Very soft, moist, low plasticity, trace rootlets. Sand: fine to medium. (TOPSOIL) Sandy silty CLAY; orange brown. Soft; moist; high plasticity; sand, fine (RESIDUAL SOIL - ALLOPHANE)	TOPSOIL	M	VS												
	0.2				M	S												
	1									HQTT								
	1.6																	
	2				M	St				SPT								
	2.4																	
	3																	
	3.0																	
	3.6																	
	4																	
	4.4																	
	5																	
	5.6																	
	6																	
	6.5																	
	7				M	F												
	7.6																	
	8																	
	8.3																	
	9				M	F												
	9.6																	
	10																	

Notes and Comments:
End of Hole @ 15.45m
Hardstand Area
No water return information

Refer to explanation sheets for abbreviation and symbols.
Shear Vane values are corrected.

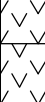
Inclination: Vertical
Orientation:
Contractor: Alton Drilling Limited
Equipment: Tractor Rig (83)

Ground Water Level
Date: 09/11/20
Time: 00:00
Reading (mbgl): 5.3
Hole depth (mbgl): 15.45

		Project : WKP Exploration Tunnel - Ground Investigation Client : Oceana Gold Corporation / GWS / Golder Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 6/11/2020 Completed: 9/11/2020				Hole No. : WFBH016 Sheet : 2 of 2 Hole Length : 15.45 Scale @ A4 : 1:50																																												
		Easting: 2763862.286 Northing: 6423642.974 System: NZMG 1949 RL: 166.16 m Datum: NZVD2016 Method: SURVEY				Logged : HJ Processed : HJ Checked : JHS																																												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Moisture condition	Consistency / Relative Density	Sample		Casing	Method	Flush Return (%)	Weathering	Estimated Strength (MPa)	TCR SCR RQD (%)	Defect Spacing (mm)	Instrumentation Installation	Water level																																	
							Number / Type	Result																																										
156	10.2		CLAY some silt, sand and gravel; brown and grey speckled white. Very stiff; moist; high plasticity; sand, fine to coarse; gravel, fine to coarse andesite, rare corestones of extremely weak andesite 12.00 becomes hard	RESIDUAL SOIL - ALLOPHANE	M	VSt	SPT 1/4 4/6 7/7 N = 24		HQTT				TCR: 100																																					
155	11																SPT 4/4 5/9 4/16 N = 44		HQTT				TCR: 100																											
154	12																							SPT 3/7 8/7 9/12 N = 36		HQTT			TCR: 100																					
153	13																													SPT 3/15 16/25 9 for 50mm N > 50		SPT			TCR: 100															
152	14																																			End of Hole @ 15.45m, Target Depth														
151	15																																																	
150	16																																																	
149	17																																																	
148	18																																																	
147	19																																																	
	20																																																	
Notes and Comments: End of Hole @ 15.45m Hardstand Area No water return information Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.															Inclination: Vertical Orientation: Contractor: Alton Drilling Limited Equipment: Tractor Rig (83)				Ground Water Level <table border="1"> <tr> <th>Date</th> <th>Time</th> <th>Reading (mbgl)</th> <th>Hole depth (mbgl)</th> </tr> <tr> <td>09/11/20</td> <td>00:00</td> <td>5.3</td> <td>15.45</td> </tr> </table>				Date	Time	Reading (mbgl)	Hole depth (mbgl)	09/11/20	00:00	5.3	15.45																				
Date	Time	Reading (mbgl)	Hole depth (mbgl)																																															
09/11/20	00:00	5.3	15.45																																															

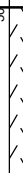
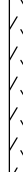
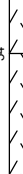
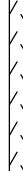
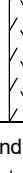
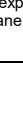
		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020										Hole No. : WNDD007 Sheet : 1 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																	
Easting: 2762466.08 RL: 237.07 m										Northing: 6424304.837 Datum: NZVD2016										System: NZMG Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level													
237.07	0		Silty CLAY minor sand; orange. Soft; moist; high plasticity; moderately to highly dilatant; sand, fine to coarse (RESIDUAL SOIL - WAIPUPU FORMATION)	RESIDUAL SOIL				PQTT			TCR: 71																		
	0.20		CORE LOSS 0.20 m																										
236.87	0.20		Silty CLAY minor sand; orange mottled pale brown. Soft; moist; extremely high plasticity; moderately to highly dilatant; sand, fine to coarse		DS1	1.00		PQTT			TCR: 100																		
	2.00		2.00 dilatant; saturated; very soft		DS2	2.30		PQTT			TCR: 100																		
	2.80		2.80 moist; firm		DS3	3.00		PQTT			TCR: 100																		
	3.30		3.30 dilatant; saturated; very soft		DS4	4.30 - 4.00		PQTT			TCR: 100																		
232.2	4.8		Silty CLAY with some sand; dark bluish grey. Firm; moist; high plasticity; sand, fine to medium	RESIDUAL SOIL	DS5	4.80 - 4.60		PQTT			TCR: 100																		
	5.6		CORE LOSS 0.70 m		DS6	5.20 - 5.00		PQTT			TCR: 53																		
	6.3		Silty CLAY some sand; bluish grey. Hard; moist; high plasticity; sand, fine to medium		DS7	6.80		PQTT			TCR: 89																		
	7.0		CORE LOSS 0.10 m																										
	7.27		Completely weathered; brownish grey, ANDESITE; very weak; corestones of weak to moderately strong andesite (WAIPUPU FORMATION)					PQTT			TCR: 100 RQD: 64																		
	9.30		9.30 - 9.70 recovered as gravel sized fragments	WAIPUPU FORMATION				PQTT			TCR: 100 RQD: 50																		
	9.7							PQTT			TCR: 100 RQD: 25																		
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.																													
Inclination: -90° Orientation: 0° Ground Water Level																													
Contractor: Alton Drilling Ltd																													
Equipment: RIG 83																													
Date Time Reading (mbgl) Hole depth (mbgl)																													

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 2 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
					Weathering Number / Type	Result											
226.1	11		Highly weathered; brownish grey, porphyritic ANDESITE; weak; some drilling disturbance (continued from layer starting at 9.7m) 10.65 - 11.60 recovered as gravel sized fragments	RESIDUAL SOIL	HW				PQTT			TCR: 100 RQD: 25		10.00 JT, 70°, u, r, CLAY, at clast boundary 10.10 JT, 0°, u, r, CN 10.40 JT, 68°, u, sm, CN, trace Fe			
225.1	12		Highly weathered; bluish grey; porphyritic ANDESITE; weak; trace corestones of moderately strong to strong andesite Moderately weathered; bluish grey; porphyritic ANDESITE; moderately strong; trace corestones of strong andesite; drilling disturbance; partially recovered as gravel sized fragments		HW				PQTT			TCR: 100 RQD: 10		11.80 VN, 75°, u, sm, CA			
224.1	13				MW				PQTT			TCR: 100 RQD: 25		12.50 JT, 70°, u, r, CA 12.67 JT, 59°, u, r, CA 12.85 JT, 50°, u, r, CA, trace CLAY			
223.1	14			WAIUPU FORMATION					PQTT			TCR: 86 RQD: 57		13.52 JT, 40°, u, r, CA 13.60 JT, 37°, u, r, CA 13.70 JT, 40°, st, r, CN			
222.1	15		CORE LOSS 0.10 m Highly weathered; grey; porphyritic ANDESITE; weak, massive; significant drilling disturbance 15.30 - 15.60 recovered as sand to gravel sized fragments						PQTT			TCR: 100 RQD: 70		14.35 JT, 60°, u, r, CA 14.50 VN, 30°, u, r, CA 14.62 JT, 70°, u, r, CA 14.70 JT, 70°, u, r, CA			
221.1	16								PQTT			TCR: 100 RQD: 50		15.15 JT, 70°, u, sm, CA 15.20 JT, 70°, u, sm, CA			
220.1	17				HW				PQTT			TCR: 100 RQD: 31		17.00 JT, 70°, u, r, CA 17.10 JT, 10°, u, r, CA 17.25 VN, 70°, u, r, CA			
219.1	18		18.10 - 18.70 recovered as sand to gravel sized fragments - possible shear zone						PQTT			TCR: 100 RQD: 0		17.95 JT, 70°, u, sm, CA			
218.1	19							PQTT			TCR: 100 RQD: 62		19.45 JT, 52°, u, r, CN 19.60 JT, 50°, u, r, CN				
								PQTT			TCR: 100 RQD: 36		19.80 JT, 75°, u, r, CLAY, trace CA				
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83				Ground Water Level Date Time Reading (mbgl) Hole depth (mbgl)			

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 3 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
					Weathering Number / Type	Result											
216.1	21		Highly weathered; grey; porphyritic ANDESITE; weak, massive; significant drilling disturbance (continued from layer starting at 14.3m) 20.90 - 21.60 recovered as gravel sized fragments	WAIPU FORMATION				PQTT			TCR: 100 RQD: 36			20.60 VN, 75°, u, r, CA			
215.1	22		22.00 - 23.20 significant drilling disturbance; recovered as gravel sized fragments					PQTT			TCR: 100 RQD: 38			21.90 JT, 82°, u, sm, CA			
214.1	23							PQTT			TCR: 100 RQD: 17			22.95 JT, 75°, u, r, CN 23.30 JT, 80°, u, r, CN 23.40 JT, 80°, u, r, CN 23.45 JT, 45°, u, r, CA 23.50 JT, 40°, u, r, CN			
213.1	24							PQTT			TCR: 100 RQD: 33			23.95 JT, 15°, u, r, CN			
212.1	25							PQTT			TCR: 100 RQD: 75			24.60 JT, 75°, u, r, CN 24.90 JT, 70°, u, r, CA			
211.1	26							PQTT			TCR: 100 RQD: 80			25.95 JT, 25°, st, r, CN			
210.1	27		Highly weathered; grey; LAPILLI TUFF (andesite); weak; poly-clastic, angular to subangular gravel sized clasts, some cobble sized clasts, calcite disseminated in matrix and around clast boundaries; shear surfaces throughout; recovered as gravel sized fragments to 26.40m		HW				PQTT			TCR: 100 RQD: 43			27.05 VN, 40°, u, r, CA		
209.1	28								PQTT			TCR: 100 RQD: 86					
208.1	29		Moderately weathered; pale grey porphyritic ANDESITE; weak; some drilling disturbance			MW				PQTT			TCR: 100 RQD: 93			29.40 VN, 30°, pl, r, CA	
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: -90°		Orientation: 0°		Ground Water Level			
										Contractor: Alton Drilling Ltd		Equipment: RIG 83		Date	Time	Reading (mbgl)	Hole depth (mbgl)

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 4 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
					Weathering Number / Type	Result											
237.07	0		Moderately weathered; pale grey porphyritic ANDESITE; weak; some drilling disturbance (continued from layer starting at 28.5m)	WAIUPU FORMATION	MW		140mm	PQTT			TCR: 100 RQD: 33			30.15 VN, 75°, u, r, CLAY, trace Py			
206	31																
205	32																
204	33																
203	34																
202	35																
201	36																
200	37																
199	38																
198	39		Moderately weathered; grey porphyritic ANDESITE; moderately strong; minor gravel sized clasts of andesite; moderately wide to widely spaced randomly orientated calcite veins (<2mm)	MW				PQTT			TCR: 100 RQD: 83			38.80 JT, 10°, pl, sm, CLAY			
														39.10 JT, 10°, pl, sm, CLAY			
														39.40 VN, 80°, u, r, CA			
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to ls(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.								Inclination: -90°		Orientation: 0°		Ground Water Level					
								Contractor: Alton Drilling Ltd				Date	Time	Reading (mbgl)	Hole depth (mbgl)		
								Equipment: RIG 83									

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 5 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
196	41		Moderately weathered; grey porphyritic ANDESITE; moderately strong; minor gravel sized clasts of andesite; moderately wide to widely spaced randomly orientated calcite veins (<2mm) (continued from layer starting at 38.8m)	MW				PQTT			TCR: 100 RQD: 83			40.40 JT, 10°, pl, r, CLAY		
195	42							PQTT			TCR: 100 RQD: 60			41.20 VN, 70°, u, r, CA, trace Py 41.27 VN, 73°, u, r, CA 41.70 VN, 50°, u, r, CA		
194	43		Highly weathered; grey; porphyritic ANDESITE; weak; with clay altered phenocrysts; minor gravel sized clasts; moderately clay altered; some drilling disturbance	WAIUPU FORMATION				PQTT			TCR: 100 RQD: 80			42.20 VN, 70°, u, r, CA, trace Py 43.30 VN, 85°, u, r, CA 43.50 VN, 80°, u, r, CA		
193	44							PQTT			TCR: 100 RQD: 80			44.20 JT, 60°, u, r, CA, trace CLAY 44.60 VN, 65°, u, r, CA		
192	45							PQTT			TCR: 100 RQD: 93			45.00 JT, 68°, u, r, CA 45.20 JT, 35°, u, r, CN 45.30 JT, 30°, u, r, CA 45.70 VN, 80°, u, r, CA		
191	46							PQTT			TCR: 100 RQD: 75			46.50 JT, 78°, u, r, CA		
190	47							PQTT			TCR: 100 RQD: 100			48.05 JT, 28°, u, r, CN		
189	48							PQTT			TCR: 100 RQD: 100					
188	49							PQTT			TCR: 100 RQD: 100			49.80 JT, 70°, u, sm, CA		
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.					Inclination: -90°				Orientation: 0°				Ground Water Level			
					Contractor: Alton Drilling Ltd				Equipment: RIG 83				Date	Time	Reading (mbgl)	Hole depth (mbgl)

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020										Hole No. : WNDD007 Sheet : 6 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																	
Easting: 2762466.08 Northing: 6424304.837 System: NZMG RL: 237.07 m Datum: NZVD2016 Method: SURVEY																											
RL (m) Depth (m) Graphic										Material Description Geological Unit Weathering Number / Type Sample / Test Result Casing Method Flush Return (%) Estimated Strength (MPa) TCR RQD SCR (%) Defect Spacing (mm) Visual Defect Description (and sub Detail) Instrumentation Installation Water level																	
186 51 										Moderately weathered; pale grey porphyritic ANDESITE; moderately strong; some drilling disturbance MW PQTT TCR: 100 RQD: 100 50.10 VN, 70°, u, r, CA																	
185 52 										PQTT TCR: 100 RQD: 94 51.05 VN, 50°, u, r, CA, trace Py and other sulphides, dark alteration halo 51.20 JT, 10°, pl, CN 51.50 VN, 75°, u, r, CA, trace Py and other sulphides																	
184 53 										53.00 - 53.90 very closely spaced calcite veins; consistent orientation; 70°-80° dip PQTT TCR: 100 RQD: 100																	
183 54 										Moderately weathered; grey; porphyritic ANDESITE; weak 54.30 - 56.00 recovered as gravel sized fragments; drilling disturbance WAIPU FORMATION PQTT TCR: 100 RQD: 87 53.95 VN, 75°, u, r, CA 54.00 VN, 78°, u, r, CA 54.40 JT, 25°, u, r, CN																	
182 55 										PQTT TCR: 100 RQD: 73																	
181 56 										PQTT TCR: 100 RQD: 80 57.50 VN, 70°, u, r, CA																	
180 57 										57.00 - 57.30 recovered as gravel sized fragments; drilling disturbance PQTT TCR: 100 RQD: 80																	
179 58										57.80 - 58.28 boulder sized clast of fine grained; pale grey andesite PQTT TCR: 100 RQD: 100 58.75 VN, 80°, u, r, CA, trace Py 59.10 VN, 60°, u, r, CA 59.50 VN, 80°, u, r, CA, trace Py																	
178 59										PQTT TCR: 100 RQD: 100																	
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to ls(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83 Ground Water Level <table><tr><td>Date</td><td>Time</td><td>Reading (mbgl)</td><td>Hole depth (mbgl)</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>										Date	Time	Reading (mbgl)	Hole depth (mbgl)				
Date	Time	Reading (mbgl)	Hole depth (mbgl)																								

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020										Hole No. : WNDD007 Sheet : 7 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																																																																																																																																																																																																																																																																																																																																																																																																																															
Easting: 2762466.08 RL: 237.07 m										Northing: 6424304.837 Datum: NZVD2016										System: NZMG Method: SURVEY																																																																																																																																																																																																																																																																																																																																																																																																																					
Material Description										Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level																																																																																																																																																																																																																																																																																																																																																																																																																			
											Weathering Number / Type	Result																																																																																																																																																																																																																																																																																																																																																																																																																													
RL (m)	Depth (m)	Graphic	Moderately weathered; grey; porphyritic ANDESITE; weak (continued from layer starting at 54.0m) 61.35 - 61.90 recovered as gravel sized fragments; drilling disturbance 60.60 JT, 45°, u, r, CA 62.30 JT, 45°, u, r, CA 65.40 VN, 70°, u, r, CA 66.15 - 66.70 VN, 85°, u, r, CA 66.95 JT, 10°, u, r, CN 67.05 JT, 10°, u, r, CN 67.80 JT, 60°, u, r, CN, dark alliteration halo 68.05 JT, 18°, u, r, CN 68.35 JT, 20°, u, r, CN 68.50 VN, 40°, u, r, CA 69.10 VN, 45°, u, r, CA 69.25 VN, 40°, u, r, CA 69.50 VN, 55°, u, r, CA																	MW	Weathering	Type	Result	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT	PQTT</

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 8 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
166.1	71		Slightly weathered; grey; porphyritic ANDESITE; strong (continued from layer starting at 66.7m)	SW	PLT 2.77 MPa - 70.20				PQTT			TCR: 100 RQD: 100			70.05 JT, 25°, u, r, CN		
166.1	71														70.25 VN, 50°, u, r, CA, dark alliteration halo		
165.1	72														71.25 JT, 55°, u, r, CA		
165.1	72														71.70 VN, 50°, u, r, CA		
165.1	72														71.90 JT, 20°, u, r, CN, dark alliteration halo		
164.1	73														72.35 JT, 15°, u, r, CA		
164.1	73														72.60 VN, 70°, u, r, CA		
164.1	73														72.72 JT, 10°, u, r, CA		
164.1	73														72.80 JT, 40°, u, r, CA		
163.1	74		72.96 JT, 30°, u, r, CN														
163.1	74		73.00 VN, 20°, u, r, CA														
163.1	74		73.05 VN, 30°, u, r, CA														
163.1	74		73.20 JT, 20°, u, r, CN														
163.1	74		73.35 VN, 60°, u, r, CA														
163.1	74		73.50 JT, 45°, u, r, CA														
162.1	75		Moderately weathered; light grey; LAPILLI TUFF (andesite); weak; clay alteration; subangular to subrounded gravel sized clasts; some cobble sized clasts; some drilling disturbance	MW	PLT 2.81 MPa - 75.20				PQTT			TCR: 100 RQD: 100			73.90 VN, 70°, u, r, CA		
162.1	75														74.10 VN, 50°, u, r, CA		
161.1	76														74.60 JT, 30°, u, r, CN		
161.1	76														74.65 VN, 50°, u, r, CA		
160.1	77														75.65 JT, 50°, u, r, CN		
160.1	77														75.70 VN, 30°, u, r, CA		
160.1	77														76.00 VN, 50°, u, r, CA		
159.1	78														76.50 VN, 25°, u, r, CA		
159.1	78														76.90 JT, 38°, u, r, CN		
158.1	79		77.50 VN, 25°, u, r, CA														
158.1	79		78.00 VN, 10°, u, r, CA														
158.1	79		78.15 VN, 25°, u, r, Py, at clast boundary														
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83				Ground Water Level				Date	Time	Reading (mbgl)	Hole depth (mbgl)		

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 9 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																	
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY																									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level													
156.1	80.7		Slightly weathered; grey; LAPILLI TUFF (andesite); moderately strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; calcite present at clast boundaries	MW	PLT 2.7 MPa - 82.70			PQTT			TCR: 100 RQD: 86			80.70 VN, 50°, u, r, CA, 5-10mm															
156.1	81													80.90 JT, 10°, u, r, CA															
155.1	82													81.20 VN, 50°, u, r, CA 81.35 VN, 67°, u, r, CA															
154.1	83													81.75 VN, 60°, u, r, CA, possible clast boundary 81.90 VN, 60°, u, r, CA, possible clast boundary 82.20 JT, 35°, u, r, CN 82.30 JT, 34°, u, r, CN 82.38 VN, 35°, u, r, CA															
153.1	84													83.20 JT, 30°, u, r, CN															
152.1	85													83.95 JT, 35°, u, r, CN															
151.1	86													85.00 JT, 35°, u, r, CN 85.30 JT, 30°, u, r, CN 85.50 JT, 20°, u, r, CN															
150.1	87													87.55 VN, 35°, u, r, CA															
149.1	88													88.60 JT, 40°, u, r, CN 88.70 JT, 60°, u, r, CN															
148.1	89													89.75 JT, 40°, u, r, CA, clast boundary															
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.																													
Inclination: -90° Orientation: 0° Ground Water Level																													
Contractor: Alton Drilling Ltd																													
Equipment: RIG 83																													
Date Time Reading (mbgl) Hole depth (mbgl)																													

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020										Hole No. : WNDD007 Sheet : 10 of 24 Hole Length : 231.7 Scale @ A4 : 1:50										
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016										System: NZMG Method: SURVEY				Logged : HJ Processed : HJ Checked : JHS						
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level					
						Number / Type	Result															
146.1	91		Slightly weathered; grey; LAPILLI TUFF (andesite); moderately strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; calcite present at clast boundaries (continued from layer starting at 80.7m)	WAIPU PU FORMATION	SW	PLT 1.53 MPa - 94.40			PQTT						89.90 JT, 43°, u, r, CA, clast boundary		90					
									PQTT						TCR: 100 RQD: 93						91	
145.1	92								PQTT						TCR: 100 RQD: 100					91.67 JT, 16°, u, r, CLAY	92	
									PQTT						TCR: 100 RQD: 100					92.20 JT, 45°, u, r, CA 92.32 JT, 40°, u, r, CA 92.45 JT, 50°, u, r, CA		
144.1	93								PQTT						TCR: 100 RQD: 100					93.05 JT, 25°, u, r, CA, trace CLAY		93
									PQTT						TCR: 100 RQD: 100					93.42 JT, 65°, u, r, CA, trace Fe 93.60 JT, 15°, u, r, CA		
143.1	94								PQTT						TCR: 100 RQD: 100					94.06 JT, 12°, u, r, CA 94.30 JT, 10°, u, r, CN		94
									PQTT						TCR: 100 RQD: 90					95.50 - 95.90 VN, 85°, u, r, CA, sub-vertical through core		95
141.1	96								PQTT						TCR: 100 RQD: 100					96.05 JT, 9°, st, r, CN		96
									PQTT						TCR: 100 RQD: 100					97.60 JT, 12°, u, r, CN		97
139.1	98				PQTT						TCR: 100 RQD: 100			98.40 VN, 35°, u, r, CA, at clast boundary 98.50 VN, 80°, u, r, CA, at clast boundary		98						
138.1	99				PQTT						TCR: 100 RQD: 100			99.02 JT, 8°, u, r, CN		99						
					PQTT						TCR: 100 RQD: 100					100						
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50)										Inclination: -90° Orientation: 0°				Ground Water Level								
Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Contractor: Alton Drilling Ltd				Date	Time	Reading (mbgl)	Hole depth (mbgl)					
										Equipment: RIG 83												

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 11 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 12 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
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Slightly weathered; grey; porphyritic ANDESITE; very strong; gravel sized calcite inclusions (continued from layer starting at 119.9m)										SW										PLT 3.12 MPa - 120.90																				PQTT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 14 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
			Slightly weathered; pale grey; porphyritic ANDESITE; moderately strong; some clay alteration; moderately wide to widely spaced randomly orientated calcite and pyrite veins (<2mm); some drilling disturbance (continued from layer starting at 128.8m) 131.35 - 132.20 drilling disturbance 131.40 - 131.55 cobble of pale grey porphyritic andesite with clay altered boundaries 131.60 moderately strong; increased clay alteration; drilling disturbance	SW		PLT 0.45 MPa - 130.10		PQTT			TCR: 100 RQD: 100			130.35 VN, 30°, u, r, CA 130.75 JT, 48°, u, sm, CA, trace Py 130.95 VN, 55°, u, r, Py, trace other sulphides		130	
106	131								PQTT			TCR: 100 RQD: 94					131
105	132							PQTT			TCR: 100 RQD: 80			132.80 VN, 76°, u, r, Py, trace CLAY and Ca 133.00 JT, 70°, u, r, CLAY		132	
104	133							PQTT			TCR: 100 RQD: 100			133.55 JT, 20°, u, r, CLAY 133.75 VN, 80°, u, r, CA 133.85 VN, 70°, u, r, CA, dark alteration halo 134.10 VN, 38°, u, r, CA, dark alteration halo 134.20 VN, 40°, u, r, CA, dark alteration halo 134.40 VN, 65°, u, sm, CA 134.55 VN, 20°, u, r, CA, dark alteration halo 134.70 VN, 65°, u, sm, CA 134.85 VN, 55°, st, r, CA 135.10 VN, 65°, u, sm, CA		133	
103	134		Slightly weathered; grey; porphyritic ANDESITE; strong; predominantly closely to moderately widely spaced randomly orientated calcite and pyrite veins (<2mm); some with dark alteration halos	WAIPU FORMATION		PLT 4.85 MPa - 135.40		PQTT			TCR: 100 RQD: 100			135.50 VN, 50°, u, r, CA, trace Py 135.80 VN, 60°, u, sm, CA 135.93 VN, 60°, u, sm, CA, trace Py		134	
102	135								PQTT			TCR: 100 RQD: 100				136.22 VN, 65°, u, r, Py, with Ca; 20-30mm 136.60 VN, 60°, u, r, Py, with Ca	135
101	136								PQTT			TCR: 100 RQD: 73				136.90 VN, 70°, u, r, CA, trace CLAY; 15-25mm	136
100	137								PQTT			TCR: 100 RQD: 100				138.85 VN, 30°, u, sm, CA 138.98 VN, 40°, u, sm, CA 139.04 VN, 45°, u, sm, CA	137
99	138		137.80 - 138.50 recovered as gravel sized fragments - some drilling disturbance			PLT 5.12 MPa - 138.50		PQTT			TCR: 100 RQD: 100			139.32 VN, 60°, u, r, CA 139.45 VN, 30°, u, sm, CA			138
98	139					PLT 3.13 MPa - 139.80		PQTT			TCR: 100 RQD: 100						139
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83				Ground Water Level Date Time Reading (mbgl) Hole depth (mbgl)									

Report ID: ROCKLOG || Project: WND007.GPJ || Library: GHD - NZGD.GLB || Date: 15 September 2021

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WND007 Sheet : 15 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2762466.08 RL: 237.07 m					Northing: 6424304.837 Datum: NZVD2016					System: NZMG Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
139			Slightly weathered; grey; porphyritic ANDESITE; strong; predominantly closely to moderately widely spaced randomly orientated calcite and pyrite veins (<2mm); some with dark alteration halos (continued from layer starting at 133.5m)	SW	PLT 1.04 MPa 143.30			PQTT			TCR: 100 RQD: 100			140.20 VN, 60°, u, r, CA, trace Py; 5-10mm 140.25 VN, 40°, u, sm, CA 140.60 VN, 30°, u, sm, CA 140.84 VN, 15°, u, r, CA 140.90 VN, 25°, u, r, CA, dark alteration halo 141.10 VN, 45°, u, r, CA 141.35 VN, 85°, u, r, CA, sub-vertical vein 141.50 VN, 80°, u, r, CA					
141																			
142																			
143																			
144			144.45 - 144.65 possible hydrothermal brecciation (fluid injection through mass flow); calcite with angular rock fragments	WAIPU FORMATION	UCS: 49 MPa 144.03			PQTT			TCR: 100 RQD: 100			142.12 VN, 42°, u, sm, CA 142.17 VN, 40°, u, sm, CA 142.30 VN, 45°, u, r, CA 142.68 JT, 40°, u, r, CN					
145																			
146																			
147																			
148			Moderately weathered; pale grey; porphyritic ANDESITE; weak; clay alteration; some drilling disturbance; moderately wide to widely spaced randomly orientated calcite veins (<2mm)	MW	PLT 2.02 MPa 145.00 145.60			PQTT			TCR: 93 RQD: 87			143.50 VN, 10°, u, r, CA 143.55 VN, 15°, u, r, CA 143.82 VN, 18°, u, r, CA 143.95 JT, 10°, u, r, CN 145.14 JT, 8°, u, sm, CN 145.58 JT, 14°, u, sm, CN 145.90 JT, 15°, st, r, CN 146.07 JT, 18°, u, r, CA, trace CLAY 146.20 JT, 15°, u, r, CLAY					
149																			
150																			
151																			
152			147.30 - 151.60 drilling disturbance - multiple core spins		Packer test 4: 145.60m - 151.60m			PQTT			TCR: 100 RQD: 33			146.60 VN, 55°, u, r, Py, trace Ca 146.70 JT, 45°, u, r, CA, trace CLAY and Py 146.75 VN, 60°, u, r, CA, trace Py and Fe 146.80 VN, 80°, u, r, CA, trace Py 147.08 VN, 80°, u, r, CA, trace Py 147.12 VN, 65°, u, r, CA, trace Py					
153																			
154																			
155																			
156								PQTT			TCR: 100 RQD: 100			149.20 VN, 78°, u, r, CA					
157								PQTT			TCR: 100 RQD: 80								
158								PQTT											
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		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 16 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
					Weathering Number / Type	Result											
187			Moderately weathered; pale grey; porphyritic ANDESITE; weak; clay alteration; some drilling disturbance; moderately wide to widely spaced randomly orientated calcite veins (<2mm) (continued from layer starting at 146.2m)	WAIUPU FORMATION	MW			PQTT						150.70 JT, 30°, u, r, CN		150	
186	151							PQTT			TCR: 100 RQD: 100						151
185	152		Slightly weathered; grey; LAPILLI TUFF (andesite); moderately strong, poly-clastic; subangular gravel sized clasts; some cobble sized clasts; close to widely spaced randomly orientated pyrite and calcite veins (<2mm)		SW	151.60			PQTT		TCR: 100 RQD: 93			152.15 VN, 55°, u, r, CA 152.25 VN, 50°, u, r, CA, trace QZ phenocrysts		152	
184	153							PQTT			TCR: 100 RQD: 84			153.35 JT, 55°, u, r, CA, trace CLAY 153.50 VN, 40°, u, r, CA, trace Py 153.60 VN, 43°, u, r, CA 153.62 VN, 60°, u, r, CA		153	
183	154			WAIUPU FORMATION				PQTT						154.20 JT, 45°, u, sm, CN		154	
182	155		Moderately weathered; grey; LAPILLI TUFF (andesite); moderately strong; poly-clastic; clay alteration; angular to subangular gravel sized clasts					PQTT			TCR: 73 RQD: 73			155.00 VN, 55°, u, r, CA 155.40 JT, 30°, u, r, CA		155	
181	156				MW			PQTT						156.50 VN, 70°, u, sm, CA		156	
180	157							PQTT			TCR: 100 RQD: 58						157
179	158			WAIUPU FORMATION				PQTT			TCR: 100 RQD: 100			158.35 VN, 60°, u, r, CA		158	
178	159		Slightly weathered; dark grey LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular; gravel sized clasts; some cobble sized clasts; predominantly widely spaced randomly orientated calcite veins (<2mm)		SW	PLT 0.91 MPa - 159.10			PQTT		TCR: 100 RQD: 100			159.25 VN, 60°, u, r, CA 159.30 VN, 70°, u, r, CA		159	
																	160
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: -90°		Orientation: 0°		Ground Water Level			
										Contractor: Alton Drilling Ltd		Equipment: RIG 83		Date	Time	Reading (mbgl)	Hole depth (mbgl)

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 17 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
160.2			Moderately weathered; pale grey; LAPILLI TUFF (andesite); moderately strong; some clay alteration; poly-clastic; angular to subangular gravel sized clasts	WAIPU PU FORMATION	SW	UCS: 15 MPa - 161.08 PLT 0.66 MPa - 162.60 PLT 1.23 MPa - 165.10 PLT 0.03 MPa - 167.90		PQTT						160.20 VN, 45°, u, r, CA, trace Py		160	
161					MW			PQTT				TCR: 100 RQD: 100					161
162			162.00 weak; increased clay alteration				PQTT					TCR: 100 RQD: 94				162.05 JT, 35°, u, r, CLAY 162.20 JT, 30°, u, r, CLAY 162.95 JT, 20°, u, r, CLAY	162
163					SW			PQTT				TCR: 100 RQD: 100				164.14 VN, 60°, u, r, Py, trace Ca and other sulphides 164.70 VN, 65°, u, r, CA, trace Py 164.80 JT, 45°, u, r, CN	163
164			Slightly weathered; dark grey; LAPILLI TUFF (andesite); strong; poly-clastic; subangular to subrounded gravel sized clasts; close to moderately wide spaced randomly orientated calcite veins (<2mm); pyrite disseminated			PQTT				TCR: 100 RQD: 100			165.40 VN, 50°, u, r, CA 165.50 VN, 65°, u, r, CA 165.90 VN, 50°, u, r, CA 166.00 VN, 55°, u, r, CA	164			
165				MW		PQTT				TCR: 100 RQD: 100			167.50 VN, 40°, u, r, CA, trace CLAY 167.80 VN, 70°, u, r, CA, trace CLAY	165			
166						PQTT				TCR: 100 RQD: 100				166			
167			Moderately weathered; pale grey; LAPILLI TUFF (andesite); weak; clay alteration; angular to subangular gravel sized clasts	SW		PQTT				TCR: 100 RQD: 92			169.35 VN, 50°, u, r, CA 169.75 JT, 48°, u, r, CLAY, trace Ca	167			
168						PQTT								168			
169			Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; closely to widely spaced randomly orientated calcite veins (<2mm); pyrite ad other sulphides disseminated in matrix			PQTT								169			
170						PQTT									170		
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.																	
Inclination: -90° Orientation: 0° Ground Water Level																	
Contractor: Alton Drilling Ltd																	
Equipment: RIG 83																	
Date Time Reading (mbgl) Hole depth (mbgl)																	

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 18 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																	
Easting: 2762466.08 RL: 237.07 m					Northing: 6424304.837 Datum: NZVD2016					System: NZMG Method: SURVEY																	
RL (m) Depth (m) Graphic Material Description Geological Unit Weathering Sample / Test Result Casing Method Flush Return (%) Estimated Strength (MPa) TCR RQD SCR (%) Defect Spacing (mm) Visual Defect Description (and sub Detail) Instrumentation Installation Water level																											
Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; closely to widely spaced randomly orientated calcite veins (<2mm); pyrite ad other sulphides disseminated in matrix (continued from layer starting at 168.8m)										170.20 VN, 30°, u, r, CA 170.50 VN, 27°, u, r, CA 170.62 VN, 30°, u, r, CA 170.80 VN, 34°, u, r, CA 171.32 VN, 28°, u, r, CA 171.50 VN, 40°, u, r, CA 171.70 VN, 40°, u, r, CA 171.94 VN, 40°, u, r, CA 172.15 VN, 70°, u, r, CA 172.58 VN, 52°, u, r, CA 172.70 VN, 50°, u, r, CA, 10-25mm 172.95 VN, 48°, u, r, CA 175.40 VN, 75°, u, r, CA 175.70 VN, 60°, u, r, CA 175.85 VN, 40°, u, r, CA, 5-10mm 177.85 JT, 40°, u, r, CLAY, trace Ca 178.40 VN, 70°, u, r, CA, dark alteration halo																	
178.10 - 178.23 cobble of pale grey andesite																											
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83																	
										Ground Water Level <table><tr><td>Date</td><td>Time</td><td>Reading (mbgl)</td><td>Hole depth (mbgl)</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>										Date	Time	Reading (mbgl)	Hole depth (mbgl)				
Date	Time	Reading (mbgl)	Hole depth (mbgl)																								

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020										Hole No. : WNDD007 Sheet : 19 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Completed: 11/08/2020															
Easting: 2762466.08 RL: 237.07 m					Northing: 6424304.837 Datum: NZVD2016					System: NZMG Method: SURVEY					Logged : HJ Processed : HJ Checked : JHS												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Number / Type	Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level									
180.00			Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; closely to widely spaced randomly orientated calcite veins (<2mm); pyrite ad other sulphides disseminated in matrix (continued from layer starting at 168.8m)	WAIPUPU FORMATION	SW	UCS: 19 MPa - 180.13				PQTT						180.00 VN, 58°, u, r, Py, trace Ca and other sulphides											
181.20										PQTT									TCR: 100 RQD: 100		181.20 VN, 45°, u, r, CA, trace other sulphides						
181.50										PQTT											181.50 JT, 60°, u, r, CA						
182.20			184.10 - 184.28 cobble of pale fine porphyritic andesite with some calcite veins (<2mm)	SW	PLT 1.64 MPa - 184.60					PQTT						184.20 VN, 65°, u, r, CA, within cobble clast											
183.30										PQTT									TCR: 100 RQD: 100								
184.20										PQTT												184.20 VN, 65°, u, r, CA, within cobble clast					
185.30										PQTT						185.30 VN, 30°, u, r, CA, trace QZ; 10-20mm											
186.00										PQTT																	
187.00										PQTT																	
187.50										PQTT						187.50 VN, 55°, u, r, Py, trace Ca and other sulphides											
188.05										PQTT						188.05 VN, 55°, u, r, Py											
188.15										PQTT						188.15 VN, 60°, u, sm, Py											
188.55										PQTT						188.55 VN, 60°, u, r, Py											
188.65										PQTT						188.65 VN, 60°, u, r, Py											
189.00										PQTT																	
190.00										PQTT																	
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50)										Inclination: -90°					Orientation: 0°					Ground Water Level							
Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.										Contractor: Alton Drilling Ltd										Date		Time		Reading (mbgl)		Hole depth (mbgl)	
										Equipment: RIG 83																	

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 20 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS											
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY																			
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level							
					Weathering	Result																	
190	46		Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; closely to widely spaced randomly orientated calcite veins (<2mm); pyrite ad other sulphides disseminated in matrix (continued from layer starting at 168.8m) 191.00 becomes moderately weathered; weak; clay altered	SW	PLT 0.78 MPa 190.30			PQTT						190.80 VN, 55°, u, r, Py									
191	45																						
192	44																						
193	43																						
194	42		Slightly weathered; grey; porphyritic ANDESITE; strong	SW	UCS: 16 MPa 196.33 PLT 1.36 MPa 197.00			PQTT						194.32 VN, 60°, u, r, CA 194.45 JT, 55°, u, r, CN									
195	41																						
196	40																						
197	39																						
198	38		Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; pyrite and other sulphides disseminated in matrix	SW				PQTT						197.40 JT, 65°, u, r, CN									
199								PQTT						199.45 JT, 45°, u, r, CN									
200																							
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.																Inclination: -90°		Orientation: 0°		Ground Water Level			
																Contractor: Alton Drilling Ltd				Date	Time	Reading (mbgl)	Hole depth (mbgl)
																Equipment: RIG 83							

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 21 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS											
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY																			
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level							
					Weathering Number / Type	Result																	
237.07			Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; angular to subangular gravel sized clasts; some cobble sized clasts; pyrite and other sulphides disseminated in matrix (continued from layer starting at 195.0m)	SW	PLT 25 MPa - 201.50 PLT 1.04 MPa - 203.00			PQTT			TCR: 100 RQD: 100			201.15 JT, 27°, u, r, CA, trace CLAY									
201																							
202																							
203				MW				PQTT			TCR: 100 RQD: 100			203.70 VN, 45°, u, r, Py, trace other sulphides									
204			Moderately weathered; grey LAPILLI TUFF (andesite); weak; clay alteration; poly-clastic; subangular gravel sized clasts; calcite and pyrite disseminated																				
205																							
206				SW	PLT 0.22 MPa - 208.90			PQTT			TCR: 100 RQD: 100			206.20 VN, 60°, u, r, CA, 15-20mm 206.35 VN, 70°, u, r, CA, 20-30mm									
207			Slightly weathered; pale grey; LAPILLI TUFF (andesite); strong; poly-clastic; subangular to subrounded; gravel sized clasts; some cobble sized clasts																				
208																							
209								PQTT			TCR: 100 RQD: 100			208.60 JT, 55°, u, r, CLAY 209.12 JT, 65°, u, r, CLAY 209.35 VN, 75°, st, r, CA 209.80 VN, 35°, u, r, CA, 10-20mm									
210																							
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.								Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83				Ground Water Level											
												Date	Time	Reading (mbgl)	Hole depth (mbgl)								

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020										Hole No. : WNDD007 Sheet : 22 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
					Weathering Number / Type	Result											
237.07			Slightly weathered; pale grey; LAPILLI TUFF (andesite); strong; poly-clastic; subangular to subrounded; gravel sized clasts; some cobble sized clasts (continued from layer starting at 206.4m)	SW	UCS: 11 MPa - 210.13			PQTT								210	
26	211							PQTT			TCR: 100 RQD: 100			211.30 JT, 30°, u, r, CN		211	
25	212						PQTT			TCR: 100 RQD: 100						212	
24	213		212.45 possible fault gouge/infilled sheared seam; strong clay alteration Slightly weathered; grey; porphyritic ANDESITE; strong; widely spaced randomly orientated calcite veins (<2mm); some with dark alteration halos	SW	PLT 0.93 MPa - 213.10			PQTT			TCR: 100 RQD: 100			212.45 - 212.50 SM, 80°, u, r, CLAY, altered weathered seam; trace gravel and sand sized rock fragments; Ca at boundaries		213	
23	214					UCS: 28 MPa - 214.63			PQTT		TCR: 100 RQD: 100			213.80 VN, 50°, u, r, CA		214	
22	215			SW	PLT 1.82 MPa - 215.70			PQTT			TCR: 100 RQD: 100			215.40 VN, 70°, u, r, CA 215.50 VN, 40°, u, sm, CA		215	
21	216							PQTT			TCR: 100 RQD: 100					216	
20	217		216.45 - 218.15 close to moderately widely spaced randomly orientated calcite veins (<2mm)	SW	PLT 0.34 MPa - 218.40			PQTT			TCR: 100 RQD: 100			216.45 VN, 75°, u, r, CA, dark alteration halo 216.60 VN, 70°, u, r, CA, dark alteration halo 216.65 VN, 75°, u, r, CA, dark alteration halo 216.80 VN, 65°, u, r, CA, dark alteration halo 217.25 VN, 70°, u, r, CA, dark alteration halo		217	
19	218							PQTT			TCR: 100 RQD: 100			217.80 VN, 65°, u, sm, CA, dark alteration halo 218.13 VN, 60°, u, r, CA, dark alteration halo		218	
18	219				UCS: 14 MPa - 219.69			PQTT			TCR: 100 RQD: 100			219.45 JT, 60°, u, r, CN		219	
																	220
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.								Inclination: -90°				Orientation: 0°		Ground Water Level			
								Contractor: Alton Drilling Ltd Equipment: RIG 83				Date	Time	Reading (mbgl)	Hole depth (mbgl)		

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 29/07/2020 Completed: 11/08/2020						Hole No. : WNDD007 Sheet : 23 of 24 Hole Length : 231.7 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS								
Easting: 2762466.08 RL: 237.07 m		Northing: 6424304.837 Datum: NZVD2016		System: NZMG Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Slightly weathered; grey; porphyritic ANDESITE; strong; widely spaced randomly orientated calcite veins (<2mm); some with dark alteration halos (continued from layer starting at 212.7m)	SW	SW	UCS: 20 MPa - 222.03 222.70		PQTT			TCR: 100 RQD: 100			221.00 VN, 50°, u, r, CA, dark alteration halo		
			Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; subangular to subrounded gravel sized clasts; minor cobble sized clasts; wide to very widely spaced randomly orientated calcite and pyrite veins (<2mm)													
			224.00 - 229.00 moderately wide to widely spaced randomly orientated calcite veins (<2mm)	SW	Packer test 5: 222.70m - EOH	PLT 2.26 MPa - 223.40		PQTT			TCR: 100 RQD: 100			224.00 VN, 80°, u, r, CA		
				SW	Packer test 5: 222.70m - EOH	UCS 23 MPa 226.63		PQTT			TCR: 100 RQD: 100			225.00 VN, 40°, u, r, CN, trace QZ 225.20 JT, 18°, u, r, CN		
				SW	Packer test 5: 222.70m - EOH	PLT 1.06 MPa 227.40		PQTT			TCR: 100 RQD: 87			226.30 VN, 50°, u, r, CA 227.00 JT, 60°, u, r, CA 227.35 VN, 60°, u, r, Py 227.50 JT, 65°, u, r, CA, dark alteration halo		
			228.30 - 228.60 moderately strong; some clay alteration					PQTT			TCR: 100 RQD: 93			228.00 VN, 60°, u, r, Py 228.10 VN, 85°, u, r, CA 228.85 - 228.90 SM, 70°, u, r, CLAY, altered weathered seam; trace calcite and rock fragments; pyrite at boundaries 229.32 VN, 70°, u, r, CA, dark alteration halo		
Notes and Comments: End of Hole @ 231.7m Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m PLT are corrected to Is(50) Refer to explanation sheets for abbreviation and symbols. Shear Vane values are corrected.				Inclination: -90° Orientation: 0° Contractor: Alton Drilling Ltd Equipment: RIG 83				Ground Water Level								
												Date	Time	Reading (mbgl)	Hole depth (mbgl)	

Completed: 11/08/2020

System: NZMG

Method: SURVEY

Logged : HJ

Processed : HJ

Checked : JHS

Date: 14/12/2013																								
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level								
				Weathering	Number / Type	Result																		
231.7	17		Slightly weathered; grey; LAPILLI TUFF (andesite); strong; poly-clastic; subangular to subrounded gravel sized clasts; minor cobble sized clasts; wide to very widely spaced randomly orientated calcite and pyrite veins (<2mm) (continued from layer starting at 221.3m)	WAIPUPU FORMATION	SW	PL T 0.8 MPa		PQTT	PQTT		TCR: 100 RQD: 100			231.10 JT, 35°, u, r, CN										
231.6	18					231.40																		
231.5	19					UCS 16 MPa																		
231.4	20					231.70																		
231.3	21																							
231.2	22		End of Hole @ 231.7m, TD																					
231.1	23																							
231.0	24																							
230.9	25																							
230.8	26																							
230.7	27																							
230.6	28																							
230.5	29																							
230.4	30																							
230.3	31																							
230.2	32																							
230.1	33																							
230.0	34																							
229.9	35																							
229.8	36																							
229.7	37																							
229.6	38																							
229.5	39																							
229.4	40																							
229.3	41																							
229.2	42																							
229.1	43																							
229.0	44																							
228.9	45																							
228.8	46																							
228.7	47																							
228.6	48																							
228.5	49																							
228.4	50																							

Notes and Comments:

End of Hole @ 231.7m
Vibrating Wire Piezometers at 49.00m, 142.00m, 217.00m
PLT are corrected to ls(50)

Refer to explanation sheets for abbreviation and symbols.
Shear Vane values are corrected.

Inclination: -90°

Orientation: 0°

Ground Water Level

Contractor: Alton Drilling Ltd

Equipment: RIG 83

Date	Time	Reading (mbal)	Hole depth (mbal)
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Completed: 6/07/2021

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
						Number / Type	Result										
0.0	0.0		Sandy silty CLAY; brown. Soft; moist; high plasticity; rootlets; sand, fine to coarse (TOPSOIL)	TOPSOIL													
0.6	0.6		CORE LOSS 1.0m						PQTT			TCR: 38					
1.6	1.6		Sandy silty CLAY with some gravel; orange brown. Soft; moist; high plasticity; sand, fine to coarse; gravel, fine, subangular to subrounded; highly weathered; extremely weak; andesite (ALLUVIAL DEPOSITS)						PQTT			TCR: 62					
2.6	2.6		Sandy gravelly CLAY; orange brown mottled grey. Firm; moist; low plasticity; sand, fine to coarse; gravel, fine to medium; subangular to subrounded; highly weathered; extremely weak; andesite						PQTT			TCR: 88					
3.2	3.2		CORE LOSS 0.6m						PQTT			TCR: 93					
4.1	4.1		Sandy CLAY with trace rootlets; brown. Soft; moist; sand, fine to coarse						PQTT			TCR: 87					
4.8	4.8		Sandy gravelly CLAY; orange brown mottled grey. Firm; moist; low plasticity; sand, fine to coarse; gravel, fine to medium; subangular to subrounded; highly weathered; extremely weak; andesite						PQTT			TCR: 20					
5.2	5.2		CORE LOSS 0.2m						PQTT			TCR: 0					
6.3	6.3		Sandy gravelly CLAY; orange brown mottled grey. Firm; moist; low plasticity; sand, fine to coarse; gravel, fine to coarse; subangular to subrounded; highly weathered; extremely weak; andesite (RESIDUAL SOIL OF WAIPUPU FORMATION)						PQTT								
7.8	7.8		CORE LOSS 0.2m						PQTT								
8.1	8.1		CLAY with some sand and trace rootlets and organics; grey. Soft; moist; high plasticity; sand, fine						PQTT								
9.3	9.3		CORE LOSS 1.2m						PQTT								
			CORE LOSS 1.5m						OB								

Notes and Comments:

End of Hole @ 706.8m

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Riq 85

Date	
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Time

Reading
(rebel)

Hole depth (mm)	
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Refer to explanation sheets for abbreviation and symbols.

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021										Hole No. : WNDD011 Sheet : 2 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS										
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY																	
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level							
			CORE LOSS 1.5m (continued from layer starting at 9.3m)	RESIDUAL SOIL OF WAIPU PU FORMATION				OB			TCR: 0												
			Sandy gravelly CLAY; bluish grey. Soft; moist; high plasticity; sand, fine to medium; gravel, fine to medium; subangular to subrounded; completely weathered; extremely weak, grey andesite					PQTT			TCR: 13												
			CORE LOSS 1.3m																				
			Sandy gravelly CLAY with trace organics; bluish grey mottled black. Soft; moist; high plasticity; sand, fine to medium; gravel, fine to medium; subangular to subrounded; completely weathered; extremely weak, grey andesite					PQTT			TCR: 80												
			CORE LOSS 0.3m																				
			CLAY with some sand and gravel and trace organics; grey mottled brown and black. Soft; moist; high plasticity; sand fine to medium; gravel; fine					PQTT			TCR: 100												
			CLAY with some sand; pale bluish grey. Soft; moist; high plasticity; sand, fine																				
			Sandy CLAY with trace rootlets; grey. Very soft; moist; high plasticity; sand, fine to medium					PQTT			TCR: 100												
			Sandy CLAY with some gravels; bluish grey. Soft; moist; high plasticity; sand, fine to medium; gravel, fine to medium, subangular to subrounded; extremely weathered andesite					PQTT			TCR: 27												
			CORE LOSS 1.1m																				
			Sandy CLAY with some gravels; bluish grey. Soft; moist; high plasticity; sand, fine to medium; gravel, fine to medium, subangular to subrounded; extremely weathered andesite					PQTT			TCR: 100												
			PEAT; dark brownish black; wood fragments; fibrous; firm; slight								TCR:												
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.								Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85				Ground Water Level <table><tr><th>Date</th><th>Time</th><th>Reading (mbgl)</th><th>Hole depth (mbgl)</th></tr><tr><td></td><td></td><td></td><td></td></tr></table>				Date	Time	Reading (mbgl)	Hole depth (mbgl)				
Date	Time	Reading (mbgl)	Hole depth (mbgl)																				

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 3 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS													
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY																					
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level									
198	20.7		hydrocarbon odor Sandy CLAY with some gravels; bluish grey. Soft; moist; high plasticity; sand, fine to medium; gravel, fine to medium, subangular to subrounded; extremely weathered andesite (<i>continued from layer starting at 19.8m</i>)	COLLUVIUM				PQTT			100					20									
21	21.5		PEAT with organics and rootlets; dark brownish black; fibrous; firm; hydrocarbon odor					PQTT			TCR: 100					21									
22	22.6		GRAVEL with cobbles and boulders; grey - Recovered as gravel, boulder and cobbles sized fragments of angular to subangular; slightly weathered; strong porphyritic andesite; strongly magnetic (possible COLLUVIUM)					PQTT			TCR: 54					22									
23	23.6		CORE LOSS 0.6m GRAVEL with cobbles and boulders; grey - Recovered as gravel, boulder and cobbles sized fragments of angular to subangular; slightly weathered; strong porphyritic andesite; strongly magnetic					PQTT			TCR: 63					23									
24	24.2		CORE LOSS 0.6m GRAVEL fragments: as per unit starting 22.60 m					PQTT			TCR: 86					24									
25	24.8		CORE LOSS 0.1m GRAVEL with cobbles and boulders; grey - Recovered as gravel, boulder and cobbles sized fragments of angular to subangular; slightly weathered; strong porphyritic andesite; strongly magnetic					PQTT			TCR: 100					25									
26	26.2			WAIPUPU FORMATION CW				PQTT			TCR: 100					26									
27	26.8		Completely weathered; grey porphyritic ANDESITE; weak; non magnetic; some gravel and boulder sized fragments of highly weathered; grey; weak to moderately strong andesite (WAIPUPU FORMATION)					PQTT			TCR: 58 RQD: 100					27									
28	27.3		CORE LOSS 0.5m Completely weathered; grey porphyritic ANDESITE; weak; non magnetic; some gravel and boulder sized fragments of highly weathered; grey; weak to moderately strong andesite					PQTT			TCR: 91 RQD: 100					28									
29	28.3		CORE LOSS 0.1m Completely weathered ANDESITE: as unit starting 27.30 m					PQTT			TCR: 87 RQD: 100					29									
29.8			29.00 - 29.25 boulder of slightly weathered; grey; ANDESITE; strong; strongly magnetic													29									
			CORE LOSS 0.2m													30									
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.														Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85		Ground Water Level <table><tr><th>Date</th><th>Time</th><th>Reading (mbgl)</th><th>Hole depth (mbgl)</th></tr><tr><td></td><td></td><td></td><td></td></tr></table>		Date	Time	Reading (mbgl)	Hole depth (mbgl)				
Date	Time	Reading (mbgl)	Hole depth (mbgl)																						

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 4 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS													
Easting: 2762594 Northing: 6424371 System: NZMG 1949 RL: 205 m Datum: NZVD2016 Method: SURVEY																							
Material Description										Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
RL (m)	Depth (m)	Graphic																					
			Moderately weathered; grey; porphyritic ANDESITE; moderately strong; disseminated pyrite; non magnetic; some gravel and boulder sized fragments of slightly weathered; grey; strong; andesite																				
			31.30 - 32.00 recovered as gravel sized fragments																				
	</																						



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 5 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
191	41		Slightly weathered; grey; porphyritic ANDESITE; strong; non magnetic; pyrite disseminated; frequent randomly orientated calcite veins (<2mm); some gravel sized fragments of moderately weathered; reddish brown; andesite (continued from layer starting at 37.9m)	SW				PQTT			TCR: 100 RQD: 90			trace sulphides		
														40.60 JT, $\alpha 50^\circ/\beta 260^\circ$, u, r, CA		
														40.90 JT, $\alpha 18^\circ/\beta 250^\circ$, u, r, CA, trace Py		
														41.05 VN, $\alpha 42^\circ/\beta 320^\circ$, u, r, CA 41.16 JT, $\alpha 75^\circ/\beta 120^\circ$, u, r, CN, trace CLAY 41.25 JT, $\alpha 60^\circ/\beta 145^\circ$, u, r, CN 41.60 VN, $\alpha 30^\circ/\beta 240^\circ$, u, sm, CLAY 41.73 JT, $\alpha 28^\circ/\beta 221^\circ$, u, sm, CN, trace CLAY 41.84 VN, $\alpha 50^\circ/\beta 285^\circ$, u, r, CA 41.93 VN, $\alpha 50^\circ/\beta 280^\circ$, u, r, CA		
	42										TCR: 100 RQD: 88					
														42.65 VN, $\alpha 62^\circ/\beta 275^\circ$, u, r, CA		
														42.87 JT, $\alpha 72^\circ/\beta 85^\circ$, pl, sm, CA		
	43										TCR: 100 RQD: 100					
														43.50 VN, $\alpha 55^\circ/\beta 245^\circ$, u, r, CA, closed		
	44													44.00 VN, $\alpha 45^\circ/\beta -$, u, r, CA		
											TCR: 100 RQD: 100					
	45													45.00 - 45.05 SS, $\alpha 62^\circ/\beta 285^\circ$, u, r, CLAY, trace gravel sized fragments of andesite		
														45.20 JT, $\alpha 50^\circ/\beta 300^\circ$, u, r, CLAY, trace Py		
														45.52 JT, $\alpha 60^\circ/\beta -$, u, r, CLAY		
														45.62 JT, $\alpha 38^\circ/\beta -$, u, r, CN, trace Py		
	46		Moderately weathered; pale grey; clay altered ANDESITE; weak; disseminated pyrite; non magnetic								TCR: 100 RQD: 100			45.84 - 45.85 SS, $\alpha 50^\circ/\beta -$, u, r, CLAY, trace gravel sized fragments of andesite		
														46.50 JT, $\alpha 28^\circ/\beta 280^\circ$, u, sl, CLAY		
	47															
											TCR: 100 RQD: 100					
	48		48.00 moderately strong													
														48.70 VN, $\alpha 60^\circ/\beta 310^\circ$, u, r, CA		
	49										TCR: 100 RQD: 100			49.00 VN, $\alpha 49^\circ/\beta 305^\circ$, u, r, CA		
														49.25 VN, $\alpha 55^\circ/\beta 340^\circ$, u, r, CA		
														49.43 VN, $\alpha 50^\circ/\beta 240^\circ$, u, r, CA		
	50										TCR: 100 RQD: 100					

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 6 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
	51		Moderately weathered; pale grey; clay altered ANDESITE; weak; disseminated pyrite; non magnetic (continued from layer starting at 45.6m)	WAIPU FORMATION	MW			PQTT			TCR: 100 RQD: 97			50.04 JT, $\alpha 52^\circ / \beta 200^\circ$, u, r, CN, low confidence ori 50.20 JT, $\alpha 30^\circ / \beta 140^\circ$, u, r, CLAY 50.25 VN, $\alpha 40^\circ / \beta 320^\circ$, u, r, CA 50.45 VN, $\alpha 60^\circ / \beta 325^\circ$, u, r, CA 50.90 VN, $\alpha 20^\circ / \beta 220^\circ$, u, r, CA 51.30 VN, $\alpha 35^\circ / \beta -$, u, r, CA					
	52		Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (<2mm)		SW			PQTT				TCR: 100 RQD: 100			51.97 VN, $\alpha 50^\circ / \beta 60^\circ$, u, r, Py, trace sulphides 52.30 VN, $\alpha 20^\circ / \beta 270^\circ$, u, r, CA 52.45 VN, $\alpha 65^\circ / \beta 280^\circ$, u, r, CA 52.60 VN, $\alpha 25^\circ / \beta 190^\circ$, u, r, CA 52.90 VN, $\alpha 65^\circ / \beta 280^\circ$, u, r, CA				
	53							PQTT			TCR: 100 RQD: 100			53.45 VN, $\alpha 55^\circ / \beta 40^\circ$, u, r, CA					
	54							PQTT			TCR: 100 RQD: 100			54.10 VN, $\alpha 60^\circ / \beta 320^\circ$, u, r, CA					
	55							PQTT			TCR: 100 RQD: 100			54.65 VN, $\alpha 75^\circ / \beta 120^\circ$, u, r, CA					
	56							PQTT			TCR: 100 RQD: 94			55.66 JT, $\alpha 62^\circ / \beta 160^\circ$, pl, r, CA 56.04 JT, $\alpha 80^\circ / \beta 340^\circ$, pl, r, CA 56.35 VN, $\alpha 30^\circ / \beta 240^\circ$, u, r, CA					
	57							PQTT						56.68 JT, $\alpha 40^\circ / \beta 330^\circ$, pl, r, CA 56.77 JT, $\alpha 60^\circ / \beta 110^\circ$, pl, r, CA 56.90 VN, $\alpha 60^\circ / \beta 260^\circ$, u, r, CA					
	58							PQTT			TCR: 100 RQD: 100			58.46 JT, $\alpha 70^\circ / \beta 352^\circ$, pl, r, CN					
	59							PQTT			TCR: 100 RQD: 100			59.00 JT, $\alpha 70^\circ / \beta 340^\circ$, u, r, CA 59.40 JT, $\alpha 40^\circ / \beta -$, u, r, CA					
Notes and Comments: End of Hole @ 706.8m										Inclination: -20° Orientation: 301°					Ground Water Level				
Refer to explanation sheets for abbreviation and symbols.										Contractor: Alton Drilling Equipment: Rig 85					Date	Time	Reading (mbgl)	Hole depth (mbgl)	

GHD		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 7 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
60			Moderately weathered; clay altered porphyritic ANDESITE; weak; pyrite disseminated; non magnetic					PQTT								
61								PQTT			TCR: 100 RQD: 100					
62								PQTT			TCR: 100 RQD: 100			62.28 VN, $\alpha 40^\circ / \beta 80^\circ$, pl, sm, Py, trace other sulphides 62.40 JT, $\alpha 45^\circ / \beta 275^\circ$, u, r, CN		
63								PQTT			TCR: 100 RQD: 100					
64								PQTT			TCR: 100 RQD: 100			64.20 VN, $\alpha 55^\circ / \beta 5^\circ$, u, r, CA		
65								PQTT			TCR: 100 RQD: 100			64.85 JT, $\alpha 75^\circ / \beta 340^\circ$, u, r, CA, trace CA 65.12 JT, $\alpha 45^\circ / \beta 320^\circ$, u, r, CN		
66								PQTT			TCR: 100 RQD: 100			66.00 JT, $\alpha 60^\circ / \beta 290^\circ$, u, r, CA		
67								PQTT			TCR: 100 RQD: 100					
68			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite					PQTT			TCR: 100 RQD: 95			67.75 JT, $\alpha 60^\circ / \beta 90^\circ$, u, r, CA		
69								PQTT			TCR: 100 RQD: 94			68.57 VN, $\alpha 60^\circ / \beta 80^\circ$, u, r, CA 68.65 JT, $\alpha 58^\circ / \beta 120^\circ$, st, r, CN, trace CLAY 68.90 JT, $\alpha 60^\circ / \beta 245^\circ$, u, r, CN 69.07 JT, $\alpha 35^\circ / \beta 250^\circ$, u, r, CN, trace CLAY		
70								PQTT								

Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.		Inclination: -20°		Orientation: 301°		Ground Water Level			
		Contractor: Alton Drilling		Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 8 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																				
Easting: 2762594 RL: 205 m				Northing: 6424371 Datum: NZVD2016				System: NZMG 1949 Method: SURVEY																								
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level															
						Number / Type	Result																									
181			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 67.5m)	WAIUPU FORMATION	SW										70.30 JT, $\alpha 82^\circ / \beta 350^\circ$, u, r, CN 70.46 JT, $\alpha 67^\circ / \beta 270^\circ$, u, r, CN 70.55 JT, $\alpha 55^\circ / \beta 110^\circ$, u, r, CN																	
71																																
72																		TCR: 100 RQD: 100			71.80 VN, $\alpha 42^\circ / \beta 260^\circ$, u, r, CA											
73																		TCR: 100 RQD: 94			72.72 VN, $\alpha 60^\circ / \beta 100^\circ$, u, r, CA											
74																		TCR: 100 RQD: 94			73.24 VN, $\alpha 48^\circ / \beta 120^\circ$, u, r, CA, closed 73.48 JT, $\alpha 60^\circ / \beta 290^\circ$, u, r, CN, trace CA 73.54 JT, $\alpha 60^\circ / \beta 90^\circ$, st, sl, CLAY 73.57 JT, $\alpha 61^\circ / \beta 90^\circ$, st, sl, CLAY											
75																					74.27 JT, $\alpha 58^\circ / \beta 30^\circ$, u, r, CA, trace CLAY 74.60 JT, $\alpha 28^\circ / \beta 10^\circ$, u, r, CA 74.81 JT, $\alpha 40^\circ / \beta 30^\circ$, u, r, CA											
76																		TCR: 100 RQD: 100			75.10 JT, $\alpha 30^\circ / \beta 280^\circ$, u, r, CA, trace sulphide and Mn											
77																					77.15 - 77.17 SS, $\alpha 58^\circ / \beta 55^\circ$, u, r, CLAY, trace Py and gravel sized fragments of andesite 77.30 JT, $\alpha 70^\circ / \beta 245^\circ$, u, r, CA, trace CLAY 77.45 JT, $\alpha 65^\circ / \beta 12^\circ$, u, r, CA, trace CLAY											
78																		TCR: 100 RQD: 100														
79																					78.80 JT, $\alpha 25^\circ / \beta 305^\circ$, u, r, CN, trace CA											
Notes and Comments: End of Hole @ 706.8m																		Inclination: -20°		Orientation: 301°		Ground Water Level										
Refer to explanation sheets for abbreviation and symbols.																		Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)							



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 9 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
81			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 67.5m)	WAIUPU FORMATION SW				PQTT			TCR: 100 RQD: 100			80.52 JT, $\alpha 58^\circ \beta 80^\circ$, st, r, CA		
														80.80 JT, $\alpha 59^\circ \beta 290^\circ$, u, r, CN		
														80.95 JT, $\alpha 80^\circ \beta 210^\circ$, u, r, CN, trace CLAY		
82								PQTT			TCR: 100 RQD: 91			81.57 VN, $\alpha 60^\circ \beta 78^\circ$, u, sm, Py, trace CA		
														81.65 VN, $\alpha 32^\circ \beta 110^\circ$, u, sm, Py, trace CA, alteration halo		
														81.85 JT, $\alpha 69^\circ \beta 240^\circ$, u, r, CA		
														81.90 JT, $\alpha 57^\circ \beta 60^\circ$, u, r, CA		
83								PQTT			TCR: 100 RQD: 100			83.30 JT, $\alpha 63^\circ \beta 85^\circ$, u, sm, CA		
84								PQTT			TCR: 100 RQD: 100			84.09 JT, $\alpha 31^\circ \beta 230^\circ$, st, r, CA		
														84.62 JT, $\alpha 50^\circ \beta 240^\circ$, u, r, CA		
85								PQTT			TCR: 100 RQD: 100			85.13 JT, $\alpha 47^\circ \beta 300^\circ$, u, r, CA		
														85.60 JT, $\alpha 71^\circ \beta 100^\circ$, u, sm, CA, trace CLAY		
86								PQTT			TCR: 100 RQD: 90			86.20 JT, $\alpha 60^\circ \beta 100^\circ$, st, sm, CN, trace CLAY		
														86.27 JT, $\alpha 25^\circ \beta 320^\circ$, u, r, CA		
														86.40 JT, $\alpha 50^\circ \beta 340^\circ$, u, r, CA		
														86.58 JT, $\alpha 50^\circ \beta 130^\circ$, u, r, CA		
														86.80 JT, $\alpha 40^\circ \beta 325^\circ$, u, r, CA		
														86.94 JT, $\alpha 62^\circ \beta 140^\circ$, u, r, CA, trace other sulphides		
														87.02 JT, $\alpha 70^\circ \beta 80^\circ$, u, r, CA, trace CLAY and other sulphides		
														87.50 JT, $\alpha 70^\circ \beta 70^\circ$, st, sm, CN		
88								PQTT			TCR: 100 RQD: 89			87.92 JT, $\alpha 61^\circ \beta 5^\circ$, u, r, CN		
														88.17 VN, $\alpha 20^\circ \beta 280^\circ$, u, sm, CA		
														88.37 VN, $\alpha 18^\circ \beta 260^\circ$, u, r, CA, partial vein		
														88.45 JT, $\alpha 50^\circ \beta 80^\circ$, u, sl, CA, trace CLAY		
														88.52 JT, $\alpha 62^\circ \beta 230^\circ$, u, r, CN		
89								PQTT			TCR: 100 RQD: 80			89.17 JT, $\alpha 40^\circ \beta 310^\circ$, u, r, CA		
														89.31 JT, $\alpha 40^\circ \beta 310^\circ$, u, r, CA		
														89.46 JT, $\alpha 38^\circ \beta 315^\circ$, u, r, CA		
														89.54 JT, $\alpha 60^\circ \beta 290^\circ$, u, sl, CA		
														89.73 JT, $\alpha 40^\circ \beta 295^\circ$, u, r, CA		
														89.82 JT, $\alpha 30^\circ \beta 280^\circ$, u, r, CA		

Notes and Comments:

End of Hole @ 706.8m

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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Refer to explanation sheets for abbreviation and symbols.

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 10 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS			
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY										
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
174	91		Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 67.5m)	WAIUPU FORMATION	SW			PQTT			TCR: 100 RQD: 94			89.90 JT, $\alpha 20^\circ / \beta 180^\circ$, u, r, CA 89.95 JT, $\alpha 40^\circ / \beta 275^\circ$, u, r, CA 90.35 JT, $\alpha 30^\circ / \beta 275^\circ$, u, sm, CLAY 90.57 JT, $\alpha 52^\circ / \beta 40^\circ$, u, sm, CLAY 90.66 JT, $\alpha 35^\circ / \beta 260^\circ$, u, r, CA, trace CLAY 90.90 JT, $\alpha 50^\circ / \beta 220^\circ$, u, r, CA, trace CLAY 91.08 VN, $\alpha 50^\circ / \beta 280^\circ$, u, r, Py, trace CA 91.21 JT, $\alpha 25^\circ / \beta 280^\circ$, u, r, CN, trace CLAY 91.71 JT, $\alpha 30^\circ / \beta 300^\circ$, u, r, CA, trace CLAY 92.00 JT, $\alpha 43^\circ / \beta 255^\circ$, u, r, CA		
92		92.50 JT, $\alpha 40^\circ / \beta 220^\circ$, u, r, CA, trace CLAY														
93		93.12 JT, $\alpha 81^\circ / \beta 80^\circ$, u, sm, CLAY, trace Py 93.58 JT, $\alpha 25^\circ / \beta 280^\circ$, u, r, CA														
94		94.00 JT, $\alpha 81^\circ / \beta 300^\circ$, u, r, CA 94.15 JT, $\alpha 40^\circ / \beta 280^\circ$, u, r, CA 94.44 JT, $\alpha 50^\circ / \beta 80^\circ$, u, r, CA 94.53 JT, $\alpha 48^\circ / \beta 305^\circ$, u, r, CA 94.73 JT, $\alpha 41^\circ / \beta 300^\circ$, u, r, CA														
95		95.05 JT, $\alpha 40^\circ / \beta 280^\circ$, u, r, CA 95.13 JT, $\alpha 60^\circ / \beta 280^\circ$, u, r, CA 95.30 JT, $\alpha 22^\circ / \beta 322^\circ$, u, r, CA														
96		95.77 JT, $\alpha 40^\circ / \beta 280^\circ$, u, r, CA 95.83 JT, $\alpha 40^\circ / \beta 330^\circ$, u, r, CA 96.22 JT, $\alpha 38^\circ / \beta 295^\circ$, u, r, CA														
97		96.60 JT, $\alpha 60^\circ / \beta 70^\circ$, u, sm, CLAY, trace Py 97.20 JT, $\alpha 35^\circ / \beta 355^\circ$, u, sl, CLAY, trace CA 97.45 JT, $\alpha 59^\circ / \beta 320^\circ$, u, r, CA 97.60 JT, $\alpha 71^\circ / \beta 250^\circ$, u, r														
98		97.84 VN, $\alpha 70^\circ / \beta 150^\circ$, u, sl, CA, trace sulphides														
99		98.56 JT, $\alpha 48^\circ / \beta 300^\circ$, u, sl, CA, trace CLAY 98.75 JT, $\alpha 68^\circ / \beta 160^\circ$, u, r, CN, trace CLAY														
171		99.52 JT, $\alpha 80^\circ / \beta 80^\circ$, u, r, CA, trace CLAY 99.61 JT, $\alpha 50^\circ / \beta 140^\circ$, u, sm, CA, trace sulphides														
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.								Inclination: -20° Contractor: Alton Drilling Equipment: Rig 85				Orientation: 301° Ground Water Level Date Time Reading (mbgl) Hole depth (mbgl)				

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 11 of 71 Hole Length : 706.8 Scale @ A4 : 1:50														
		Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY		Logged : HJ Processed : HJ Checked : JHS																		
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level									
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 67.5m)	WAIPU FORMATION SW					PQTT			TCR: 100 RQD: 94			100.10 JT, $\alpha 70^\circ / \beta 70^\circ$, u, r, CA											
101															101.30 JT, $\alpha 40^\circ / \beta 20^\circ$, u, r, CN											
102															101.85 JT, $\alpha 80^\circ / \beta 220^\circ$, u, r, CLAY, trace CA 102.10 JT, $\alpha 45^\circ / \beta 50^\circ$, u, r, CN											
103															102.80 JT, $\alpha 60^\circ / \beta 300^\circ$, u, r, CA, trace CLAY 102.88 JT, $\alpha 72^\circ / \beta 70^\circ$, u, r, CN											
104															103.62 - 103.65 SS, $\alpha 45^\circ / \beta 295^\circ$, u, r, CLAY, trace gravel fragments 104.00 JT, $\alpha 60^\circ / \beta 305^\circ$, u, r, CN 104.20 JT, $\alpha 30^\circ / \beta 190^\circ$, u, r, CN 104.35 JT, $\alpha 60^\circ / \beta 40^\circ$, st, sm, CLAY											
105															104.95 JT, $\alpha 50^\circ / \beta 308^\circ$, u, r, CN 105.38 JT, $\alpha 50^\circ / \beta 300^\circ$, u, r, CA											
106															105.80 JT, $\alpha 18^\circ / \beta 280^\circ$, u, r, CA 106.00 JT, $\alpha 25^\circ / \beta 160^\circ$, u, r, CA, trace CLAY, low confidence ori											
107															107.10 JT, $\alpha 25^\circ / \beta 260^\circ$, u, r, CN, trace CA 107.68 JT, $\alpha 70^\circ / \beta 60^\circ$, u, sl, CLAY											
108															108.00 - 108.30 VN, $\alpha 18^\circ / \beta 120^\circ$, u, r, CA, trace Py and other sulphides											
109															108.90 JT, $\alpha 10^\circ / \beta 270^\circ$, u, sm, CA, trace sulphides 109.56 JT, $\alpha 75^\circ / \beta 20^\circ$, u, r, CA, trace sulphides 109.65 JT, $\alpha 60^\circ / \beta 20^\circ$, u, r, CA, trace											
Notes and Comments: End of Hole @ 706.8m															Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85						Ground Water Level					
Refer to explanation sheets for abbreviation and symbols.																					Date	Time	Reading (mbgl)	Hole depth (mbgl)		

GHD		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY		Sheet : 12 of 71 Hole Length : 706.8 Scale @ A4 : 1:50		Logged : HJ Processed : HJ Checked : JHS								
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
111.3	111.3		Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 67.5m)	SW				PQTT			TCR: 100 RQD: 100			109.71 JT, $\alpha 35^\circ / \beta 50^\circ$, u, r, CA, trace sulphides 109.85 VN, $\alpha 40^\circ / \beta 340^\circ$, u, r, CA 110.20 JT, $\alpha 28^\circ / \beta 335^\circ$, u, sl, CLAY, trace Py 110.60 JT, $\alpha 51^\circ / \beta 48^\circ$, u, r, CLAY		110
112	112		Highly weathered; grey; clast altered ANDESITE; weak; recovered partially as gravel sized fragments	HW				PQTT			TCR: 100 RQD: 100			111.08 JT, $\alpha 55^\circ / \beta 280^\circ$, u, sm, CLAY, trace CA 111.35 JT, $\alpha 55^\circ / \beta 190^\circ$, u, r, CA 111.60 JT, $\alpha 20^\circ / \beta 150^\circ$, u, r, CLAY, trace Py		111
113	113		Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite	SW				PQTT			TCR: 100 RQD: 100			113.30 JT, $\alpha 52^\circ / \beta 280^\circ$, u, r, CA 113.62 VN, $\alpha 22^\circ / \beta 80^\circ$, u, r, CA 113.73 VN, $\alpha 40^\circ / \beta 285^\circ$, u, r, CA		113
114	114							PQTT			TCR: 100 RQD: 100			114.75 JT, $\alpha 50^\circ / \beta 240^\circ$, u, r, CA 115.17 JT, $\alpha 60^\circ / \beta 250^\circ$, st, r, CA, trace CLAY		114
115	115							PQTT			TCR: 100 RQD: 100			116.48 JT, $\alpha 48^\circ / \beta -$, u, r, CA 116.74 JT, $\alpha 65^\circ / \beta -$, u, r, CN, trace CLAY 116.90 - 116.95 SS, $\alpha 48^\circ / \beta 240^\circ$, st, r, CLAY, trace gravel and sand sized fragments of andesite; CA at boundaries		115
116	116							PQTT			TCR: 100 RQD: 100			117.61 JT, $\alpha 62^\circ / \beta 265^\circ$, u, r, CN 118.15 JT, $\alpha 71^\circ / \beta 35^\circ$, st, sm, CA, trace CLAY 118.21 VN, $\alpha 60^\circ / \beta 222^\circ$, u, r, CA		116
117	117							PQTT			TCR: 100 RQD: 96			119.51 JT, $\alpha 66^\circ / \beta 85^\circ$, u, r, CLAY 119.53 - 119.57 VN, $\alpha 70^\circ / \beta 90^\circ$, u, r, CA, pebble dyke (angular gravel fragments), CA at		117
118	118							PQTT			TCR: 100 RQD: 99					118
119	119							PQTT								119
120	120							PQTT								120

Notes and Comments: End of Hole @ 706.8m		Inclination: -20° Orientation: 301°		Ground Water Level	
Contractor: Alton Drilling Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)
Refer to explanation sheets for abbreviation and symbols.					

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 13 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS							
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 112.9m)	WAIUPU FORMATION SW				PQTT						boundaries, closed 119.82 JT, $\alpha 62^\circ / \beta 309^\circ$, u, r, CA, trace Py		120			
	121								PQTT			TCR: 100 RQD: 100			120.45 JT, $\alpha 82^\circ / \beta 5^\circ$, u, r, CA, trace CLAY 120.70 JT, $\alpha 79^\circ / \beta 150^\circ$, u, r, CA		121		
	122								PQTT			TCR: 100 RQD: 100			121.86 JT, $\alpha 70^\circ / \beta -$, u, sm, CA 122.07 JT, $\alpha 65^\circ / \beta -$, u, r, CA		122		
	123								PQTT			TCR: 100 RQD: 100			122.90 JT, $\alpha 35^\circ / \beta 230^\circ$, u, r, CA, trace CLAY 123.10 JT, $\alpha 39^\circ / \beta 155^\circ$, u, r, CA		123		
	124								PQTT			TCR: 100 RQD: 100			123.46 JT, $\alpha 35^\circ / \beta 280^\circ$, u, r, CA 123.64 JT, $\alpha 30^\circ / \beta 180^\circ$, u, r, CA 123.80 JT, $\alpha 40^\circ / \beta 205^\circ$, u, r, CA 124.05 JT, $\alpha 41^\circ / \beta 260^\circ$, u, r, CA		124		
	125								PQTT			TCR: 100 RQD: 100						125	
	126								PQTT			TCR: 100 RQD: 100			125.90 JT, $\alpha 85^\circ / \beta 260^\circ$, u, sm, CA, trace CLAY 126.50 VN, $\alpha 22^\circ / \beta 280^\circ$, u, r, CA		126		
	127								PQTT			TCR: 100 RQD: 100						127	
	128								PQTT			TCR: 100 RQD: 100			127.60 JT, $\alpha 71^\circ / \beta 300^\circ$, u, r, CN 127.90 JT, $\alpha 30^\circ / \beta 309^\circ$, u, sm, CA, trace CLAY 128.29 JT, $\alpha 40^\circ / \beta 300^\circ$, u, r, CA 128.65 JT, $\alpha 80^\circ / \beta 300^\circ$, st, sm, CA		128		
	129								PQTT			TCR: 100 RQD: 100			129.00 JT, $\alpha 50^\circ / \beta 18^\circ$, st, r, CA, trace Py 129.46 JT, $\alpha 60^\circ / \beta 270^\circ$, u, r, CN 129.65 JT, $\alpha 42^\circ / \beta 40^\circ$, u, r, CA, trace Py		129		
Notes and Comments: End of Hole @ 706.8m																			
Refer to explanation sheets for abbreviation and symbols.																			
Inclination: -20°										Orientation: 301°			Ground Water Level						
Contractor: Alton Drilling Equipment: Rig 85													Date	Time	Reading (mbgl)	Hole depth (mbgl)			

Completed: 6/07/2021

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

Data: NEW2013																	
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
					Number / Type	Result											
	130.5		Moderately weathered; grey; clay altered ANDESITE; moderately strong; pyrite disseminated; recovered partially as gravel sized fragments	SW				PQTT			TCR: 100 RQD: 100		/	130.30 JT, $\alpha 49^\circ/\beta -$, u, r, CA, trace Py		130	
	131.1			MW				PQTT			TCR: 100 RQD: 100						131
	131.6		Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) calcite veins with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite					PQTT			TCR: 100 RQD: 98		/	131.46 JT, $\alpha 55^\circ/\beta 18^\circ$, u, r, CLAY, trace Py 131.60 JT, $\alpha 42^\circ/\beta 280^\circ$, u, r, CA 131.70 JT, $\alpha 50^\circ/\beta 330^\circ$, u, r, CA 131.72 JT, $\alpha 50^\circ/\beta 330^\circ$, u, r, CA 131.98 JT, $\alpha 22^\circ/\beta 300^\circ$, u, r, CA, trace Py		132	
	132.2							PQTT			TCR: 100 RQD: 100		/				133
	133.2							PQTT			TCR: 100 RQD: 100		/	133.46 VN, $\alpha 40^\circ/\beta 280^\circ$, u, r, Py, trace other sulphides 133.68 VN, $\alpha 40^\circ/\beta 300^\circ$, u, r, Py, trace other sulphides		134	
	134.2							PQTT			TCR: 100 RQD: 100		/	134.00 JT, $\alpha 46^\circ/\beta 320^\circ$, u, r, CLAY, trace Py and other sulphides 134.40 JT, $\alpha 40^\circ/\beta 290^\circ$, u, r, CLAY, trace CA and Py 134.67 JT, $\alpha 32^\circ/\beta 340^\circ$, u, r, CLAY, trace CA and Py		135	
	135.2							PQTT			TCR: 100 RQD: 91		/	135.10 JT, $\alpha 60^\circ/\beta 320^\circ$, u, r, CA 135.80 JT, $\alpha 10^\circ/\beta 70^\circ$, u, r, CA, trace CLAY		136	
	136.2							PQTT			TCR: 100 RQD: 97		/	136.30 JT, $\alpha 45^\circ/\beta 340^\circ$, u, sl, CA, trace CLAY 136.40 JT, $\alpha 30^\circ/\beta 320^\circ$, u, sl, CA, trace CLAY 136.47 VN, $\alpha 40^\circ/\beta 315^\circ$, u, r, Py, trace sulphides 136.53 VN, $\alpha 35^\circ/\beta 325^\circ$, u, r, Py, trace sulphides 136.86 JT, $\alpha 75^\circ/\beta 240^\circ$, u, r, CA 137.40 JT, $\alpha 30^\circ/\beta 140^\circ$, u, r, CLAY, trace other sulphides 137.45 JT, $\alpha 40^\circ/\beta 40^\circ$, u, r, CLAY, trace CA and other sulphides		137	
	137.2							PQTT			TCR: 100 RQD: 96		/	137.94 JT, $\alpha 78^\circ/\beta 150^\circ$, u, r, CA 138.88 JT, $\alpha 56^\circ/\beta 295^\circ$, u, r, CA, trace CLAY 139.05 VN, $\alpha 48^\circ/\beta 350^\circ$, u, r, Py, trace CA and other sulphides 139.11 JT, $\alpha 70^\circ/\beta 121^\circ$, u, r, Py, trace CA 139.59 JT, $\alpha 55^\circ/\beta 305^\circ$, u, r, CA, trace Py		138	
	138.2							PQTT					/			139	

Notes and Comments:

End of Hole @ 706.8m

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Riq 85

Date	Time	Reading (mbal)	Hole depth (mbal)
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Refer to explanation sheets for abbreviation and symbols.

GHD		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 15 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
157			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) calcite veins with pale grey alteration halos; some gravel to boulder sized inclusions of red (hematite altered) andesite (continued from layer starting at 131.1m)	SW				PQTT			TCR: 100 RQD: 100		140.00 JT, $\alpha 30^\circ / \beta 248^\circ$, u, sl, CLAY, trace Py, CA and other sulphides 140.23 JT, $\alpha 62^\circ / \beta 230^\circ$, u, r, CA			
141								PQTT			TCR: 100 RQD: 100		141.02 JT, $\alpha 58^\circ / \beta 226^\circ$, u, r, Py 141.13 VN, $\alpha 35^\circ / \beta 60^\circ$, u, r, Py, trace other sulphides			
142								PQTT			TCR: 100 RQD: 100		142.30 JT, $\alpha 72^\circ / \beta 65^\circ$, u, r, CA, trace Py 142.40 JT, $\alpha 85^\circ / \beta 75^\circ$, u, r, CA			
143								PQTT			TCR: 100 RQD: 100		143.33 VN, $\alpha 50^\circ / \beta 30^\circ$, u, r, Py, trace other sulphides 143.60 VN, $\alpha 55^\circ / \beta 0^\circ$, u, r, CA 143.75 VN, $\alpha 22^\circ / \beta 270^\circ$, u, r, CA			
144								PQTT			TCR: 100 RQD: 100		144.00 JT, $\alpha 47^\circ / \beta 335^\circ$, u, r, CA, trace CLAY			
145			Moderately weathered; grey; clay altered ANDESITE; moderately strong; pyrite disseminated; recovered partially as gravel sized fragments	WAIPU FORMATION				PQTT			TCR: 100 RQD: 100		144.60 JT, $\alpha 50^\circ / \beta -$, u, r, CLAY			
146								PQTT			TCR: 100 RQD: 100		146.20 JT, $\alpha 30^\circ / \beta -$, u, r, CA, trace CLAY 146.42 JT, $\alpha 40^\circ / \beta -$, u, r, CA, trace CLAY			
147								PQTT			TCR: 100 RQD: 100					
148			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) with pale grey alteration halos	SW				PQTT			TCR: 100 RQD: 95		148.04 JT, $\alpha 40^\circ / \beta 15^\circ$, u, sl, CLAY, trace Py 148.12 VN, $\alpha 60^\circ / \beta 330^\circ$, u, r, Py, trace other sulphides			
149								PQTT			TCR: 100 RQD: 100		149.55 JT, $\alpha 65^\circ / \beta 240^\circ$, u, r, CN			
Notes and Comments: End of Hole @ 706.8m				Inclination: -20° Orientation: 301°				Ground Water Level								
Refer to explanation sheets for abbreviation and symbols.				Contractor: Alton Drilling Equipment: Rig 85				Date				Time				
								Reading (mbgl)				Hole depth (mbgl)				

GHD		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 16 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS										
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY																		
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level						
151			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) with pale grey alteration halos (continued from layer starting at 148.0m)	WAIPU FORMATION	SW			PQTT						150.00 JT, $\alpha 12^\circ / \beta 320^\circ$, u, r, CLAY, trace Py		150						
151								PQTT			TCR: 100 RQD: 100			150.60 JT, $\alpha 60^\circ / \beta 290^\circ$, u, r, CLAY		151						
152								PQTT			TCR: 100 RQD: 100			151.00 JT, $\alpha 40^\circ / \beta 285^\circ$, u, r, CA 151.11 JT, $\alpha 40^\circ / \beta 285^\circ$, u, r, CLAY 151.25 JT, $\alpha 45^\circ / \beta 320^\circ$, u, r, CLAY 151.40 JT, $\alpha 38^\circ / \beta 290^\circ$, u, r, CLAY, trace Py and CA		152						
153								PQTT			TCR: 100 RQD: 100			152.07 VN, $\alpha 20^\circ / \beta 135^\circ$, u, r, CA, trace Mn 152.45 JT, $\alpha 70^\circ / \beta 320^\circ$, u, r, CA, trace CLAY		153						
154								PQTT			TCR: 100 RQD: 94			153.59 VN, $\alpha 15^\circ / \beta 322^\circ$, u, r, Py, trace CLAY and other sulphides 154.10 JT, $\alpha 60^\circ / \beta 200^\circ$, u, r, CA, trace CLAY		154						
155								PQTT			TCR: 100 RQD: 100			154.52 JT, $\alpha 68^\circ / \beta 110^\circ$, u, r, CA 154.58 JT, $\alpha 70^\circ / \beta 300^\circ$, u, r, CA 154.61 JT, $\alpha 60^\circ / \beta 160^\circ$, u, r, CA 154.93 VN, $\alpha 40^\circ / \beta 240^\circ$, u, r, CA		155						
156								PQTT			TCR: 100 RQD: 100			155.15 JT, $\alpha 12^\circ / \beta 320^\circ$, u, sl, CLAY, trace Py and other sulphides 155.40 JT, $\alpha 55^\circ / \beta -$, u, r, CA, trace Py 155.67 JT, $\alpha 81^\circ / \beta -$, u, r, CA		156						
157								PQTT			TCR: 100 RQD: 99			156.00 JT, $\alpha 40^\circ / \beta -$, u, r, CA, trace Py 156.40 VN, $\alpha 80^\circ / \beta -$, u, r, CA, unable to ori 156.91 JT, $\alpha 55^\circ / \beta 320^\circ$, u, r, CA, trace CLAY 156.93 JT, $\alpha 65^\circ / \beta 340^\circ$, u, r, CA, trace CLAY 157.20 JT, $\alpha 50^\circ / \beta 130^\circ$, u, r, CA 157.55 JT, $\alpha 10^\circ / \beta 300^\circ$, u, r, CA		157						
158								PQTT			TCR: 100 RQD: 100			158.25 - 158.45 SZ, $\alpha 42^\circ / \beta 280^\circ$, u, r, CLAY, trace gravel and sand sized fragments of andesite 158.45 VN, $\alpha 30^\circ / \beta 350^\circ$, u, r, CA		158						
159								PQTT			TCR: 93 RQD: 100					159						
Notes and Comments: End of Hole @ 706.8m							Inclination: -20° Orientation: 301°				Ground Water Level											
Refer to explanation sheets for abbreviation and symbols.							Contractor: Alton Drilling Equipment: Rig 85				<table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Reading (mbgl)</th> <th>Hole depth (mbgl)</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Date	Time	Reading (mbgl)	Hole depth (mbgl)				
											Date	Time	Reading (mbgl)	Hole depth (mbgl)								

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021						Hole No. : WNDD011 Sheet : 17 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS								
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			CORE LOSS 0.1m Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) calcite veins	WAIPU FORMATION SW				PQTT			TCR: 93 RQD: 100			160.15 JT, $\alpha 50^\circ/\beta -$, u, r, CA		
								PQTT				TCR: 100 RQD: 88				161.10 JT, $\alpha 50^\circ/\beta 305^\circ$, u, r, CLAY
								PQTT				TCR: 100 RQD: 97				161.53 JT, $\alpha 10^\circ/\beta 290^\circ$, u, r, CA 161.60 JT, $\alpha 10^\circ/\beta 280^\circ$, u, r, CA 161.62 JT, $\alpha 10^\circ/\beta 245^\circ$, u, r, CA, trace Py 161.70 JT, $\alpha 85^\circ/\beta 280^\circ$, u, r, CA
								PQTT				TCR: 100 RQD: 96				162.58 VN, $\alpha 20^\circ/\beta -$, u, r, Py, trace other sulphides 162.95 - 163.04 SS, $\alpha 30^\circ/\beta -$, u, r, CA, trace gravel and sand sized fragments of andesite 163.20 JT, $\alpha 30^\circ/\beta -$, u, r, CA 163.25 JT, $\alpha 50^\circ/\beta -$, u, r, CA 163.37 JT, $\alpha 15^\circ/\beta -$, u, r, CLAY, trace Py 163.50 JT, $\alpha 38^\circ/\beta -$, u, r, CA
								PQTT				TCR: 100 RQD: 100				164.17 JT, $\alpha 60^\circ/\beta 70^\circ$, u, sl, CLAY, trace Py and other sulphides 164.79 JT, $\alpha 80^\circ/\beta 200^\circ$, u, r, CA
								PQTT				TCR: 100 RQD: 96				165.25 - 165.49 SZ, $\alpha 30^\circ/\beta -$, u, r, CLAY, trace gravel and sand sized fragments of andesite, unable to ori 165.55 JT, $\alpha 30^\circ/\beta -$, u, r, CA 165.81 JT, $\alpha 80^\circ/\beta -$, u, r, CA
								PQTT				TCR: 100 RQD: 100				166.50 VN, $\alpha 38^\circ/\beta 300^\circ$, u, r, CA
								PQTT				TCR: 100 RQD: 100				167.30 JT, $\alpha 40^\circ/\beta 190^\circ$, u, r, CA 167.40 JT, $\alpha 30^\circ/\beta 200^\circ$, u, r, CA
								PQTT				TCR: 100 RQD: 95				167.72 VN, $\alpha 68^\circ/\beta 230^\circ$, u, r, CA 167.80 JT, $\alpha 18^\circ/\beta -$, u, r, CA, trace Py 168.09 JT, $\alpha 40^\circ/\beta 200^\circ$, u, r, CN 168.20 JT, $\alpha 32^\circ/\beta 230^\circ$, u, r, CA 168.40 JT, $\alpha 55^\circ/\beta 40^\circ$, u, r, CA 168.60 JT, $\alpha 55^\circ/\beta 220^\circ$, u, r, CA, trace Py
								PQTT				TCR: 100 RQD: 100				169.00 JT, $\alpha 60^\circ/\beta 20^\circ$, u, r, Py, trace CLAY 169.20 VN, $\alpha 38^\circ/\beta 30^\circ$, u, r, Py, trace CA
Notes and Comments: End of Hole @ 706.8m			Inclination: -20° Orientation: 301°						Ground Water Level							
Refer to explanation sheets for abbreviation and symbols.			Contractor: Alton Drilling Equipment: Rig 85						Date	Time	Reading (mbgl)	Hole depth (mbgl)				

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 18 of 71 Hole Length : 706.8 Scale @ A4 : 1:50																					
		Easting: 2762594 Northing: 6424371 System: NZMG 1949 Method: SURVEY Datum: NZVD2016										Logged : HJ Processed : HJ Checked : JHS																					
RL (m)		Depth (m)		Graphic		Material Description		Geological Unit		Weathering		Sample / Test		Casing		Method		Flush Return (%)		Estimated Strength (MPa)		TCR RQD SCR (%)		Defect Spacing (mm)		Visual Defect		Description (and sub Detail)		Instrumentation Installation		Water level	
170.8						Slightly weathered; pale grey; ANDESITE; moderately strong; pyrite disseminated; intense alteration halos around defects (continued from layer starting at 169.6m)		SW								PQTT						TCR: 100 RQD: 100						170.00 VN, $\alpha 20^\circ / \beta 295^\circ$, u, r, Py, trace CA and Mn				170	
171						Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) calcite veins with pale grey alteration halos		SW								PQTT						TCR: 100 RQD: 97						171.95 JT, $\alpha 18^\circ / \beta 275^\circ$, u, r, CA 172.00 JT, $\alpha 32^\circ / \beta 155^\circ$, u, r, CA				171	
172								SW								PQTT						TCR: 100 RQD: 94						172.90 JT, $\alpha 80^\circ / \beta 350^\circ$, u, r, CN 173.11 JT, $\alpha 18^\circ / \beta -$, u, r, CA 173.20 JT, $\alpha 70^\circ / \beta 270^\circ$, u, r, CA				172	
173								SW								PQTT						TCR: 100 RQD: 100						173.60 JT, $\alpha 40^\circ / \beta 0^\circ$, u, r, CA				173	
174								SW								PQTT						TCR: 100 RQD: 100						175.00 JT, $\alpha 30^\circ / \beta 220^\circ$, u, r, CA 175.25 VN, $\alpha 79^\circ / \beta 110^\circ$, u, r, CA				174	
175								SW								PQTT						TCR: 100 RQD: 100						175.77 JT, $\alpha 60^\circ / \beta 170^\circ$, u, r, CA 176.14 JT, $\alpha 65^\circ / \beta 240^\circ$, u, r, CA 176.29 JT, $\alpha 60^\circ / \beta 80^\circ$, u, r, CA				175	
176								SW								PQTT						TCR: 100 RQD: 100						178.80 JT, $\alpha 80^\circ / \beta -$, u, r, Py, trace CA 179.00 VN, $\alpha 11^\circ / \beta -$, u, r, Py				176	
177								SW								PQTT						TCR: 100 RQD: 100						179.45 JT, $\alpha 30^\circ / \beta -$, u, r, CA				177	
178								SW								PQTT						TCR: 100 RQD: 100										178	
179								SW								PQTT						TCR: 100 RQD: 100										179	
180								SW								PQTT						TCR: 100 RQD: 100										180	
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.										Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85										Ground Water Level													
										Date		Time		Reading (mbgl)		Hole depth (mbgl)																	

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 19 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-6 mm) calcite veins with pale grey alteration halos (continued from layer starting at 178.0m)	SW				PQTT			TCR: 100 RQD: 100			180.00 JT, $\alpha 60^\circ / \beta 70^\circ$, u, r, CA		180
143	181													181.25 JT, $\alpha 48^\circ / \beta 210^\circ$, u, r, CA		181
	182							PQTT				TCR: 100 RQD: 100		181.70 VN, $\alpha 12^\circ / \beta 340^\circ$, u, r, CA, trace Py 182.07 JT, $\alpha 62^\circ / \beta 60^\circ$, u, r, CN		182
	183													182.41 JT, $\alpha 65^\circ / \beta 82^\circ$, u, r, CA 182.64 JT, $\alpha 60^\circ / \beta 100^\circ$, u, r, CA 182.78 JT, $\alpha 80^\circ / \beta 90^\circ$, u, r, CN		183
	184							PQTT				TCR: 100 RQD: 100		183.33 VN, $\alpha 30^\circ / \beta 287^\circ$, u, r, CA, trace Py 183.95 JT, $\alpha 50^\circ / \beta 230^\circ$, u, r, CA 184.18 VN, $\alpha 30^\circ / \beta 320^\circ$, u, r, CA, trace Py and other sulphides 184.36 JT, $\alpha 79^\circ / \beta 70^\circ$, u, r, CN		184
	185							PQTT				TCR: 100 RQD: 100		184.91 VN, $\alpha 72^\circ / \beta 80^\circ$, u, r, CA 185.21 JT, $\alpha 79^\circ / \beta 225^\circ$, u, r, CA		185
	186													185.60 VN, $\alpha 82^\circ / \beta 310^\circ$, u, r, CA 185.82 VN, $\alpha 78^\circ / \beta 335^\circ$, u, r, CA		186
141	187							PQTT				TCR: 100 RQD: 100		186.46 JT, $\alpha 45^\circ / \beta 240^\circ$, u, r, CA 186.74 JT, $\alpha 60^\circ / \beta 290^\circ$, u, r, CA 186.90 JT, $\alpha 75^\circ / \beta$ -, u, r, CA		187
	188							PQTT				TCR: 100 RQD: 99		187.40 JT, $\alpha 70^\circ / \beta 30^\circ$, u, r, CA 187.80 JT, $\alpha 45^\circ / \beta$ -, u, r, CA 187.82 JT, $\alpha 45^\circ / \beta$ -, u, r, CA 188.00 JT, $\alpha 40^\circ / \beta$ -, u, sm, CA		188
	189				MW				PQTT			TCR: 100 RQD: 100		188.65 JT, $\alpha 40^\circ / \beta$ -, u, r, CA 189.50 JT, $\alpha 20^\circ / \beta$ -, u, r, CA, trace Py 189.62 JT, $\alpha 22^\circ / \beta$ -, u, sm, CA, trace Py		189
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level				
Refer to explanation sheets for abbreviation and symbols.				Contractor: Alton Drilling				Date		Time		Reading (mbgl)		Hole depth (mbgl)		
				Equipment: Rig 85												

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 20 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS						
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY														
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level		
191			Moderately weathered; pale grey; ANDESITE; moderately strong; pyrite disseminated; clay and pyrite altered; alteration halos around defects (continued from layer starting at 186.0m)	MW				PQTT			TCR: 100 RQD: 100			189.90 JT, $\alpha 72^\circ / \beta 100^\circ$, u, r, CA 190.45 JT, $\alpha 20^\circ / \beta 320^\circ$, u, r, Py, trace CLAY and other sulphides				
192			CORE LOSS 0.2m					PQTT			TCR: 71 RQD: 100			191.22 JT, $\alpha 81^\circ / \beta 330^\circ$, u, r, CA 191.38 JT, $\alpha 60^\circ / \beta 190^\circ$, u, r, CN, trace Py				
193			Moderately weathered; pale grey; ANDESITE; moderately strong; pyrite disseminated; clay and pyrite altered; alteration halos around defects					PQTT			TCR: 100 RQD: 100			192.00 JT, $\alpha 70^\circ / \beta 175^\circ$, u, r, CN, trace Py 193.08 JT, $\alpha 68^\circ / \beta 140^\circ$, u, r, CN, trace Py 193.47 JT, $\alpha 82^\circ / \beta 135^\circ$, u, r, CN, trace Py				
194								PQTT			TCR: 100 RQD: 100							
195				SW				PQTT			TCR: 100 RQD: 100							
196			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic					PQTT			TCR: 100 RQD: 100			195.90 JT, $\alpha 80^\circ / \beta -$, u, r, CA 196.00 - 196.06 SS, $\alpha 78^\circ / \beta 190^\circ$, u, r, CLAY, trace gravel and sand sized fragments of andesite; CA at boundaries 196.27 JT, $\alpha 71^\circ / \beta 230^\circ$, u, r, CA 196.50 JT, $\alpha 36^\circ / \beta 260^\circ$, u, r, CA				
197								PQTT			TCR: 100 RQD: 94			197.03 JT, $\alpha 42^\circ / \beta -$, u, r, CA 197.12 - 197.16 SS, $\alpha 45^\circ / \beta 250^\circ$, u, r, CA, trace Py 197.27 JT, $\alpha 50^\circ / \beta 270^\circ$, u, r, CA 197.53 JT, $\alpha 72^\circ / \beta 230^\circ$, u, r, CA, trace Py and other sulphides				
198								PQTT			TCR: 100 RQD: 94			197.90 JT, $\alpha 35^\circ / \beta 225^\circ$, u, r, CA				
199				MW				PQTT			TCR: 100 RQD: 94			198.90 JT, $\alpha 80^\circ / \beta 320^\circ$, u, r, CA 198.99 JT, $\alpha 80^\circ / \beta 200^\circ$, u, r, CA				
			Moderately weathered; pale grey; clay altered ANDESITE; moderately strong; pyrite disseminated; non magnetic											199.30 JT, $\alpha 22^\circ / \beta 350^\circ$, u, sl, CLAY, trace CA 199.60 JT, $\alpha 18^\circ / \beta 10^\circ$, u, r, CLAY, trace CA 199.70 VN, $\alpha 8^\circ / \beta 236^\circ$, u, r, CA,				
Notes and Comments: End of Hole @ 706.8m																		
Refer to explanation sheets for abbreviation and symbols.																		
Inclination: -20° Orientation: 301° Ground Water Level																		
Contractor: Alton Drilling																		
Equipment: Rig 85																		
Date Time Reading (mbgl) Hole depth (mbgl)																		

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 21 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Moderately weathered; pale grey; clay altered ANDESITE; moderately strong; pyrite disseminated; non magnetic (continued from layer starting at 199.2m)	WAIPUPO FORMATION	MW			PQTT			TCR: 100 RQD: 100			trace Py 200.40 JT, $\alpha 40^\circ / \beta 240^\circ$, u, r, CN		
			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic					PQTT			TCR: 100 RQD: 99			200.90 JT, $\alpha 60^\circ / \beta 250^\circ$, u, r, CA 201.20 JT, $\alpha 50^\circ / \beta$ -, u, r, CA 201.32 JT, $\alpha 62^\circ / \beta$ -, u, r, CN 201.70 JT, $\alpha 80^\circ / \beta$ -, u, r, CA 201.72 VN, $\alpha 22^\circ / \beta$ -, u, r, CA 201.97 JT, $\alpha 60^\circ / \beta$ -, u, r, CA 202.04 JT, $\alpha 58^\circ / \beta$ -, u, r, CA		
				SW			PQTT			TCR: 100 RQD: 95			203.16 JT, $\alpha 60^\circ / \beta$ -, u, r, CA 203.30 JT, $\alpha 62^\circ / \beta$ -, u, r, CA 203.66 JT, $\alpha 35^\circ / \beta$ -, u, r, Py, trace CA 203.80 JT, $\alpha 55^\circ / \beta$ -, u, r, CA 204.10 JT, $\alpha 50^\circ / \beta 10^\circ$, u, r, CN 204.30 JT, $\alpha 80^\circ / \beta 80^\circ$, u, r, CN 204.44 JT, $\alpha 70^\circ / \beta 10^\circ$, u, r, CN 204.66 JT, $\alpha 75^\circ / \beta 160^\circ$, u, r, CN			
			Moderately weathered; pale grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic				PQTT			TCR: 100 RQD: 100			204.90 JT, $\alpha 58^\circ / \beta 155^\circ$, u, r, CN 205.00 JT, $\alpha 40^\circ / \beta 340^\circ$, u, r, CN 205.06 JT, $\alpha 18^\circ / \beta 340^\circ$, u, r, CA, trace CLAY 205.70 VN, $\alpha 40^\circ / \beta 320^\circ$, u, r, Py, trace other sulphides 205.90 VN, $\alpha 18^\circ / \beta 310^\circ$, u, r, Py, trace other sulphides			
							PQTT			TCR: 100 RQD: 96			206.40 VN, $\alpha 8^\circ / \beta 290^\circ$, u, r, Py, trace other sulphides			
			CORE LOSS 0.4m	MW				PQTT			TCR: 67 RQD: 100					
			Moderately weathered; pale grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic					PQTT			TCR: 100 RQD: 100					
			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic	SW				PQTT			TCR: 100 RQD: 100					
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.				Inclination: -20° Contractor: Alton Drilling Equipment: Rig 85				Orientation: 301°				Ground Water Level				
												Date	Time	Reading (mbgl)		Hole depth (mbgl)

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 22 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY											
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
133			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic (continued from layer starting at 209.0m)	SW				PQTT			TCR: 100 RQD: 100		210.10 JT, $\alpha 19^\circ / \beta 280^\circ$, u, r, CLAY, trace CA 210.74 JT, $\alpha 60^\circ / \beta 130^\circ$, u, r, Py			210	
211																	212
212			Moderately weathered; pale grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic	MW				PQTT			TCR: 100 RQD: 100		211.88 JT, $\alpha 60^\circ / \beta -$, u, r, CN, trace Py			212	
213																	214
214			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm)	WAIPU FORMATION SW				PQTT			TCR: 100 RQD: 100		215.13 JT, $\alpha 55^\circ / \beta 300^\circ$, u, r, CA, trace Py 215.28 VN, $\alpha 68^\circ / \beta 300^\circ$, u, r, CA 215.40 VN, $\alpha 80^\circ / \beta 290^\circ$, u, r, CA 215.49 JT, $\alpha 75^\circ / \beta 280^\circ$, u, r, CA 215.58 JT, $\alpha 72^\circ / \beta 150^\circ$, u, r, CN 215.92 JT, $\alpha 65^\circ / \beta 100^\circ$, u, r, CA 216.07 JT, $\alpha 70^\circ / \beta 60^\circ$, u, r, CN 216.43 JT, $\alpha 52^\circ / \beta 130^\circ$, u, r, CA 216.87 JT, $\alpha 80^\circ / \beta 170^\circ$, u, r, CA, trace Py 217.05 JT, $\alpha 50^\circ / \beta 220^\circ$, u, r, CN 217.37 JT, $\alpha 45^\circ / \beta 200^\circ$, u, r, CN, trace CA 217.56 JT, $\alpha 82^\circ / \beta 56^\circ$, u, r, CA, trace CLAY 218.73 JT, $\alpha 82^\circ / \beta 60^\circ$, u, r, CN 219.10 JT, $\alpha 80^\circ / \beta 70^\circ$, u, r, CN			215	
215																	216
216								PQTT			TCR: 100 RQD: 89						216
217								PQTT			TCR: 100 RQD: 100						217
218								PQTT			TCR: 100 RQD: 100						218
219								PQTT			TCR: 100 RQD: 100						219
220								PQTT			TCR: 100 RQD: 100			219.87 JT, $\alpha 70^\circ / \beta -$, u, r, CA, trace			220
Notes and Comments: End of Hole @ 706.8m										Inclination: -20°		Orientation: 301°		Ground Water Level			
										Contractor: Alton Drilling				Date	Time	Reading (mbgl)	Hole depth (mbgl)
										Equipment: Rig 85							
Refer to explanation sheets for abbreviation and symbols.																	

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 23 of 71 Hole Length : 706.8 Scale @ A4 : 1:50				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY		Logged : HJ Processed : HJ Checked : JHS										
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some randomly orientated calcite veins (2-6 mm) (continued from layer starting at 215.5m)	WAIPU FORMATION SW				PQTT			TCR: 100 RQD: 100			Py		
221								PQTT			TCR: 100 RQD: 100			221.00 JT, $\alpha 71^\circ / \beta -, u, r, CA$		
222								PQTT			TCR: 100 RQD: 100			221.30 JT, $\alpha 75^\circ / \beta -, u, r, CA$		
223								PQTT			TCR: 100 RQD: 100					
224								PQTT			TCR: 100 RQD: 100					
225								PQTT			TCR: 100 RQD: 100					
226								PQTT			TCR: 100 RQD: 100			225.90 VN, $\alpha 45^\circ / \beta -, st, r, CA$		
227								PQTT			TCR: 100 RQD: 100			226.20 - 226.40 SZ, $\alpha 12^\circ / \beta 255^\circ, u, r, CLAY, trace Py and CA; gravel sized fragments of host rock$		
227.25								PQTT			TCR: 100 RQD: 100			226.60 JT, $\alpha 39^\circ / \beta 260^\circ, u, r, CLAY, trace CA$		
228								PQTT			TCR: 100 RQD: 98			227.02 JT, $\alpha 50^\circ / \beta 230^\circ, u, r, CA$ 227.05 JT, $\alpha 65^\circ / \beta 230^\circ, u, r, CA$		
229			Slightly weathered; dark grey; porphyritic ANDESITE; strong; slightly magnetic; chlorite present; pyrite at defect boundaries				PQTT			TCR: 100 RQD: 88			227.44 JT, $\alpha 65^\circ / \beta 260^\circ, u, r, CA$ 227.75 JT, $\alpha 72^\circ / \beta 272^\circ, u, r, CA$ 228.17 JT, $\alpha 50^\circ / \beta 252^\circ, u, r, CA$ 228.43 JT, $\alpha 50^\circ / \beta 250^\circ, u, r, CA$ 228.52 JT, $\alpha 50^\circ / \beta 60^\circ, u, r, CA$ 228.73 JT, $\alpha 63^\circ / \beta 240^\circ, u, r, CA$ 228.96 JT, $\alpha 60^\circ / \beta 250^\circ, u, r, CA$ 229.16 JT, $\alpha 80^\circ / \beta 40^\circ, u, r, CA$ 229.25 VN, $\alpha 55^\circ / \beta 255^\circ, u, r, CA$ 229.47 JT, $\alpha 35^\circ / \beta 260^\circ, u, r, CA$			
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level				
				Contractor: Alton Drilling				Date				Time				
				Equipment: Rig 85				Reading (mbgl)				Hole depth (mbgl)				
Refer to explanation sheets for abbreviation and symbols.																

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 24 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
230	231		Slightly weathered; dark grey; porphyritic ANDESITE; strong; slightly magnetic; chlorite present; pyrite at defect boundaries (continued from layer starting at 227.3m)	SW				PQTT			TCR: 100 RQD: 100			230.00 JT, $\alpha 40^\circ / \beta 200^\circ$, u, r, CA 230.32 JT, $\alpha 75^\circ / \beta 40^\circ$, u, r, CN 230.59 JT, $\alpha 52^\circ / \beta 210^\circ$, u, r, CA, trace QZ 230.98 JT, $\alpha 80^\circ / \beta 100^\circ$, u, r, CN 231.12 JT, $\alpha 70^\circ / \beta 140^\circ$, st, r, CN		
232	233		Moderately weathered; pale grey; ANDESITE; weak; intense hydrothermal alteration to ground mass; disseminated pyrite; frequent pyrite/sulphide and randomly orientated calcite veins (<2mm) CORE LOSS 0.2m					PQTT			TCR: 87 RQD: 100			231.70 JT, $\alpha 35^\circ / \beta 110^\circ$, u, r, CA, trace Py 232.20 - 232.80 VN, $\alpha 12^\circ / \beta 235^\circ$, u, r, CLAY, trace sulphides		
234	235		Moderately weathered; pale grey; ANDESITE; weak; intense hydrothermal alteration to ground mass; disseminated pyrite; frequent pyrite/sulphide and randomly orientated calcite veins (<2mm)	MW				PQTT			TCR: 100 RQD: 100			233.50 VN, $\alpha 5^\circ / \beta -$, u, r, CLAY, trace sulphides		
236	237							PQTT			TCR: 100 RQD: 100					
238	239		Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong	SW				PQTT			TCR: 100 RQD: 100			239.30 - 239.80 VN, $\alpha 10^\circ / \beta 210^\circ$, u, r, CA, trace Py and other sulphides 239.85 JT, $\alpha 60^\circ / \beta 70^\circ$, st, r, CA		
Notes and Comments: End of Hole @ 706.8m				Inclination: -20° Orientation: 301°				Ground Water Level								
Refer to explanation sheets for abbreviation and symbols.				Contractor: Alton Drilling Equipment: Rig 85				Date				Time				
				Reading (mbgl)				Hole depth (mbgl)								

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 25 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong (continued from layer starting at 237.3m)	WAIUPU FORMATION SW				PQTT			TCR: 100 RQD: 92			240.43 JT, $\alpha 50^\circ / \beta 280^\circ$, u, r, CN 240.48 JT, $\alpha 35^\circ / \beta 65^\circ$, u, r, Py 240.62 JT, $\alpha 56^\circ / \beta 340^\circ$, u, r, CA 240.93 JT, $\alpha 58^\circ / \beta 280^\circ$, u, r, CN 240.94 JT, $\alpha 58^\circ / \beta 280^\circ$, u, r, CN 241.08 JT, $\alpha 50^\circ / \beta 330^\circ$, u, r, CA, trace CLAY 241.47 JT, $\alpha 48^\circ / \beta 330^\circ$, st, r, Py 241.59 JT, $\alpha 50^\circ / \beta 320^\circ$, u, r, CA, trace CLAY 241.66 JT, $\alpha 45^\circ / \beta 330^\circ$, u, r, CA, trace Py 241.87 - 241.89 SS, $\alpha 50^\circ / \beta 310^\circ$, st, r, CA, trace CLAY 242.13 JT, $\alpha 35^\circ / \beta 70^\circ$, u, r, CA, trace Py 242.19 VN, $\alpha 15^\circ / \beta 80^\circ$, u, r, CA, gravel fragments of andesite 242.34 VN, $\alpha 40^\circ / \beta 50^\circ$, u, r, CA, trace Py 242.41 - 242.42 VN, $\alpha 50^\circ / \beta 50^\circ$, u, r, CA, trace Py 242.63 JT, $\alpha 58^\circ / \beta 330^\circ$, u, r, CA 242.66 VN, $\alpha 35^\circ / \beta 50^\circ$, u, r, CA 242.82 VN, $\alpha 18^\circ / \beta 320^\circ$, u, r, CA 243.60 VN, $\alpha 80^\circ / \beta -$, u, r, CA 243.74 VN, $\alpha 60^\circ / \beta -$, u, r, CA 243.82 JT, $\alpha 40^\circ / \beta -$, u, r, CA 243.90 VN, $\alpha 40^\circ / \beta -$, u, r, CA 243.96 JT, $\alpha 70^\circ / \beta -$, u, r, CA, trace CLAY 244.22 JT, $\alpha 50^\circ / \beta -$, u, r, CA			
241									PQTT			TCR: 100 RQD: 89			245.26 VN, $\alpha 60^\circ / \beta -$, u, r, CA		
242									PQTT			TCR: 100 RQD: 100			245.90 VN, $\alpha 15^\circ / \beta 300^\circ$, u, r, CA, trace Py 246.20 VN, $\alpha 25^\circ / \beta 30^\circ$, u, r, CA, trace Py 246.43 JT, $\alpha 65^\circ / \beta 320^\circ$, u, r, CA 246.70 JT, $\alpha 30^\circ / \beta 240^\circ$, u, r, CA		
243									PQTT			TCR: 100 RQD: 85			247.10 JT, $\alpha 75^\circ / \beta 330^\circ$, u, r, CA 247.22 JT, $\alpha 50^\circ / \beta 220^\circ$, u, r, CA, trace Py 247.40 - 247.50 SS, $\alpha 45^\circ / \beta 220^\circ$, u, r, CLAY, trace CA and Py 247.66 VN, $\alpha 25^\circ / \beta 220^\circ$, u, r, CA, trace QZ and Py 248.05 JT, $\alpha 50^\circ / \beta 220^\circ$, u, r, CA		
244									PQTT			TCR: 100 RQD: 96			248.26 JT, $\alpha 50^\circ / \beta 220^\circ$, u, r, CA, trace Py 248.44 JT, $\alpha 40^\circ / \beta 100^\circ$, u, r, CA, trace Py 248.80 JT, $\alpha 80^\circ / \beta 300^\circ$, u, r, CA 248.86 JT, $\alpha 40^\circ / \beta 60^\circ$, u, r, CA		
245									PQTT			TCR: 100 RQD: 100			249.70 VN, $\alpha 20^\circ / \beta 300^\circ$, u, r, CA 249.80 VN, $\alpha 15^\circ / \beta 310^\circ$, u, r, CA,		
246									PQTT								
247									PQTT								
248									PQTT								
249									PQTT								
Notes and Comments: End of Hole @ 706.8m								Inclination: -20° Orientation: 301°				Ground Water Level					
Refer to explanation sheets for abbreviation and symbols.								Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)		

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 26 of 71 Hole Length : 706.8 Scale @ A4 : 1:50					
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY			Logged : HJ Processed : HJ Checked : JHS									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level		
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong (continued from layer starting at 237.3m)	WAIUPU FORMATION	SW			PQTT			TCR: 100 RQD: 100			trace Py and other sulphides 250.13 JT, $\alpha 40^\circ / \beta 210^\circ$, u, r, CA 250.60 JT, $\alpha 50^\circ / \beta 40^\circ$, u, r, CN 251.09 - 251.11 SS, $\alpha 88^\circ / \beta 30^\circ$, u, r, CLAY, trace Py and CA; gravel fragments 251.23 VN, $\alpha 80^\circ / \beta 160^\circ$, u, r, CA 251.32 JT, $\alpha 40^\circ / \beta 180^\circ$, u, r, CA 251.43 JT, $\alpha 70^\circ / \beta 180^\circ$, u, r, CA 252.53 JT, $\alpha 60^\circ / \beta -$, u, r, CA 252.58 JT, $\alpha 60^\circ / \beta -$, u, r, CA 252.70 JT, $\alpha 70^\circ / \beta -$, u, r, CA 252.80 JT, $\alpha 50^\circ / \beta -$, u, r, CN 252.95 JT, $\alpha 30^\circ / \beta 330^\circ$, u, r, CA 253.12 - 253.13 SS, $\alpha 50^\circ / \beta 300^\circ$, CLAY 253.32 JT, $\alpha 30^\circ / \beta 60^\circ$, u, sm, CLAY 253.40 JT, $\alpha 32^\circ / \beta 10^\circ$, u, sm, CLAY 253.86 VN, $\alpha 55^\circ / \beta 350^\circ$, u, r, CA 253.90 VN, $\alpha 38^\circ / \beta 10^\circ$, u, r, CA 254.22 JT, $\alpha 50^\circ / \beta 260^\circ$, st, r, CA 254.34 VN, $\alpha 22^\circ / \beta 270^\circ$, u, r, CA 254.36 JT, $\alpha 45^\circ / \beta 40^\circ$, st, r, CA 254.55 JT, $\alpha 42^\circ / \beta 70^\circ$, u, r, CA 256.40 VN, $\alpha 20^\circ / \beta 100^\circ$, u, r, CA, trace other sulphides 256.50 JT, $\alpha 60^\circ / \beta 340^\circ$, u, r, CN 256.64 JT, $\alpha 50^\circ / \beta 110^\circ$, st, r, CN 256.94 JT, $\alpha 58^\circ / \beta 250^\circ$, u, r, CA 257.75 JT, $\alpha 45^\circ / \beta 330^\circ$, u, r, CA 257.90 VN, $\alpha 32^\circ / \beta 308^\circ$, u, r, CA, trace Py 258.07 VN, $\alpha 30^\circ / \beta 310^\circ$, u, r, CA, trace Py 258.36 JT, $\alpha 25^\circ / \beta 240^\circ$, u, r, CN 258.70 JT, $\alpha 72^\circ / \beta 200^\circ$, u, r, CN 258.80 JT, $\alpha 60^\circ / \beta 220^\circ$, u, r, CA 258.85 JT, $\alpha 65^\circ / \beta 300^\circ$, u, r, CA 259.04 JT, $\alpha 50^\circ / \beta 130^\circ$, u, r, CN 259.29 JT, $\alpha 55^\circ / \beta 150^\circ$, u, r, CA 259.38 JT, $\alpha 20^\circ / \beta 280^\circ$, u, r, CN, trace CA 259.75 - 259.78 SS, $\alpha 51^\circ / \beta 220^\circ$, u, r, CLAY, trace CA				
251										PQTT			TCR: 100 RQD: 94					
252										PQTT			TCR: 100 RQD: 91					
253			253.20 - 253.90 hydrothermal breccia dyke; pale grey; weak							PQTT			TCR: 100 RQD: 96					
254										PQTT			TCR: 100 RQD: 100					
255										PQTT			TCR: 100 RQD: 100					
256										PQTT			TCR: 100 RQD: 100					
257										PQTT			TCR: 100 RQD: 100					
258										PQTT			TCR: 100 RQD: 91					
259										PQTT								
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level						
				Contractor: Alton Drilling								Date						
				Equipment: Rig 85								Time						
												Reading (mbgl)						
												Hole depth (mbgl)						
Refer to explanation sheets for abbreviation and symbols.																		

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 27 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
116			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong (continued from layer starting at 237.3m)	WAIUPU FORMATION SW				PQTT			TCR: 100 RQD: 97		/	and gravel sized fragments of host rock 260.13 VN, $\alpha 45^\circ / \beta 280^\circ$, u, r, CA, trace QZ 260.18 JT, $\alpha 85^\circ / \beta 120^\circ$, st, sm, CA, trace CLAY 260.60 JT, $\alpha 50^\circ / \beta 100^\circ$, st, sm, CA 260.85 JT, $\alpha 58^\circ / \beta 345^\circ$, u, r, CA 261.04 JT, $\alpha 80^\circ / \beta 350^\circ$, u, r, CN		260
261								PQTT			TCR: 100 RQD: 100		/	262.38 JT, $\alpha 80^\circ / \beta 320^\circ$, u, r, CN		261
262								PQTT			TCR: 100 RQD: 100		/			262
115								PQTT			TCR: 100 RQD: 100		/	263.05 - 263.09 SS, $\alpha 40^\circ / \beta -$, u, sl, CLAY, trace sand and gravel sized fragments		263
263								PQTT			TCR: 100 RQD: 100		/	263.80 - 263.90 SS, $\alpha 60^\circ / \beta -$, st, r, CA, hydrothermal brecciation		264
264			Slightly weathered; dark grey; porphyritic ANDESITE; moderately strong; intense hydrothermal veining of calcite through ground mass; some clay altered phenocrysts; trace disseminated pyrite					PQTT			TCR: 100 RQD: 100		/	264.35 - 264.60 VN, $\alpha 78^\circ / \beta -$, u, r, CA, hydrothermal brecciation		265
265								PQTT			TCR: 100 RQD: 100		/	265.50 JT, $\alpha 49^\circ / \beta 280^\circ$, u, r, CA		266
266			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak					PQTT			TCR: 100 RQD: 100		/	266.40 VN, $\alpha 33^\circ / \beta 90^\circ$, u, r, Py, trace other sulphides 266.75 JT, $\alpha 65^\circ / \beta 240^\circ$, u, r, CA, trace Py 267.00 JT, $\alpha 55^\circ / \beta 275^\circ$, u, r, CA, trace Py 267.19 JT, $\alpha 65^\circ / \beta 240^\circ$, u, r, CN		267
267								PQTT			TCR: 87 RQD: 100		/	267.70 VN, $\alpha 40^\circ / \beta -$, u, r, CLAY, closed, sand to fine grained angular rock fragments (dyke)		268
268								PQTT			TCR: 100 RQD: 100		/	269.21 VN, $\alpha 32^\circ / \beta -$, u, r, Py 269.38 JT, $\alpha 81^\circ / \beta -$, u, sl, CLAY		269
269							PQTT									270
Notes and Comments: End of Hole @ 706.8m				Inclination: -20° Orientation: 301°				Ground Water Level								
				Contractor: Alton Drilling Equipment: Rig 85												
Refer to explanation sheets for abbreviation and symbols.																

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 28 of 71 Hole Length : 706.8 Scale @ A4 : 1:50					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY		Logged : HJ Processed : HJ Checked : JHS											
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
271			Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong (continued from layer starting at 268.5m)	SW							TCR: 100 RQD: 100			269.90 VN, $\alpha 32^\circ / \beta 50^\circ$, u, r, CA		270	
272												TCR: 100 RQD: 100				271.70 JT, $\alpha 40^\circ / \beta -$, u, r, CLAY	271
273											TCR: 100 RQD: 100			272.21 JT, $\alpha 38^\circ / \beta -$, u, r, CLAY, trace Py		272	
274			CORE LOSS 0.1m Moderately weathered; grey; porphyritic ANDESITE; weak; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong	WAIPU FORMATION MW							TCR: 93 RQD: 100			274.10 JT, $\alpha 83^\circ / \beta 40^\circ$, u, r, CLAY, trace Py		274	
275												TCR: 100 RQD: 100					275
276												TCR: 100 RQD: 100				276.18 VN, $\alpha 50^\circ / \beta 60^\circ$, u, r, CA, trace QZ	276
277			CORE LOSS 0.1m Moderately weathered; grey; porphyritic ANDESITE; weak; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong									TCR: 93 RQD: 100				276.90 VN, $\alpha 30^\circ / \beta 30^\circ$, u, r, CA, trace QZ	277
278											TCR: 100 RQD: 100			277.50 - 277.95 SZ, $\alpha 20^\circ / \beta -$, st, r, CLAY, possible fault gouge; trace Py and CA, gravel sized fragments of host rock		278	
279											TCR: 100 RQD: 100			279.10 VN, $\alpha 30^\circ / \beta -$, u, r, CA		279	
											TCR: 100 RQD: 100			279.50 VN, $\alpha 15^\circ / \beta 335^\circ$, u, r, CA		280	
Notes and Comments: End of Hole @ 706.8m										Inclination: -20°		Orientation: 301°		Ground Water Level			
Refer to explanation sheets for abbreviation and symbols.										Contractor: Alton Drilling				Date	Time	Reading (mbgl)	Hole depth (mbgl)
										Equipment: Rig 85							

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 29 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
109	281		Moderately weathered; grey; porphyritic ANDESITE; weak; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong (continued from layer starting at 277.1m)	WAIUPU FORMATION MW				PQTT						280.00 JT, $\alpha 20^\circ / \beta 240^\circ$, u, r, CA		280	
								PQTT			TCR: 100 RQD: 100			280.85 JT, $\alpha 30^\circ / \beta 170^\circ$, u, r, CA		281	
	282							PQTT			TCR: 100 RQD: 100			282.70 JT, $\alpha 51^\circ / \beta 260^\circ$, u, r, CLAY, trace CA		282	
	283							PQTT			TCR: 100 RQD: 100			283.47 VN, $\alpha 60^\circ / \beta 180^\circ$, u, r, Py, trace other sulphides 283.65 VN, $\alpha 60^\circ / \beta 200^\circ$, u, r, Py, trace other sulphides		283	
108	284							PQTT			TCR: 100 RQD: 95			284.40 JT, $\alpha 60^\circ / \beta 230^\circ$, u, r, CLAY 284.48 JT, $\alpha 50^\circ / \beta 330^\circ$, u, r, CLAY, trace Py 284.60 JT, $\alpha 55^\circ / \beta 175^\circ$, u, r, CLAY		284	
	285							PQTT			TCR: 100 RQD: 100			285.26 JT, $\alpha 38^\circ / \beta 210^\circ$, u, r, CLAY, trace sulphides		285	
	286							PQTT			TCR: 100 RQD: 100			286.50 - 286.80 SZ, $\alpha 59^\circ / \beta 90^\circ$, u, r, CLAY, possible fault gouge; gravel and sand sized fragments of weathered host rock		286	
	287							PQTT			TCR: 100 RQD: 100					287	
	288							PQTT			TCR: 100 RQD: 100					288	
	289		Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated, sulphide rich; some hydrothermal brecciation through ground mass					PQTT			TCR: 100 RQD: 100					289	
106								PQTT			TCR: 100 RQD: 100					290	
Notes and Comments: End of Hole @ 706.8m								Inclination: -20°				Orientation: 301°		Ground Water Level			
Refer to explanation sheets for abbreviation and symbols.								Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)		



Project : WKP Exploration Tunnel - Ground Investigations

Client : OceanaGold Corporation

Site : Willows Farm, Waihi North,

Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 30 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
291			Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated, sulphide rich; some hydrothermal brecciation through ground mass (continued from layer starting at 288.0m)	WAIPU FORMATION	MW			PQTT			TCR: 100 RQD: 100			290.10 JT, $\alpha 60^\circ / \beta 110^\circ$, u, r, CLAY, trace other sulphides		
292								PQTT			TCR: 100 RQD: 100					
293								PQTT			TCR: 100 RQD: 100					
294								PQTT			TCR: 100 RQD: 100					
295								PQTT			TCR: 100 RQD: 100					
296								PQTT			TCR: 100 RQD: 99			296.44 JT, $\alpha 70^\circ / \beta 335^\circ$, u, sl, Py		
297								PQTT			TCR: 100 RQD: 100			296.94 JT, $\alpha 62^\circ / \beta 330^\circ$, u, sl, CLAY 296.96 JT, $\alpha 50^\circ / \beta 260^\circ$, u, r, CLAY		
298								PQTT			TCR: 100 RQD: 100			297.90 JT, $\alpha 50^\circ / \beta 98^\circ$, u, sl, CLAY		
299								PQTT			TCR: 100 RQD: 100					

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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GHD		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 31 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
300			Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins 300.00 - 300.30 recovered as gravel sized fragments - drilling induced					PQTT									300
301								HQTT			TCR: 100 RQD: 100						301
302								HQTT			TCR: 100 RQD: 100						302
303								HQTT			TCR: 100 RQD: 100						303
304								HQTT			TCR: 100 RQD: 100			303.22 JT, $\alpha 55^\circ/\beta-$, u, r, CN 303.39 JT, $\alpha 45^\circ/\beta-$, u, r, CN, trace CLAY			304
305								HQTT			TCR: 100 RQD: 100			304.87 VN, $\alpha 40^\circ/\beta-$, u, r, CA			305
306								HQTT			TCR: 100 RQD: 100			306.50 VN, $\alpha 30^\circ/\beta-$, u, r, Py			306
307								HQTT			TCR: 100 RQD: 100			307.98 JT, $\alpha 65^\circ/\beta-$, u, r, CA, trace CLAY			307
308								HQTT			TCR: 100 RQD: 100			308.52 JT, $\alpha 18^\circ/\beta-$, u, sl, CLAY			308
309								HQTT			TCR: 100 RQD: 100						309
310								HQTT			TCR: 100 RQD: 100						310

Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.		Inclination: -20°		Orientation: 301°		Ground Water Level			
		Contractor: Alton Drilling Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)		



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 32 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
311.2	311.2		Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins (continued from layer starting at 300.0m)	WAIUPU FORMATION MW				HQTT			TCR: 100 RQD: 100					310
311.6	311.6		CORE LOSS 0.4m													311
312	312		Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins					HQTT			TCR: 87 RQD: 100					312
313.8	313.8		CORE LOSS 1.8m					HQTT			TCR: 14 RQD: 100					313
315.6	315.6		Moderately weathered clay altered ANDESITE: as unit starting 311.6 m					HQTT			TCR: 40 RQD: 100					314
316.3	316.3		CORE LOSS 0.1m					HQTT			TCR: 100 RQD: 100					315
316.5	316.5		Moderately weathered clay altered ANDESITE: as unit starting 311.6 m					HQTT			TCR: 100 RQD: 100					316
317	317		CORE LOSS 0.2m					HQTT			TCR: 100 RQD: 100					317
318	318		Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins					HQTT			TCR: 100 RQD: 100					318
319	319							HQTT			TCR: 100 RQD: 100					319
320	320							HQTT			TCR: 100 RQD: 100					320

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 33 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins (continued from layer starting at 316.3m)					HQTT			TCR: 100 RQD: 100					
	321							HQTT			TCR: 100 RQD: 100			322.07 JT, $\alpha 62^\circ/\beta -$, u, r, CA		
	322							HQTT			TCR: 100 RQD: 100					
	323		323.00 no drilling induced damage/core spins													
	324							HQTT			TCR: 100 RQD: 100			324.85 JT, $\alpha 11^\circ/\beta 20^\circ$, u, sl, CLAY, trace CA		
	325			WAIPU FORMATION MW												
	326													326.15 VN, $\alpha 18^\circ/\beta -$, u, r, CA		
	327							HQTT			TCR: 100 RQD: 100			326.97 JT, $\alpha 50^\circ/\beta -$, u, r, CLAY		
	328													327.65 JT, $\alpha 60^\circ/\beta 25^\circ$, u, r, CLAY, trace CA 327.97 JT, $\alpha 70^\circ/\beta 48^\circ$, u, r, CA		
	329							HQTT			TCR: 100 RQD: 100			328.40 JT, $\alpha 80^\circ/\beta 178^\circ$, u, r, CN 328.62 JT, $\alpha 38^\circ/\beta 355^\circ$, u, r, CN 329.40 JT, $\alpha 55^\circ/\beta 60^\circ$, u, r, CA, trace CLAY 329.85 JT, $\alpha 22^\circ/\beta 210^\circ$, u, sl, CLAY,		
Notes and Comments: End of Hole @ 706.8m							Inclination: -20° Orientation: 301°				Ground Water Level					
Refer to explanation sheets for abbreviation and symbols.							Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)		

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 34 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS							
Easting: 2762594 RL: 205 m				Northing: 6424371 Datum: NZVD2016				System: NZMG 1949 Method: SURVEY											
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
330			Moderately weathered; dark grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins (continued from layer starting at 316.3m)	WAIUPU FORMATION	MW			HQTT			TCR: 100 RQD: 100			trace CA 330.10 JT, $\alpha 65^\circ / \beta 55^\circ$, u, r, CN 330.36 JT, $\alpha 35^\circ / \beta 310^\circ$, u, r, CN 330.47 JT, $\alpha 15^\circ / \beta 340^\circ$, u, sl, CLAY, trace CA and Py 330.67 JT, $\alpha 50^\circ / \beta 18^\circ$, u, r, CN, trace CLAY					
331			CORE LOSS 0.4m						HQTT			TCR: 87 RQD: 100							
332			Moderately weathered; dark blackish grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins																
333			CORE LOSS 0.6m						HQTT			TCR: 100 RQD: 100							
334			Moderately weathered; dark blackish grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins					HQTT			TCR: 50 RQD: 100								
335			CORE LOSS 0.6m					HQTT			TCR: 100 RQD: 100								
336			Moderately weathered; dark blackish grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins					HQTT			TCR: 100 RQD: 100								
337			Vein structure: Slightly weathered; pale grey CHERT with fine to medium gravel sized calcite and quartz phenocrysts; pale yellowish white clay and other sulphides		SW			HQTT			TCR: 100 RQD: 100								
338			Shear zone: highly weathered; light grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich		HW									337.75 - 338.65 SZ, $\alpha 30^\circ / \beta 297^\circ$, u, sl, CLAY					
339			Moderately weathered; dark blackish grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins		MW			HQTT			TCR: 83 RQD: 81			338.70 JT, $\alpha 61^\circ / \beta 20^\circ$, u, sl, CLAY, trace other sulphides 338.72 VN, $\alpha 60^\circ / \beta 18^\circ$, u, r, CA					
340			CORE LOSS 0.5m																
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.														Inclination: -20° Orientation: 301°		Ground Water Level			
														Contractor: Alton Drilling Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 35 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
340.3			CORE LOSS 0.5m (continued from layer starting at 339.8m)	WAIUPU FORMATION MW				HQTT			TCR: 83 RQD: 81					340
341			Moderately weathered; dark blackish grey; clay altered ANDESITE; weak; pyrite disseminated; sulphide rich; frequent drilling induced damage/core spins					HQTT						340.80 JT, $\alpha 30^\circ / \beta -$, u, r, CA		341
341.25								HQTT						341.15 JT, $\alpha 69^\circ / \beta 356^\circ$, u, r, CN		
342			Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic					HQTT			TCR: 100 RQD: 98			341.79 JT, $\alpha 70^\circ / \beta 340^\circ$, u, sl, CLAY 341.84 JT, $\alpha 45^\circ / \beta 102^\circ$, u, sl, CLAY		342
343								HQTT			TCR: 100 RQD: 100			342.35 JT, $\alpha 58^\circ / \beta 20^\circ$, u, r, CLAY 342.60 JT, $\alpha 65^\circ / \beta 140^\circ$, u, r, CLAY		343
344			CORE LOSS 0.5m					HQTT			TCR: 71 RQD: 100					344
344.5								HQTT			TCR: 100 RQD: 100					345
345			Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic 344.50 - 345.60 drilling disturbance					HQTT			TCR: 100 RQD: 100					346
346								HQTT			TCR: 100 RQD: 100					347
347								HQTT			TCR: 100 RQD: 100					348
348								HQTT			TCR: 100 RQD: 100					349
349								HQTT			TCR: 100 RQD: 100			349.10 JT, $\alpha 50^\circ / \beta 20^\circ$, u, r, CLAY 349.22 JT, $\alpha 75^\circ / \beta 260^\circ$, u, r, CLAY 349.72 JT, $\alpha 70^\circ / \beta 240^\circ$, u, r, CLAY		350

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 36 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
			Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic (continued from layer starting at 344.5m)	WAIPU FORMATION MW										349.89 JT, $\alpha 75^\circ / \beta 300^\circ$, u, r, CLAY 350.06 JT, $\alpha 55^\circ / \beta 105^\circ$, u, r, CLAY 350.25 JT, $\alpha 20^\circ / \beta 120^\circ$, u, sl, CA, trace CLAY		350	
	351							HQTT				TCR: 100 RQD: 100				350.96 JT, $\alpha 50^\circ / \beta 265^\circ$, u, sl, CLAY	351
	352															352.47 JT, $\alpha 30^\circ / \beta 5^\circ$, u, sl, CLAY	352
	353															352.91 JT, $\alpha 82^\circ / \beta -$, u, r, CLAY	353
																353.27 JT, $\alpha 40^\circ / \beta 42^\circ$, u, r, CLAY	
	354							HQTT				TCR: 100 RQD: 100				353.86 JT, $\alpha 50^\circ / \beta 281^\circ$, u, sl, CLAY 354.04 JT, $\alpha 68^\circ / \beta 214^\circ$, u, r, CLAY	354
																354.43 JT, $\alpha 72^\circ / \beta 260^\circ$, u, sl, CLAY 354.60 JT, $\alpha 71^\circ / \beta 235^\circ$, u, sl, CLAY, trace CA 354.78 JT, $\alpha 70^\circ / \beta 225^\circ$, u, r, CLAY	355
	356															355.67 JT, $\alpha 40^\circ / \beta -$, u, r, CLAY	356
	357							HQTT				TCR: 100 RQD: 97				357.07 JT, $\alpha 42^\circ / \beta -$, u, sl, CLAY 357.14 JT, $\alpha 40^\circ / \beta -$, u, r, CLAY 357.27 JT, $\alpha 45^\circ / \beta -$, u, sm, CLAY 357.40 JT, $\alpha 55^\circ / \beta -$, u, sl, CLAY 357.58 JT, $\alpha 20^\circ / \beta -$, st, r, CLAY, trace CA	357
	358															357.95 JT, $\alpha 18^\circ / \beta -$, u, r, CLAY	358
	359							HQTT				TCR: 94 RQD: 100				358.40 JT, $\alpha 60^\circ / \beta 300^\circ$, u, r, CLAY	
																359.03 JT, $\alpha 65^\circ / \beta 260^\circ$, u, sl, CLAY 359.28 JT, $\alpha 70^\circ / \beta 185^\circ$, u, sl, CN 359.40 JT, $\alpha 52^\circ / \beta 270^\circ$, u, sl, CLAY	359
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level					
Refer to explanation sheets for abbreviation and symbols.				Contractor: Alton Drilling								Date	Time	Reading (mbgl)	Hole depth (mbgl)		
				Equipment: Rig 85													



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 37 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
360.1			CORE LOSS 0.2m (continued from layer starting at 359.9m) Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic	WAIUPU FORMATION MW				HQTT			TCR: 94 RQD: 100					360
361								HQTT			TCR: 100 RQD: 100			361.65 JT, $\alpha 60^\circ/\beta-$, u, sl, CLAY		361
362														361.95 JT, $\alpha 30^\circ/\beta-$, st, r, CLAY		362
363			CORE LOSS 1.1m					HQTT			TCR: 100 RQD: 100			362.40 JT, $\alpha 81^\circ/\beta-$, st, r, CN, trace CLAY		363
364			Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic					HQTT			TCR: 100 RQD: 100			364.65 JT, $\alpha 20^\circ/\beta 350^\circ$, u, r, CLAY		364
365														365.20 JT, $\alpha 20^\circ/\beta 210^\circ$, u, r, CN		365
366								HQTT			TCR: 100 RQD: 100			365.50 JT, $\alpha 65^\circ/\beta 260^\circ$, u, r, CN		366
367														367.26 JT, $\alpha 40^\circ/\beta 150^\circ$, u, sl, CLAY		367
368			CORE LOSS 1.4m													368
369			Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic					HQTT			TCR: 55 RQD: 100					369

Notes and Comments:

End of Hole @ 706.8m

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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Refer to explanation sheets for abbreviation and symbols.

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 38 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
	370.6		Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic (continued from layer starting at 368.9m) CORE LOSS 2.3m	MW				HQTT			TCR: 55 RQD: 100					370	
	371																371
	372							HQTT			TCR: 26 RQD: 100					372	
	373		Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic	WAIPU FORMATION				HQTT			TCR: 100 RQD: 100					373	
	374		373.80 - 375.00 drilling disturbance - re-drilled					HQTT			TCR: 100 RQD: 100						374
	375							HQTT			TCR: 100 RQD: 100						375
	376		Slightly weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; some pale grey clay alteration halos around defects that are weak to moderately strong					HQTT			TCR: 100 RQD: 100			375.16 JT, $\alpha 46^\circ/\beta$ -, u, r, CLAY, trace Py, alteration halo 375.55 JT, $\alpha 68^\circ/\beta$ -, st, r, CN 375.72 JT, $\alpha 30^\circ/\beta$ -, u, r, CLAY			376
	377							HQTT			TCR: 100 RQD: 100			376.15 JT, $\alpha 84^\circ/\beta 5^\circ$, u, r, CLAY 376.31 JT, $\alpha 72^\circ/\beta 5^\circ$, u, r, CA, trace CLAY 376.67 JT, $\alpha 60^\circ/\beta 185^\circ$, u, r, Py, trace CLAY			377
	378			SW				HQTT			TCR: 100 RQD: 100			377.13 JT, $\alpha 69^\circ/\beta 330^\circ$, u, sl, CLAY, trace Py 377.59 JT, $\alpha 51^\circ/\beta 135^\circ$, u, r, CLAY			378
	379		Slightly weathered; pale light grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (<2mm) with dark grey halos					HQTT			TCR: 97 RQD: 95			378.34 JT, $\alpha 80^\circ/\beta 140^\circ$, st, r, CN 378.90 JT, $\alpha 60^\circ/\beta 230^\circ$, pl, sl 379.67 VN, $\alpha 15^\circ/\beta$ -, u, r, CA 379.73 JT, $\alpha 55^\circ/\beta$ -, u, r, CA			379
Notes and Comments: End of Hole @ 706.8m																	
Refer to explanation sheets for abbreviation and symbols.																	
Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85								Ground Water Level				Date Time Reading (mbgl) Hole depth (mbgl)					

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021										Hole No. : WNDD011 Sheet : 39 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Completed: 6/07/2021 Logged : HJ Processed : HJ Checked : JHS										
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY										
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level				
380.7			CORE LOSS 0.1m	WAIPU FORMATION SW				HQTT			TCR: 97 RQD: 95			380.16 JT, $\alpha 60^\circ/\beta -$, u, r, Py, trace CLAY 380.25 JT, $\alpha 85^\circ/\beta -$, u, r, CN						
381			Slightly weathered; pale light grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (<2mm) with dark grey halos					HQTT			TCR: 100 RQD: 100			380.95 JT, $\alpha 65^\circ/\beta -$, pl, sl, Py						
382								HQTT			TCR: 100 RQD: 100			382.00 JT, $\alpha 22^\circ/\beta 350^\circ$, u, r, CA, trace CLAY 382.24 JT, $\alpha 15^\circ/\beta 340^\circ$, u, r, CA, trace CLAY and Py						
383								HQTT			TCR: 100 RQD: 100									
384								HQTT			TCR: 100 RQD: 82			384.44 JT, $\alpha 70^\circ/\beta 30^\circ$, u, r, Py 384.51 JT, $\alpha 65^\circ/\beta 350^\circ$, u, r, CA, trace Py						
385								HQTT			TCR: 100 RQD: 94			385.17 JT, $\alpha 40^\circ/\beta -$, u, r, Py						
386								HQTT			TCR: 100 RQD: 100			385.57 VN, $\alpha 30^\circ/\beta -$, u, r, CA, trace Py 385.64 VN, $\alpha 70^\circ/\beta -$, u, r, Py, trace CA 385.95 JT, $\alpha 80^\circ/\beta 100^\circ$, st, r 386.08 JT, $\alpha 85^\circ/\beta 310^\circ$, u, r, CA, trace Py 386.40 JT, $\alpha 80^\circ/\beta 310^\circ$, st, r, CA						
387								HQTT			TCR: 100 RQD: 100			386.65 JT, $\alpha 60^\circ/\beta 320^\circ$, u, r, CA 386.73 VN, $\alpha 30^\circ/\beta 80^\circ$, u, r, CA 386.90 VN, $\alpha 20^\circ/\beta 40^\circ$, u, r, CA, trace Py 386.91 VN, $\alpha 20^\circ/\beta 80^\circ$, u, r, CA, trace Py 387.41 JT, $\alpha 25^\circ/\beta 70^\circ$, u, r, CA						
388								HQTT			TCR: 100 RQD: 100			387.74 JT, $\alpha 70^\circ/\beta 300^\circ$, u, r, CA						
389			CORE LOSS 0.1m					HQTT			TCR: 97 RQD: 97			388.39 JT, $\alpha 70^\circ/\beta 80^\circ$, u, r, CA 388.57 JT, $\alpha 80^\circ/\beta 40^\circ$, st, r, CN 389.13 JT, $\alpha 60^\circ/\beta -$, u, r, CN 389.22 JT, $\alpha 80^\circ/\beta -$, u, r, CN 389.50 JT, $\alpha 40^\circ/\beta -$, st, r, CN						
			Slightly weathered ANDESITE: as per unit starting 380.80 m					HQTT												
Notes and Comments: End of Hole @ 706.8m								Inclination: -20°				Orientation: 301°				Ground Water Level				
Refer to explanation sheets for abbreviation and symbols.								Contractor: Alton Drilling								Date	Time	Reading (mbgl)	Hole depth (mbgl)	
								Equipment: Rig 85												

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 40 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description		Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 41 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																							
Easting: 2762594 RL: 205 m				Northing: 6424371 Datum: NZVD2016				System: NZMG 1949 Method: SURVEY																											
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level																			
68			Slightly weathered; dark grey porphyritic ANDESITE; moderately strong; pyrite disseminated; sulphide rich (continued from layer starting at 394.5m)	SW				HQTT			TCR: 100 RQD: 93			400.00 JT, $\alpha 60^\circ / \beta 290^\circ$, u, r, CN																					
														400.21 JT, $\alpha 65^\circ / \beta 50^\circ$, u, r, CN																					
														400.29 JT, $\alpha 30^\circ / \beta 230^\circ$, u, r, CN																					
														400.53 JT, $\alpha 60^\circ / \beta 170^\circ$, u, r, CN																					
401														401.28 JT, $\alpha 50^\circ / \beta -$, u, r, CN																					
														401.44 JT, $\alpha 50^\circ / \beta -$, u, r, CN																					
														401.52 JT, $\alpha 70^\circ / \beta -$, u, r, CLAY, trace CA																					
402											TCR: 100 RQD: 100						HQTT				402.40 JT, $\alpha 60^\circ / \beta -$, u, r, CA														
																					402.46 VN, $\alpha 30^\circ / \beta -$, u, r, CA														
																					402.80 VN, $\alpha 50^\circ / \beta -$, u, r, CA														
403																					402.95 JT, $\alpha 45^\circ / \beta 300^\circ$, u, r, CA														
																					403.17 VN, $\alpha 18^\circ / \beta 320^\circ$, u, r, CA														
																					403.64 VN, $\alpha 28^\circ / \beta 340^\circ$, u, r, CA														
404																					403.90 VN, $\alpha 20^\circ / \beta 240^\circ$, u, r, CA														
																					404.12 JT, $\alpha 58^\circ / \beta 290^\circ$, u, r, CA														
																					404.40 JT, $\alpha 60^\circ / \beta 290^\circ$, u, r, CA, trace CLAY														
405																					404.45 JT, $\alpha 35^\circ / \beta 300^\circ$, u, r, CA, trace Py														
			Moderately weathered; grey; BRECCIA (andesite); weak; pyrite disseminated; non magnetic; matrix supported; poly-clastic; clasts of moderately strong to strong andesite and chert	MW				HQTT			TCR: 100 RQD: 97			404.67 JT, $\alpha 25^\circ / \beta 280^\circ$, u, r, CA																					
														404.97 JT, $\alpha 80^\circ / \beta 160^\circ$, u, r, CA																					
406														405.00 JT, $\alpha 70^\circ / \beta 190^\circ$, u, r, CA																					
														406.14 - 406.26 VN, $\alpha 45^\circ / \beta 190^\circ$																					
														407.90 - 407.97 VN, $\alpha 36^\circ / \beta 345^\circ$																					
407											TCR: 100 RQD: 100						HQTT				408.50 - 408.52 SS, $\alpha 60^\circ / \beta -$, u, sl														
																					409.57 JT, $\alpha 35^\circ / \beta 20^\circ$, u, r, CLAY														
																					409.85 VN, $\alpha 50^\circ / \beta -$, CA														
408																																			
409																																			
410																																			
Notes and Comments: End of Hole @ 706.8m																					Inclination: -20°				Orientation: 301°				Ground Water Level						
Refer to explanation sheets for abbreviation and symbols.															Contractor: Alton Drilling						Date		Time		Reading (mbgl)		Hole depth (mbgl)								
															Equipment: Rig 85																				

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 42 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
410			Moderately weathered; light pale grey porphyritic ANDESITE; weak; clay and pyrite altered; pyrite disseminated; non magnetic	WAIUPU FORMATION MW				HQTT			TCR: 100 RQD: 100			410.05 JT, $\alpha 60^\circ / \beta -$, u, r, CA 410.17 JT, $\alpha 40^\circ / \beta -$, u, r, CA 410.35 JT, $\alpha 45^\circ / \beta -$, u, r, Py			
411															411.00 JT, $\alpha 30^\circ / \beta 190^\circ$, st, r, CLAY		
412															411.75 JT, $\alpha 19^\circ / \beta 280^\circ$, u, sl, CLAY 412.02 JT, $\alpha 60^\circ / \beta 215^\circ$, u, sl, CLAY		
413			Moderately weathered; grey; BRECCIA (andesite); weak; pyrite disseminated; non magnetic; matrix supported; poly-clastic; clasts of moderately strong to strong andesite and chert						HQTT			TCR: 100 RQD: 100					
414																	
415									HQTT			TCR: 100 RQD: 100					
416			Moderately weathered; light pale grey porphyritic ANDESITE; weak; clay and pyrite altered; pyrite disseminated; non magnetic												416.14 JT, $\alpha 68^\circ / \beta -$, u, r, CN 416.33 - 416.35 SS, $\alpha 55^\circ / \beta -$, u, sm, CN		
417			Moderately weathered; grey; BRECCIA (andesite); weak; pyrite disseminated; non magnetic; matrix supported; poly-clastic; clasts of moderately strong to strong andesite and chert														
418									HQTT			TCR: 100 RQD: 100			417.95 JT, $\alpha 40^\circ / \beta 340^\circ$, u, r, CLAY		
419																	
420																	
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.					Inclination: -20°		Orientation: 301°		Ground Water Level								
					Contractor: Alton Drilling				Date	Time	Reading (mbgl)	Hole depth (mbgl)					
					Equipment: Rig 85												

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021										Hole No. : WNDD011 Sheet : 43 of 71 Hole Length : 706.8 Scale @ A4 : 1:50									
		Completed: 6/07/2021										Logged : HJ Processed : HJ Checked : JHS									
Easting: 2762594				Northing: 6424371				System: NZMG 1949				Method: SURVEY									
RL: 205 m				Datum: NZVD2016																	
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level					
420			Moderately weathered; light pale grey porphyritic ANDESITE; moderately strong; clay and pyrite altered; pyrite disseminated; non magnetic	WAIUPU FORMATION	MW									420.40 VN, $\alpha 42^\circ / \beta -$, u, r, CA 420.60 JT, $\alpha 60^\circ / \beta -$, u, r, CN 420.80 JT, $\alpha 72^\circ / \beta -$, u, r, CN							
421			Moderately weathered; grey; clay altered ANDESITE; weak, pyrite disseminated; non magnetic					HQTT			TCR: 81 RQD: 100		421.30 - 421.62 VN, $\alpha 45^\circ / \beta -$, st, r, CLAY, chert and andesite breccia, recovered as gravel fragments								
422			CORE LOSS 0.6m																		
423			Moderately weathered; grey; clay altered ANDESITE; weak, pyrite disseminated; non magnetic					HQTT			TCR: 100 RQD: 98		423.86 JT, $\alpha 58^\circ / \beta 300^\circ$, u, sm, CN 424.07 VN, $\alpha 55^\circ / \beta 100^\circ$, pebble dyke (angular gravel fragments) 424.10 JT, $\alpha 45^\circ / \beta 70^\circ$, u, r, CLAY 424.20 JT, $\alpha 60^\circ / \beta 70^\circ$, u, r, CLAY 424.43 JT, $\alpha 48^\circ / \beta 40^\circ$, u, sm, CLAY 424.67 JT, $\alpha 60^\circ / \beta 40^\circ$, u, r, CA, trace CLAY								
424																					
425								HQTT			TCR: 100 RQD: 97		426.51 JT, $\alpha 48^\circ / \beta 10^\circ$, u, r, CA, trace CLAY 427.11 JT, $\alpha 70^\circ / \beta 345^\circ$, u, r								
426																					
427																					
428			Slightly weathered; grey; porphyritic ANDESITE moderately strong; pyrite disseminated; non magnetic	SW				HQTT			TCR: 100 RQD: 100		428.22 VN, $\alpha 60^\circ / \beta 60^\circ$, u, sm, CA 428.46 JT, $\alpha 30^\circ / \beta 45^\circ$, st, sm, CA								
429																					
430																					
Notes and Comments: End of Hole @ 706.8m														Inclination: -20° Orientation: 301°				Ground Water Level			
Refer to explanation sheets for abbreviation and symbols.														Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 44 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
		Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY					
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
			Slightly weathered; grey; porphyritic ANDESITE moderately strong; pyrite disseminated; non magnetic (continued from layer starting at 427.8m)	WAIUPU FORMATION SW				HQTT			TCR: 100 RQD: 100			431.02 JT, $\alpha 71^\circ / \beta 80^\circ$, u, r, CA			
431			Slightly weathered; fine ANDESITE; moderately strong; calcite veining; pyrite disseminated and at defect boundaries; fairly consistent orientation of veins 65/340 very closely spaced					HQTT			TCR: 100 RQD: 100			431.63 JT, $\alpha 70^\circ / \beta 20^\circ$, u, r, CLAY			
432			Slightly weathered; grey; porphyritic ANDESITE moderately strong; pyrite disseminated; non magnetic					HQTT			TCR: 100 RQD: 100			432.84 VN, $\alpha 61^\circ / \beta 5^\circ$, CA, trace Py 433.01 JT, $\alpha 65^\circ / \beta 300^\circ$, u, r, CN 433.24 VN, $\alpha 8^\circ / \beta 220^\circ$, u, r, CA			
433								HQTT			TCR: 100 RQD: 100						
434								HQTT			TCR: 100 RQD: 100						
435								HQTT			TCR: 100 RQD: 100						
436								HQTT			TCR: 100 RQD: 100				436.09 JT, $\alpha 40^\circ / \beta 195^\circ$, u, sl, CA 436.61 JT, $\alpha 82^\circ / \beta 340^\circ$, u, r, CN		
437								HQTT			TCR: 100 RQD: 100				437.68 VN, $\alpha 12^\circ / \beta -$, u, r, CA 437.85 JT, $\alpha 48^\circ / \beta -$, u, sl, CLAY		
438								HQTT			TCR: 100 RQD: 100				439.40 JT, $\alpha 84^\circ / \beta -$, u, r, CN		
439								HQTT			TCR: 100 RQD: 100						
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.				Inclination: -20°				Orientation: 301°				Ground Water Level					
				Contractor: Alton Drilling Equipment: Rig 85								Date	Time	Reading (mbgl)	Hole depth (mbgl)		

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 45 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
			Slightly weathered; grey; porphyritic ANDESITE moderately strong; pyrite disseminated; non magnetic (continued from layer starting at 431.9m)	WAIPUPU FORMATION SW				HQTT			TCR: 100 RQD: 100			440.27 JT, $\alpha 59^\circ / \beta 98^\circ$, u, r, CN 440.46 VN, α / β -, CA, trace QZ					
441														441.00 JT, $\alpha 62^\circ / \beta 80^\circ$, u, r, CLAY					
442														441.90 JT, $\alpha 80^\circ / \beta 152^\circ$, u, r, CN					
														442.27 JT, $\alpha 64^\circ / \beta 20^\circ$, u, sl, CLAY					
														442.60 JT, $\alpha 60^\circ / \beta 155^\circ$, u, r, CLAY					
443			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic											443.05 JT, $\alpha 50^\circ / \beta$ -, u, sl, CLAY					
														443.35 JT, $\alpha 15^\circ / \beta$ -, u, sl, CLAY					
444												TCR: 100 RQD: 100		443.75 JT, $\alpha 45^\circ / \beta$ -, u, r, CLAY					
														444.00 JT, $\alpha 57^\circ / \beta$ -, u, r, CLAY					
														444.20 JT, $\alpha 55^\circ / \beta$ -, u, r, CLAY					
														444.35 JT, $\alpha 28^\circ / \beta$ -, u, r, CA, trace CLAY					
445														445.25 JT, $\alpha 22^\circ / \beta$ -, u, r, CA, trace CLAY					
446														445.97 VN, $\alpha 28^\circ / \beta 210^\circ$, u, r, CA					
447												TCR: 100 RQD: 95		446.90 JT, $\alpha 12^\circ / \beta 270^\circ$, u, r, CLAY					
														447.16 JT, $\alpha 20^\circ / \beta 260^\circ$, u, sl, CLAY					
														447.25 VN, $\alpha 35^\circ / \beta 220^\circ$, u, r, CA					
														447.31 VN, $\alpha 30^\circ / \beta 260^\circ$, u, r, CA					
														447.40 JT, $\alpha 55^\circ / \beta 280^\circ$, u, sl, CLAY					
448																			
449												TCR: 100 RQD: 98		448.49 JT, $\alpha 86^\circ / \beta 30^\circ$, u, sm, CN, trace Py					
Notes and Comments: End of Hole @ 706.8m										Inclination: -20° Orientation: 301°					Ground Water Level				
										Contractor: Alton Drilling Equipment: Rig 85					Date	Time	Reading (mbgl)	Hole depth (mbgl)	
Refer to explanation sheets for abbreviation and symbols.																			



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 46 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
451			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic (continued from layer starting at 442.8m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 98			450.91 JT, $\alpha 26^\circ / \beta 155^\circ$, u, r, CA 450.96 JT, $\alpha 40^\circ / \beta 158^\circ$, u, r, CA, trace CLAY 451.46 JT, $\alpha 52^\circ / \beta 97^\circ$, u, r, CA		
451																
452														452.61 JT, $\alpha 35^\circ / \beta 295^\circ$, u, r, CA, trace CLAY		
453								HQTT			TCR: 100 RQD: 100					
454														454.01 JT, $\alpha 78^\circ / \beta 50^\circ$, st, sm, CN 454.30 JT, $\alpha 8^\circ / \beta 26^\circ$, u, r, CLAY, trace Py		
455																
456								HQTT			TCR: 100 RQD: 100					
457																
458								HQTT			TCR: 100 RQD: 100			458.36 JT, $\alpha 72^\circ / \beta 10^\circ$, st, r, CN		
459								HQTT			TCR: 100 RQD: 100			459.19 JT, $\alpha 87^\circ / \beta 40^\circ$, u, sm, CN 459.38 JT, $\alpha 79^\circ / \beta 90^\circ$, u, r, CN		

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 47 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic (continued from layer starting at 442.8m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			460.10 JT, $\alpha 34^\circ / \beta 345^\circ$, u, r, CA 460.45 JT, $\alpha 83^\circ / \beta 350^\circ$, u, sm, CN 461.02 JT, $\alpha 61^\circ / \beta 72^\circ$, st, sm, CA					
461																			
462									HQTT				TCR: 100 RQD: 100			463.60 JT, $\alpha 57^\circ / \beta 32^\circ$, st, r, CN			
463																			
464																464.97 VN, $\alpha 60^\circ / \beta 145^\circ$, u, r, CA, closed			
465									HQTT				TCR: 100 RQD: 100			466.11 JT, $\alpha 81^\circ / \beta 50^\circ$, u, sm, CN 466.27 JT, $\alpha 85^\circ / \beta 300^\circ$, u, r, CN			
466																467.47 JT, $\alpha 65^\circ / \beta 100^\circ$, u, r, CN 467.66 JT, $\alpha 50^\circ / \beta 120^\circ$, u, r, CN			
467																468.00 JT, $\alpha 62^\circ / \beta -$, u, r, CA, trace CLAY 468.72 JT, $\alpha 70^\circ / \beta -$, st, r, CA 468.78 JT, $\alpha 78^\circ / \beta -$, st, r, CLAY 469.02 JT, $\alpha 80^\circ / \beta -$, st, r, CN			
468									HQTT				TCR: 100 RQD: 98			469.50 JT, $\alpha 70^\circ / \beta -$, st, r, CN, trace Py			
469																			
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.								Inclination: -20°				Orientation: 301°				Ground Water Level			
								Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)				

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 48 of 71 Hole Length : 706.8 Scale @ A4 : 1:50			
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY			Logged : HJ Processed : HJ Checked : JHS							
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
44			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic (continued from layer starting at 442.8m)	SW				HQTT			TCR: 100 RQD: 92		470.10 JT, $\alpha 55^\circ / \beta 100^\circ$, u, r, CA 470.15 JT, $\alpha 50^\circ / \beta 80^\circ$, u, r, CA 470.17 JT, $\alpha 60^\circ / \beta 10^\circ$, u, r, CA 470.47 VN, $\alpha 20^\circ / \beta 230^\circ$, u, Py, trace sulphides and CA 470.62 JT, $\alpha 59^\circ / \beta 30^\circ$, u, r, CA 470.79 JT, $\alpha 78^\circ / \beta 260^\circ$, u, r, CA			
471													471.20 JT, $\alpha 60^\circ / \beta 322^\circ$, st, r, CN 471.28 JT, $\alpha 40^\circ / \beta 20^\circ$, u, r, CA 471.70 JT, $\alpha 60^\circ / \beta 295^\circ$, st, r, CLAY			
472			Moderately weathered; grey; porphyritic ANDESITE; moderately strong; pyrite disseminated; non magnetic	WAIUPU FORMATION MW				HQTT			TCR: 100 RQD: 100		472.03 JT, $\alpha 62^\circ / \beta 320^\circ$, u, r, CN 472.04 VN, $\alpha 70^\circ / \beta 320^\circ$, u, CA, closed			
473													473.30 - 473.80 SZ, $\alpha 30^\circ / \beta -$, u, r, CLAY, possible fault gouge; gravel sized fragments of weathered rock; trace CA			
474								HQTT			TCR: 100 RQD: 100		474.22 JT, $\alpha 15^\circ / \beta -$, u, r, CA 474.72 VN, $\alpha 55^\circ / \beta -$, u, CA, closed - trace Py 474.80 JT, $\alpha 65^\circ / \beta -$, u, r, CN			
475													477.03 JT, $\alpha 50^\circ / \beta 216^\circ$, u, r, CLAY 477.25 JT, $\alpha 25^\circ / \beta 190^\circ$, u, r, CA 477.44 JT, $\alpha 71^\circ / \beta 60^\circ$, st, sm, CLAY			
476								HQTT			TCR: 100 RQD: 100		479.05 JT, $\alpha 65^\circ / \beta -$, u, r, CLAY			
477													479.67 JT, $\alpha 62^\circ / \beta -$, st, r, CLAY 479.80 JT, $\alpha 80^\circ / \beta -$, st, r, CLAY			
478																
479																
480																
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level				
				Contractor: Alton Drilling								Date	Time	Reading (mbgl)	Hole depth (mbgl)	
				Equipment: Rig 85												
Refer to explanation sheets for abbreviation and symbols.																

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 49 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Moderately weathered; grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic; some drilling induce damage	MW				HQTT			TCR: 100 RQD: 100			480.26 JT, $\alpha 80^\circ / \beta -$, st, r, CLAY		
481								HQTT			TCR: 100 RQD: 100			482.04 JT, $\alpha 62^\circ / \beta -$, u, r, CLAY 482.32 JT, $\alpha 65^\circ / \beta -$, u, r, CLAY		
482								HQTT			TCR: 100 RQD: 100			483.44 JT, $\alpha 51^\circ / \beta -$, u, r, CLAY		
483								HQTT			TCR: 100 RQD: 100			484.15 JT, $\alpha 45^\circ / \beta -$, u, r, CLAY 484.29 JT, $\alpha 72^\circ / \beta -$, u, r, CLAY		
484							HQTT			TCR: 100 RQD: 100						
485							HQTT			TCR: 100 RQD: 100						
486							HQTT			TCR: 100 RQD: 100						
487			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; frequent randomly orientated calcite veins (<2mm); some with dark grey alteration halos	SW				HQTT			TCR: 100 RQD: 100			487.57 JT, $\alpha 60^\circ / \beta 140^\circ$, st, r, CA		
488								HQTT			TCR: 100 RQD: 100			488.50 JT, $\alpha 30^\circ / \beta 172^\circ$, u, r, CA 488.80 JT, $\alpha 85^\circ / \beta 240^\circ$, u, r, CA 489.08 JT, $\alpha 65^\circ / \beta 22^\circ$, u, r, CA, trace Py 489.40 JT, $\alpha 55^\circ / \beta 345^\circ$, u, r, CA		
489								HQTT			TCR: 100 RQD: 100			489.85 JT, $\alpha 20^\circ / \beta 182^\circ$, u, r, CA,		
								HQTT			TCR: 100 RQD: 100					
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level				
				Contractor: Alton Drilling								Date	Time	Reading (mbgl)	Hole depth (mbgl)	
				Equipment: Rig 85												
Refer to explanation sheets for abbreviation and symbols.																



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 50 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
491.37			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; frequent randomly orientated calcite veins (<2mm); some with dark grey alteration halos (continued from layer starting at 486.3m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			trace CLAY 490.05 JT, $\alpha 71^\circ / \beta 350^\circ$, u, r, CA		490
														490.40 JT, $\alpha 63^\circ / \beta 150^\circ$, u, r, CN		
														490.70 JT, $\alpha 68^\circ / \beta 5^\circ$, u, r, CA		
														490.90 JT, $\alpha 65^\circ / \beta 20^\circ$, u, r, CA		491
														491.00 JT, $\alpha 55^\circ / \beta 40^\circ$, u, r, CA		
														491.13 JT, $\alpha 75^\circ / \beta 0^\circ$, u, r, CA		
														491.30 VN, $\alpha 20^\circ / \beta 320^\circ$, u, r, CA, closed		
														491.32 JT, $\alpha 75^\circ / \beta 20^\circ$, u, r, CA		
														491.88 JT, $\alpha 75^\circ / \beta 20^\circ$, u, r, CA		492
492								HQTT			TCR: 100 RQD: 99			492.54 VN, $\alpha 20^\circ / \beta 60^\circ$, u, CA		
														492.75 VN, $\alpha 12^\circ / \beta 180^\circ$, u, CA		
493														493.00 VN, $\alpha 28^\circ / \beta 119^\circ$, u, CA		493
494																
														494.62 JT, $\alpha 30^\circ / \beta 60^\circ$, u, sl, CLAY		494
495								HQTT			TCR: 100 RQD: 100			495.30 VN, $\alpha 21^\circ / \beta 80^\circ$, u, r, Py		495
496														496.41 JT, $\alpha 85^\circ / \beta 350^\circ$, u, r, CN		496
497																
498								HQTT			TCR: 100 RQD: 100			498.12 JT, $\alpha 66^\circ / \beta 82^\circ$, u, r, CA		498
499														499.13 JT, $\alpha 70^\circ / \beta 280^\circ$, u, r, CN		499
														499.24 JT, $\alpha 79^\circ / \beta 20^\circ$, st, r, CN		
														499.46 JT, $\alpha 44^\circ / \beta 97^\circ$, u, r, CA		

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 51 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)		Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level		
						Weathering	Number / Type											Result	
				Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; frequent randomly orientated calcite veins (<2mm); some with dark grey alteration halos (continued from layer starting at 486.3m)	WAIPU FORMATION	SW													
501																	500.68 - 500.75 SS, $\alpha 32^\circ / \beta 350^\circ$, u, sl, CLAY		
502																	501.29 JT, $\alpha 60^\circ / \beta 260^\circ$, u, r, Py		
503																	502.16 JT, $\alpha 60^\circ / \beta 280^\circ$, u, r, CN 502.28 JT, $\alpha 85^\circ / \beta 316^\circ$, u, sm, Py		
504																	502.85 JT, $\alpha 11^\circ / \beta 45^\circ$, u, r, CA		
505																	503.68 JT, $\alpha 67^\circ / \beta 355^\circ$, st, r, Py		
506																	504.16 JT, $\alpha 85^\circ / \beta 275^\circ$, u, r, CN		
507																	505.08 JT, $\alpha 85^\circ / \beta 300^\circ$, u, r, CN 505.40 JT, $\alpha 51^\circ / \beta 35^\circ$, u, r, CA		
508																	506.43 VN, $\alpha 15^\circ / \beta -$, u, r, CA, closed, trace Py 506.50 JT, $\alpha 68^\circ / \beta -$, st, sm, CN		
509																	507.52 JT, $\alpha 35^\circ / \beta -$, u, sl, CLAY 507.90 JT, $\alpha 78^\circ / \beta -$, st, sm, CN 508.12 JT, $\alpha 32^\circ / \beta -$, u, sl, CLAY 508.41 JT, $\alpha 55^\circ / \beta -$, u, sl, CLAY, trace Py		
510																	509.71 VN, $\alpha 18^\circ / \beta -$, u, CA, closed		

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 52 of 71 Hole Length : 706.8 Scale @ A4 : 1:50					
		Easting: 2762594 Northing: 6424371 System: NZMG 1949 RL: 205 m Datum: NZVD2016 Method: SURVEY										Logged : HJ Processed : HJ Checked : JHS					
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; frequent randomly orientated calcite veins (<2mm); some with dark grey alteration halos (continued from layer starting at 486.3m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			509.90 JT, $\alpha 70^\circ / \beta -$, st, sm, CN 510.67 JT, $\alpha 38^\circ / \beta -$, u, sl, CLAY 510.85 JT, $\alpha 40^\circ / \beta -$, u, sl, CLAY 511.18 JT, $\alpha 35^\circ / \beta -$, u, sl, CLAY 511.33 JT, $\alpha 27^\circ / \beta -$, u, sl, CLAY, trace CA 511.57 JT, $\alpha 35^\circ / \beta -$, u, sl, CLAY 511.94 JT, $\alpha 87^\circ / \beta -$, u, sm, CN			
511																	
512																	
513									HQTT			TCR: 100 RQD: 100				513.86 JT, $\alpha 68^\circ / \beta -$, st, sm, CN 513.97 JT, $\alpha 52^\circ / \beta -$, u, sl, CLAY 514.36 JT, $\alpha 65^\circ / \beta -$, pl, sm, CN	
514																	
515																515.24 JT, $\alpha 70^\circ / \beta -$, st, sm, CA 515.39 VN, $\alpha 30^\circ / \beta -$, u, CA, closed 515.50 JT, $\alpha 15^\circ / \beta -$, u, r, CA, trace Py 515.80 JT, $\alpha 70^\circ / \beta -$, st, sm, CN	
516									HQTT			TCR: 100 RQD: 100				516.20 JT, $\alpha 70^\circ / \beta -$, u, r, CN 516.55 JT, $\alpha 65^\circ / \beta -$, u, r, CN 516.84 VN, $\alpha 20^\circ / \beta -$, u, CA, closed	
517																517.29 JT, $\alpha 65^\circ / \beta -$, u, r, CLAY	
518			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some dark grey halos around defects; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite													518.53 JT, $\alpha 60^\circ / \beta 55^\circ$, u, r, CA, trace Py 518.85 JT, $\alpha 79^\circ / \beta 240^\circ$, u, r, CN 519.10 JT, $\alpha 80^\circ / \beta 80^\circ$, u, r, Py, trace CA 519.55 JT, $\alpha 70^\circ / \beta 120^\circ$, u, r, CA	
519									HQTT			TCR: 100 RQD: 100					
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.				Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85				Ground Water Level Date Time Reading (mbgl) Hole depth (mbgl)									

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 53 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
527			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some dark grey halos around defects; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite (continued from layer starting at 517.2m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100						
521															521.43 JT, $\alpha 55^\circ / \beta 140^\circ$, u, r, CA 521.53 JT, $\alpha 50^\circ / \beta 135^\circ$, u, r, CN		
522															521.85 JT, $\alpha 54^\circ / \beta 80^\circ$, u, r, CLAY 522.14 JT, $\alpha 61^\circ / \beta 85^\circ$, u, r, CLAY 522.22 VN, $\alpha 20^\circ / \beta 310^\circ$, u, r, CA, closed, trace Py		
523															523.00 JT, $\alpha 40^\circ / \beta 115^\circ$, u, r, CA, trace Py 523.45 JT, $\alpha 41^\circ / \beta 110^\circ$, u, sl, CA		
524															523.90 JT, $\alpha 60^\circ / \beta -$, u, sm, CN 524.03 JT, $\alpha 55^\circ / \beta -$, u, sm, CN 524.09 JT, $\alpha 40^\circ / \beta -$, u, sm, CN 524.28 JT, $\alpha 50^\circ / \beta -$, st, r, CA 524.40 JT, $\alpha 50^\circ / \beta -$, u, sm, CN		
525															524.87 VN, $\alpha 38^\circ / \beta -$, u, Py, closed, trace CA 525.26 JT, $\alpha 65^\circ / \beta -$, u, sm, CN 525.50 VN, $\alpha 12^\circ / \beta -$, u, CA, closed, trace Py 525.76 JT, $\alpha 65^\circ / \beta -$, u, sm, CN		
526															526.58 JT, $\alpha 30^\circ / \beta -$, u, r, CLAY 526.63 JT, $\alpha 25^\circ / \beta -$, u, sl, CLAY		
527															527.47 JT, $\alpha 55^\circ / \beta 355^\circ$, u, r, CA, trace Py		
528															528.10 JT, $\alpha 25^\circ / \beta 310^\circ$, st, r, CA 528.78 JT, $\alpha 55^\circ / \beta 100^\circ$, u, r, Py		
529															529.53 JT, $\alpha 80^\circ / \beta 210^\circ$, u, r, CN		
Notes and Comments: End of Hole @ 706.8m			Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85				Ground Water Level				Date Time Reading (mbgl) Hole depth (mbgl)						
Refer to explanation sheets for abbreviation and symbols.																	



Project : WKP Exploration Tunnel - Ground Investigations
Client : OceanaGold Corporation
Site : Willows Farm, Waihi North,
Job Number: 12533958

Commenced: 17/05/2021

Completed: 6/07/2021

Hole No. : WNDD011

Sheet : 54 of 71

Hole Length : 706.8

Scale @ A4 : 1:50

Logged : HJ

Processed : HJ

Checked : JHS

Easting: 2762594

Northing: 6424371

System: NZMG 1949

RL: 205 m

Datum: NZVD2016

Method: SURVEY

RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
					Weathering Number / Type	Result										
531			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some dark grey halos around defects; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite (continued from layer starting at 517.2m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			530.32 - 530.35 SS, $\alpha 40^\circ/\beta$ -, u, sl, CLAY, trace weathered gravel sized fragments of andesite		530
532														531.71 JT, $\alpha 71^\circ/\beta$ -, u, r, CN		531
533														532.30 JT, $\alpha 41^\circ/\beta$ -, u, r, CA 532.70 JT, $\alpha 82^\circ/\beta$ -, st, r, CN		532
534																533
535			Slightly weathered; grey; fine grained ANDESITE; strong; some calcite phenocrysts (possible intermittent flow/large clast)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 99			534.00 JT, $\alpha 60^\circ/\beta 245^\circ$, pl, r, CA 534.16 JT, $\alpha 71^\circ/\beta 230^\circ$, pl, r, CA 534.65 JT, $\alpha 85^\circ/\beta 100^\circ$, pl, r, CA, trace Py 534.80 JT, $\alpha 48^\circ/\beta 180^\circ$, u, r, CA		534
536														535.39 JT, $\alpha 61^\circ/\beta 200^\circ$, u, r, CN 535.50 JT, $\alpha 50^\circ/\beta 220^\circ$, u, r, CA 535.52 JT, $\alpha 52^\circ/\beta 300^\circ$, u, r, CN 535.67 JT, $\alpha 50^\circ/\beta 200^\circ$, u, r, CA		535
537														536.33 JT, $\alpha 51^\circ/\beta 310^\circ$, u, r, CN 536.70 VN, $\alpha 50^\circ/\beta 60^\circ$, u, CA, closed, trace Py 536.79 JT, $\alpha 42^\circ/\beta 285^\circ$, u, r, CA 537.00 JT, $\alpha 45^\circ/\beta 280^\circ$, u, r, CN, trace Py		536
538								HQTT			TCR: 100 RQD: 97			537.70 JT, $\alpha 33^\circ/\beta 310^\circ$, u, r, CLAY, trace CA and Py 538.24 JT, $\alpha 36^\circ/\beta 160^\circ$, u, r, CN		537
539														538.66 JT, $\alpha 78^\circ/\beta 220^\circ$, u, r, CN		538
																539
																540

Notes and Comments:

End of Hole @ 706.8m

Refer to explanation sheets for abbreviation and symbols.

Inclination: -20°

Orientation: 301°

Ground Water Level

Contractor: Alton Drilling

Equipment: Rig 85

Date	Time	Reading (mbgl)	Hole depth (mbgl)
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 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 55 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																																	
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY																																	
RL (m) Depth (m) Graphic										Material Description										Geological Unit	Weathering	Sample / Test		Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)										Instrumentation Installation	Water level	
540 541 542 543 544 545 546 547 548 549 550										Slightly weathered; grey; fine grained ANDESITE; strong; some calcite phenocrysts (possible intermittent flow/large clast) (continued from layer starting at 534.0m) 543.00 - 544.80 drilling disturbance Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some dark grey halos around defects; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite										WAIUPU FORMATION SW					HQTT				TCR: 100 RQD: 100			540.18 JT, $\alpha 70^\circ / \beta 240^\circ$, u, r, CN 540.40 JT, $\alpha 72^\circ / \beta 240^\circ$, st, r, CN 541.00 JT, $\alpha 79^\circ / \beta 240^\circ$, u, r, CN, trace Py 542.04 JT, $\alpha 35^\circ / \beta -$, u, r, Py, trace other sulphides 542.73 JT, $\alpha 42^\circ / \beta -$, u, r, CN 545.07 JT, $\alpha 68^\circ / \beta -$, u, r, CN, trace Py 546.24 JT, $\alpha 60^\circ / \beta -$, u, r, CN, trace Py 546.71 VN, $\alpha 35^\circ / \beta -$, u, r, CA, closed 546.73 JT, $\alpha 75^\circ / \beta -$, u, r, Py 546.87 JT, $\alpha 76^\circ / \beta -$, u, r, CN, trace Py 547.00 JT, $\alpha 60^\circ / \beta -$, u, r, Py 547.67 JT, $\alpha 80^\circ / \beta -$, u, r, Py 548.10 JT, $\alpha 80^\circ / \beta -$, u, r, CN 548.28 JT, $\alpha 48^\circ / \beta -$, u, r, Py 549.06 JT, $\alpha 81^\circ / \beta -$, st, r, CN, trace CLAY											
Notes and Comments: End of Hole @ 706.8m										Inclination: -20° Orientation: 301°										Ground Water Level																							
										Contractor: Alton Drilling Equipment: Rig 85										Date	Time	Reading (mbgl)	Hole depth (mbgl)																				
Refer to explanation sheets for abbreviation and symbols.																																											

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 56 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
551			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some dark grey halos around defects; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite (continued from layer starting at 546.8m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100						
552								HQTT				TCR: 100 RQD: 100					
553														552.51 JT, $\alpha 85^\circ/\beta -$, u, r, CN, trace Py			
														552.70 JT, $\alpha 62^\circ/\beta -$, u, sm, CN			
														552.87 VN, $\alpha 10^\circ/\beta -$, u, r, CA, closed			
														553.04 JT, $\alpha 65^\circ/\beta -$, st, sm, CN, trace Py			
554																	
555									HQTT			TCR: 100 RQD: 100			555.25 JT, $\alpha 63^\circ/\beta -$, u, r, CN		
556																	
557			Slightly weathered; pale grey ANDESITE; moderately strong; some clay alteration at defect boundaries; pyrite disseminated; non magnetic 556.30 - 556.60 drilling disturbance												556.34 JT, $\alpha 40^\circ/\beta -$, u, r, CA, trace CLAY		
															556.65 JT, $\alpha 60^\circ/\beta -$, u, r, CN, trace Py		
															557.19 JT, $\alpha 50^\circ/\beta -$, u, r, CLAY		
															557.58 JT, $\alpha 55^\circ/\beta -$, u, r, CLAY, trace CA		
															557.85 JT, $\alpha 30^\circ/\beta -$, u, r, CLAY		
558									HQTT			TCR: 100 RQD: 100			558.25 JT, $\alpha 19^\circ/\beta -$, u, r, CLAY		
															558.50 JT, $\alpha 45^\circ/\beta -$, u, sm, CLAY		
														558.67 - 558.69 SS, $\alpha 45^\circ/\beta -$, u, sl, CLAY, trace gravel fragments			
559														558.85 JT, $\alpha 48^\circ/\beta -$, u, r, CLAY			
														559.46 JT, $\alpha 39^\circ/\beta -$, u, sl, CLAY			
														559.60 JT, $\alpha 50^\circ/\beta -$, u, r, CLAY			
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level					
Refer to explanation sheets for abbreviation and symbols.				Contractor: Alton Drilling				Date				Time					
				Equipment: Rig 85				Reading (mbgl)				Hole depth (mbgl)					

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 57 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS																	
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY																	
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level											
			Slightly weathered; pale grey ANDESITE; moderately strong; some clay alteration at defect boundaries; pyrite disseminated; non magnetic (continued from layer starting at 556.3m)	WAIPIPU FORMATION SW				HQTT			TCR: 100 RQD: 98			560.05 JT, $\alpha 60^\circ / \beta 80^\circ$, u, r, Py 560.50 JT, $\alpha 59^\circ / \beta 70^\circ$, u, r, Py 560.70 JT, $\alpha 50^\circ / \beta 80^\circ$, u, r, CA 560.90 VN, $\alpha 25^\circ / \beta 330^\circ$, u, r, CA, closed 561.30 JT, $\alpha 62^\circ / \beta 80^\circ$, u, r, CLAY 561.42 JT, $\alpha 70^\circ / \beta 120^\circ$, u, r, CN 561.87 JT, $\alpha 72^\circ / \beta 45^\circ$, u, r, CN 562.03 JT, $\alpha 80^\circ / \beta 240^\circ$, u, sm, Py 562.56 JT, $\alpha 56^\circ / \beta 180^\circ$, u, r, CA 562.61 JT, $\alpha 54^\circ / \beta 220^\circ$, u, r, CA 563.24 JT, $\alpha 60^\circ / \beta 50^\circ$, u, r, CA, trace Py													
561																											
562																											
563			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos at defect boundaries; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite						HQTT			TCR: 100 RQD: 100			564.66 JT, $\alpha 58^\circ / \beta 60^\circ$, u, r, CN 564.87 JT, $\alpha 60^\circ / \beta 45^\circ$, u, r, CA 565.04 JT, $\alpha 55^\circ / \beta 350^\circ$, st, sm, CN, trace Py 565.36 JT, $\alpha 25^\circ / \beta 355^\circ$, u, r, CA 566.27 JT, $\alpha 69^\circ / \beta -$, u, r, CA 567.00 JT, $\alpha 18^\circ / \beta -$, u, r, CA 567.26 JT, $\alpha 22^\circ / \beta -$, u, r, CA 567.47 JT, $\alpha 20^\circ / \beta -$, u, r, CN 568.35 JT, $\alpha 62^\circ / \beta -$, u, r, CN 568.59 JT, $\alpha 50^\circ / \beta -$, u, r, CN 568.87 JT, $\alpha 35^\circ / \beta -$, u, r, CA 569.20 JT, $\alpha 30^\circ / \beta -$, u, r, CA, trace Py 569.22 JT, $\alpha 45^\circ / \beta -$, u, r, CA, trace Py 569.39 JT, $\alpha 50^\circ / \beta -$, u, r, CN 569.75 JT, $\alpha 30^\circ / \beta -$, u, r, CA												
564																											
565																											
566																											
567																											
568			567.50 - 567.80 drilling disturbance - recovered as gravel sized fragments									TCR: 100 RQD: 100															
569												TCR: 100 RQD: 99															
Notes and Comments: End of Hole @ 706.8m										Inclination: -20° Orientation: 301°					Ground Water Level												
										Contractor: Alton Drilling Equipment: Rig 85					<table><tr><td>Date</td><td>Time</td><td>Reading (mbgl)</td><td>Hole depth (mbgl)</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>					Date	Time	Reading (mbgl)	Hole depth (mbgl)				
Date	Time	Reading (mbgl)	Hole depth (mbgl)																								
Refer to explanation sheets for abbreviation and symbols.																											

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 58 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
570			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos at defect boundaries; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite (continued from layer starting at 562.3m)					HQTT			TCR: 100 RQD: 99			570.45 VN, $\alpha 30^\circ/\beta-$, u, r, CA, closed, trace Py			
571								HQTT			TCR: 100 RQD: 100			571.81 VN, $\alpha 21^\circ/\beta-$, u, r, CA, closed, trace Py			
572			575.80 - 576.20 drilling disturbance					HQTT			TCR: 100 RQD: 100			572.20 VN, $\alpha 10^\circ/\beta-$, u, r, CA, closed			
573								HQTT			TCR: 100 RQD: 100			572.67 JT, $\alpha 40^\circ/\beta-$, st, r, CA, trace Py			
574								HQTT			TCR: 100 RQD: 100			572.95 VN, $\alpha 20^\circ/\beta-$, u, r, CA, closed			
575								HQTT			TCR: 100 RQD: 100			573.51 VN, $\alpha 30^\circ/\beta-$, u, r, CA, closed			
576								HQTT			TCR: 100 RQD: 97			575.50 JT, $\alpha 50^\circ/\beta-$, u, r, Py			
577								HQTT			TCR: 100 RQD: 100			576.76 JT, $\alpha 71^\circ/\beta-$, u, r, CN			
578								HQTT			TCR: 100 RQD: 100			577.52 JT, $\alpha 80^\circ/\beta-$, u, r, CA 577.60 JT, $\alpha 65^\circ/\beta-$, u, r, CN, trace Py 577.70 VN, $\alpha 50^\circ/\beta-$, u, r, CA, closed			
579								HQTT			TCR: 100 RQD: 100			578.88 JT, $\alpha 40^\circ/\beta-$, st, r, CN, trace Py			
580														579.78 JT, $\alpha 70^\circ/\beta-$, st, r, CN, trace			
Notes and Comments: End of Hole @ 706.8m										Inclination: -20°		Orientation: 301°		Ground Water Level			
Refer to explanation sheets for abbreviation and symbols.										Contractor: Alton Drilling		Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 59 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Slightly weathered; grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos at defect boundaries; rare gravel to boulder sized inclusion inclusions of strong fine grained andesite (continued from layer starting at 562.3m)					HQTT			TCR: 100 RQD: 100			Py		
	581													581.02 JT, $\alpha 70^\circ / \beta 185^\circ$, u, sm, CA, trace Py		
	582							HQTT			TCR: 100 RQD: 97			581.91 JT, $\alpha 57^\circ / \beta 180^\circ$, u, sm, CA, trace Fe		
	583													582.94 JT, $\alpha 78^\circ / \beta 260^\circ$, u, r, CA, trace Py		
	584													583.40 JT, $\alpha 55^\circ / \beta 200^\circ$, u, r, Py 583.48 JT, $\alpha 72^\circ / \beta 220^\circ$, u, r, CN		
	584.5													584.07 JT, $\alpha 78^\circ / \beta -$, u, r, Py		
	585		Slightly weathered; pale grey; ANDESITE; moderately strong; pyrite disseminated; non magnetic; some dark grey alteration halos at defect boundaries	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			584.64 JT, $\alpha 50^\circ / \beta -$, st, r, CLAY		
	586													586.44 JT, $\alpha 69^\circ / \beta -$, u, r, CLAY, trace Fe 586.67 JT, $\alpha 70^\circ / \beta 330^\circ$, u, sl, CLAY		
	587							HQTT			TCR: 100 RQD: 100					
	588							HQTT			TCR: 100 RQD: 100					
	589													589.27 JT, $\alpha 79^\circ / \beta -$, u, r, Py, trace Fe		
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.			Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85										Ground Water Level Date Time Reading (mbgl) Hole depth (mbgl)			

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 60 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level		
591			Slightly weathered; pale grey; ANDESITE; moderately strong; pyrite disseminated; non magnetic; some dark grey alteration halos at defect boundaries (continued from layer starting at 584.5m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			591.23 JT, $\alpha 42^\circ / \beta$ -, st, sm, CLAY, trace Py				
592																		
593																		
594									HQTT				TCR: 100 RQD: 97			594.50 JT, $\alpha 58^\circ / \beta 160^\circ$, st, r, CLAY 594.70 JT, $\alpha 81^\circ / \beta 30^\circ$, u, sl, CLAY, trace Py 594.87 JT, $\alpha 53^\circ / \beta 75^\circ$, u, sl, CLAY 594.93 JT, $\alpha 45^\circ / \beta 60^\circ$, u, sl, CLAY 594.95 JT, $\alpha 60^\circ / \beta 100^\circ$, u, sl, CLAY 595.12 JT, $\alpha 65^\circ / \beta 0^\circ$, st, r, CN, trace Py 595.37 JT, $\alpha 72^\circ / \beta 80^\circ$, u, r, CN		
595																		
596																596.14 JT, $\alpha 20^\circ / \beta$ -, u, r, CN 596.62 JT, $\alpha 60^\circ / \beta$ -, u, r, CN		
597									HQTT				TCR: 100 RQD: 100			597.11 JT, $\alpha 62^\circ / \beta 120^\circ$, u, r, CN 597.96 JT, $\alpha 58^\circ / \beta 55^\circ$, u, r, CLAY 598.37 JT, $\alpha 65^\circ / \beta 310^\circ$, st, r, CN 598.47 JT, $\alpha 70^\circ / \beta 40^\circ$, st, r, CN 598.66 JT, $\alpha 40^\circ / \beta 155^\circ$, st, r, CN		
598																		
599									HQTT				TCR: 100 RQD: 100					
600																599.80 VN, $\alpha 25^\circ / \beta$ -, u, r, CA, closed		
Notes and Comments: End of Hole @ 706.8m										Inclination: -20°		Orientation: 301°		Ground Water Level				
Refer to explanation sheets for abbreviation and symbols.										Contractor: Alton Drilling		Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)	

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 61 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS															
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY																							
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level											
601			Slightly weathered; pale grey; ANDESITE; moderately strong; pyrite disseminated; non magnetic; some dark grey alteration halos at defect boundaries (continued from layer starting at 584.5m) 600.20 drilling disturbance	SW				HQTT			TCR: 100 RQD: 100			599.95 VN, $\alpha 50^\circ/\beta-$, u, r, CA, closed, trace Py		600											
602																601											
603								HQTT			TCR: 100 RQD: 98			602.37 JT, $\alpha 71^\circ/\beta-$, u, sm, CN 602.47 JT, $\alpha 48^\circ/\beta-$, st, sm, CN 602.51 JT, $\alpha 70^\circ/\beta-$, st, r, CN		602											
604														603.47 JT, $\alpha 85^\circ/\beta-$, u, r, CN 603.62 JT, $\alpha 80^\circ/\beta-$, u, r, CN		603											
605			Moderately weathered; pale grey clay altered ANDESITE; weak; pyrite disseminated; non magnetic	WAIPU FORMATION				HQTT		TCR: 100 RQD: 100			604.17 JT, $\alpha 68^\circ/\beta-$, st, sm, CLAY	604													
606														604.75 - 604.78 SS, $\alpha 50^\circ/\beta-$, u, r, CLAY, trace gravel fragments, trace Py 604.91 JT, $\alpha 70^\circ/\beta-$, u, r, CLAY		605											
607														605.43 JT, $\alpha 50^\circ/\beta-$, u, r, CLAY		606											
608									HQTT		TCR: 100 RQD: 100			606.02 JT, $\alpha 50^\circ/\beta-$, st, r, Py 606.38 JT, $\alpha 65^\circ/\beta-$, u, r, CLAY		607											
609														606.80 JT, $\alpha 60^\circ/\beta-$, st, r, CLAY		608											
				MW							TCR: 100 RQD: 100			609.40 JT, $\alpha 15^\circ/\beta-$, u, sl, CLAY 609.83 JT, $\alpha 62^\circ/\beta 60^\circ$, u, sl, CLAY			609										
																610											
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.				Inclination: -20°				Orientation: 301°				Ground Water Level															
				Contractor: Alton Drilling				Equipment: Rig 85				Date				Time				Reading (mbgl)				Hole depth (mbgl)			

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 62 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Moderately weathered; pale grey clay altered ANDESITE; weak; pyrite disseminated; non magnetic (continued from layer starting at 605.0m)	WAIPU FORMATION	MW			HQTT			TCR: 100 RQD: 100			610.36 JT, $\alpha 48^\circ / \beta 130^\circ$, st, r, Py, trace CLAY 610.60 JT, $\alpha 50^\circ / \beta 158^\circ$, st, sm, CLAY, trace Py 611.57 JT, $\alpha 60^\circ / \beta -$, u, sl, CLAY 612.91 JT, $\alpha 60^\circ / \beta -$, st, r, CLAY 613.20 JT, $\alpha 50^\circ / \beta -$, u, r, CN, trace CLAY 613.60 JT, $\alpha 70^\circ / \beta -$, u, r, CLAY 614.23 JT, $\alpha 80^\circ / \beta -$, u, r, CN 614.40 VN, $\alpha 62^\circ / \beta -$, u, r, CA 614.67 VN, $\alpha 61^\circ / \beta -$, u, r, CN, closed 614.73 JT, $\alpha 65^\circ / \beta -$, u, r, CLAY 616.80 VN, $\alpha 20^\circ / \beta -$, u, r, CA, closed 617.00 VN, $\alpha 30^\circ / \beta -$, u, r, CA, closed 617.53 VN, $\alpha 40^\circ / \beta -$, u, r, CA, closed, dark alteration halo 617.75 VN, $\alpha 50^\circ / \beta -$, u, r, Py, closed 617.83 VN, $\alpha 12^\circ / \beta -$, u, r, CA, closed 618.40 JT, $\alpha 45^\circ / \beta -$, u, r, CA 618.68 JT, $\alpha 40^\circ / \beta -$, u, r, CA 619.05 JT, $\alpha 70^\circ / \beta -$, u, r, CLAY 619.27 JT, $\alpha 72^\circ / \beta -$, u, r, CN 619.40 JT, $\alpha 70^\circ / \beta -$, u, r, CN 619.80 VN, $\alpha 20^\circ / \beta 45^\circ$, u, r, CA,		
			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos		SW				HQTT			TCR: 100 RQD: 98				
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.				Inclination: -20°				Orientation: 301°				Ground Water Level				
				Contractor: Alton Drilling Equipment: Rig 85								Date	Time	Reading (mbgl)	Hole depth (mbgl)	

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 63 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS									
Easting: 2762594 RL: 205 m					Northing: 6424371 Datum: NZVD2016					System: NZMG 1949 Method: SURVEY									
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level			
			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos (continued from layer starting at 615.6m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			closed 620.84 JT, $\alpha 71^\circ / \beta 50^\circ$, u, r, CA, trace Fe 621.14 VN, $\alpha 39^\circ / \beta 325^\circ$, u, r, CA, closed 622.14 JT, $\alpha 60^\circ / \beta 90^\circ$, u, r, CA, trace Fe 623.40 JT, $\alpha 37^\circ / \beta 355^\circ$, u, r, CA, trace Py 623.63 VN, $\alpha 59^\circ / \beta 110^\circ$, u, r, CA, trace CLAY at boundaries 623.86 JT, $\alpha 79^\circ / \beta 120^\circ$, u, r, CA 623.89 VN, $\alpha 50^\circ / \beta 120^\circ$, u, r, CA, trace CLAY at boundaries 624.60 JT, $\alpha 75^\circ / \beta 150^\circ$, u, r, CA, trace CLAY 624.71 VN, $\alpha 35^\circ / \beta 0^\circ$, u, r, CA, closed 624.94 JT, $\alpha 57^\circ / \beta 50^\circ$, u, r, CA					
			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos; some gravel to boulder sized inclusions of strong fine grained andesite					HQTT			TCR: 100 RQD: 99								
								HQTT			TCR: 100 RQD: 100								
								HQTT			TCR: 100 RQD: 95								
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level							
				Contractor: Alton Drilling								Date	Time	Reading (mbgl)	Hole depth (mbgl)				
				Equipment: Rig 85															
Refer to explanation sheets for abbreviation and symbols.																			

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 64 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
631			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos; some gravel to boulder sized inclusions of strong fine grained andesite (continued from layer starting at 625.0m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 95			630.00 VN, $\alpha 85^\circ / \beta 210^\circ$, u, r, CA, closed 630.14 JT, $\alpha 85^\circ / \beta 270^\circ$, u, r, CA 630.22 VN, $\alpha 80^\circ / \beta 180^\circ$, u, r, CA, closed 630.32 JT, $\alpha 65^\circ / \beta 185^\circ$, u, r, CA 630.47 JT, $\alpha 70^\circ / \beta 185^\circ$, u, r, CA 630.62 VN, $\alpha 22^\circ / \beta 25^\circ$, u, r, CA, closed, dark alteration halo 631.16 JT, $\alpha 68^\circ / \beta 150^\circ$, u, r, CA 631.64 JT, $\alpha 49^\circ / \beta 80^\circ$, u, r, CA 632.00 VN, $\alpha 15^\circ / \beta -$, u, r, CA, closed 632.06 VN, $\alpha 60^\circ / \beta -$, u, r, CA 632.15 JT, $\alpha 80^\circ / \beta -$, u, r, CA 632.22 JT, $\alpha 45^\circ / \beta -$, u, r, CA 632.56 JT, $\alpha 30^\circ / \beta -$, u, r, CA 632.73 JT, $\alpha 48^\circ / \beta -$, u, r, CA 632.92 JT, $\alpha 45^\circ / \beta -$, u, r, CA 633.45 JT, $\alpha 72^\circ / \beta -$, u, r, CLAY, trace Py 633.47 VN, $\alpha 65^\circ / \beta -$, u, r, CA, closed 633.69 VN, $\alpha 72^\circ / \beta -$, u, r, CA, trace CLAY 634.00 VN, $\alpha 70^\circ / \beta 110^\circ$, u, r, CA, gravel sized fragments of host rock, trace clay 635.10 VN, $\alpha 50^\circ / \beta -$, u, r, CA, closed, trace Py 635.43 JT, $\alpha 85^\circ / \beta -$, st, r, CN 635.67 JT, $\alpha 85^\circ / \beta -$, u, r, CA 636.90 JT, $\alpha 50^\circ / \beta -$, u, r, CA, trace CLAY 637.14 JT, $\alpha 32^\circ / \beta -$, u, r, CA 637.54 JT, $\alpha 62^\circ / \beta 280^\circ$, st, sm, CA 638.46 JT, $\alpha 68^\circ / \beta 175^\circ$, u, r, CA 638.90 VN, $\alpha 30^\circ / \beta 315^\circ$, u, r, CA, closed 639.26 JT, $\alpha 52^\circ / \beta 100^\circ$, u, r, CA, trace Py			
632								HQTT			TCR: 100 RQD: 92						
633								HQTT			TCR: 100 RQD: 92						
634								HQTT			TCR: 100 RQD: 92						
635								HQTT			TCR: 100 RQD: 92						
636								HQTT			TCR: 100 RQD: 100						
637								HQTT			TCR: 100 RQD: 100						
638								HQTT			TCR: 100 RQD: 100						
639								HQTT			TCR: 100 RQD: 100						
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.					Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85				Ground Water Level				Date	Time	Reading (mbgl)	Hole depth (mbgl)	

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 65 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
-14			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; some randomly orientated calcite veins (<2mm); some with dark grey alteration halos; some gravel to boulder sized inclusions of strong fine grained andesite (continued from layer starting at 625.0m)	WAIUPU FORMATION SW				HQTT			TCR: 100 RQD: 100			640.36 JT, $\alpha 49^\circ/\beta -$, u, r, CN		
641			Slightly weathered; dark grey; porphyritic ANDESITE; strong; sulphide rich; pyrite disseminated; non magnetic; some randomly orientated calcite veins (<2mm) with dark grey halos					HQTT			TCR: 100 RQD: 97			641.05 VN, $\alpha 60^\circ/\beta -$, u, r, CA, closed 641.07 VN, $\alpha 30^\circ/\beta -$, u, r, CA, closed 641.24 VN, $\alpha 30^\circ/\beta -$, u, r, CA, closed 641.34 VN, $\alpha 20^\circ/\beta -$, u, r, CA, closed 641.49 JT, $\alpha 50^\circ/\beta -$, u, r, CA		
642								HQTT			TCR: 100 RQD: 93			641.95 JT, $\alpha 60^\circ/\beta -$, u, r, CA, trace CLAY and Py		
643														642.95 JT, $\alpha 65^\circ/\beta -$, u, r, CN 643.21 VN, $\alpha 35^\circ/\beta -$, u, r, CA, closed 643.27 VN, $\alpha 32^\circ/\beta -$, u, r, CA, closed 643.58 VN, $\alpha 20^\circ/\beta -$, u, r, CA, closed 643.78 VN, $\alpha 78^\circ/\beta -$, u, r, CA, closed 643.85 VN, $\alpha 28^\circ/\beta 300^\circ$, u, r, CA, closed 644.13 VN, $\alpha 32^\circ/\beta 300^\circ$, u, r, CA, closed 644.46 VN, $\alpha 38^\circ/\beta 300^\circ$, u, r, CA, closed 644.73 JT, $\alpha 60^\circ/\beta 240^\circ$, u, r, CA 644.89 VN, $\alpha 30^\circ/\beta 300^\circ$, u, r, CA, closed 645.17 VN, $\alpha 22^\circ/\beta 295^\circ$, u, r, CA, closed 645.47 VN, $\alpha 45^\circ/\beta 30^\circ$, u, r, CA, closed 645.51 VN, $\alpha 28^\circ/\beta 330^\circ$, u, r, CN, closed 645.87 - 645.92 VN, $\alpha 28^\circ/\beta 280^\circ$, u, r, CA, closed 645.93 VN, $\alpha 28^\circ/\beta 290^\circ$, u, r, CA, closed 646.10 JT, $\alpha 70^\circ/\beta 60^\circ$, u, r, CA 646.13 VN, $\alpha 21^\circ/\beta 270^\circ$, u, r, CA, closed		
644			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-20mm); some with dark grey alteration halos					HQTT			TCR: 100 RQD: 92			647.12 VN, $\alpha 20^\circ/\beta 235^\circ$, u, r, CA, closed 647.35 JT, $\alpha 60^\circ/\beta 260^\circ$, u, r, CA, trace Py 647.56 VN, $\alpha 55^\circ/\beta 240^\circ$, u, r, CA, closed 647.70 JT, $\alpha 70^\circ/\beta 60^\circ$, u, r, CA 647.73 VN, $\alpha 80^\circ/\beta 300^\circ$, u, r, CA, closed 648.14 VN, $\alpha 20^\circ/\beta 230^\circ$, u, r, CA, closed 648.28 VN, $\alpha 22^\circ/\beta 225^\circ$, u, r, CA, closed 648.52 VN, $\alpha 25^\circ/\beta 200^\circ$, u, r, CA, closed 648.61 JT, $\alpha 60^\circ/\beta 280^\circ$, u, r, CA, trace Py 648.86 VN, $\alpha 45^\circ/\beta 300^\circ$, u, r, CA, closed, trace Py 649.26 VN, $\alpha 40^\circ/\beta 250^\circ$, u, r, CA, closed, trace Py 649.37 VN, $\alpha 55^\circ/\beta 265^\circ$, u, r, CA, closed, trace Py 649.65 VN, $\alpha 50^\circ/\beta 100^\circ$, u, r, CA, closed, trace Py		
645																
646																
647																
648																
649																
Notes and Comments: End of Hole @ 706.8m				Inclination: -20°				Orientation: 301°				Ground Water Level				
Refer to explanation sheets for abbreviation and symbols.				Contractor: Alton Drilling				Date				Time				
				Equipment: Rig 85				Reading (mbgl)				Hole depth (mbgl)				

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 66 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY												
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering	Sample / Test	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
651			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic; frequent randomly orientated calcite veins (2-20mm); some with dark grey alteration halos (continued from layer starting at 643.9m)	WAIPUPU FORMATION SW				HQTT			TCR: 100 RQD: 98			649.68 VN, $\alpha 20^\circ / \beta 230^\circ$, u, r, CA, closed, trace Py 649.77 VN, $\alpha 22^\circ / \beta 220^\circ$, u, r, CA, closed, trace Py 650.32 VN, $\alpha 50^\circ / \beta 200^\circ$, u, r, CA, closed, trace Py 650.39 VN, $\alpha 55^\circ / \beta 260^\circ$, u, r, CA, closed 650.62 VN, $\alpha 45^\circ / \beta 300^\circ$, u, r, CA, closed 650.90 VN, $\alpha 18^\circ / \beta 220^\circ$, u, r, CA, closed 651.20 VN, $\alpha 12^\circ / \beta 220^\circ$, u, r, CA, closed, trace Py 651.73 VN, $\alpha 50^\circ / \beta 250^\circ$, u, r, CA, closed, trace dark alteration halo 651.91 VN, $\alpha 20^\circ / \beta 202^\circ$, u, r, CA, closed, trace dark alteration halo 652.10 VN, $\alpha 20^\circ / \beta 215^\circ$, u, r, CA, closed, trace dark alteration halo 652.26 - 652.35 VN, $\alpha 35^\circ / \beta 220^\circ$, u, r, CA, hydrothermal brecciation 652.47 VN, $\alpha 25^\circ / \beta 30^\circ$, u, r, CA, closed 653.21 JT, $\alpha 62^\circ / \beta 45^\circ$, u, r, CLAY		
652			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic					HQTT			TCR: 100 RQD: 100			654.22 JT, $\alpha 60^\circ / \beta 200^\circ$, u, r, CLAY		
653								HQTT			TCR: 100 RQD: 100			655.20 JT, $\alpha 35^\circ / \beta 210^\circ$, u, r, CLAY		
654								HQTT			TCR: 100 RQD: 99			659.46 VN, $\alpha 48^\circ / \beta 140^\circ$, u, r, CLAY, closed 659.84 VN, $\alpha 51^\circ / \beta 200^\circ$, u, r, CA,		
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.				Inclination: -20°		Orientation: 301°		Ground Water Level								
				Contractor: Alton Drilling Equipment: Rig 85				Date	Time	Reading (mbgl)	Hole depth (mbgl)					

 Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 67 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : 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GHD		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011				
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY		Logged : HJ Processed : HJ Checked : JHS										
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic (continued from layer starting at 666.3m)	WAIPU FORMATION	SW			HQTT			TCR: 100 RQD: 100		669.95 JT, $\alpha 51^\circ / \beta -$, u, r, CLAY 670.29 JT, $\alpha 62^\circ / \beta 245^\circ$, u, sl, CLAY, trace Py 670.95 JT, $\alpha 60^\circ / \beta 50^\circ$, u, r, CN 671.10 JT, $\alpha 45^\circ / \beta 160^\circ$, u, r, CLAY, trace CA 671.35 JT, $\alpha 50^\circ / \beta 80^\circ$, u, r, CN, trace CLAY 671.75 JT, $\alpha 55^\circ / \beta 300^\circ$, u, r, CLAY		670	
								HQTT			TCR: 100 RQD: 100		673.46 JT, $\alpha 70^\circ / \beta 0^\circ$, st, r, CN 674.34 JT, $\alpha 25^\circ / \beta 260^\circ$, u, r, CLAY 674.82 JT, $\alpha 80^\circ / \beta 140^\circ$, u, r, CLAY 675.20 JT, $\alpha 80^\circ / \beta -$, u, r, CLAY 675.66 JT, $\alpha 70^\circ / \beta -$, u, r, CLAY		671	
								HQTT			TCR: 100 RQD: 99		677.57 JT, $\alpha 50^\circ / \beta -$, u, r, CA 677.59 VN, $\alpha 80^\circ / \beta -$, u, r, CLAY 677.89 JT, $\alpha 50^\circ / \beta -$, u, r, CA 678.47 JT, $\alpha 40^\circ / \beta -$, u, sl, CLAY		672	
								HQTT			TCR: 100 RQD: 100		679.34 VN, $\alpha 60^\circ / \beta -$, u, r, CA, closed 679.45 JT, $\alpha 60^\circ / \beta -$, st, r, CA 679.61 JT, $\alpha 45^\circ / \beta -$, u, r, CA 679.78 JT, $\alpha 58^\circ / \beta -$, u, sm, CLAY		673	
																674
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Notes and Comments: End of Hole @ 706.8m		Inclination: -20° Orientation: 301°		Ground Water Level	
Equipment: Rig 85		Date	Time	Reading (mbgl)	Hole depth (mbgl)
Refer to explanation sheets for abbreviation and symbols.					

			Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 69 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS			
Easting: 2762594 RL: 205 m			Northing: 6424371 Datum: NZVD2016			System: NZMG 1949 Method: SURVEY										
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level
681.2			Slightly weathered; pale grey; porphyritic ANDESITE; strong; pyrite disseminated; non magnetic (continued from layer starting at 666.3m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100		679.90 JT, $\alpha 45^\circ / \beta -$, u, r, CN 680.25 JT, $\alpha 50^\circ / \beta -$, u, r, CN 680.52 JT, $\alpha 48^\circ / \beta -$, u, r, CA, trace CLAY 680.85 JT, $\alpha 55^\circ / \beta -$, u, r, CLAY 681.35 JT, $\alpha 43^\circ / \beta -$, u, sl, CLAY			
682			Slightly weathered; pale grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic					HQTT			TCR: 100 RQD: 98		682.90 JT, $\alpha 40^\circ / \beta 240^\circ$, u, sl, CLAY 682.95 VN, $\alpha 42^\circ / \beta 245^\circ$, u, r, CA, trace Py 683.42 JT, $\alpha 34^\circ / \beta 100^\circ$, u, sl, CLAY			
684								HQTT			TCR: 100 RQD: 97		684.70 JT, $\alpha 35^\circ / \beta 278^\circ$, u, sl, CLAY 684.83 JT, $\alpha 30^\circ / \beta 300^\circ$, u, sl, CLAY, trace CA 685.10 JT, $\alpha 18^\circ / \beta 283^\circ$, u, sl, CLAY, trace Py 685.55 JT, $\alpha 29^\circ / \beta 270^\circ$, u, sl, CLAY, trace Py 686.00 JT, $\alpha 22^\circ / \beta 345^\circ$, u, sl, CLAY 686.20 JT, $\alpha 48^\circ / \beta 275^\circ$, u, sl, CLAY			
687								HQTT			TCR: 100 RQD: 100		686.51 JT, $\alpha 65^\circ / \beta 335^\circ$, u, r, CLAY 686.60 JT, $\alpha 20^\circ / \beta 275^\circ$, u, r, CA 686.70 VN, $\alpha 32^\circ / \beta 95^\circ$, u, r, CA, closed 687.22 JT, $\alpha 62^\circ / \beta 348^\circ$, u, r, CLAY 687.47 VN, $\alpha 33^\circ / \beta 270^\circ$, u, r, CA, closed 687.90 JT, $\alpha 33^\circ / \beta 260^\circ$, u, sl, CLAY, trace CA 688.80 JT, $\alpha 50^\circ / \beta 140^\circ$, st, sl, CLAY 689.27 JT, $\alpha 50^\circ / \beta 180^\circ$, u, r, CA 689.50 JT, $\alpha 55^\circ / \beta 190^\circ$, u, r, CN 689.70 JT, $\alpha 56^\circ / \beta 165^\circ$, u, r, CLAY			
Notes and Comments:			Inclination: -20°			Orientation: 301°			Ground Water Level							
End of Hole @ 706.8m			Contractor: Alton Drilling			Equipment: Rig 85			Date	Time	Reading (mbgl)	Hole depth (mbgl)				
Refer to explanation sheets for abbreviation and symbols.																

Report ID: ROCKLOG || Project: WNDD011.GPJ || Library: GHD - NZGD.GLB || Date: 30 August 2021

		Project : WKP Exploration Tunnel - Ground Investigations Client : OceanaGold Corporation Site : Willows Farm, Waihi North, Job Number: 12533958 Commenced: 17/05/2021 Completed: 6/07/2021										Hole No. : WNDD011 Sheet : 71 of 71 Hole Length : 706.8 Scale @ A4 : 1:50 Logged : HJ Processed : HJ Checked : JHS					
Easting: 2762594 RL: 205 m		Northing: 6424371 Datum: NZVD2016		System: NZMG 1949 Method: SURVEY													
RL (m)	Depth (m)	Graphic	Material Description	Geological Unit	Weathering Number / Type	Sample / Test Result	Casing	Method	Flush Return (%)	Estimated Strength (MPa)	TCR RQD SCR (%)	Defect Spacing (mm)	Visual Defect	Description (and sub Detail)	Instrumentation Installation	Water level	
	701		Slightly weathered; pale grey; clay altered ANDESITE; weak; pyrite disseminated; non magnetic (continued from layer starting at 681.2m)	WAIPU FORMATION SW				HQTT			TCR: 100 RQD: 100			700.35 JT, $\alpha 28^\circ / \beta 20^\circ$, u, sl, CLAY		700	
	702		Slightly weathered; light pale grey; ANDESITE; moderately strong; pyrite disseminated; non magnetic; some dark halos at defects					HQTT			TCR: 100 RQD: 100					701	
	703														703.39 JT, $\alpha 59^\circ / \beta 290^\circ$, u, r, CN		702
	704														704.55 JT, $\alpha 72^\circ / \beta -$, u, r, CN		703
	705								HQTT			TCR: 100 RQD: 100			705.20 JT, $\alpha 73^\circ / \beta -$, u, r, CN 705.60 JT, $\alpha 75^\circ / \beta -$, u, r, CN 705.95 JT, $\alpha 45^\circ / \beta -$, u, sl, CLAY		704
	706															705	
	707		End of Hole @ 706.8m, TD													706	
	708															707	
	709															708	
																709	
																710	
Notes and Comments: End of Hole @ 706.8m Refer to explanation sheets for abbreviation and symbols.							Inclination: -20° Orientation: 301° Contractor: Alton Drilling Equipment: Rig 85				Ground Water Level Date Time Reading (mbgl) Hole depth (mbgl)						

APPENDIX D

Wharekirauponga Preliminary
Economics Analysis (PEA) –
Geotechnical Section
(OceanaGold)

1 GEOTECHNICAL

The geotechnical investigation undertaken by the OGC Studies Group team entailed the establishment of the geotechnical characterization and geotechnical design elements for the project area.

1.1 Overview

To establish the geotechnical characteristics and design elements for the underground mine. The assessment entailed the following:

- Understanding the geological setting of the gold deposit(s).
- Creation and population of an interpretable geotechnical property database based on the limited geotechnical core logging available at the time of this study.
- Collection and recording of suitable core samples for rock property testing in a laboratory, supported by field estimates (point loads) of rock strengths.
- Graphical representation and interpretation of recorded data, culminating in compilation of a written report that qualifies the geotechnical environment.
- Transformation of data into Barton's Q' value.
- Transformation of data into N'-values for assessing slope dimensions using the Stability Graph Method.
- Numerical stress modelling of various slope sequences and layouts using MAP3D.

1.2 Drill hole data

Table 1 provides a list of 77 geotechnical drill holes that were provided in the data file WKP_DH_collar_info.csv. A drill hole database of these drill holes was created in Surpac. An RQD model was created within the drill hole database. Core photos for all of these drill holes were downloaded for visual review.

Not all of the drill holes had geotechnical logging for the full suite of Q-rating parameters. This will be discussed in the section on the rock mass classification.

Table 1: List of all available geotechnical drill holes

WKP-P01D	WKP32A	WKP43	WKP52	WKP63	WKP73	WKP84
WKP-P02D	WKP33	WKP43A	WKP53	WKP64	WKP74	WKP85
WKP24	WKP34	WKP44	WKP54	WKP65	WKP75	WKP86
WKP25	WKP35	WKP45A	WKP55	WKP66	WKP76	WKP87
WKP26	WKP36	WKP45	WKP56	WKP68	WKP77	WKP88
WKP27	WKP37	WKP46	WKP57	WKP69	WKP78	WKP89
WKP28	WKP38	WKP48	WKP58	WKP70	WKP79	WKP91
WKP29	WKP39	WKP48A	WKP59	WKP71	WKP80	WKP92
WKP30	WKP40	WKP48B	WKP60	WKP71A	WKP81	WKP93
WKP31	WKP41	WKP50	WKP61	WKP71B	WKP82	WKP94
WKP32	WKP42	WKP51	WKP62	WKP72	WKP83	WKP94A

1.2.1 Lithostratigraphy

In the Scoping Study (SRK, 2019) the geotechnical domains were based on the lithology. These lithological domains included the following:

- Eastern Rhyolite Flow
- Multi Lithic Lapili Tuff
- West Rhyolite Flow
- Country Rock

The Country Rock was defined as areas located outside of the wireframe surfaces that were provided.

In this report the lithological domains are based on new lithological wireframe models. Only the following lithological models located adjacent to the PFS model are considered relevant:

- Eastern Rhyolite Flow
- Northern Rhyolite Flow
- Post Min Andesite Flow

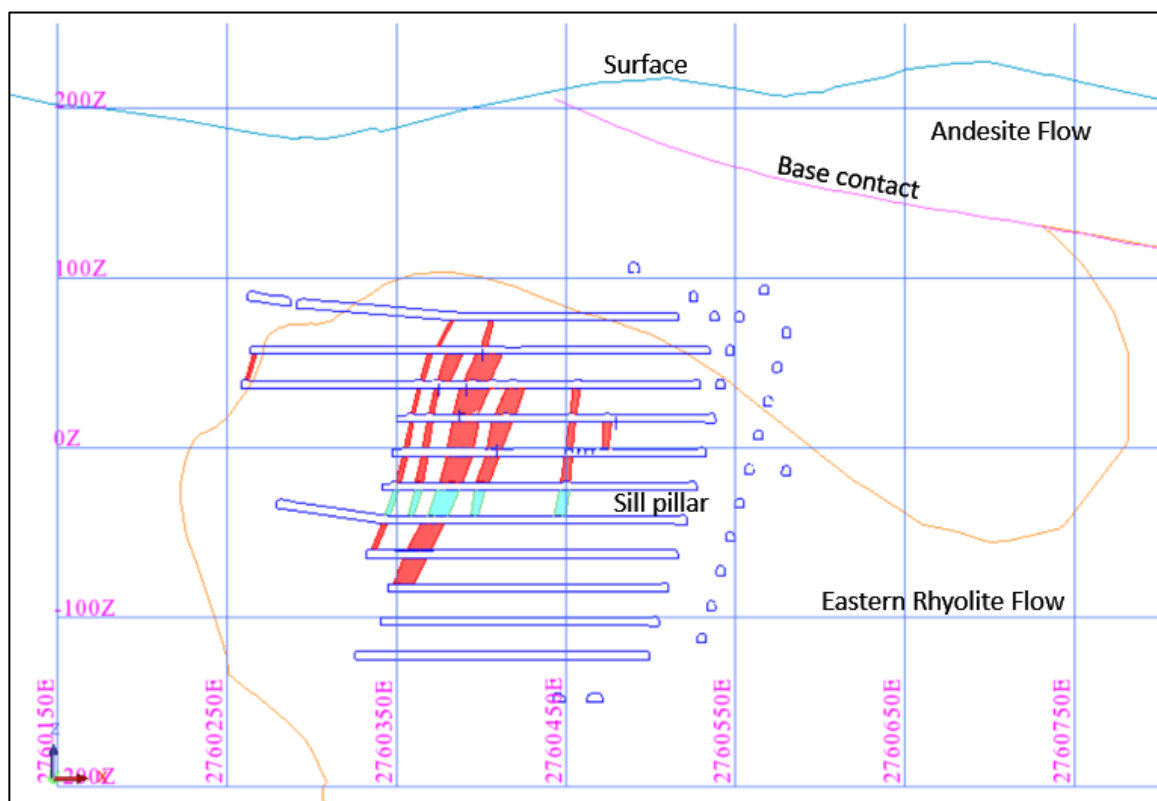


Figure 1: Southern decline access lithology

Figure 1 shows a cross-section (looking north) through the Southern Decline stope access. The stopes and access drives are located within the Eastern Rhyolite Flow.

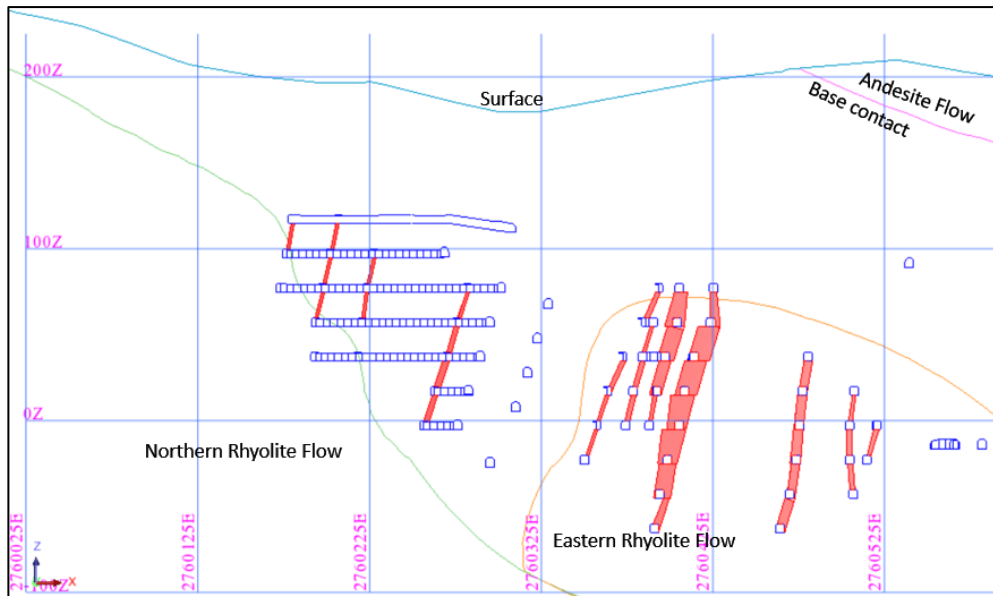


Figure 2: Western decline access lithology

Figure 2 shows a cross-section (looking north) through the Western Decline stope access. Most of the stopes and access drives from the Western Decline are located within an unclassified lithology (no wireframe model for this area). The far western side of the access drives are located within the Northern Rhyolite Flow. The stopes and ore drives located on the northern side of the South Decline are located within the Eastern Rhyolite Flow.

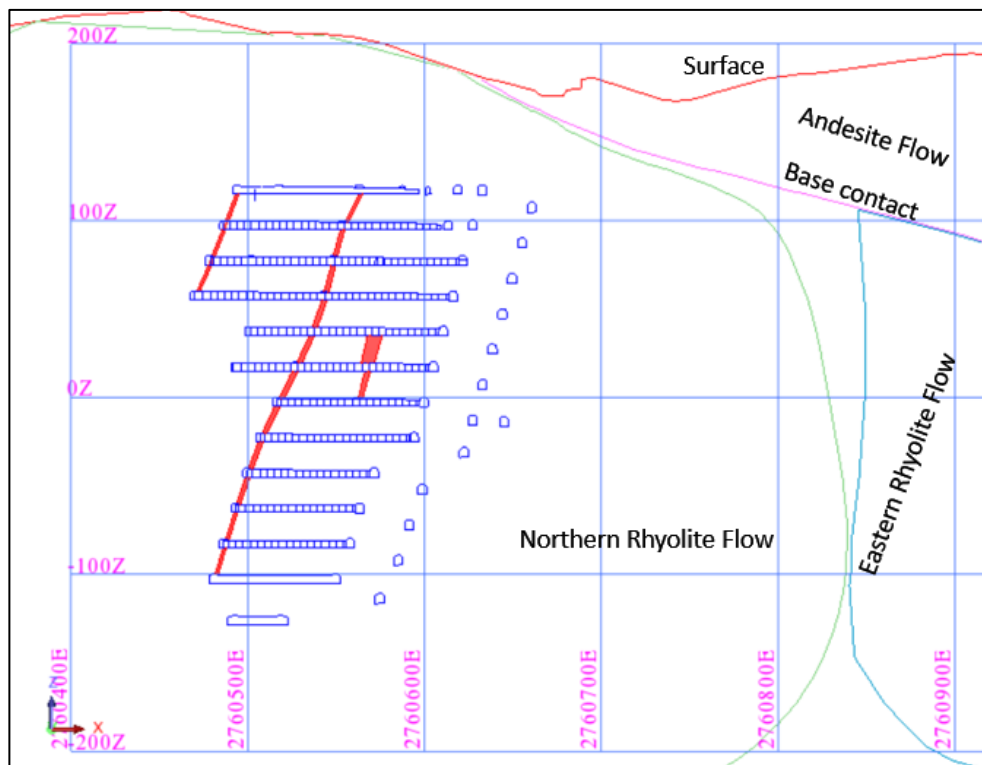


Figure 3: Northern decline access lithology

Figure 3 shows a cross-section (looking north) through the Northern Decline stope access. The stopes and access drives are located within the Northern Rhyolite Flow.

1.2.2 Major Structural

Figure 4 was taken from the Scoping Study (SRK, 2019). All of the stopes in PFS design are located east of the Andesite Dyke.

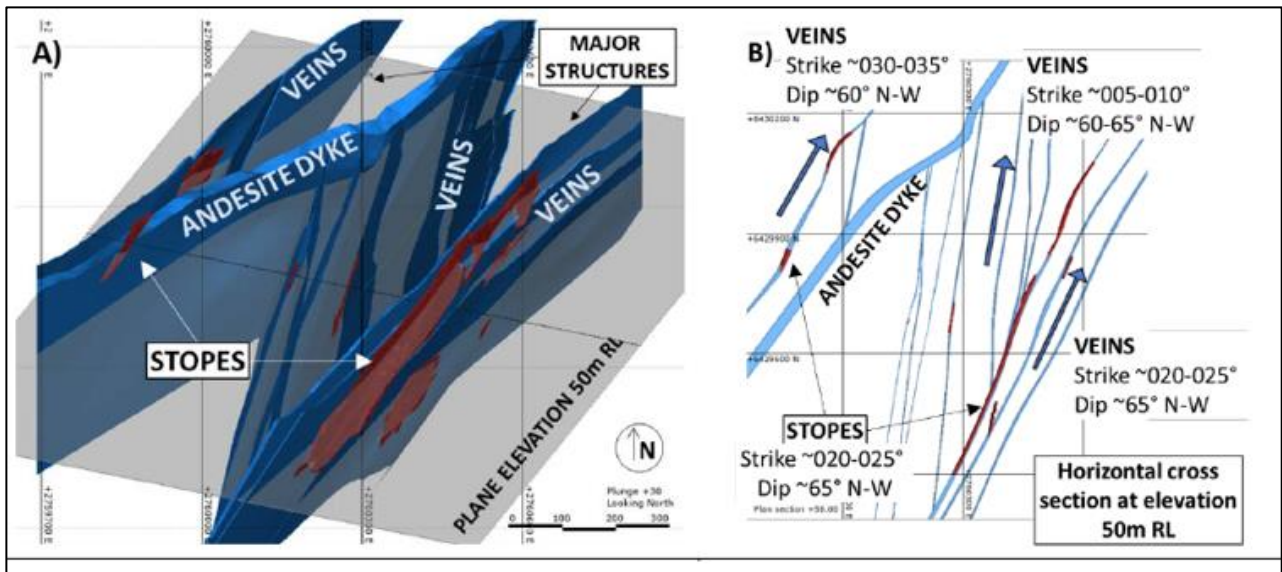


Figure 4: A) View of stopes and major structures; B) Horizontal cross section (50 m RL) showing stopes and orientation of major structures.

1.3 Structural Sets

The structural orientations shown in Figure 5 stereonet were analysed in the Scoping Study (SRK, 2019). This information has not been updated or re-analysed for the PFS. The general conclusion from the Scoping Study was that the structural sets strike parallel to structural veins (~ 020°), with the dip angle varying from 40° to 90° toward the northwest.

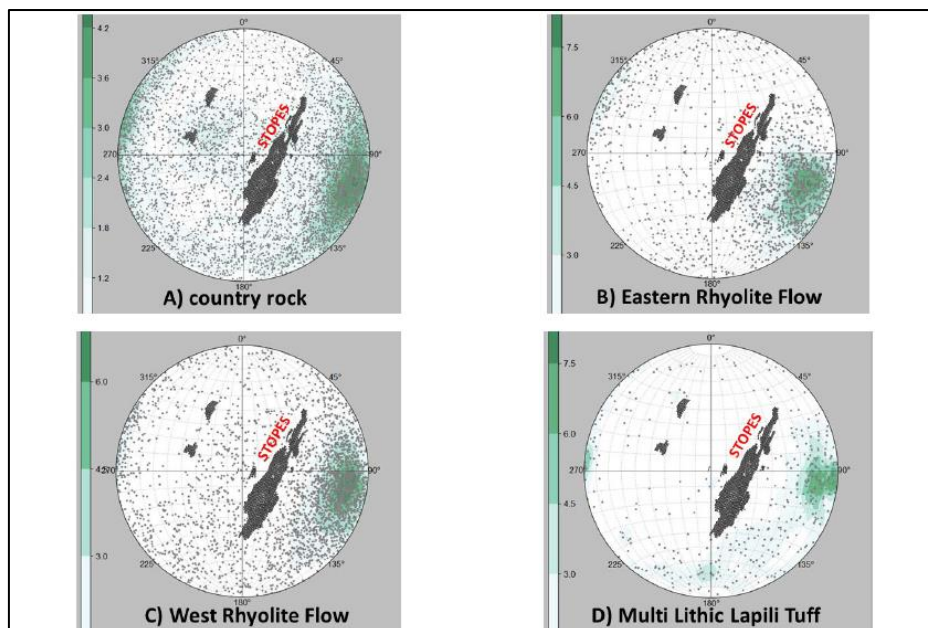


Figure 5: Lithological based sets

1.4 Rock mass quality parameter

The logged parameters Jn, Ja, Jr and rock quality designation (RQD) that were provided in the geotechnical database were used to calculate Barton's Q' value (Barton et al., 1974; NGI, 2015).

$$Q' = (RQD/J_n) \times (J_r/J_a) \text{ (Equation 1)}$$

All geotechnical logging located within the current PFS mine design area was considered. Logging related to the area adjacent to the T-Stream vein was excluded because it is located too far away from the current PFS mine design zone. The data that was analysed involves a sample size population of 516 rows of logging data with the full suite of Q' parameters. The total length of core that was evaluated was 1,910 metres. The logging intervals were based on geotechnical domains, therefore the interval lengths for each line of data is not equal. The data was analysed according to 1st quartile and 2nd quartile (median) values. The Q-ratings were converted to Geological Strength Index (GSI) values using the standard empirical conversion formula. The GSI ratings were converted to a weighted average that was based on the interval length, and then the final GSI weighted average was converted back to a Q' value using the standard empirical conversion formula.

$$GSI = 9 \ln_e(Q') + 44 \text{ (Equation 2)}$$

The table below shows a summary of the drill holes and zones used to evaluate the rock mass quality. The actual geotechnical logging database has Q' drill hole intervals that are a subset of the zone lengths shown below. Because the current WKP mine design involves development and stoping on a series of sub-parallel veins, the data cannot be easily categorized as being "20m into the hanging wall" or "20m into the footwall." However, the geotechnical logging intervals were categorized as being located in either the hanging wall, the footwall, or the vein. This was done by looking at each drill hole in the drill hole database model, and then looking at the relative location within the solids models of all the known veins. In the case of a drill hole traversing through sub-parallel veins, the description of "footwall" or "hanging wall" was based on the relative location to the nearest vein.

Table 2: Summary of drill holes and zones used to evaluate the rock mass quality

Drill hole	From	To	Metres	Drill hole	From	To	Metres
WKP50	45.0	110.8	65.8	WKP71B	337.7	491.6	153.9
WKP50	133.0	160.0	27.0	WKP74	85.3	91.3	6.0
WKP50	170.9	171.7	0.8	WKP74	340.3	363.7	23.4
WKP50	187.7	194.3	6.6	WKP74	365.0	370.9	5.9
WKP50	195.0	347.0	152.0	WKP74	372.4	389.0	16.6
WKP50	352.5	396.6	44.1	WKP77	373.8	392.0	18.2
WKP52	396.9	433.5	36.6	WKP79	360.0	502.6	142.6
WKP53	558.0	616.0	58.0	WKP80	207.0	265.2	58.2
WKP54	429.8	558.0	128.2	WKP81	398.2	523.6	125.4
WKP57	227.8	265.6	37.8	WKP83	373.0	446.0	73.0
WKP57	269.2	303.2	34.0	WKP85	300.0	350.0	50.0
WKP60	440.0	451.3	11.3	WKP86	336.0	439.4	103.4
WKP63	373.1	375.6	2.5	WKP87	220.0	320.0	100.0
WKP63	376.2	502.3	126.1	WKP89	211.0	257.1	46.1
WKP64	238.9	241.5	2.6	WKP91	236.0	307.0	71.0
WKP66	278.4	328.2	49.8	WKP93	300.0	433.4	133.4

Table 3 below shows a summary of the Q-ratings and GSI values for the hangingwall, footwall and vein. As expected, the hangingwall and footwall have nearly identical values. The vein material appears to have slightly lower values compared with the host rock. This could possibly be caused by slightly more intense shearing in the vicinity of the mineralization.

In general, the median values and the weighted average values are similar, and they describe a “fair quality” rock mass using Barton’s Q-rating description. The 1st quartile values describe a “poor quality” rock mass according to the Barton system. In practical terms, however, the 1st quartile values are still good enough to pull 4m rounds in a 5m x 5m development drive, and these drive can be easily supported with 1.8m Friction Bolts and weld mesh. Fibrecrete would only be necessary where $Q < 1$.

Table 3: Summary of Q-ratings and GSI values

Parameter	Hangingwall	Footwall	Vein	All Data
Sample Population	231	165	120	516
Metres Logged	921	617	372	1910
GSI weighted average	65	65	60	64
GSI 2nd quartile (median)	64	62	61	63
GSI 1st quartile	55	56	52	54
Q' weighted average	9.8	10.5	6.1	9.2
Q' 2nd quartile (median)	9.1	7.3	6.7	8.2
Q' 1st quartile	3.4	3.6	2.5	3.2

Table 4 shows a summary of the Q-ratings described in the WKP Scoping Study, and this data was generated using only 422m of core logging. 1st quartile values are similar to those described in the most current analysis that used 1,910 metres of core logging. From a design perspective at a PFS level, the 1st quartile values should be used for the geotechnical designs.

Table 4: Summary of Q-ratings from the WKP Scoping Study (SRK, April 2019)

Lithology	Q'		
	25 th Percentile	50 th Percentile	75 th Percentile
Country Rock	2.3	6.0	11.0
Eastern Rhyolite Flow	3.0	5.0	14.0
West Rhyolite Flow	4.8	8.6	25.0
Multi Lithic Lapili Tuff	4.0	4.0	8.0

1.5 Laboratory testing

1.5.1 Rock Density

The WKP rock density database used in this report is based on rock sample density information from the following file: WKP_DH_SG_values_20201127.xls. There are 352 density samples taken from 84.2m of drill core. The drill holes in this density database are shown in Table 5 below.

Table 5: Drill holes used in the WKP rock density database

WKP42	WKP52	WKP62	WKP75	WKP85
WKP43	WKP53	WKP63	WKP76	WKP86
WKP44	WKP54	WKP65	WKP77	WKP89
WKP45	WKP55	WKP66	WKP79	WKP91
WKP46	WKP57	WKP68	WKP80	WKP93
WKP48	WKP58	WKP71B	WKP81	WKP94
WKP50	WKP60	WKP74	WKP83	WKP94A

The density data base provides information that can be used for estimating vertical stress. The rock density also has a high correlation with rock strength, i.e. higher rock densities are associated with relatively higher UCS values. The WKP rock density statistics are shown in the table below. The average and the mean density are both approximately 2.5 t/m³, and this implies that the vertical stress gradient can be approximately as 2.5 MPa per 100m of depth below surface.

Table 6: Rock density statistics

Min	2.04
Max	3.31
Average	2.49
1st quartile	2.44
2nd quartile	2.50
3rd quartile	2.55

1.5.2 Uniaxial Compressive Strength

All rock testing has been done at the E-Precision laboratory in Perth, Australia. Table 7 shows the rock density and UCS values measured for the 11 lab samples that were tested. The samples were taken from various lithologies including Andesite Flow, Eastern Rhyolite Flow, and Northern Rhyolite Flow. The lithologies that is most relevant for the WKP mine design in the PFS are the Eastern Rhyolite Flow and Northern Rhyolite Flow. The sample diameters range from 45mm to 83mm. The UCS values have been normalized to a standard 50mm diameter using the standard empirical formula:

$$\sigma_{c50} = \sigma_c / (50/D)^{0.18} \text{ (Equation 3)}$$

Table 7: UCS results for WKP rock

Sample ID	Drillhole ID	From (m)	To (m)	Core Size	Lithology	Diameter (mm)	Length (mm)	Density (t/m ³)	UCS (MPa)	Corrected UCS σ_{c50} (MPa)
WKP2020RP-001	WKP93	45.00	45.25	PQ	AFM	82.77	195.41	2.47	102.58	112
WKP2020RP-002	WKP93	181.50	181.80	PQ	AFM	82.46	195.01	2.65	42.88	46.9
WKP2020RP-003	WKP93	319.80	320.10	HQ	Eastern RF	60.26	148.90	2.12	17.95	18.6
WKP2020RP-005	WKP93	463.50	464.00	HQ	Eastern RF	60.75	149.72	2.29	14.20	14.7
WKP2020RP-006	WKP94	146.70	147.10	PQ	AFM	82.64	198.59	2.54	112.42	123
WKP2020RP-007	WKP94	272.00	272.40	HQ	Eastern RF	61.01	149.27	2.34	43.10	44.7
WKP2020RP-008	WKP94A	292.90	293.40	HQ	Eastern RF	61.02	149.15	2.59	229.45	238
WKP2020RP-009	WKP94A	330.80	331.50	NQ	Eastern RF	45.06	114.62	2.33	137.88	135
WKP Scoping Study	WKP68	316.50	317.00	HQ	Northern RF	61	N/A	2.29	133.19	138
WKP Scoping Study	WKP68	333.20	334.00	HQ	Northern RF	61	N/A	2.36	153.26	159
WKP Scoping Study	WKP68	359.20	360.60	HQ	Northern RF	61	N/A	2.47	184.56	191

There are large variations in the UCS values even within the same lithology. Andesite ranges from 47 to 123 MPa. Northern Rhyolite ranges from 138 to 191 MPa. Eastern Rhyolite ranges from 15 to 238 MPa. The large variation in the UCS implies that the sample population is too small, and more UCS testing will be required to understand this important geotechnical parameter.

In the Scoping Study (SRK, 2019). The point load testing data was analysed in order to make up for the lack of UCS testing. However, point load testing (PLT) is also subject to a lot of variation, and its correlation with UCS is not reliable. For example, Sample WKP2020RP-006 has a UCS of 123 MPa and a PLT value of 3.76. Sample WKP2020RP-002 has a UCS of 47 MPa and a PLT value of 4.9. The relationship between the UCS and the PLT described in the Scoping Study was as follows:

$$\text{UCS} = 17.4 * \text{PLT} \text{ (Equation 4)}$$

This equation would have predicted a UCS value of 65 MPa for Sample-006, and 85 MPa for Sample-002.

Another way to estimate the UCS of a rock sample is to use the relationship with rock density. Figure 6 shows that the relationship between the rock density and the UCS for the eight samples of rhyolite

$$\text{UCS} = 1170 * \ln(\rho) - 880 \text{ (Equation 5)}$$

However, the data shows that the density-UCS relationship can be unreliable for rock densities less than 2.35. The WKP density database shows that the 1st quartile is 2.44, and the 2nd quartile is 2.5. Therefore, Equation 5 would predict that the 1st quartile UCS is 164 MPa.

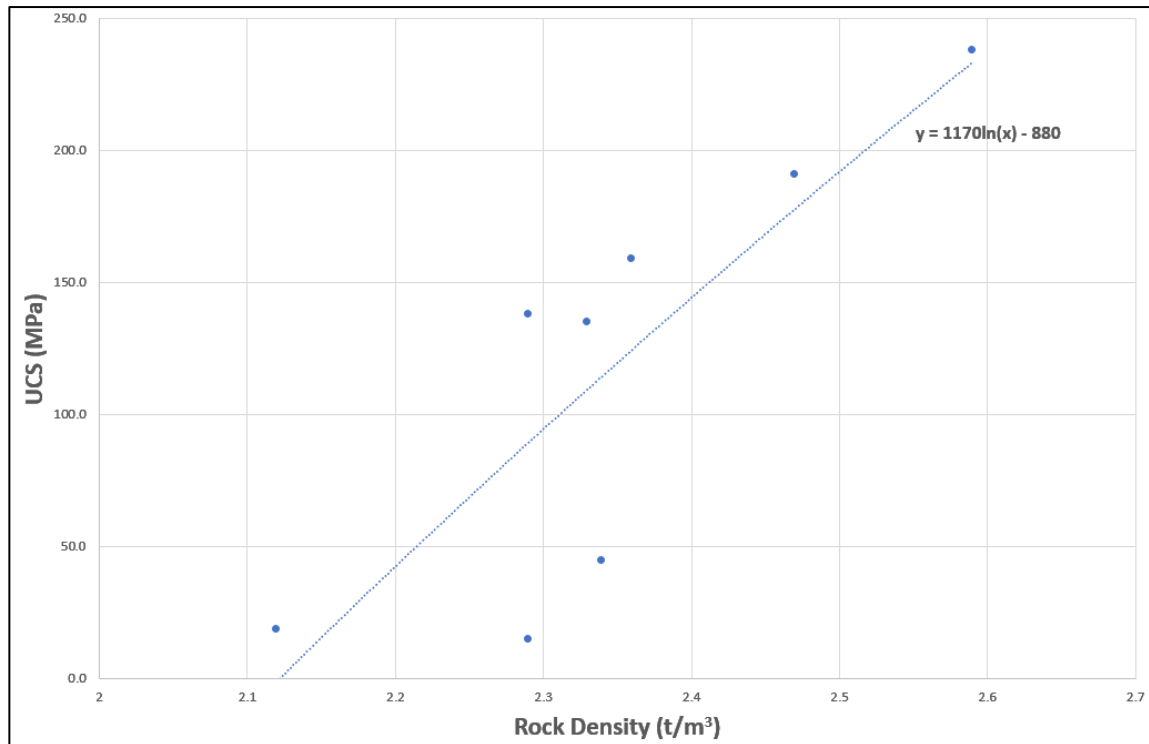


Figure 6: Rock density versus UCS in WKP rhyolite UCS samples

1.5.3 Uniaxial Tensile Strength

The uniaxial tensile strength was estimated in the laboratory using the Brazilian testing method of applying a load to a wafer-shaped disc of the core. Table 8 below shows the results of 5 different Brazilian tests. The UCS:UTS ratio ranges from 8 to 18. The UCS in the rhyolite samples ranged from 1.4 to 5 MPa, however all of the rhyolite samples were taken from core with a density of less than the 1st quartile value of 2.44.

Table 8: Tensile strength results for WKP rock

Sample ID	Drillhole ID	From (m)	To (m)	Core Size	Lithology	Diameter (mm)	Density (t/m3)	Corrected UCS σ_{c50} (MPa)	Brazilian Tensile (MPa)	UCS/UTS ratio
WKP2020RP-001	WKP93	45.00	45.25	PQ	AFM	82.77	2.46	112	6.41	17.5
WKP2020RP-003	WKP93	319.80	320.10	HQ	Eastern RF	60.26	2.08	18.6	2.84	6.5
WKP2020RP-004	WKP93	393.30	394.00	HQ	Eastern RF	N/A	2.12	N/A	1.38	N/A
WKP2020RP-005	WKP93	463.50	464.00	HQ	Eastern RF	60.75	2.30	14.7	1.77	8.3
WKP2020RP-007	WKP94	272.00	272.40	HQ	Eastern RF	61.01	2.42	44.7	5.07	8.8

1.5.4 Young's Modulus and Poisson's Ratio

Table 9 shows the Young's modulus and Poisson's ratio for 10 lab samples taken from WKP core. The results show a strong correlation between the UCS and Young's modulus. More lab testing would be required to understand the variations. However, the main use for the Young's modulus is for numerical stress modelling. For numerical models the elastic modulus is derived from the Geological Strength Index (GSI) that comes from rock mass classification. The numerical models use the derived elastic modulus for the overall rock mass (the rock mass elastic modulus). This numerical model uses the rock mass elastic modulus to calculate elastic convergence of stopes, and the stress regeneration on the backfill material. Additional lab testing for Young's modulus is not as critical as additional lab testing for UCS.

Table 9: Young's modulus and Poisson's ratio for WKP lab samples

Sample ID	Drillhole ID	From (m)	To (m)	Lithology	Diameter (mm)	Young's E_s (GPa)	Poisson's ν secant 0-50%
WKP2020RP-001	WKP93	45.00	45.25	AFM	82.77	52	0.23
WKP2020RP-002	WKP93	181.50	181.80	AFM	82.46	64	0.26
WKP2020RP-003	WKP93	319.80	320.10	Eastern RF	60.26	3.6	0.25
WKP2020RP-005	WKP93	463.50	464.00	Eastern RF	60.75	3.0	0.14
WKP2020RP-006	WKP94	146.70	147.10	AFM	82.64	45	0.19
WKP2020RP-007	WKP94	272.00	272.40	Eastern RF	61.01	16	0.16
WKP2020RP-008	WKP94A	292.90	293.40	Eastern RF	61.02	75	0.26
WKP2020RP-009	WKP94A	330.80	331.50	Eastern RF	45.06	63	0.15
WKP Scoping Study	WKP68	359.20	360.60	Northern RF	61	52	0.19

1.5.5 Triaxial Strength

In the Scoping Study (SRK, 2019) triaxial testing was performed on Northern Rhyolite samples taken from WKP68. The results are shown below in Figure 7. The m_i value of 25 is used in numerical stress modelling for the Hoek-Brown failure criterion for the rock mass.

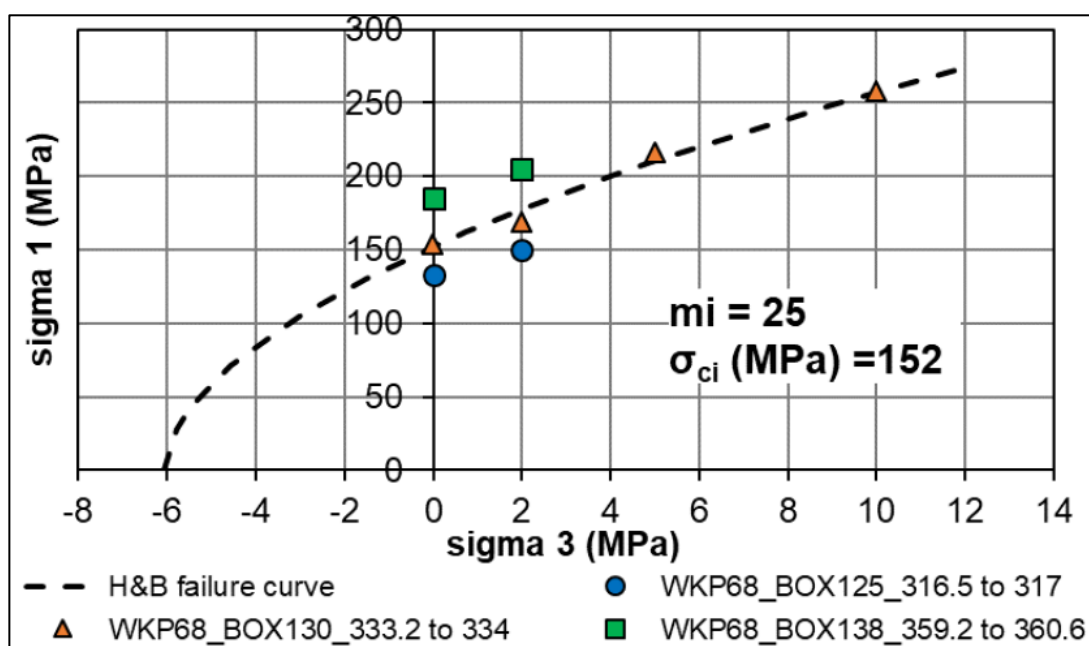


Figure 7: Triaxial testing results from Northern Rhyolite samples taken from WKP68

1.5.6 Sonic Velocity

Sonic velocity tests were done on Sample WKP2020RP-004 at the E-Precision laboratory. This sample was taken from WKP93 at a depth of 393.3 to 394m in the Eastern Rhyolite. The density of this sample was only 2.17 t/m³, and this is far below the median density of 2.5. The tensile strength on this sample was also relatively low at 1.38 MPa. No UCS measurements were taken, but it would likely be less than 20 MPa given the results taken from adjacent low density samples.

The results of the sonic velocity tests were as follows:

- $V_p = 2201$ m/s (P-wave velocity)
- $V_s = 1036$ m/s (S-wave velocity)

Given the low density and tensile strength of this rock sample, it is not likely representative of the typical rhyolite rock mass. The sonic velocity parameters are not used for numerical stress modelling. The P-wave and S-wave velocities are used when calibrating seismic networks and blast vibration monitoring equipment.

1.5.7 Cerchar Abrasivity

The Scoping Study (SRK, 2019) provides the results of Cerchar abrasivity for samples of Northern Rhyolite take from WKP68. The Cerchar abrasivity test is used for estimating the life of drill bits on the jumbo and the cutters on raisebore heads.

Figure 8 shows that the results of the Cerchar abrasivity tests average 1.5. This is classified as “slightly abrasive”, which is relatively benign. CAI values exceeding 4.0 are classified as “abrasive to extremely abrasive.”

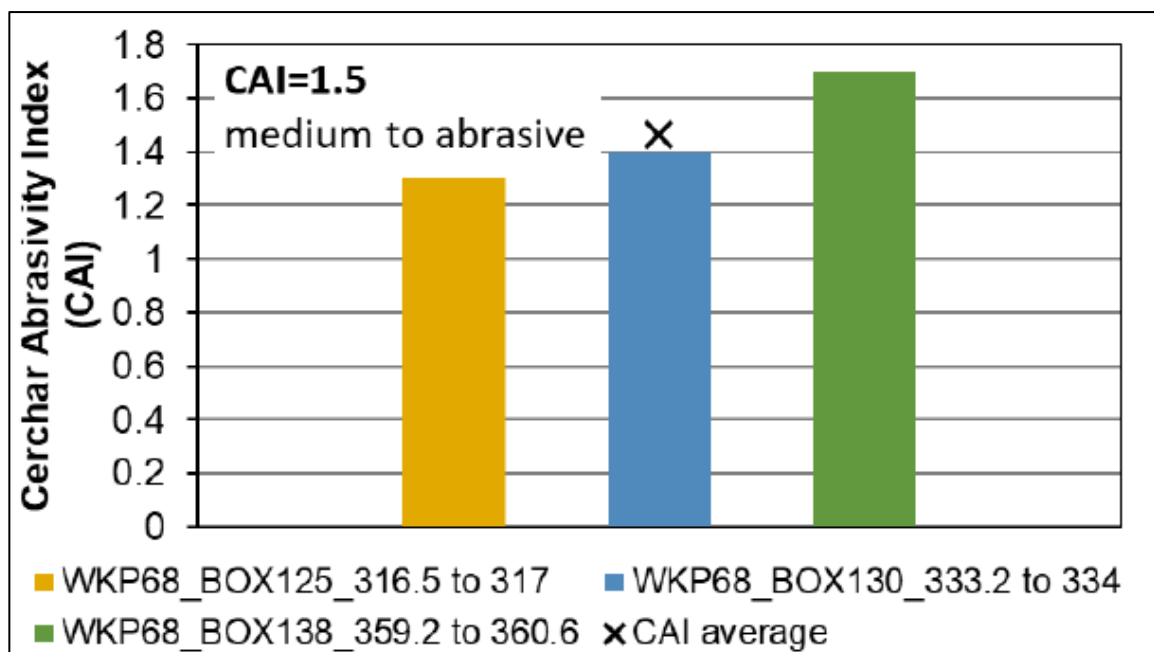


Figure 8: Cerchar abrasivity in the Northern Rhyolite

1.6 Mining method selection

The mining method selected is open stoping. Open stoping will be applied to all stopes that will be developed and extracted within the proposed mining footprint. The aim of open stoping is to induce free draw of the ore zone while maintaining the stability of the host rock, and lagged introduction of rock fill. Cemented rockfill (CRF) will be required where sub-parallel ore zones are separated by less than a 7.5m pillar. A pumpable cemented aggregate fill (CAF) will be required for the extraction of the 340 level sill pillar located (-25 RL to -45 RL). Due the relatively high-grade nature of the WKP ore body, it is not envisaged that permanent rib pillars will be used to control stope stability.

The mine design and sequencing were based on the following assumptions:

- Bottom-up mining sequence, starting from the 360 level (-25 RL).
- Longitudinal retreat along the ore drives back to a central access.
- Nominal stope dimensions of 15m along strike prior to backfilling with uncemented rockfill.

The general shape and geometry of the ore bodies is shown in the Figure 9 below and can be summarized as follows:

- Dip ranging from 60 to 80 degrees.
- Minimum mining width for ore drives is 5m.
- Stope widths can range from 2m to 12m
- Some stoping blocks are as wide as 20m, but these wider areas will be stoped and backfilled into 2 to 3 separate blocks to avoid the formation of extremely wide spans across the backs.
- Surface ranges from the 180 RL up to the 260 RL; the nominal surface is assumed to be the 220 RL for the purposes of estimating the vertical stress.
- The backs of the highest ore drives are at the 120 RL.
- The floors of the lowest ores are at the -125 RL
- The nominal depth of stoping ranges from 100m to 325m below surface.

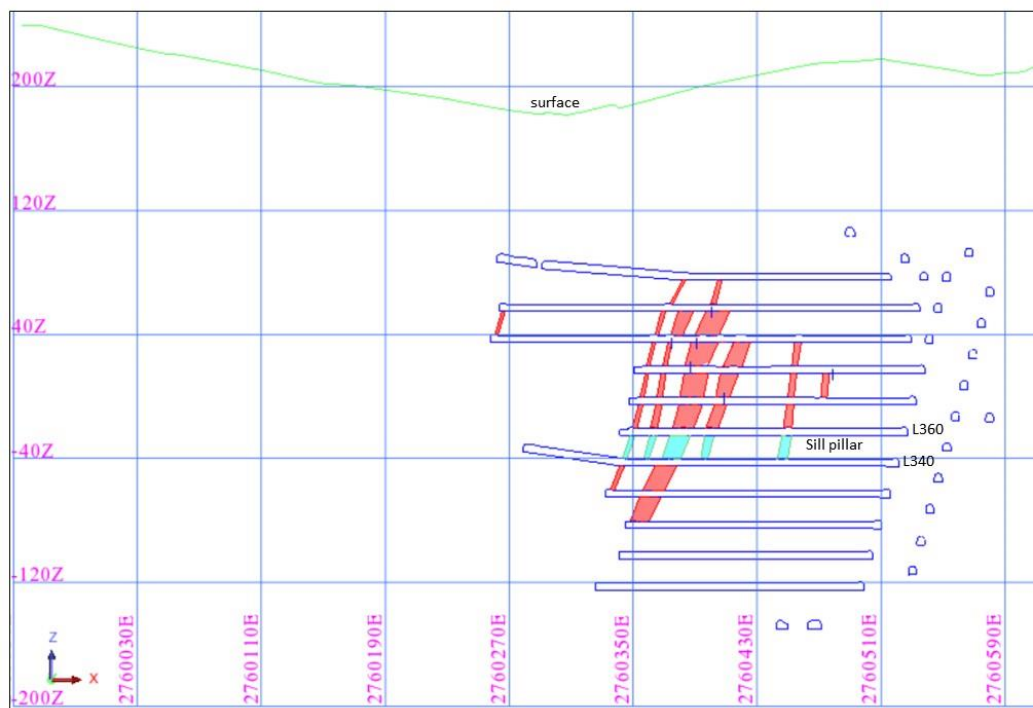


Figure 9: Cross section view (looking north) through South Decline Access

1.7 The Stability number N'

The stability number, N', is used with the empirical stability graph chart to determine the critical hydraulic radius (HR) for slope stability. The equation for N' is as follows:

$$N' = Q' \times A \times B \times C \text{ (Equation 6)}$$

where,

Q' is from Barton's equation, i.e. $Q' = (RQD/J_n) \times (J_r/J_a)$

A = Rock Stress Factor (ranging from 0.1 to 1.0)

B = Joint Orientation Factor (ranging from 0.2 to 1)

C = Gravity Adjustment Factor (ranging from 2 to 8)

Typically, the A-parameter is simply a function of the ratio of the UCS to the induced stress parallel to the surface that is being evaluated. Due to the complexity of stoping on multiple ore bodies at WKP, the stress damage is more likely to be a tensile failure and each stoping area must be evaluated with numerical modelling to determine the extent of stress damage. For the base case, the A-parameter at WKP will be set to a value of 1, i.e. no stress damage. The A-parameter used in the Scoping Study (SRK, 2019) ranged from 0.3 to 1.0, and the main source of variability in the Scoping Study A-parameter was the due to the depth of mining, i.e. the *in-situ* stress.

The B-parameter is evaluated by determining the angle between the critical joint or shear and the surface being evaluated, i.e. hanging wall, footwall, or backs. The B-parameter used in the Scoping Study (SRK, 2019) was 0.4. Based on the orientation of the ore body and the typical orientation of the major structures, this value is equivalent to a 40° angle between the poles of the stope surface and the major structures. The analysis in this report has also assumed a value of 0.4 for the B-parameter.

The C-parameter is an adjustment factor that accounts for the relative dip of the stope surface. It can range from 2 to 8, i.e. a value of 2 is assigned to flat backs; a value of 8 is assigned to the hanging wall and footwall of a vertical stope. The C-parameter was assigned a value of 5 in the Scoping Study, and this was also used to calculate the N' values in this report, except that a value of 2 was assigned for evaluating the N' in the backs. A value of 5 corresponds to a 60° dipping hanging wall and footwall. A value of 2 corresponds to the flat-dipping stope backs.

Table 10 below provides a summary of critical values for Q', N', and maximum HR at WKP assuming that unsupported backs and walls, i.e. no cablebolts or other ground support. For the stope design for a PFS should assume the most conservative design parameters, i.e. 1st quartile values (denoted as "q1" in the table).

Figure 10: Summary of Q', N', and maximum HR for unsupported stopes at WKP

Zone	QP_q2	QP_q1	A-value	B-value	C_value	N'_q2	N'_q1	HR_q2	HR_q1
Ore backs (vein)	6.7	2.5	1	0.4	2	5	2	5	4.5
Hangingwall	9.1	3.4	1	0.4	5	18	7	6	5
Footwall	7.3	3.6	1	0.4	5	15	7	5	5

The stope designs for the PFS assumed that strike lengths would typically be restricted to 15m along strike. The floor-to-floor spacing of ore drives is 20m. Narrow stopes could be as high as 25m if the ore drive is included. Wider stopes would have “wing pillars” left below the upper ore drive, thus these stopes would only be 20m high. Stope widths would be restricted to about 12m wide. Wider ore bodies would be mined as separate longitudinal stopes, therefore the actual HR in the backs of would range from 1.9 in the narrow stopes, and up to 3.3 in the widest stopes if the “wing pillars” failed.

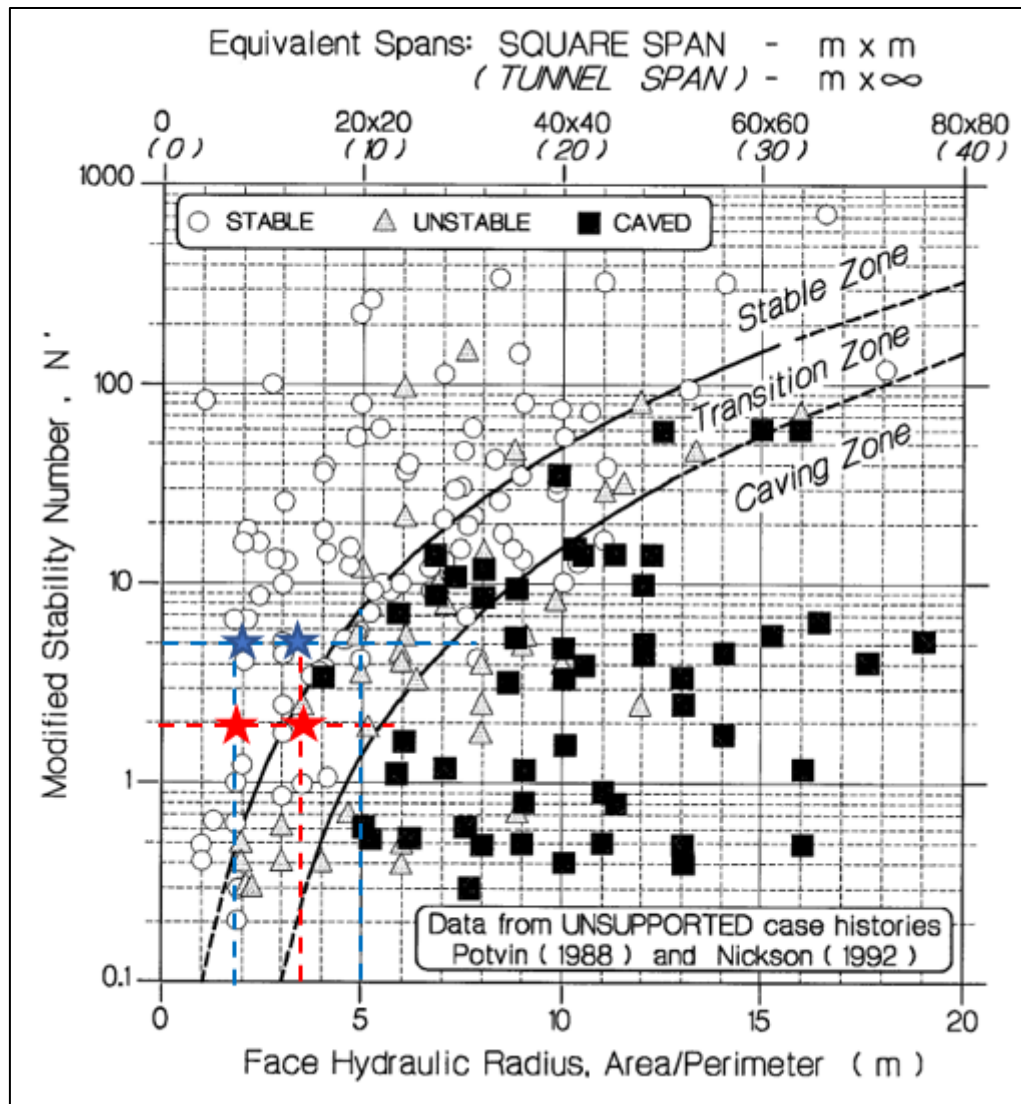


Figure 11: Stope backs design chart

Figure 11, the design chart for stope backs, shows the 1st quartile N' plots in the “stable zone” for hydraulic radii up to 3, and then the N' plots in the “transition zone” for hydraulic radii ranging from 3 to 5.5. The 2nd quartile (mean) N' plots in the “stable zone” for hydraulic radii up to 7.

For the hanging wall and footwall, the slope distance for a 20m high stope that is dipping at 60° is 23m, therefore the actual HR in the hanging wall and footwall is 4.5. Since the actual HR for the stope design does not exceed maximum HR values for the 1st quartile rock mass (as per the table above), then no additional ground support will be required in the stopes.

Of course, in the case of stoping on sub-parallel ore bodies with relatively small pillar distances, different rules will apply for the stope geometry and stope support. These rules were determined by numerical modelling, and they will be discussed in the numerical stress modelling section.

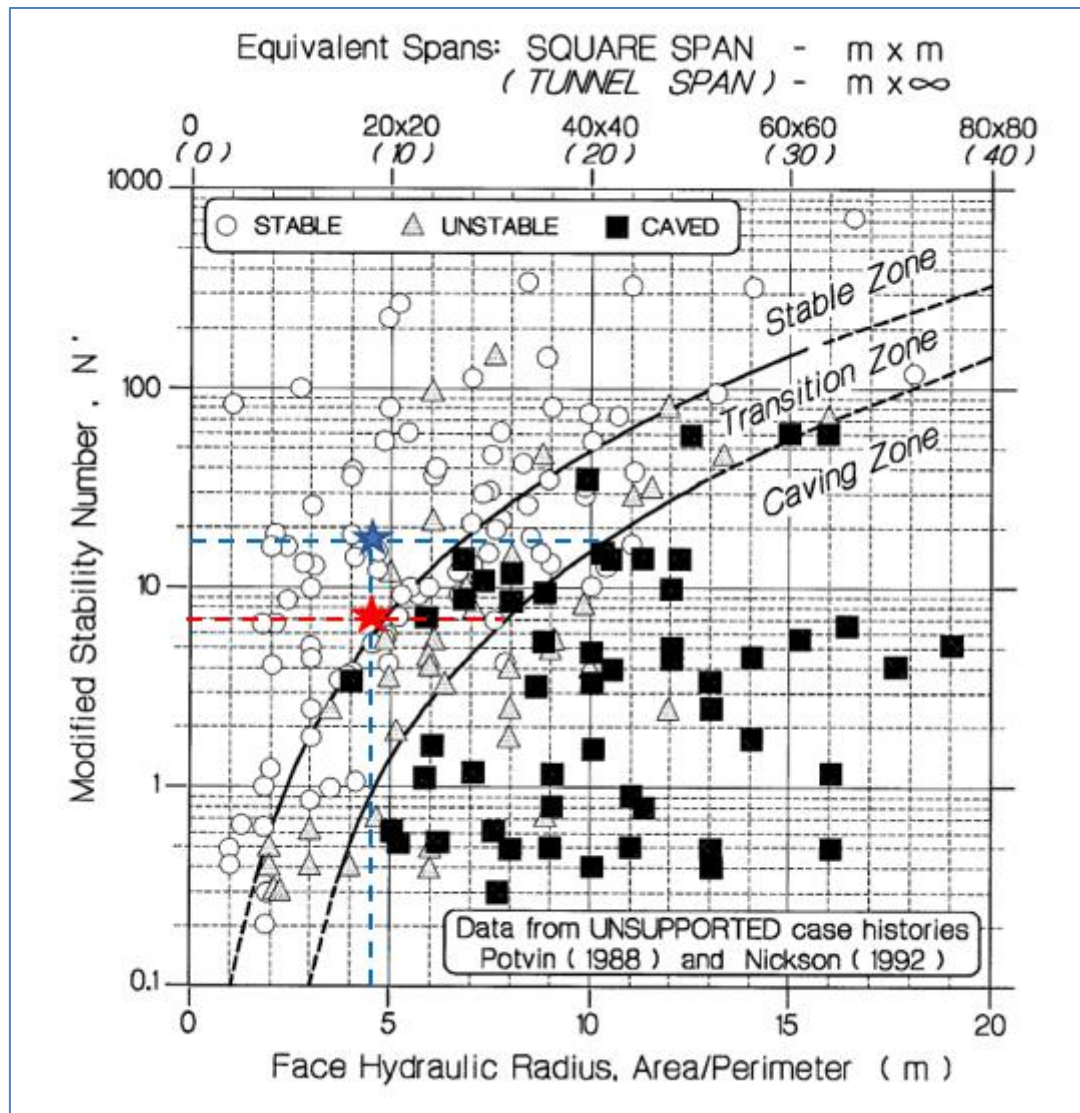


Figure 12: Stope hanging wall design chart

Figure 12, the design chart for stope hanging wall, shows that both the 1st quartile and 2nd quartile N' plot in the “stable zone” for hydraulic radii of 4.5. The 2nd quartile N' remains in the “stable zone” for hydraulic radii up to 7. This indicates that in the most typical ground conditions, the Avoca backfill cycle could be delayed, and the strike length of the open stope could be doubled from 15m to 30m.

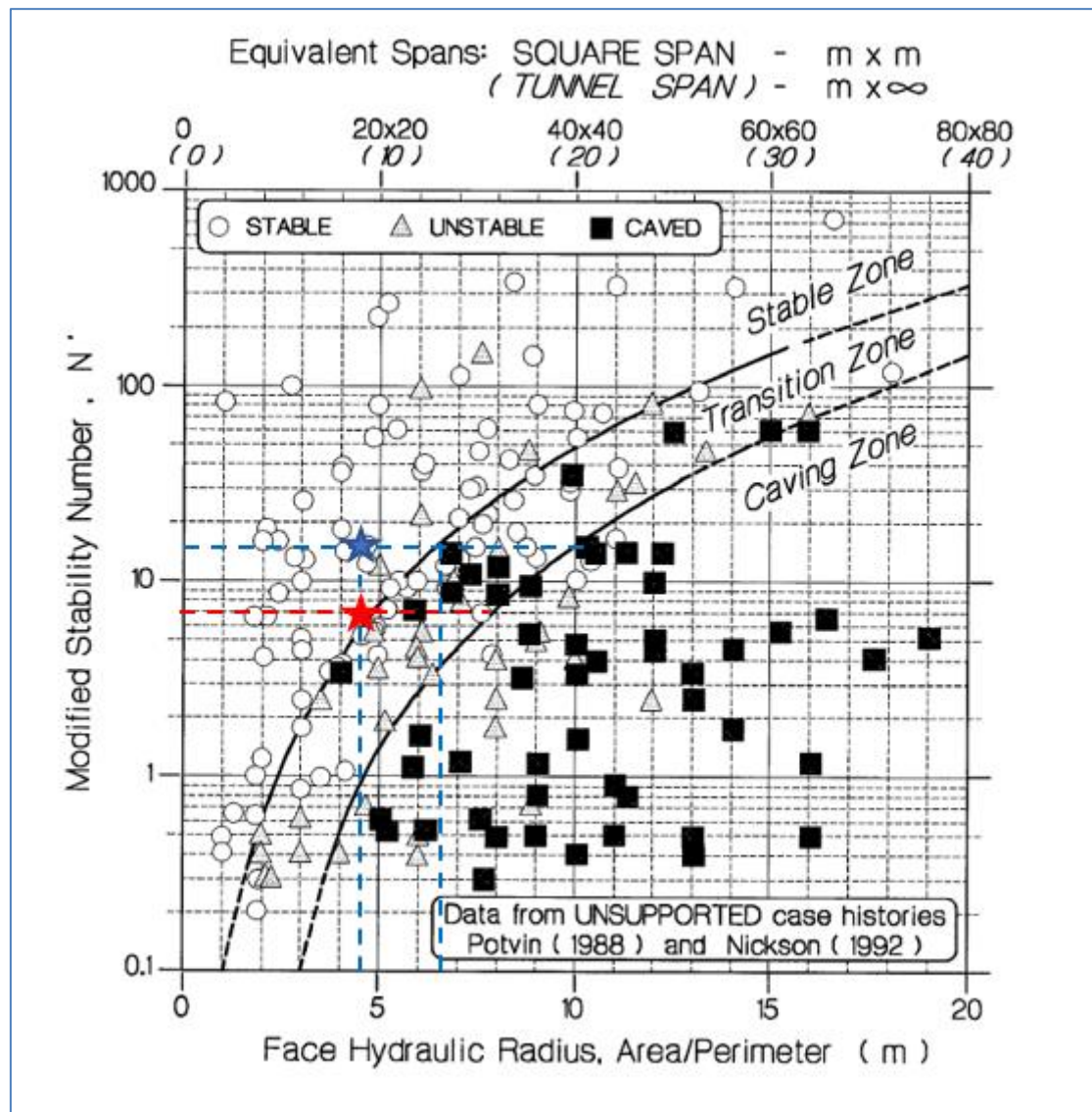


Figure 13: Stope footwall design chart

Figure 13, the design chart for stope footwall, shows that both the 1st quartile and 2nd quartile N' plot in the “stable zone” for hydraulic radii of 4.5. The 2nd quartile N' remains in the “stable zone” for hydraulic radii up to 6.5.

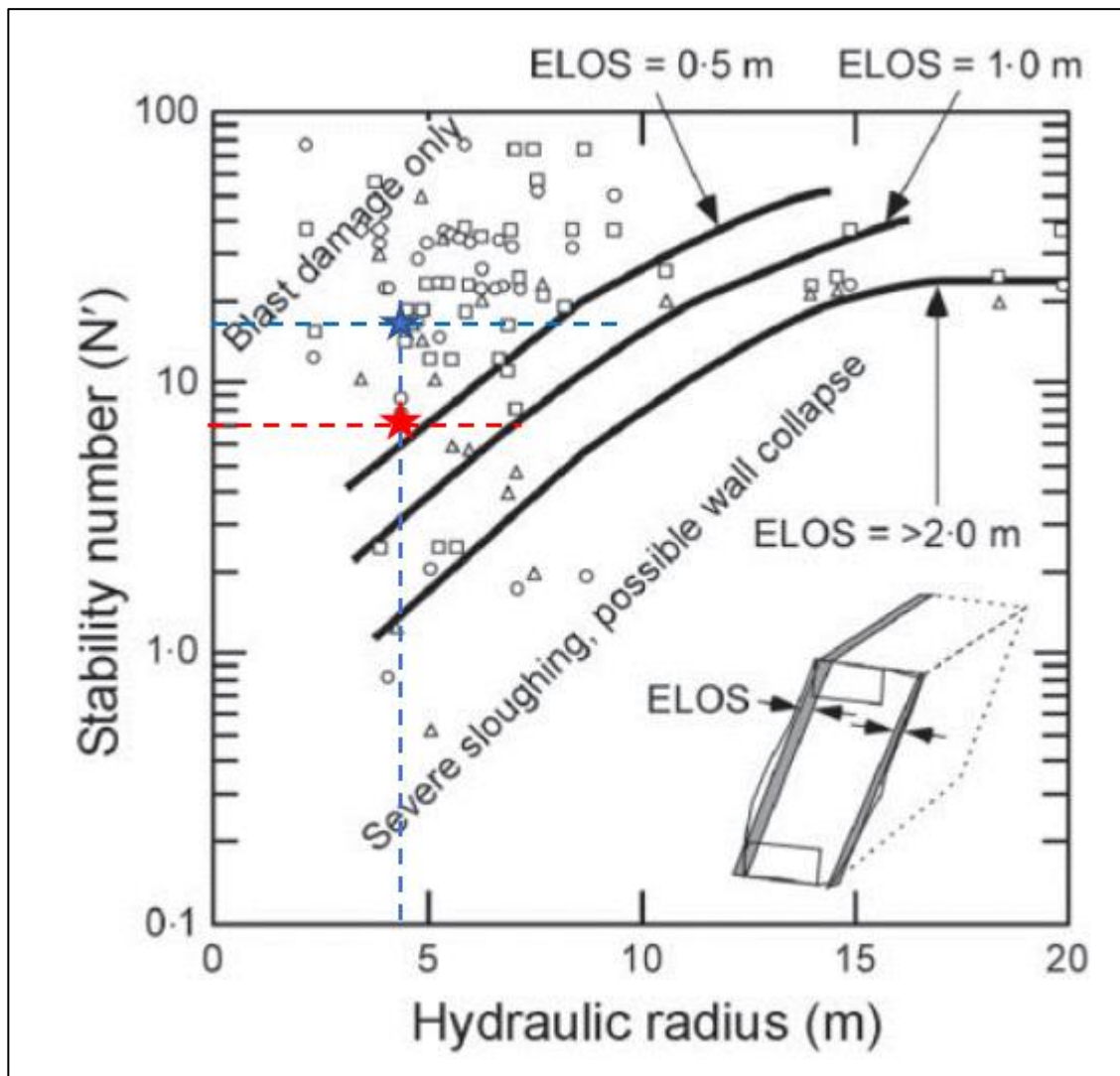


Figure 14: ELOS Chart for Stope HW and FW

ELOS is the acronym for “equivalent linear overbreak slough” or stope dilution from overbreak. The ELOS design chart in Figure 14 shows that less than 0.5m of dilution is expected from the stope hanging wall and stope footwall for hydraulic radii of 4.5 and the 1st quartile N' value of 7.

1.8 Numerical stress modelling summary

A MAP3D numerical stress model was constructed for the Life-of-Mine mining sequence using the PFS mine design for WKP. The main issues that were analyzed in the numerical model included the following:

- Stress damage zones after all mining has been completed with particular attention to the stress damage in the final crown pillar above the backs of the highest ore drive at 120 mRL.
- Effects of horizontal pillar distance and mining sequence with two separate sub-parallel ore bodies in close proximity.
- Stand-off distance and mining sequence required for the stability of ore pass and waste pass infrastructure located close to the ore body.

The pre-mining *in situ* stress used in the numerical model is given below in Table 10. The vertical stress is assumed to be vertical with the magnitude estimated from the average rock density. The maximum principal stress, S1, is assumed to be oriented parallel to the strike of the EG Vein (025°). The magnitude of S1 is assumed to be 2.5 times the vertical stress. The magnitude of S2 is assumed to be oriented toward 115° with a magnitude of 1.5 times the vertical stress. This stress field is similar to the orientations and magnitudes described by previous authors (He et al., 2020) for numerical modelling work at Martha.

Table 11 shows the material properties used in the model. Note that that extremely UCS and UTS values were used for all backfill types. MAP3D cannot model backfill strength, but it can model the affects of the regional support that it provides the overall rock mass.

Table 10: *In situ* stress magnitudes and orientations assumed for WKP

WKP In-situ Stresses			
Component	S1 = Sv*2.5	S2 = Sv*1.5	S3 = Sv
Bearing	25	115	295
Dip	0	0	90
MPa/m	0.063	0.038	0.025

Table 11: Material properties used in the model

Material	Unit Weight (kN/m³)	Ei (MPa)	Erm	v	Q'	GSI	mi	mb	s	UCS	Tension cut-off	Cohesion (MPa)	Phi (°)
CRF (first level above sill pillar)	20		1200	0.25	-	-	-	5	1	300	-60	-	-
Rockfill (all slopes except above sill pillar)	19		300	0.25	-	-	-	5	1	300	-60	-	-
Host Rock, Rhyolite	25	52000	26582.81	0.19	6.25	60.49	25	6.098	0.012	153	-0.3	-	-
Ore Material, Quartz & Sheared Rhyolite	25	38000	17693.6	0.29	5.00	58.48	20	4.541	0.01	133	-0.3	-	-
MOX (mostly oxidized; soil; saprolite)	18	~ 400	17	0.3	0.02	9.94	20	0.802	5E-05	1	0	0.026	25
POX (partially oxidized; broken with soil)	22	~ 6000	557	0.26	0.28	32.47	20	1.793	6E-04	15	-0.005	-	-
SLOX (oxidation along joints or rockmass)	25	~ 30000	9785	0.19	2.08	50.61	20	3.427	0.004	75	-0.1	-	-

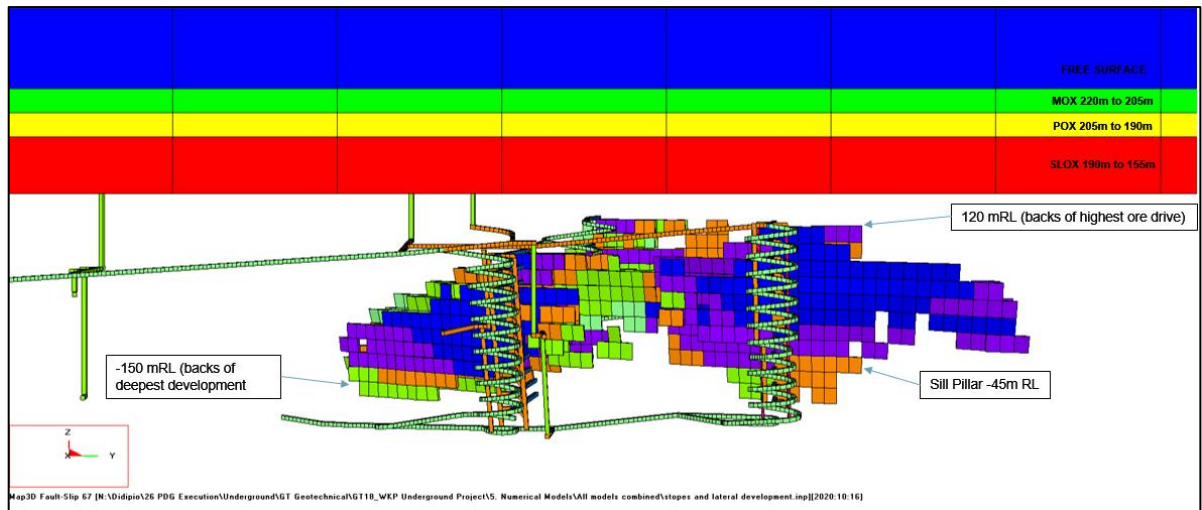


Figure 15: MAP3D mine design and model geometry

Figure 15 shows the overall mine design and model geometry. The surface was set at the 220 RL. The MOX, POX, and SLOX zones ranged from the 220 RL to the 155 RL. The host rock below the 155 RL was set to the material properties of fresh rhyolite. The stopes and ore drives located below the 155 RL were set to the material properties of ore material. The UCS values for the rhyolite were based on the testing information from WKP68 from the Scoping Study. The latest lab results from E-Precision were not available when the model was run. Despite the relatively low UCS results from some of the samples tested in October 2020, the average UCS of 153 MPa for the rhyolite is likely to be in the ballpark (given the relationship between rock density and UCS discussed earlier in this report).

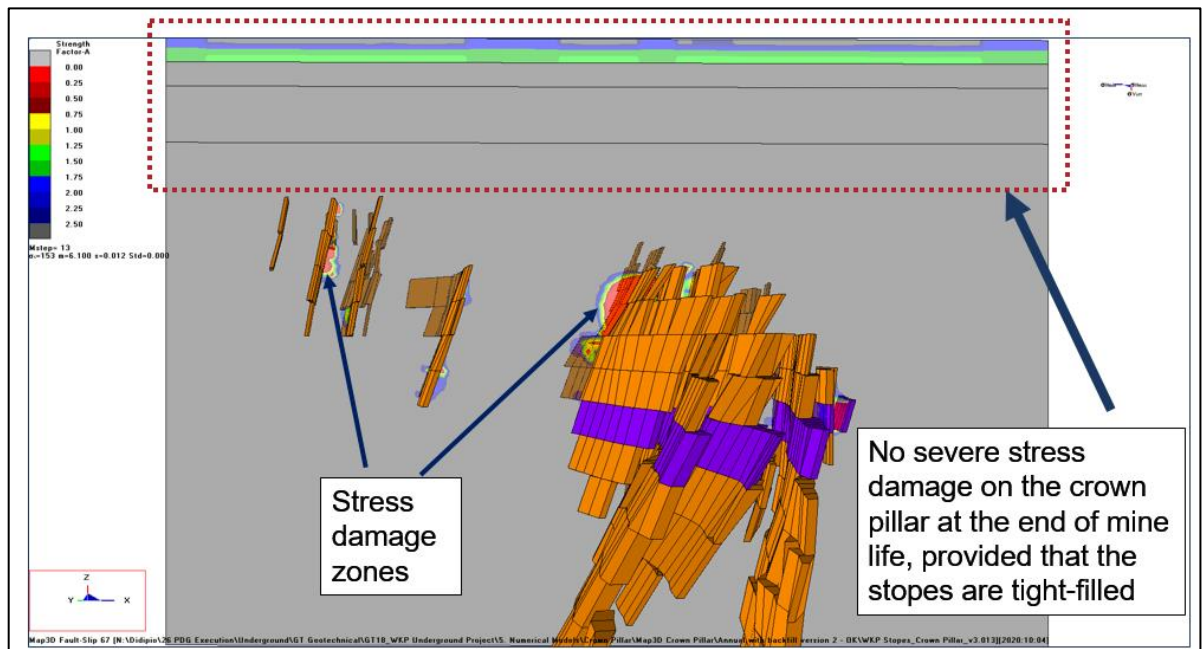


Figure 16: Stress damage in the stopes and crown pillar at the end of life-of-mine

Figure 16 shows the stress damage in the stopes and crown pillar at the end of life-of-mine. Apart from the isolated areas shown, there is not much stress damage.

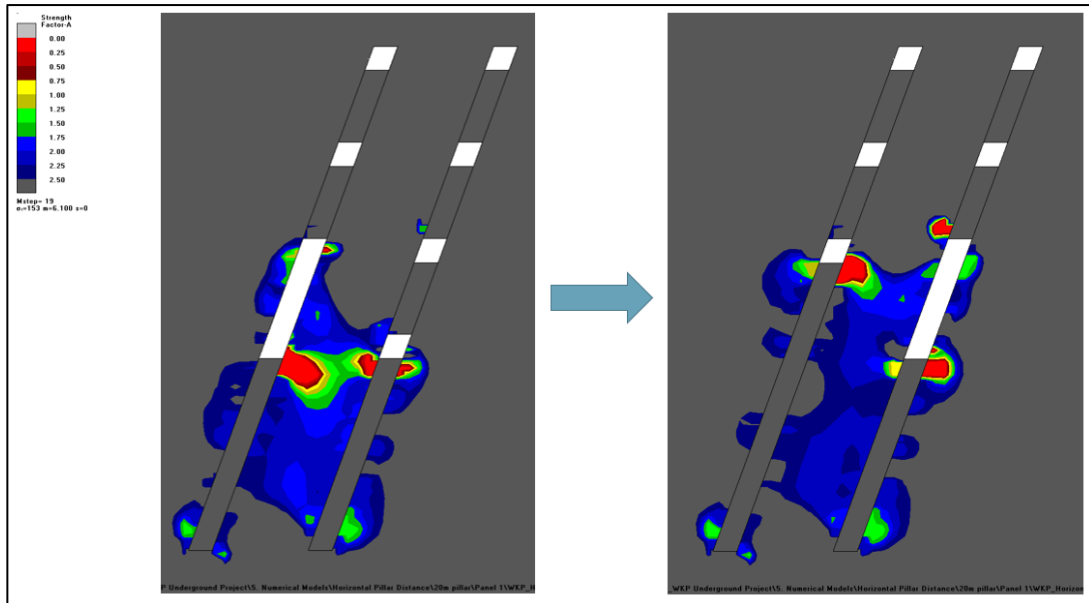


Figure 17: Stress damage with 20m horizontal pillar

Figure 17 shows the affect of stress damage on a 20m horizontal pillar with a 15m long stope. The left side shows the situation when the hanging wall stope is mined first. The right side shows the situation when the footwall stope is mined first. When the horizontal pillar is at least 20m, it does not make any significant difference which stope is mined first. When the horizontal pillar is less than 20m, it is preferable to mine the footwall stope first and backfill it. If the mine planning team strongly prefer to mine the hanging wall stope first, then (for stability reasons) the length of the footwall stope may need to be reduced to about 7.5m to 10m prior to backfilling. Cable bolting will also assist with the stability of the internal pillar.

Figure 18 shows a 5m horizontal pillar with a 7.5m long secondary stope, i.e. footwall stope is mine first, then backfilled, and then a 7.5m long stope is exposed in the hanging wall. Once the horizontal pillar is 5m or less, then it will be impossible to prevent the central pillar from failing into the hanging wall stope. For situations with horizontal pillars of 5m to 20m, it is preferable to mine the footwall first, backfill the stope, and then mine the hanging wall stope. Pillar stability can be managed with a combination of cable bolting, backfilling, and reducing the strike length on the secondary stope.

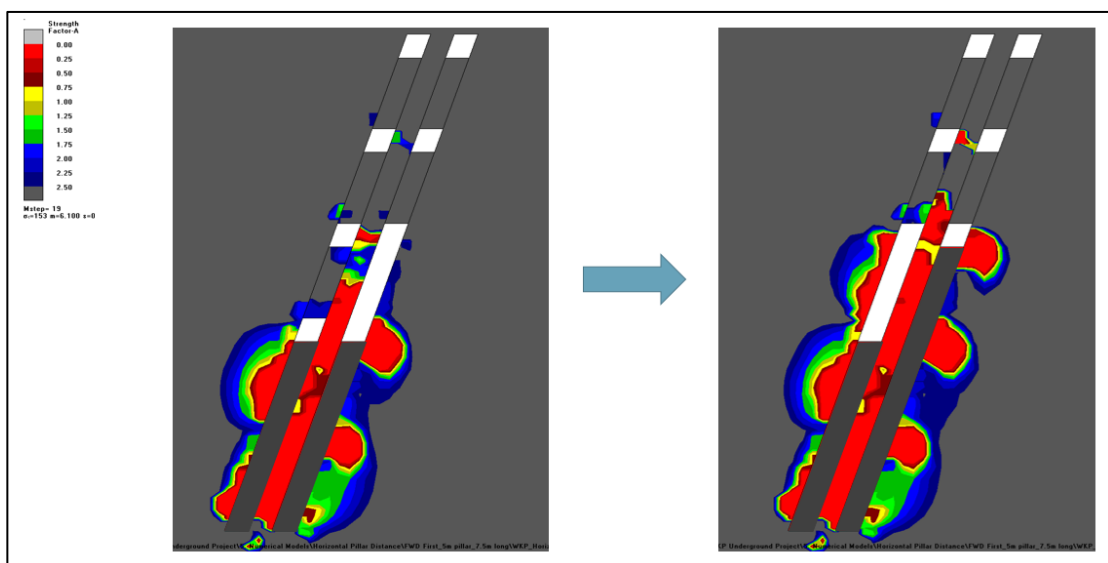


Figure 18: 5m horizontal pillar with 7.5m long stope

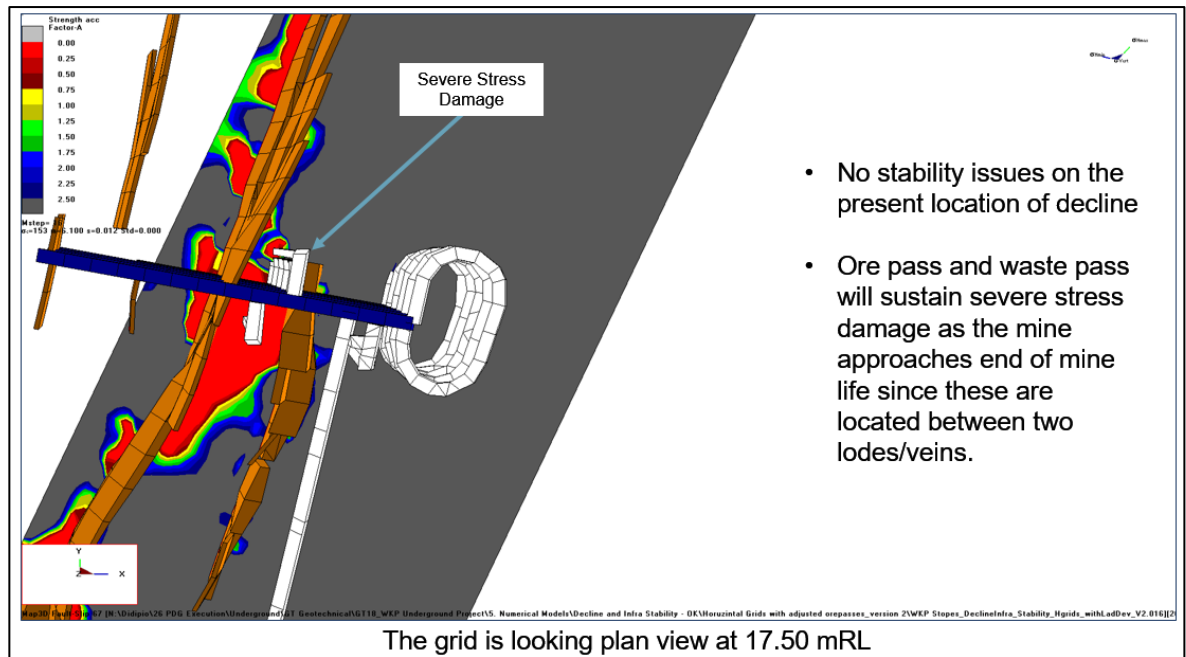


Figure 19: Stability of waste pass & ore pass system

In the southern section of the mine, the waste pass and ore pass system are located between two ore bodies. Figure 19 shows that extreme stress damage is likely to occur in the waste pass and ore pass system if the mining sequence is not carefully managed.

Figure 20 shows the improvement to the rock mass stability if central pillars are used at each stope access intersection. In the model, a 30m long pillar (two stopes) were left on the south side of the access, and a 15m long pillar (one stope) was left to the north of the access. These pillars would be recovered in a bottom-up sequence near the end of the life-of-mine.

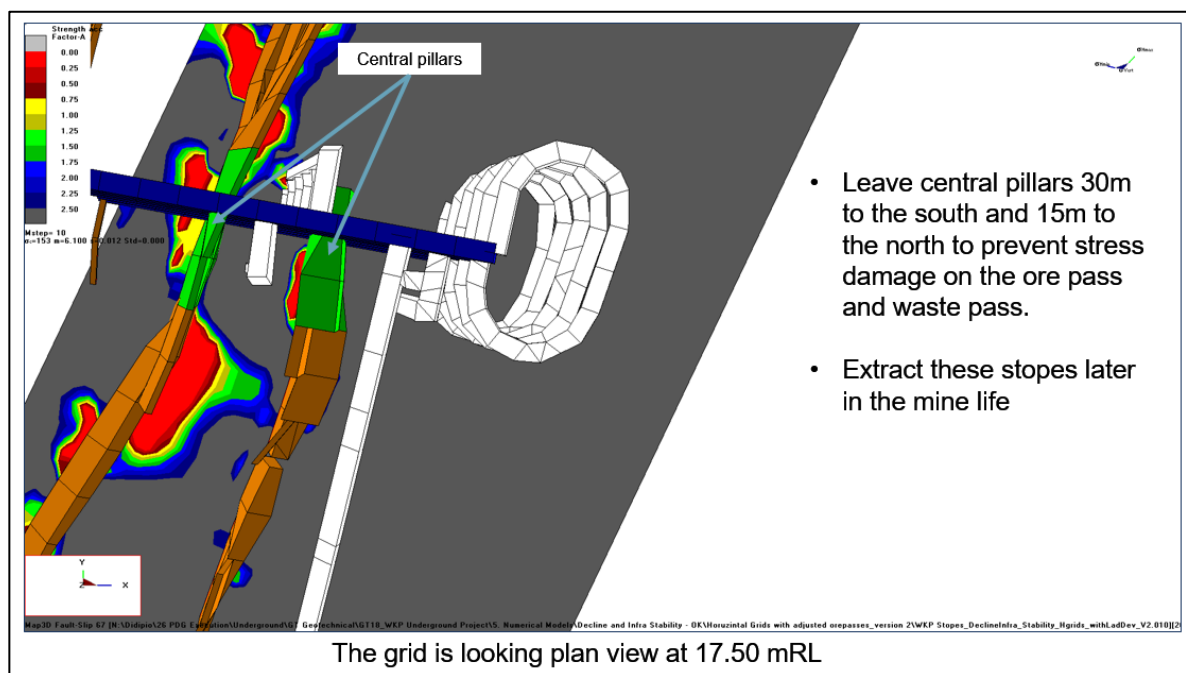


Figure 20: Stability of waste pass and ore pass system with central pillars

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APPENDIX E

Post-Closure Structural
Capping of Shaft Openings
(WSP 2022)



17 June 2022

Reference No. G-01483.84-008-LR-Rev0_FINAL

Phillip Jones

OceanaGold Corporation
Level 3, 99 Melbourne Street
South Brisbane
QLD 4101
Australia

WKP MINE DEVELOPMENT: POST-CLOSURE STRUCTURAL CAPPING OF SHAFT OPENINGS

Dear Phillip

Introduction

Golder Associates (NZ) Limited (Golder) (now WSP New Zealand Limited (WSP)) has prepared this preliminary design for post-closure structural capping/backfilling for the five mine shaft openings at Wharekirauponga (WKP) Mine, part of the Waihi North Project at the request of OceanaGold Corporation (OceanaGold).

This letter report¹ has been prepared by Golder-WSP under the terms and conditions of the existing Master Consulting Agreement between OceanaGold and Golder for the WKP project (OGN-2891).

Shafts Proposed for the WKP Mine

We understand that development of the WKP mine will include five shafts connecting the mine and access tunnels to the surface. These are:

- A 250 m deep ventilation shaft (Shaft 1) on the Willows Road farm property, approximately 1200 m from the mine portal. This location is accessible from current farm tracks.
- The remaining shaft locations are located within Coromandel Forest Park and are not accessible via surface roads. These include:
 - A 400 m deep ventilation shaft (Shaft 2) approximately 4000 m from the portal.
 - Three shafts at the WKP orebody:
 - A 110 m deep egress/escape shaft (Shaft 3).
 - A 215 m deep fresh air raise (FAR – Shaft 4) to supply fresh air to the exploration tunnels.

¹ This letter report is provided subject to the attached Report Limitations.

- A 130 m deep return air raise (RAR – Shaft 5) to exhaust air from the exploration tunnels.

Shaft sizes are anticipated to be in the range of 3 m to 5.5 m diameter; however, for this preliminary design exercise we have assumed all will have a diameter of 5.5 m (Sketch 1 and 2, 3 Attachment B). Owing to the lack of surface access and the rock mass conditions, the shafts are anticipated to be constructed using a bottom-up technique from the mine, such as an Alimak raise, with support being installed progressively.

Ground Conditions

Geotechnical drilling investigations have been completed at the Willows Road farm site, including the proposed location of Ventilation Shaft 1, and extensive exploration drilling has undertaken at the WKP orebody. However, there is currently no subsurface geotechnical information available from the proposed sites of the four shafts described above within the DOC reserve. However, based on a high-level geological model (GHD 2020) summarised from publicly available data, airborne geophysical investigations and surface mapping completed by OGC, the ground conditions for the shafts are expected to comprise:

- Late Miocene to Pliocene volcanic rocks including andesite and rhyolite.
- The rocks are anticipated to comprise gently inclined layers metres to tens of metres in thickness.
- The rock mass quality is anticipated to vary from very weak to strong rock, including andesitic lava flows, airfall tuffs and breccias and potentially thin sedimentary layers.
- Groundwater is anticipated to be within ten to twenty metres of the ground surface and the rock mass permeability is likely to vary from low to high. However, in the vicinity of the orebody and future underground mine, the groundwater may be effectively drained.

Shaft Closure Options

There are many factors that influence the optimal choice of shaft closure that is required at any of the five shaft sites, including accessibility, topography, surface water runoff and subsurface ground conditions, including potentially aggressive soils. We have prepared sketches of various options for shaft capping, including reinforced concrete or a prefabricated structural element and level ground or sloping ground situations and a sketch of bottom-up placement of cemented backfill.

Detailed design of the shaft capping for each location will need to take into account the above factors, final size of the shaft opening and the presence of operational elements such as egress structures, ventilation equipment, utility ducting, etc. However, the general design features of the shaft caps will comprise the features presented in the design sketches.

Option 1: Prefabricated structural cover

This option involves a metal plate (steel, aluminium, stainless steel or equivalent) being installed over the shaft opening and bolted to the existing concrete shaft lining and supported on the steel cross beams. The plate is then covered by a structural steel frame and Glass Reinforced Plastic (GRP) or equivalent. The purpose of the structural frame and cover is to protect the plate from the elements while allowing for periodic condition inspections. The structural steel frame and plate will be prefabricated in sections that can be transported to the shaft opening by helicopter for assembly.

The structural steel frame would require anchoring into the concrete ring beam; or would require a concrete footing to allow for the surrounding ground conditions. The structural steel frame would be covered in GRP. GRP has low weight with high mechanical strengths, resistance against chemical corrosion, UV radiation and temperature extremes. GRP is also waterproof, fire-retardant, and highly durable material with a long-life expectancy.

The ground level around the outside of the shaft lining would need to be built up to the height of the shaft cap above ground level at a suitable angle to allow surface water to flow away from the shaft opening.

A sketch of this design option as a plan and section is presented in sketches 3 and 4 with details A and B in Attachment B.

Option 2: Reinforced cast in-situ concrete cover

This option involves installing a reinforced concrete cover over the shaft opening and bolting the cover into the surrounding ring beam and steel crossbeams. The reinforced concrete cover has a nominal thickness of 450 mm. The opening of the shaft would need to be covered by a temporary element that supports a working platform and false floor on which the reinforcing can be assembled and the concrete can be placed. Concrete, batched offsite, will need to be transported by helicopter to the site. Based on a 5.5 m diameter shaft opening, the volume of concrete required will be 10.7 m³.

The ground level around the outside of the shaft lining would need to be built up to the height of the shaft cap above ground level at a suitable angle to allow surface water to flow away from the shaft opening.

A sketch of this design option as a plan and section is presented in sketches 5 and 6 in Attachment B.

Option 3: Cemented backfilling

This option involves placement of cemented backfill in the shaft opening in multiple lifts. The backfill would be a self-consolidating type concrete. The backfill would be mixed underground and pumped into the shaft via boreholes drilled into the shaft at multiple elevations, or pipe to be suspended in the shaft and terminating at multiple elevations. A specialized concrete pump capable of pumping the cemented backfill would be required. Such pumps are sometimes referred to as “high-rise” concrete pumps as they are used in the construction of high-rise buildings in civil construction. Prior to selecting this option, additional studies are required to confirm the

availability and suitability of the pump and confirm that the pump selected will fit in the drift development openings.

A waste rock or concrete wall barricade would be required to retain the first lift of backfill, which would be poured until it is slightly above the drift brow elevation in the shaft (i.e., above the drift back elevation). This would be used to retain the first lift of backfill until it cures enough to support subsequent lifts. Subsequent lifts, or a continuous pour, would be completed upon initial curing of the first lift, typically after a minimum of 7 days of curing. Backfilling would progress until surface elevation is reached.

The volume of cemented backfill required varies depending on the depth of the shaft. For a 5.5 m diameter shaft, approximately 23.7 m³ of fill per metre of shaft height is required.

A sketch of this design option as a section is presented in sketch 7 in Attachment B. An example of a specialised high pressure pump is included in Attachment C.

Consideration for Sloping Ground

Given the general topography at the WKP site, it is anticipated that shafts may be constructed beneath sloping ground. Consideration will need to be given of the impacts of sloping ground on the design of a shaft opening and post closure capping. It is likely that some cut and fill will be required to create a level site large enough to construct surface structures needed for operation of the shaft during mining. Sketch 7 shows a concept design for a shaft opening in sloping ground. This option includes the use of precast concrete blocks to form a retained edge to the working platform. Design of the shaft opening for capping options (1&2) will also need to take into account potential for slope instability or surface water flow.

Maintenance and Monitoring

We assume that a design life of at least 100 years will be required to meet stakeholder expectations of mine shafts at closure. We believe a structural capping solution, such as the options illustrated in sketches 3 to 7 can be constructed to achieve a 100-year design life using conventional materials and approaches. Should a longer design life be required consideration will need to be given to use of more durable materials or capping Options 1 and 2, such as stainless steel.

The consequence of failure of a shaft cap are potentially high, given the possibility of people or wildlife falling into the open shaft. Potential failure modes include degradation of the structural elements and erosion and collapse of the soil or rock around the shaft collar. For capping Options 1 and 2 we would expect that regular inspections (perhaps annually) would be carried out to determine whether the shaft closure materials are undamaged and functioning. Should any evidence be observed of erosion around the shaft cap consideration would need to be given to a repair strategy. We would expect that vegetation around the shaft cap would need to be evaluated to identify and mitigate any potential risk of damage to the capping material. Once constructed, Option 3 backfill is not anticipated to require regular monitoring or collar maintenance.

Should an adverse event occur within the area of the shafts, e.g., earthquake, fire, or other natural hazard, we would expect the site to be inspected and potential for damage and need for repair be assessed.

Conclusions and Recommendations

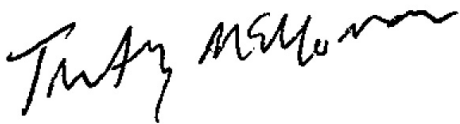
Options 3, Bottom-up concrete backfilling of the vent shaft, although more expensive and difficult to construct, is considered to have the lowest risk of failure for the purposes of permanent closure. Before selecting this option, additional studies are required to confirm the availability and suitability of the concrete pump and confirm that the pump selected will fit in the final constructed drift development openings.

Closure

Should you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely

WSP NEW ZEALAND LIMITED



Tim McMorran
Technical Director Engineering Geology
CMENG NZ (PENGGEOL) 176867

Attachments: Attachment A – Report Limitations

Attachment B – WKP Mine Development – Sketches - Concept Shaft Closure Options

Attachment C – Example Specifications High Pressure Concrete Pump

ATTACHMENT A

Report Limitations

Report Limitations

The following Clarification of the Golder company status is provided:

In April 2021 Golder Associates Inc. and its subsidiaries and affiliated companies, including Golder Associates (NZ) Limited ('the Company') was acquired by Canadian listed company, WSP Global Inc. As part of that acquisition, in January 2022 the Company amalgamated with WSP New Zealand Limited (ultimately owned by WSP Global Inc.) under Part XIII of the Companies Act 1993. On 1 January 2022 the Company changed its legal name to "WSP New Zealand Limited".

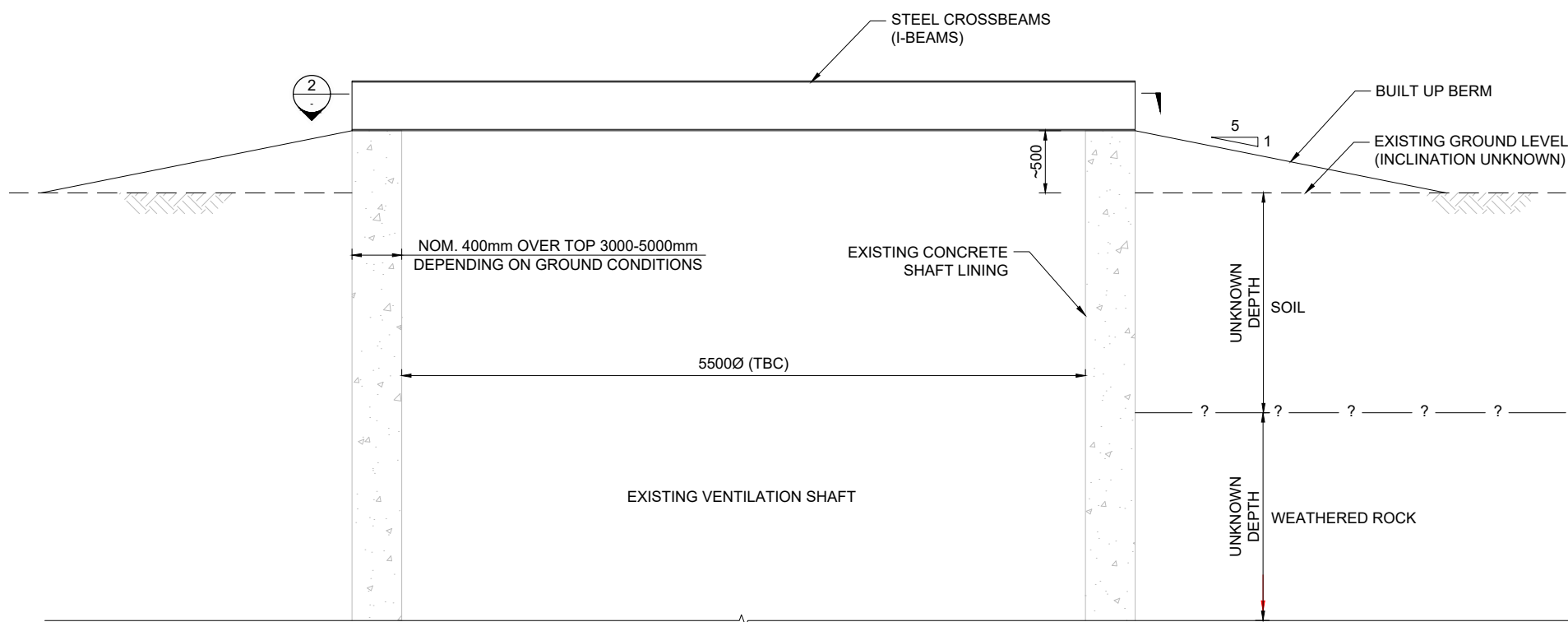
This report ('**Report**') has been prepared by WSP exclusively for OceanaGold Corporation ('**Client**') in relation to Wharekirauponga Underground Mine (WUG) ('**Purpose**'). The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('**Client Data**') provided by or on behalf of the Client. Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable in relation to incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

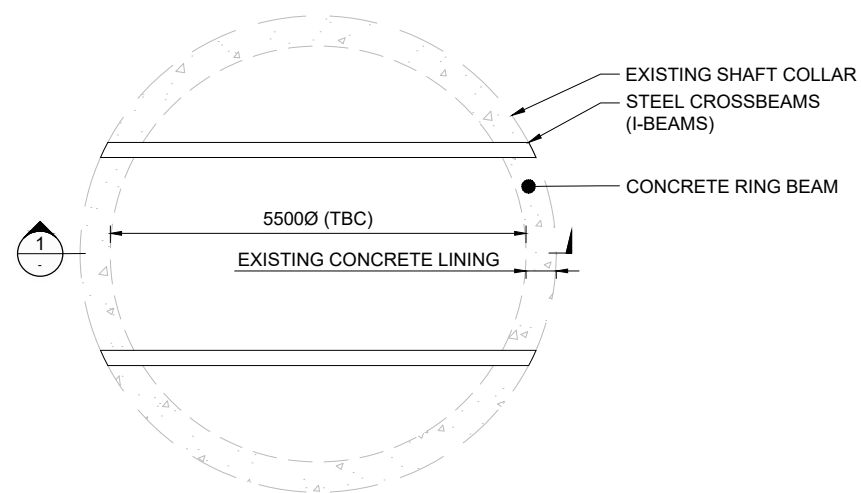
ATTACHMENT B

WKP Mine Development – Concept Shaft Closure Options

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1 SECTION - THROUGH SHAFT
SCALE: 1:25 (A1)



2 PLAN - EXISTING SHAFT
SCALE: 1:50 (A1)

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE INDICATIVE ONLY.
3. DESIGN SHOWN IS INDICATIVE AND HAS BEEN PROVIDED FOR CONCEPT ONLY.
4. BERM AROUND SHAFT OPENING GRADED TO LIMIT POOLING OF WATER ON SURFACE.

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WKP MINE DEVELOPMENT - CONCEPT PERMANENT COVER POST MINING CLOSURE OF SHAFT OPENINGS.

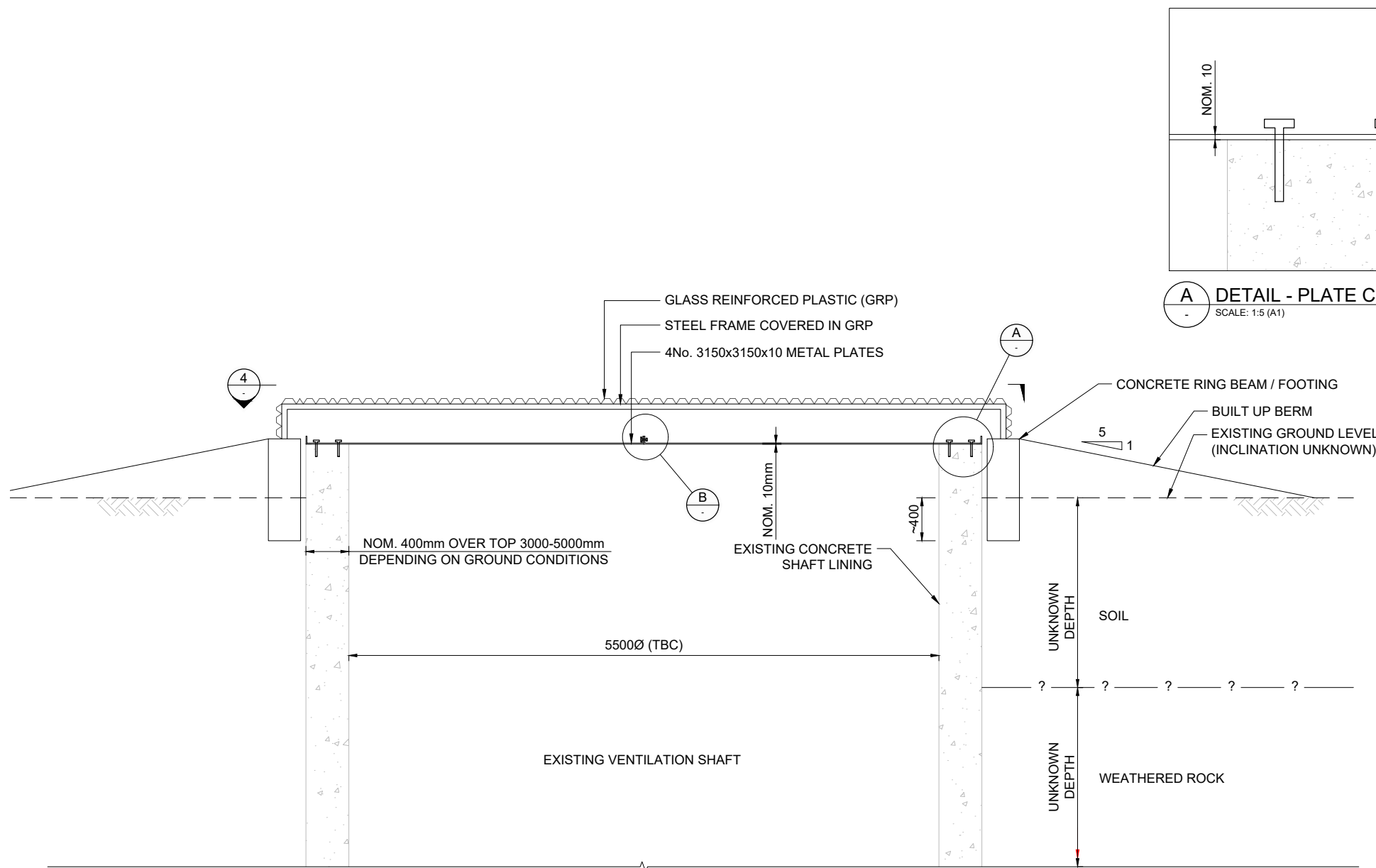
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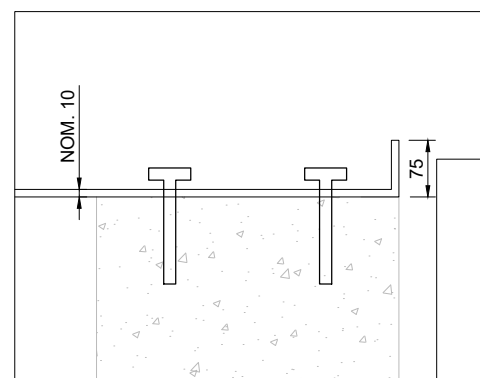
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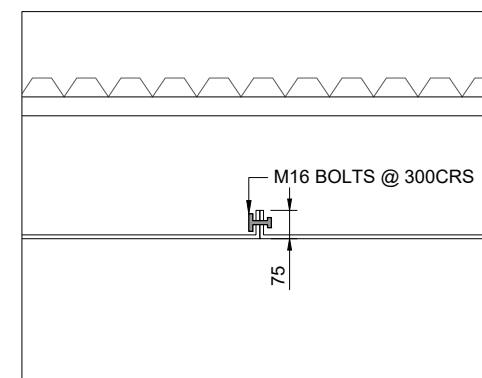
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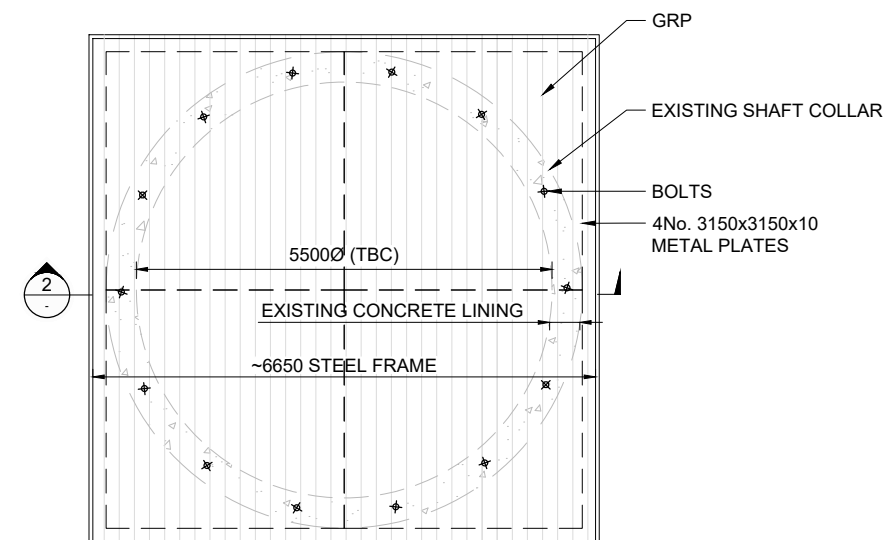
3 SECTION - THROUGH SHAFT - OPTION 1
SCALE: 1:25 (A1)



A DETAIL - PLATE CONNECTION
SCALE: 1:5 (A1)



B DETAIL - PLATE CONNECTION
SCALE: 1:5 (A1)



4 PLAN - METAL PLATE INSTALLATION
SCALE: 1:50 (A1)

NOTES:

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4. BERM AROUND SHAFT OPENING GRADED TO LIMIT POOLING OF WATER ON SURFACE.

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1:20 @ A3

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1:10 @ A3

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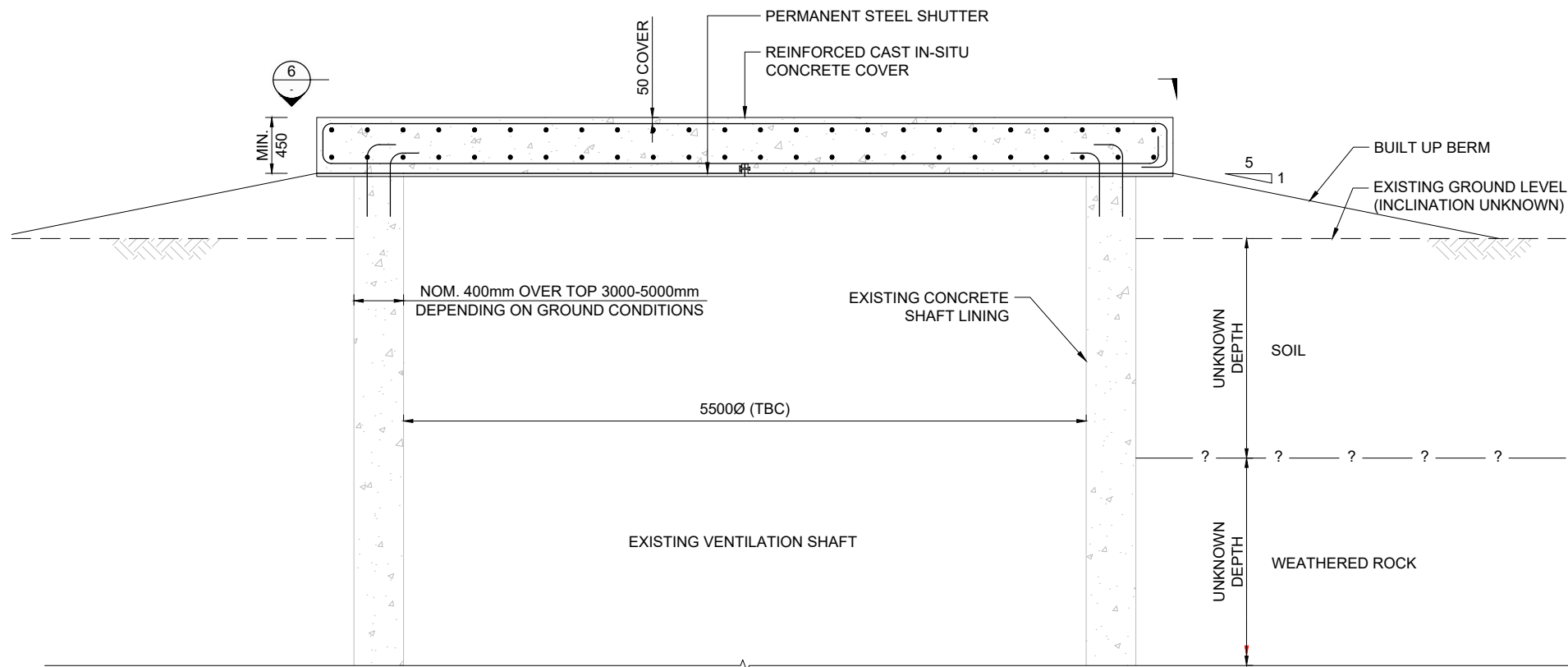
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WKP MINE DEVELOPMENT - CONCEPT PERMANENT COVER OPTION 1 - STRUCTURAL STEEL FRAME

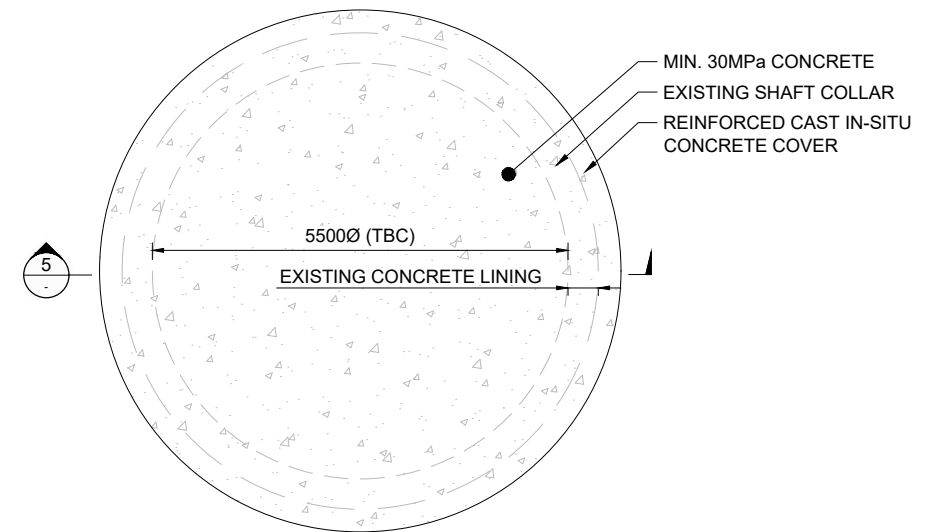
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5 SECTION - THROUGH SHAFT - OPTION 2
SCALE: 1:25 (A1)



6 PLAN - REINFORCED / PRECAST CONCRETE COVER
SCALE: 1:50 (A1)

NOTES:

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3. DESIGN SHOWN IS INDICATIVE AND HAS BEEN PROVIDED FOR CONCEPT ONLY.
4. BERM AROUND SHAFT OPENING GRADED TO LIMIT POOLING OF WATER ON SURFACE.

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WKP MINE DEVELOPMENT - CONCEPT PERMANENT COVER OPTION 2 - REINFORCED CAST IN-SITU CONCRETE COVER

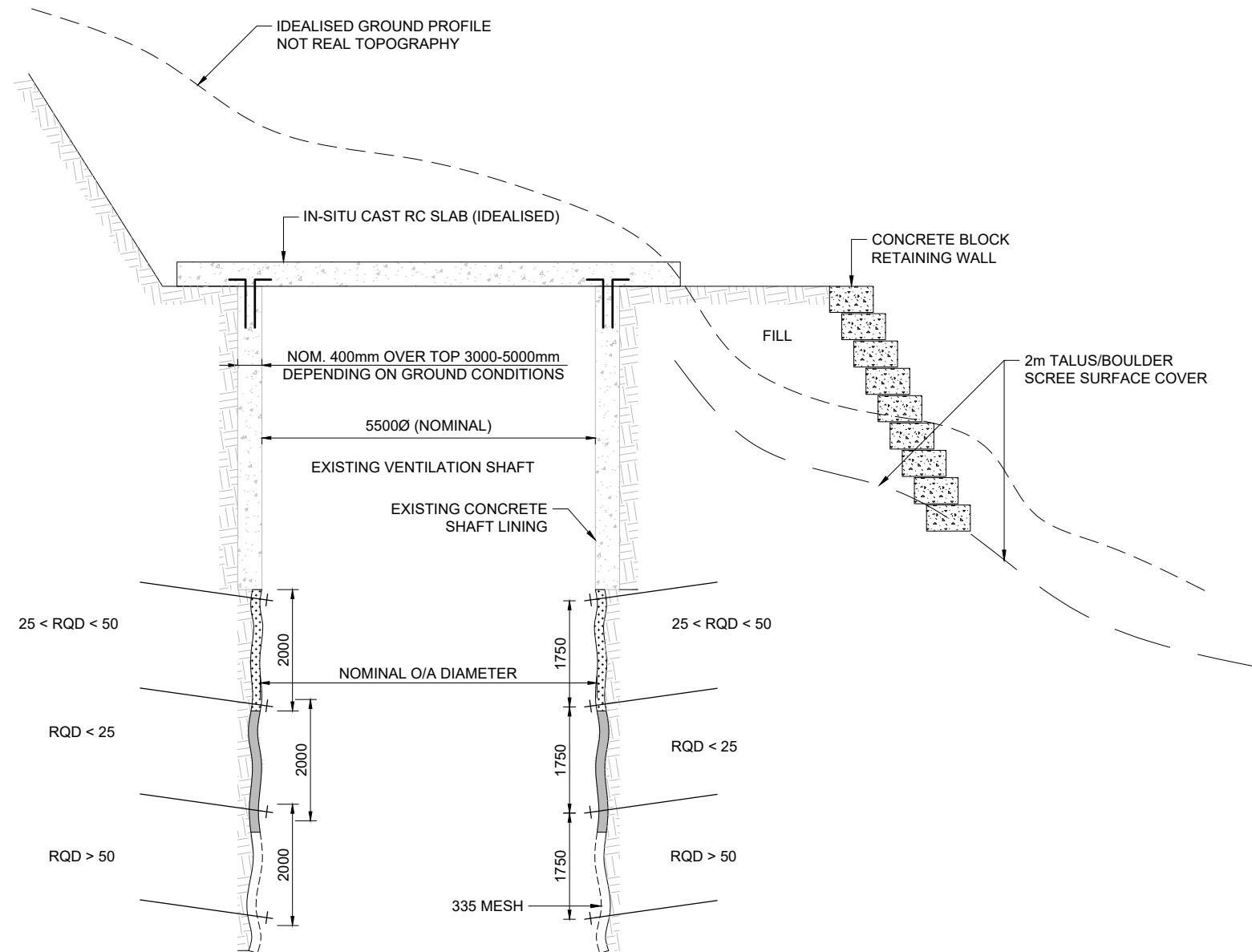
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7 ELEVATION - TYPICAL SLOPING GROUND SHAFT TOP
SCALE: 1:50 (A1)

NOTES:

1. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
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3. DESIGN SHOWN IS INDICATIVE AND HAS BEEN PROVIDED FOR CONCEPT ONLY.
4. BERM AROUND SHAFT OPENING GRADED TO LIMIT POOLING OF WATER ON SURFACE.

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1:100 @ A3
0 1 2 3 4 5 m



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WKP MINE DEVELOPMENT - CONCEPT PERMANENT COVER SHAFT CLOSURE SLAB FOR SLOPING GROUND

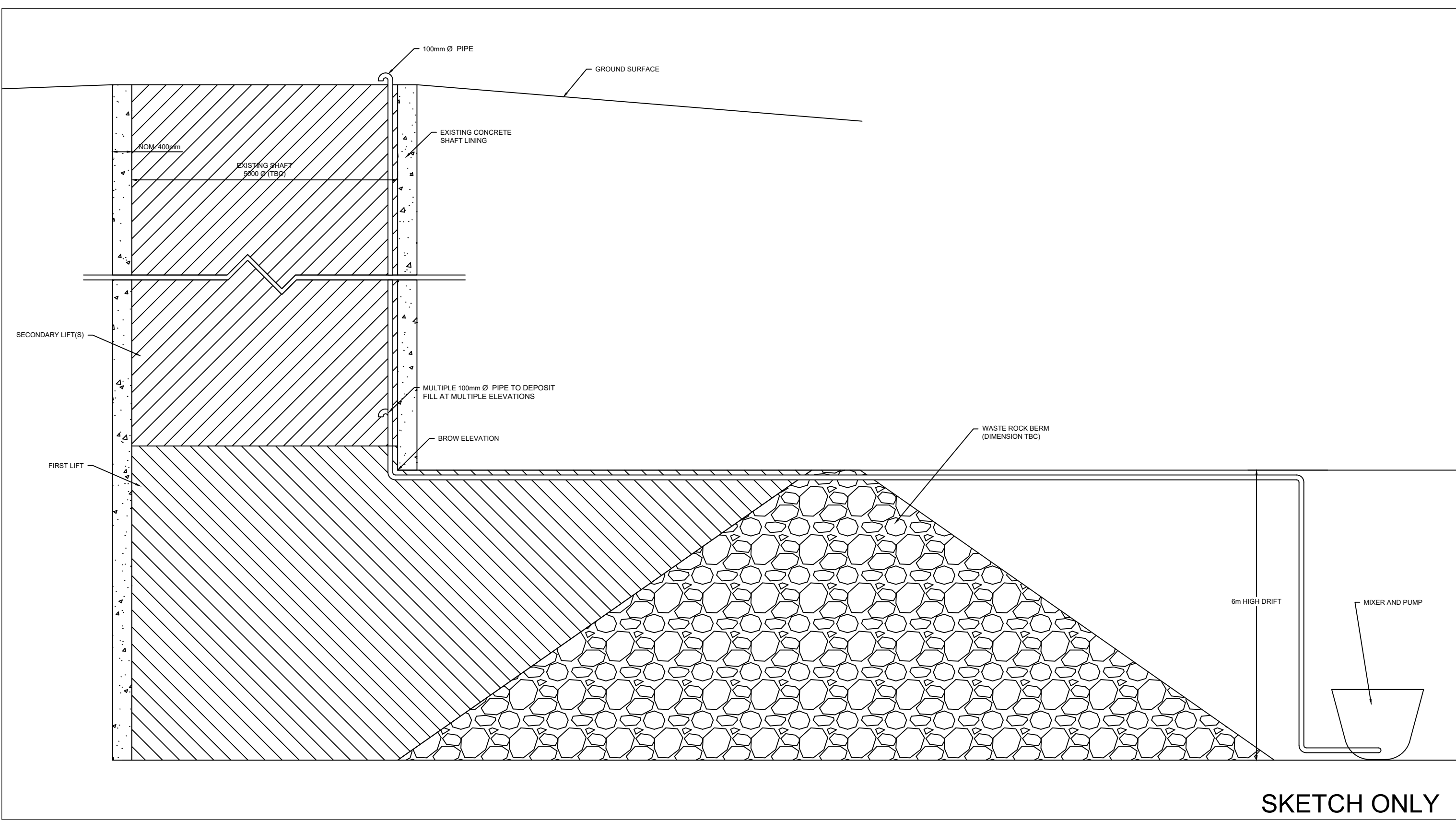
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CLIENT
OCEANAGOLD CORPORATION

PROJECT
WKP MINE DEVELOPMENT
POST MINING CLOSURE OF SHAFT OPENINGS

CONSULTANT



YYYY-MM-DD	2021-11-03
DESIGNED	JJT
PREPARED	JJT
REVIEWED	####
APPROVED	####

TITLE
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PROJECT NO.
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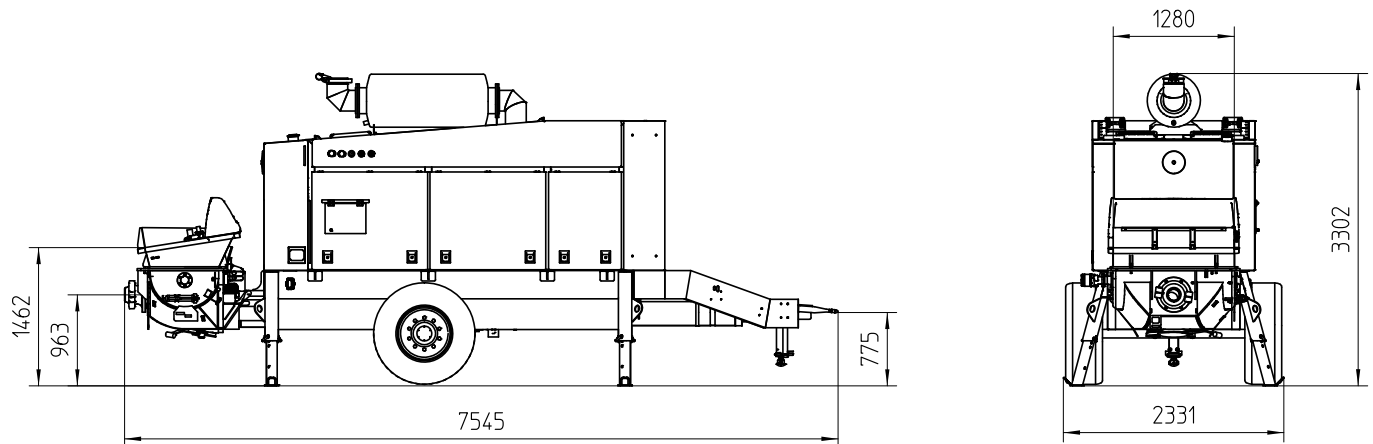
ATTACHMENT C

Example Specifications High Pressure Concrete Pump

Stationary concrete pump

BSA 14000 SHP D

The machine for extreme applications
Output up to 72 m³/h



Note: Standard version. Dimensions and weights depend on equipment. Subject to technical modifications and errors.

Technical data

Model		BSA 14000 SHP D
Material number		102362.000
Output	m ³ /h	72 / 37 *
Delivery pressure	bar	project specific +)
Delivery cylinder	Ø mm	180
Delivery cyl. stroke	mm	2100
Strokes / minute		22 / 11 *
Engine	kW	470
Hopper		RS 905 SHP
Capacity	l	approx. 600
Filling height	m	1.3
Transfer tube		S 1812 D
Line connection	mm	ZX 125
Pressure connection	"	8
Control system		EPS FFH-20
Weight	kg	11000

* Option, Values for hydraulic fluid
being fed to piston-side

+) works setting 250 bar
All data max. theoretical

Serial equipment

Agitator safety switch off	Ergonic Graphic Display (EGD)
Balloon tyres incl. transport protection	Flushing water pump
Cable remote control 10 m	160 l/min 25 bar
Central lubrication on hopper, electrically	Gate valve connection
Cleaning accessories	Grill 60 mm
Coloring: Pump, frame, roof and tank anthracite grey; cover chrome yellow	Hard metal wear parts
Concrete hopper with agitator	Operating manuals (1× paper, 1× CD-ROM) spare part list
Concrete output adjust, electrically	Outriggers 4× mech.
Concrete pressure adjust, electrically	Pump flow meter
Coupling ring (DIN)	Set-up foot hydraulically
Drive diesel, CAT 470 kW (Option: 571 kW)	Speed drawdown automatically on pump stop
Electronic error management	Splash guard
	Tool set incl. standard equipment
	Trailer F8, can be driven on job site

See quotation for exact serial delivery scope.
Comprehensive range of options available on request.



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