Response to Schedule 1

Information requirements	Specifications (including professional accreditation requirements)	Rationale	Proponent Response
Detailed figures of the premises	Please provide detailed labelled figures of the premises including the lay-out of the processing plant (including the location of stacks) and the location of all ancillary infrastructure proposed in this application.	Labelled figures of the premises are required for the works approval. The figures provided contain insufficient detail relating to the location of the TSF, processing plant, stockpiles, process water pond and other ancillary infrastructure.	Refer attachment 1 updated Figure 1-2 with prescribed premise details.
Legal occupancy	Mining tenements M 29/2, M 29/165 and M 29/444 are held by Mt Ida Lithium Pty Ltd. Please provide evidence that Mt Ida AU Pty Ltd has legal authority to undertake the proposed works under Mt Ida Lithium Pty Ltd's tenements.	While it is acknowledged that Mt Ida Lithium Pty Ltd and Mt Ida AU Pty Ltd are both subsidiaries wholly owned by Delta Lithium Limited, the department considers the companies as separate entities and requires Mt Ida AU Pty Ltd to provide evidence that they have legal occupancy on the premises to undertake the proposed activities.	Refer attachment 2 Authorisation letter for the premises.
Regulatory crossover with W6897/2024/1	Please explain how you intend to manage the crossover between works approval W6897/2024/1 held by Mt Ida Lithium Pty Ltd (pervious name Mt Ida Gold Pty Ltd) and the proposal. In particular, please explain how this proposal impacts the movement of historic tailings (noting condition 2 of works approval W6898/2024/1 requires historic tailings to be encapsulated within the waste rock landform) and if this proposal impacts landfilling activities as conditioned in W6898/2024/1.	It is noted that there are a number of contradictions between the proposal and works approval W6897/2024/1 held by Mt Ida Lithium Pty Ltd. The department is unable to grant an instrument whereby the granting of that instrument contradicts the conditions of another instrument for the same prescribed premises.	Noted that the overlap of the two works approvals was discussed with DWER as part of the pre-scoping meeting, with the advice that a new works approval (rather than an amendment) would be required. As per our meeting on the 20th May 2025, we have submitted an amendment for W6987/2024/1 to change the proponent to Mt Ida AU. We understand that this alleviates this risk to the department.
Stack testing	Please provide more information on the proposed stack testing including proposed analytical suite. Please provide an estimate of concentrations of sulfur oxides and nitrogen oxides expected to be discharge to air during gold processing.	The discharge of certain wastes to air is considered an authorised discharge. Further information regarding the proposed discharge to air is required to conduct a risk assessment.	Note that on review of the commissioning plan, the reference to stacks is not consistent with the construction. Stacks have been removed. An updated copy of the commissioning plan is provided as Attachment 3.
Process / raw water ponds	Please provide the following details on the process water pond and any other pond proposed for the site: • The location of the pond(s) on a figure; • The design and construction requirements of the pond(s); • The proposed freeboard of the pond(s); and • Any other controls relating to the construction and/or operation of the pond(s).	Ponds, especially process water ponds, are considered to be containment infrastructure which have the potential to be sources of discharges. The specified information on ponds on the premises is required to undertake the risk assessment.	Note that the turkey nest is consistent with W6987/2024/1; with the design and construction requirements as follows: • For storage of saline water only up to 30,000mg/L total dissolved solids (TDS) • Footprint no larger than 4.6 hectares • Constructed with a PVC liner, and outer embankment constructed from mined materials. 20 mm PVC liner; • Constructed to provide a minimum 0.5 meter total freeboard (including an allowance for the 1% annual exceedance probability 72 hour rain event) above the normal operating pond; • Visual markers for freeboard placed; • Entire perimeter of the turkey's nest fenced to restrict access; and • Egress points for fauna constructed at regular intervals around the pond. The above pond is already approved within W6987/2024/1. Refer Table 1 below, being an excerpt of the design from the Mining

Information requirements	Specifications (including professional accreditation requirements)	Rationale	Proponent Response
			Proposal for the Project. Figure 1-2 (Attachment 1) shows a processing pond within the processing plant footprint, however the specific location has yet to be confirmed. We would propose that the design and construction commitments above (except for the total footprint size) be replicated in the works approval, with the dam size being calculated within the Mining Proposal (note that the processing pond sits within the Mine Activity Reference for "Plant Site").
Acid and metalliferous drainage (AMD) management plan	Please provide an AMD management plan for the premises that describes how AMD will be managed during site operations.	The proposed management of PAF and AMD across the premises during site operations is required to inform the risk assessment.	Refer attachment 4 for the approved AMD plan for the Project. This plan was approved under Mining Proposal RegID 124386.
Conformance Quality Assurance (CQA) testing	Please provide the CQA plans for the TSF HDPE liner, Flownet and geotextile. The CQA plans should specify the type of test, the test property, the applicable standard the test will be performed to, the test frequency and the minimum test pass value where applicable. The CQA plans should also specify actions to be taken where the material fails minimum requirements.	CQA plans are required to inform the risk assessment.	Attachment 5 provides an indicative CQA plan for the geotextile membrane.

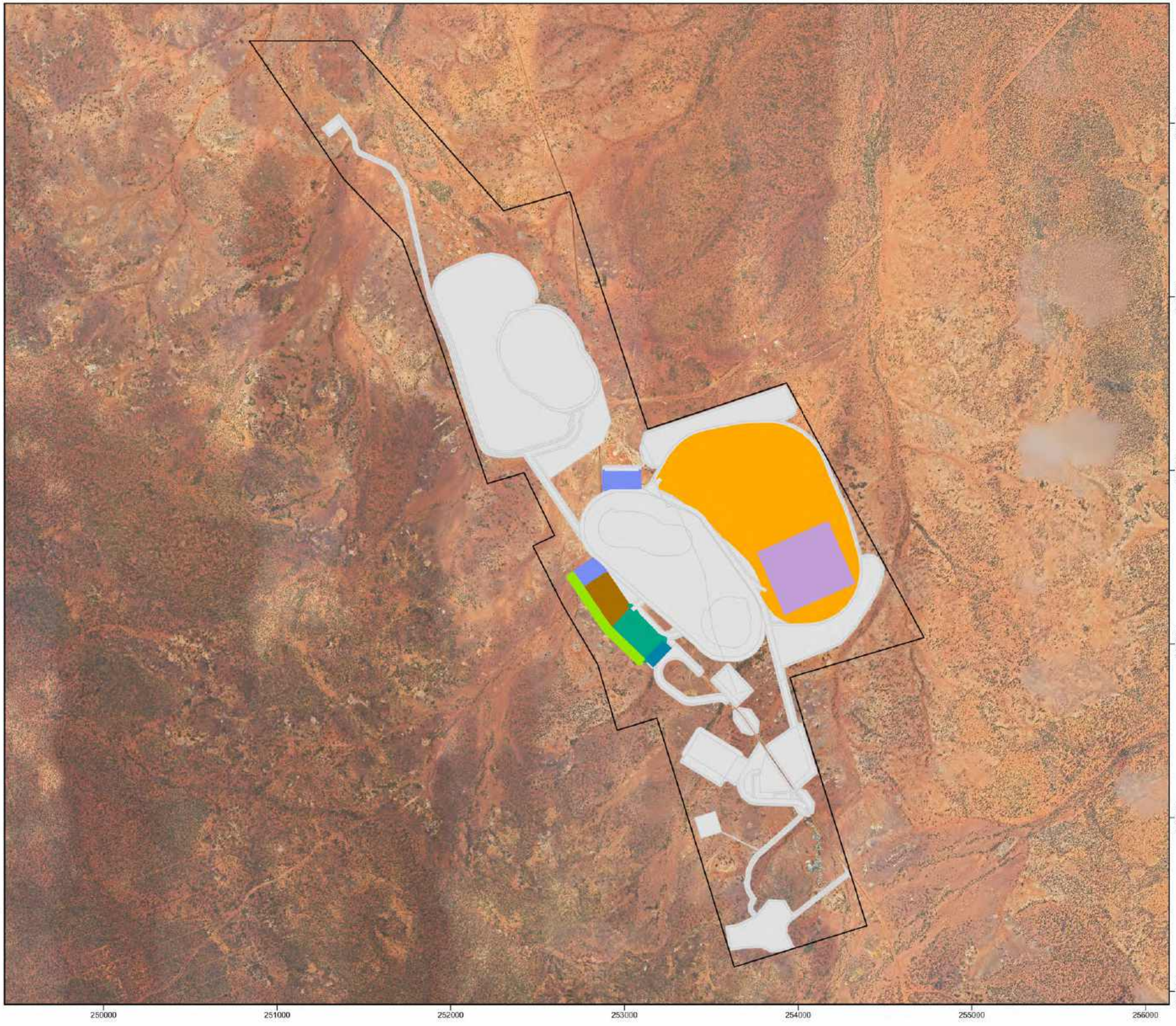
Table 1. Excerpt from Mining Proposal RegID 500396 -Key Activity Details, Turkey Nest

Activity Type	Dam – saline water or process liquor		
Mine Activity Reference	Turkey Nest(s), Process Pond, Settlement Pond		
Total Area (ha)	4.6 ha		
Area per tenement (ha)	M29/2	3.6 ha	
	M29/165	1.0 ha	
Design description	**Turkeys Nest** A large turkey nest will be installed to manage water for dust suppression. The turkey nest will be no greater than 2.0 m in height and will be fenced to minimise feral animal and cattle entry. Fauna egress will be placed around the pond in accordance with DEMIRS guidance note Fauna Egress Matting and Ramps (dmp.wa.gov.au). The turkey nest will be lined with a PVC liner, with the outer embankment constructed from mined materials. **Process Dam** The process dam will be constructed adjacent to the Process Plant. Nominal capacity will be 4,000 m^3 and have an operational freeboard of 0.5 m. The pond will be lined with an HDPE liner and receive excess water from the raw water pond, tailings supernatant return water from the IWLTSF and hydrogen peroxide treated water from the settlement pond associated with the cyanide destruct plant. **Settlement Pond** The settlement pond will be constructed within the Process Plant footprint adjacent to the cyanide destruct plant. The nominal capacity will be 500 m^3 and will be lined with an HDPE liner. Treated water from the settlement pond will feed into the process pond.		
Material characteristics	Fibrous minerals?	N	
	Radioactive materials?	N	
	Materials capable of generating acid/metalliferous/saline or neutral mine drainage?	N	
	Highly erodible material?	N	

Attachment 1: Prescribed Premises Boundary

Mt Ida Project

Figure 1-2:
Prescribed premises boundary



☐	Prescribed premises
▨	Indicative infrastructure footprint

Proposed works approval infrastructure

🟦	Dam – saline water or process liquor (proposed turkey's nest)
🟦	Laydown or hardstand area
🟫	Low-grade ore stockpile (Class 1)
🟩	Plant site
🟩	Topsoil stockpile
🟧	Waste dump or overburden stockpile (Class 1)
🟪	Putrescible landfill site

Data sources
Imagery: Outline Global, 2022

0 0.5 1
Kilometres
GDA 1994 MGA Zone 51

Date: 20/05/2025 Rev: C
Project: 220057
Author: R. Houlihan; Drawn: L. Weggelaar
Print @ A3

GREEN VALUES AUSTRALIA

File: 2025 01 11 - Works Approval - Mt Ida

Attachment 2: Authorisation Letter

15 May 2025

Department of Water and Environmental Regulation
Locked Bag 10
JOONDALUP DC WA 6919

RE: AUTHORITY TO LODGE A WORKS APPROVAL UNDER THE *ENVIRONMENTAL PROTECTION ACT 1986* ON MINING LEASES M 29/02, M 29/165 AND M 29/444.

Mt Ida Lithium Pty Ltd (ACN 106 608 986) is a wholly owned subsidiary of Delta Lithium Limited (ACN 107 244 039) (**Company**) and the registered holder of Mining Lease M29/02, M29/165 and M29/444, granted under the *Mining Act 1978* (WA).

The above listed tenements are held in the name of Mt Ida Lithium Pty Ltd (ACN: 106 608 986) (“**Mt Ida Lithium**”).

Mt Ida Lithium acknowledge that Mt Ida AU Pty Ltd (ACN 664 555 873) (“**Mt Ida Au**”) intends to lodge a Works Approval application under the *Environmental Protection Act 1986* to undertake operations on the aforementioned tenure.

Mt Ida Lithium authorises Mt Ida Au to have legal occupancy to undertake the activities associated with the mining tenure.

[redacted]

Attachment 3: Mt Ida Project: Environmental Commissioning Plan Rev2

MT IDA AU PTY LTD

MT IDA PROJECT | ENVIRONMENTAL COMMISSIONING PLAN

Revision No: 0
Date: 27/05/2025

PREPARED BY

Green Values Australia

[redacted]

File name	DLI_MIG_Environmental Commissioning Plan_Rev0v4
[redacted]	[redacted]
[redacted]	[redacted]
Client name	Delta Lithium Limited
Project name	Mt Ida Project
Document title	Environmental Commissioning Plan
Revision number	1
Project number	220057

DOCUMENT CONTROL

[redacted]

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

Acronyms

Acronym	Meaning
AMD	Acid Mine Drainage
DWER	Department of Water and Environment Regulation
HDPE	High Density Polyethylene
Km	Kilometres
L	Litres
M	Metres
M	Million
Mg	Milligrams
Mtpa	Million tonnes per annum
PAF	Potentially Acid Forming
T	Tonnes
Tpa	Tonnes per annum

1 INTRODUCTION

The Mt Ida Project is situated on Mining Leases M29/165, M29/02 and M29/444 in the Murchison region of Western Australia, approximately 100 km north-west of the town of Menzies, WA.

A brownfield project, Mt Ida Au Pty Ltd (MIG or Mt Ida) proposes to mine gold ore to produce a gold doré on site. MIG proposes to mine gold from multiple open-pit underground mines. Mining will be at an average rate of 1 Mtpa over a nominal 5-year mine life. The ore will be treated on site in a conventional 1 Mtpa carbon-in-leach processing plant, with the potential increase to a 1.5 Mtpa plant when treating oxide and transitional ores.

This commissioning plan describes the testing that will occur to check the actual environmental performance of the proposed Process Plant relative to predicted performance, as described in the Works Approval Application prepared for the Process Plant by MIG (submitted to the Department of Water and Environmental Regulation in March 2025).

This commissioning plan also explains the pollution control features that will form part of the tailings management systems and describes how the performance of those elements of the tailings conveyance and containment system will be checked.

2 SCOPE AND OBJECTIVES

The commissioning phase relates to gold ore processing facilities and related process waste management infrastructure at MIG's Mt Ida mine site. The Process Plant encompasses activities required to bring it from the construction to the operations phase. The purpose of the commissioning activities described in this plan is to:

- Demonstrate that the process plant and tailings storage facilities ('the Premises') can operate to the specifications detailed in the works approval application.
- Demonstrate that all environmental commissioning activities have concluded.
- Confirm that emissions and discharges from the premises meet the required performance standards.

The commissioning plan does not address environmental controls for non-Category 5 prescribed activities (for example, putrescible waste disposal or mine dewatering) and does not address Category 5 activities or infrastructure for the processing of lithium ore.

3 PROJECT OVERVIEW

3.1 Mining

Mine operations at the Mt Ida Project will involve:

- Mining from multiple open pits and underground mines
- Construction of two waste rock landforms (WRL), one of which will incorporate the tailings storage facility as part of an integrated waste landform (IWLTSF)
- Mining support infrastructure, including access and haulage roads, a run-of-mine (ROM) ore stockpile, laydown areas, workshop, raw water turkey nest, groundwater abstraction bores and explosives magazine.

3.2 Category 5 Activities

3.2.1 Description of Process Plant

The Process Plant was designed to process up to 1 Mtpa of the fresh type of gold ore initially. Oxide and transitional ore types may also be processed, which will increase the throughput of the plant up to 1.5 Mtpa. The crushing plant will be designed for continuous operation, 24 hours per day, seven days a week, processing fresh ore at a nominal rate of 163 dry tonnes per hour, at a crushing circuit utilisation rate of 70%.

The grinding and carbon-in-leach (CIL) plant will be designed for continuous operation, 24 hours per day, seven days a week, processing fresh ore at a nominal rate of 125 dry tonnes per hour, at a circuit utilisation of approximately 93%.[1]

3.2.2 Process Description

The proposed gold processing facility makes use of conventional technology for gold recovery and includes the following unit processes:

- A crushing and grinding circuit
- A centrifugal gravity concentrate and electrowinning of the resultant pregnant solution
- Thickening the leach feed to about 45% solids (w/w) before leaching
- Leaching and adsorption using a CIL circuit consisting of two leach tanks and six CIL adsorption tanks

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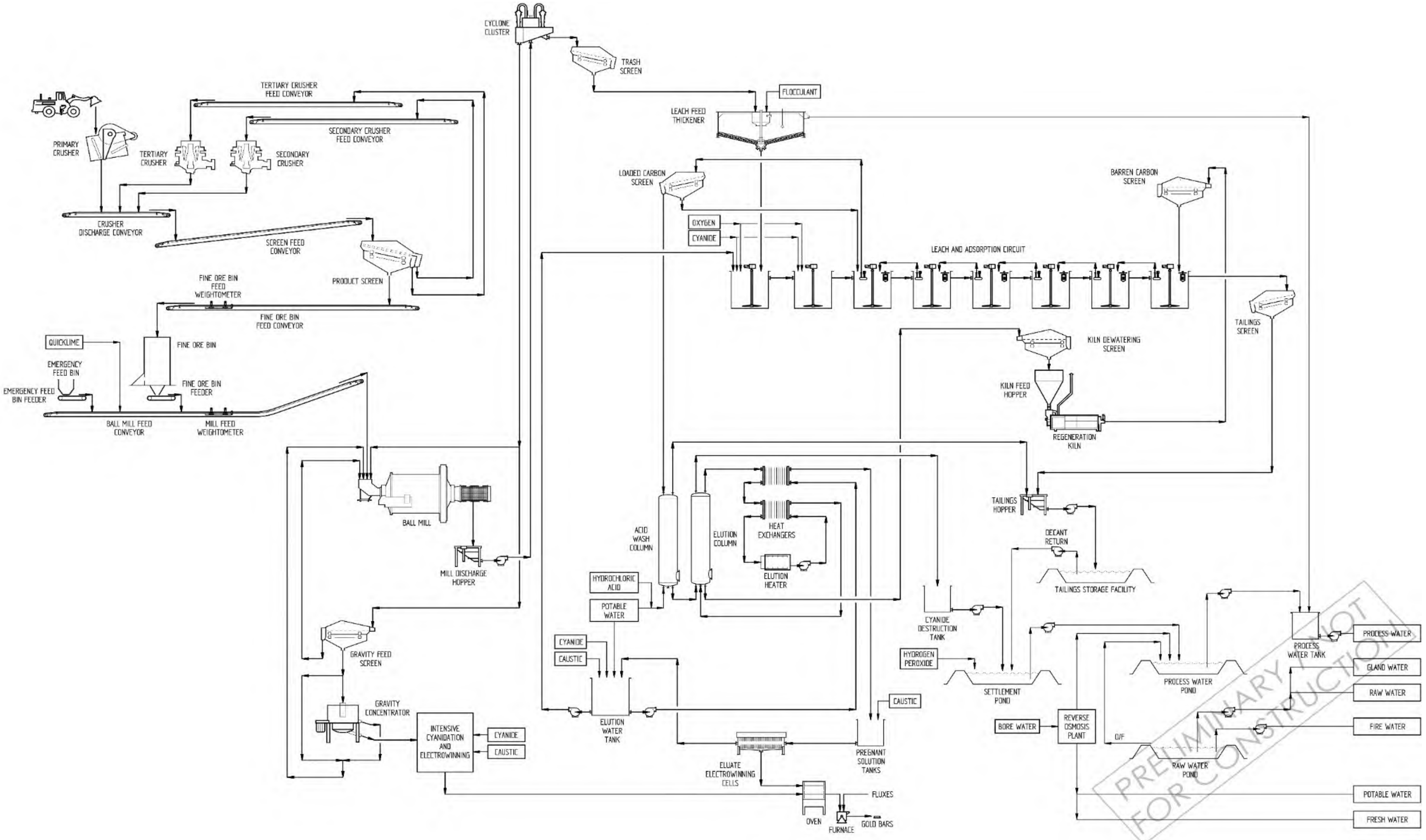
[1] Utilisation is defined as the percentage of total time that the process plant is actually operated with feed, while availability is defined as the percentage of total time that the process plant is mechanically and electrically able to operate

- Acid washing and elution of loaded carbon in separate columns using the pressure Zadra method, and thermally regenerating barren carbon before returning it to the CIL circuit
- Smelting cathode sludge form electrowinning to produce gold doré as the final product
- Pumping tailings from the leaching circuit to the TSF.

A schematic process diagram is provided in Figure 3-1.



Overall Schematic Process Flow Diagram

Reference: 12994 5459327:P:mr Revision A

3.2.3 Reagents

Key reagents to be used in gold processing are listed in Table 3-2, along with information about typical inventories, annual consumption rates and storage methods.

Table 3-1: Gold processing reagents and additives

Process Additive	Packaging	Mixing	Storage/Capacity	Addition
Quicklime	Bulk	Not required	150 t silo	Rotary valve and variable speed screw feeder
Sodium cyanide	Bulk liquid (30% solution)	Not required	110 m^3 tank	Ringmain, control valves and flowmeters
Activated carbon	500 kg bags	Not required	30 bags	By crane to CIL tanks
Sodium hydroxide	1 t IBCs (49% solution)	Not required	10 m^3 tank	Ringmain, control valves and flowmeters
Hydrochloric acid	Bulk liquid (32% solution)	Not required	30 m^3 tank	Dosing pump
Leach aid	10 kg plastic bucket	Not required	20 buckets	Manual
Flocculant	750 kg bags	Automatic mixing plant	4 m^3 tank	Dosing pumps
Hydrogen peroxide	Bulk liquid (70% solution)	Not required	30 m^3 tank	2 m^3 break tank, dosing pumps
Antiscalent	1 m^3 bulky-boxes	Not required	-	Dosing pump
Smelting fluxes	25 kg bags	Not required	Warehouse	Manual

3.2.4 Management of Process Wastes

3.2.4.1 Tailings characteristics

A tailings sample made up of tailings derived from processing of oxide/transitional ore and fresh ore was tested in late 2023 (CMW, 2024). The sample was classified as a clayey silt with a P80 value of approximately 100 µm. The saturated hydraulic conductivity of the drained (but not compacted) tailings sample was 4.56 x10^{-6} m/s (EPrecision lab report WG23_18758_FH). A drained settling test on the tailings sample estimated the maximum dry density the tailings can achieve would be approximately 1.19 t/m^3 and that the time required to achieve maximum dry density would be about 1.5 days.

Geochemical properties of gold tailings were assessed in early 2025 (MBS, 2025). Testing was conducted on one composite sample derived from oxide/transitional ore and two composite samples derived from fresh ore. The oxide/transitional sample was classified as non-acid forming (NAF), while both samples derived from fresh ore were classified as potentially acid forming (PAF) (Figure 3-2).

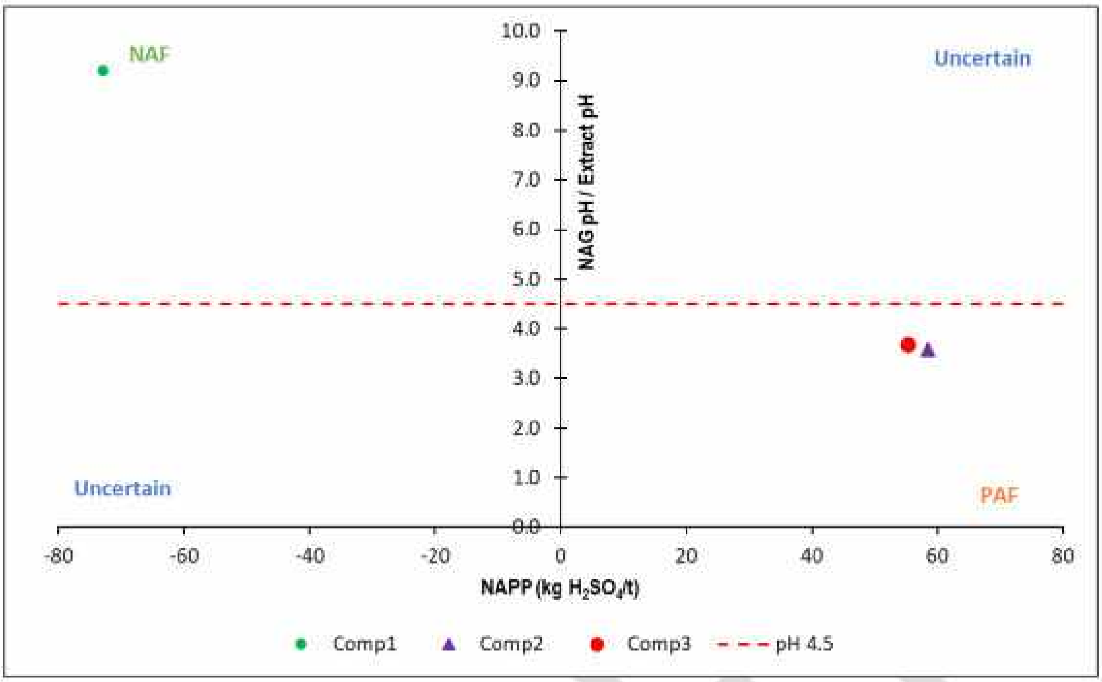


Figure 3-2: Classification of Mt Ida gold tailings (MBS, 2025)

Testing of ‘total’ metals (by a 4-acid digest) found that the oxide/transitional tailings composite sample was enriched in silver (GAI 3), bismuth (GAI 5), copper (GAI 3), antimony (GAI 5), tellurium (GAI 6) and tungsten (GAI 3), while the samples derived from fresh ore were enriched in silver (GAI 4), bismuth (GAI 5 and 6), copper (5 and 6), molybdenum (GAI 3) and tellurium (GAI 6). ‘Environmentally available’ metals in the tailings samples (as determined by extraction with an aqua regia digest) were generally unremarkable, with the exception of copper, which recorded concentrations ranging from 970 mg/kg to 5817 mg/kg in the composite tailings samples. Water leachates from the tailings samples were non-saline and strongly alkaline. Concentrations of most metals and metalloids in leachates from a 1:20 water extraction were low or below their limits of reporting. None of the trace metals/metalloids concentrations exceeded their respective ANZECC guideline values for the livestock drinking water.

The composite samples were determined not to be radioactive, and no fibrous minerals were detected in the samples (MBS, 2025).

3.2.4.2 Historic tailings material

Historic tailings from previous mining operations within the Project tenement package may be processed on site, and the use of the historic tailings as commissioning material for the Process Plant is being considered. There are an estimated 400,000 tonnes of historic tailings to be managed at the Mt Ida Project. Mine Earth was commissioned to complete a tailings characterisation study of the historic tailings in 2023. The results of this study were provided to CMW to be factored into developing the IWLTSF design. A summary of the study's results is provided below, with the full report included as APPENDIX 3.

The key characteristics of the historic tailings materials are as follows (Mine Earth, 2023):

- All samples were classified as ‘extremely saline’.
- Variable sodicity, ranging from non-sodic to sodic.
- A ‘moderately slow’ drainage capacity, with a high potential for hard setting.
- Observations from site indicate that the tailings are prone to dusting and erosion by surface water flow.
- The tailings are classified as non-acid forming and typically have low total metal content, below National Environmental Protection Council (NEPC) (2013) health investigation levels for soil contaminants.
- In one sample, the mercury content was over 100 times the average crustal abundance, however, the concentration was below the NEPC health investigation level.
- Water-soluble metal concentrations were typically below the ANZECC and ARMCANZ (200) guideline values for Livestock Drinking Water aside from minor exceedances in cobalt, selenium and mercury. These concentrations were only marginally above the limit of detection.

3.2.4.3 Tailings storage

Solid residues from the processing of gold ore will be placed in an aboveground storage cell within an Integrated Waste Landform (IWL). The IWL tailings storage facility (IWLTSF) was selected as the preferred storage option given the early availability of mine waste, the bulk of which could be transported and placed directly in the final location without the need for double handling the material.

The IWLTSF comprises a tailings storage cell surrounded by a WRL. The tailing storage cell is formed using compacted waste rock and selected clayey borrow material to form a perimeter embankment to retain the tailings. This style of TSF offers environmental and operational advantages. Environmental benefits include the ability to implement progressive rehabilitation of the embankments using nearby mineral waste materials. The method optimises the beneficial use of mine waste for embankment construction, thereby reducing capital and operational expenses. The design enhances embankment stability due to the waste mass surrounds. Tailings distribution lines can remain in place during embankment construction.

Gold processing tailings will be contained within an HDPE-lined zoned earthen embankment. A typical embankment cross section is shown in Figure 3-2. Seepage and pollution control features included in the tailings storage design include:

- Compacted clay base
- A clay-filled cutoff trench at the upstream toe of the embankment
- HDPE liner on upstream embankment walls and base
- Underdrainage water collection system comprising Flownet and a protective layer of geotextile and associated slotted collection pipes placed over the HDPE liner to capture water that percolates through the tailings stack during the operation of the facility.
- A tailings supernatant recovery system (rock ring decant) to allow water to be recovered from the tailings storage and minimise water ponded on the TSF.

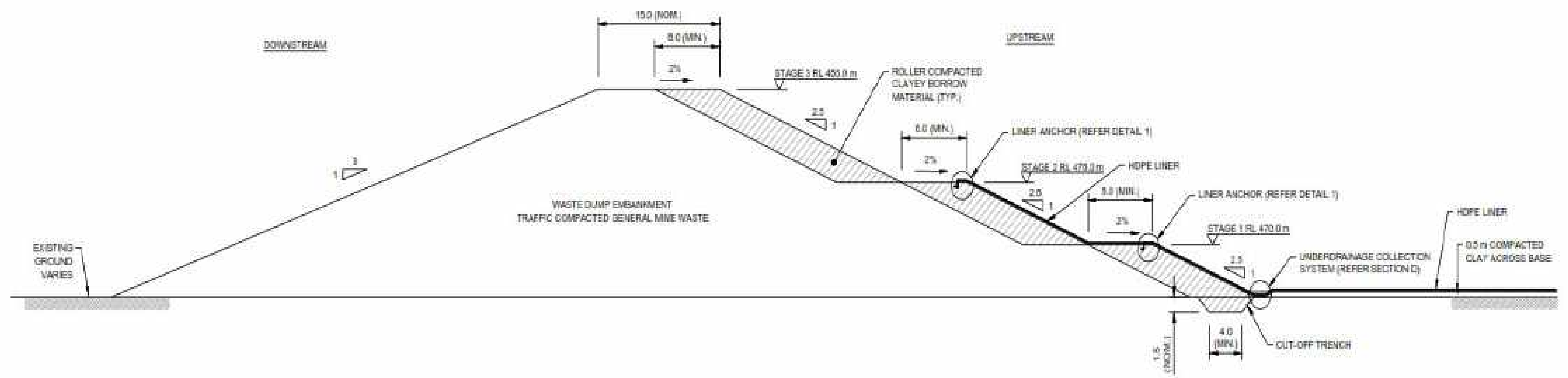


Figure 3-3: Tailing cell perimeter embankment – typical cross section.

3.3 Ancillary Infrastructure: Power Generation and Fuel Storage

Power required for the 1 Mtpa Mt Ida gold project will be supplied by a nominal 5-10 MW hybrid gas, diesel and solar-powered power station located at the plant site. Power will be distributed throughout the site at a voltage of 11 kV. The main 11 kV switchboard will be located in a substation adjacent to the power station, and it will be used to distribute power to substations located at the:

- Crushing area
- Wet plant area
- Mining services area
- Administration area
- Accommodation village.

Power will generally be distributed to the substations via buried cables. Transformers will be installed in fenced, bunded compounds and located adjacent to the low voltage switchboard or motor control centres they supply.

Liquefied petroleum gas (LPG) will be used to fire the elution heater, the carbon regeneration kiln and the smelting furnace in the gold room. LPG will be stored on site in tanks and will be piped directly to the end-use points in the elution area.

Bulk diesel fuel required by the heavy and light fleet vehicles will be delivered to site in road tankers and discharged into approximately five 100,000L self-bunded tanks. High flow and low flow pumps will be provided to supply diesel to a heavy vehicle refuelling bowser and a light vehicle refuelling bowser, respectively. All hydrocarbons stored on site will be managed in accordance with AS/NZS 1940:2017 (as amended, 2019 and 2021).

Neither the proposed power generation facilities nor the bulk fuel storage trigger relevant licensing thresholds under Part V of the EP Act (Category 52 and Category 73, respectively).

4 COMMISSIONING ACTIVITIES

The commissioning of the Process Plant will involve the commissioning of the following equipment:

- Comminution infrastructure (crushers, conveyors and screens, mill(s))
- Gravity separation equipment
- Cyanidation and electrowinning plant
- Carbon regeneration equipment
- Smelting furnace.

A range of related plant and infrastructure will also be installed and commissioned as part of the plant commissioning process, including:

- Lime silo and associated equipment
- Cyanide storage and handling
- Hydrochloric acid storage and handling
- Caustic storage and handling
- Flocculant plant
- Tailings storage and conveyance infrastructure and decant/water recovery pumps
- Water services reticulation and storage infrastructure
- Compressed air plant and reticulation.

4.1 Ore Process Plant

The sequence of commissioning activities at the Process Plant is:

- Construction verification
- Dry commissioning
- Wet commissioning (no load)
- Ore commissioning
- Performance verification against specifications warranted by plant construction contractor.

4.1.1 Construction Verification (Pollution Control Plant)

The purpose of this stage is to confirm that works required for the containment of wastes and/or control and monitoring of emissions or discharges have been completed in accordance with design specifications and are ready for live testing. Examples include:

- Dust control systems
- Plant stormwater drainage
- ‘Dirty’ water storage infrastructure (for example, process water pond)
- Pipeline leak detection systems.

4.1.2 Dry Commissioning

The purpose of this stage is to confirm that the Process Plant has been completed mechanically and structurally in accordance with the engineering specifications and all legislative requirements.

4.1.3 Wet (Water) Commissioning (No Load)

The purpose of this stage is to ensure the Process Plant is ready for ore commissioning. This involves preliminary commissioning and testing in accordance with the engineering specification and legislative requirements.

Wet commissioning will comprise the testing and operating of equipment and facilities to the extent possible without the addition of reagents or ore. It will include, where possible, water circulation through systems, testing control sequences, and operating the equipment grouped together into systems or modules but without ore or reagents or other process material.

Wet commissioning will include:

- Filling tanks and vessels with water
- Pumping water along liquid and slurry pipelines
- Simulation of operating conditions, using water and air, where practical
- Testing of all instruments, systems and equipment
- Ensuring plant operates in accordance with the Control Philosophy
- Taking and recording measurements required by the appropriate check sheets
- Surveillance for abnormal conditions.

4.1.4 Ore Commissioning

This stage aims to operate the Process Plant using ore to establish that the it can produce and discharge tailings to the IWLTSF.

This phase will start with the introduction of ore, reagents, grinding media, and other process requirements to the process facilities, which are operated as a whole.

The ore commissioning is completed when the plant has continuously discharged tailings for a single period (normally 24 hours) and a gold ore bar has been produced.

4.1.5 Performance Verification

The purpose of this stage is to demonstrate that the plant is operating according to the engineering specifications, such as plant throughput rates and grind size. This verification phase usually relates to performance guarantees associated with the contract for the construction of the plant and are commercial in nature (rather than relating specifically to environmental compliance) regarding warranting defects that are remedied.

4.2 Tailings Storage

CMW has prepared an IWLTSF design report for the Project, which includes the construction specifications, the scope of works and the technical specifications for the IWLTSF (APPENDIX 2).

4.2.1 Construction Verification

A post-construction survey must be completed to confirm the embankments are built within the construction tolerances specified in Table 4-1 below.

Table 4-1: Construction tolerances (CMW, 2024)

Construction Item	Tolerance Item		Specification	Tolerance[1]
Perimeter Embankment	Crest level		485 RL (final)	+200 mm, -0 mm
	Crest width		8 m	+500 mm, -0 mm
	Slopes[2]	Upstream	1:2.5	+ or -10% of specified
		Downstream	1:3	+ or -2% of specified
Decant Accessway	Crest level		485 RL (final)	+200 mm, -0 mm
	Crest width		8 m	+500 mm, -0 mm
	Side slopes[2]		1:1.5	+ or -5% of specified

Notes:

1. These shall mean that if a dimension is checked at a particular location, the work is acceptable provided that the dimension departs from that shown on the Drawings by no more than the amount shown above. They shall not be read to imply any basis for payment other than the design dimensions or levels shown on the Design Drawings, upon which all quantities for payment purposes shall be calculated. The average dimension shall not be less than that shown on the Design Drawings.
2. Tolerances on slopes assumes that slopes are specified in the format 1 vertical: X horizontal. The tolerance shall apply to X.

4.2.2 Dry Commissioning

The main EPC Contractor will undertake dry commissioning of the IWLTSF as part of the overall dry commissioning phase of the Process Plant.

4.2.3 Wet Commissioning

Wet commissioning of the TSF forms part of the overall Process Plant ore commissioning by the main EPC Contractor as per Section 4.1.4 above. At the proposed start-up of the IWLTSF, tailings deposition will commence from the north-eastern embankment to fill the low-lying area. Deposition will then be extended along the southern and western embankments and ultimately move around the entire perimeter of the IWLTSF to raise the tailings beach and force the supernatant pond towards the rock filter decant. The discharge points must be regularly moved to ensure the even development of sloped tailings beaches. This deposition and water recovery regime will continue as the perimeter embankments are raised to the final crest level.

4.2.4 Performance Verification

A draft Operations Manual has been prepared for the IWLTSF. This document outlines the procedures to ensure the IWLTSF is operated, maintained and monitored to achieve the design objectives. This includes water recovery, tailings deposition and routine daily inspections and monitoring.

5 MANAGEMENT STRUCTURE AND PROCEDURES

MIG will engage a suitable qualified engineering contractor for the Process Plant construction, utilising an Engineer, Procure, Construct (EPC) style contract that is standard throughout the industry. The EPC contract will set out the requirements related to complying with commissioning requirements. The Management Structure and Procedures will, therefore, be a combination of Proponent and the engineering contractor to ensure compliance with the various environmental, quality, safety and compliance activities.

Table 5-1 provides an overview of the responsibilities of key personnel involved in the commissioning of the Process Plant

Table 5-1: Accountabilities for commissioning

Role	Accountabilities
Project Manager	• Completion of the Project in accordance with Project objectives. • Overall management of risk during commissioning works. • Provides final approval for the commissioning plan. • Monitors the progress of commissioning works. • Accepts the commissioned processing facilities.
MIG Processing Manager	• Interface between the commissioning team and MIG operations personnel. • Ensures effective communication of work instructions to the commissioning team. • Responsible for the supply of suitably qualified operations and maintenance personnel, ore feed of similar characteristics to that used in the design report, power and water and consumables and reagents.
Process operators/maintenance technicians	• Operation and maintenance of the plant during commissioning. • Operation and maintenance of the plant following commissioning. • Monitor and report any faults, potential hazards and/or environmental incidents encountered during commissioning. • Report to the MIG Processing Manager and Project Manager.
TSF engineer (Design Consultant)	• Ensure all QA/QC is undertaken during construction. • Respond to any Technical Queries that arise during construction. • Responsible for verification as per the Operations Manual for commissioning.
Environment & Sustainability Manager	• Identifies and communicates statutory requirements for safety and environmental performance. • Ensures periodic inspections and audits are carried out to check performance and compliance. • If required, reports safety / environmental incidents and ensures effective investigation and follow-up of incidents.
Environmental Superintendent	• Schedules and conduct (or commissions) routine testing of pollution control systems. • Carries out and assesses the results of routine environmental monitoring. • Conducts regular workplace inspections. • Assists in the preparation of performance and compliance reports.

6 RISK ASSESSMENT – PLANT COMMISSIONING

6.1 Risk Identification and Assessment Methods

A risk-based assessment of MIG's proposed Category 5 activities was completed in accordance with the DWER Guidance Statement: Risk Assessments (Version 3, December 2020). The risk assessment process identified the following:

- Emission sources
- Potential pathways from the source to the receptor
- Environmental receptors
- Potential impacts of project emissions on receptors
- Project-specific controls and mitigation measures to prevent or limit emissions and mitigate impacts
- The likelihood, consequence and overall risk rating associated with this factor
- The requirement for monitoring.

Potential emissions, pathways, receptors, and impact avoidance/control measures for commissioning activities are summarised in Table 6-4.

The risk of significant adverse environmental impacts from the activities associated with this works approval application is considered low due to the following:

- Remote location of the works (away from noise-sensitive premises)
- Use of dust suppression systems to control dust emissions from crushing and screening equipment and lift off from stockpiled materials.

Storage and management of chemicals and hydrocarbons in accordance with Australian Standards:

- Construction of the IWLTSF
- Lining of storage facilities (i.e., IWLTSF and process water dam).

Table 6-1: Likelihood definitions

Likelihood Criteria	Probability
Almost Certain	The risk event is expected to occur in most circumstances
Likely	The risk event will probably occur in most circumstances
Possible	The risk event could occur at some time
Unlikely	The risk event will probably not occur in most circumstances
Rare	The risk event may only occur in exceptional circumstances

Table 6-2: DWER Risk rating matrix (2020)

	Consequence				
Likelihood	Slight	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

Table 6-3: Consequence definitions

Consequence level	Environment	Public Health and Amenity (such as air and water quality, noise and odour)
Severe	• Onsite impacts: catastrophic • Offsite impacts local scale: high level or above • Offsite impacts wider scale: mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance • Specific Consequence Criteria (for environment) are significantly exceeded.	• Loss of life • Adverse health effects: high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • Local scale impacts: permanent loss of amenity.
Major	• Onsite impacts: high level • Offsite impacts local scale: mid-level • Offsite impacts on a wider scale: low level • Short-term impact to an area of high conservation value or special significance • Specific Consequence Criteria (for environment) are exceeded	• Adverse health effects: mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • Local scale impacts: high level impact to amenity
Moderate	• Onsite impacts: mid-level • Offsite impacts local scale: low level • Offsite impacts on a wider scale: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• Adverse health effects: low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • Local scale impacts: mid-level impact to amenity
Minor	• Onsite impacts: low level • Offsite impacts local scale: minimal • Offsite impacts on a wider scale: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • Local scale impacts: low level impact to amenity
Slight	• Onsite impact: minimal • Specific Consequence Criteria (for environment) met	• Local scale: minimal impacts to amenity • Specific Consequence Criteria (for public health) criteria met

Consequence level	Environment	Public Health and Amenity (such as air and water quality, noise and odour)
Note – specific consequence criteria may be derived from—or informed by—the following: • Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000) • Western Australian Guidelines for biosolids management (DEC, 2012) • Department of Water and Environmental Regulation Draft Guideline: Air Emissions (DWER, 2019) • WA Department of Environment Air Quality Modelling Guidance Notes (DoE, 2006) • Approved methods for the modelling and assessment of air pollutants in NSW (DEC, 2022) • Contaminated sites ground and surface water chemical screening guidelines (DoH, 2014) • Australian Drinking Water Guidelines (NHMRC & ARMCANZ, 2022) • National Environment Protection (ambient air quality) Measure • National Environment Protection (Air Toxics) Measure.		

6.2 Risk Assessment

Of the six environmental risks considered for commissioning the Process Plant, two (noise and dust emissions) were assessed as having low residual risks. Four risks were classified as having moderate residual risk. The moderate risk events were:

- Contamination of surface water by runoff from plant site during flood events
- Loss of containment of mine-affected water due to damage of critical containment infrastructure (pond liners)
- Loss of containment of mine-affected water or tailings due to pipeline failure
- Fauna ingestion of water containing cyanide.

The proposed engineering and administrative controls to mitigate these risks during construction and commissioning are detailed in Table 6-4.

Table 6-4: Mt Ida Process Plant Environmental Risk Assessment (Commissioning)

Aspect	Initiating Event	Potential Hazards/ Emissions	Potential Receptors	Potential Pathway	Potential Adverse Impacts	Proposed Mitigation/Management	Likelihood Of Impact	Plausible Consequence	Residual Risk
Commissioning of Process Plant and IWLTSF	Processing, transporting, handling and stockpiling of rock and other earth materials	Dust from historic tailings	Proximal native vegetation.	Air/wind dispersion	Smothering of vegetation	• Fugitive dust emissions will be minimised through the use of water sprays and misters on processing equipment and use of a water sprays on stockpiles as required. • Water cart on standby to assist with additional dust suppression if required. • Tailings characterisation test work completed.	Possible	Slight	Low
		Noise	No nearby residences or other sensitive receptors	Air/wind dispersion	Amenity impacts	• Use new generators with modern noise suppression devices attached. • Regularly service and maintain vehicles, plant, equipment and generators to maintain an appropriate sound power level. • Ensure machinery and mobile equipment is appropriately operated by competent and trained operators to minimise excess noise and vibration. • Ensure internal combustion engines are fitted with a suitable muffler in good repair.	Unlikely	Slight	Low
	Extreme weather event	Contaminated stormwater	Surface water	Flood events	Contamination of surface water quality	• Diversion drains will be installed around the plant site to direct surface water around the hardstand areas. • Potentially contaminated stormwater will be directed to sumps where it will be pumped. • Facilities managed in accordance with the *Department of Water's (DoW) Water Quality Protection Note: Stormwater Management at Industrial Sites (DoW, 2002).*	Possible	Minor	Medium
	Commissioning activities	Process water	Surface water Soil/land	Failure of process pond liner/ liner tear	Contamination of surface water and/or soils	• Dam is commissioned at reduced capacity (i.e. <50%). • Continuous, in situ telemetry monitoring pond level.	Unlikely	Minor	Medium
		Process water	Surface water Soil/land	Pipeline failure	Contamination of surface water and/or soils	• Pipelines are tested using fresh water where possible. • Dedicated discharge points (sumps) established for test water.	Possible	Minor	Medium
	Water storage	Process water/tailings	Fauna	Ingestion of water containing cyanide	Death of fauna	• Commission dam at reduced capacity. • Regular monitoring of water quality during commissioning. • Daily inspections for signs of fauna and evidence of fauna death.	Possible	Moderate	Medium

7 POLLUTION CONTROL MONITORING PROGRAM

Routine monitoring of pollution control, water management and waste management systems linked to the gold processing facility will commence during the commissioning phase of the Project. Monitoring will include:

- Routine inspections
- Emissions monitoring
- Ambient environmental monitoring

Monitoring and inspections will be carried out in accordance with the Part V works approval and licence (when issued) and may include:

Table 7-1: Process Plant commissioning – indicative monitoring program

Asset	Monitoring
ROM pad and comminution infrastructure	Dust deposition monitoring
Tailings pipelines	Daily inspections of pipeline integrity and bunding. weekly checks of flow metres, leak detection telemetry and automatic shut-off systems.
Integrated waste landform/tailings cell	Groundwater quality, groundwater depth, IWLTSF monitoring as per the Operations Manual (includes assessment of ponding extent). Testing of CN concentrations at the point of tailings discharge. Monthly water balance.
Process water infrastructure, tanks, ponds and pipelines	Visual check of integrity, verification of freeboard, ponding extent on tailings storage cell, monthly review of decant water recovery, quarterly testing of water quality, monthly testing of CN in tailings supernatant and settlement pond (after CN destruction unit).

8 COMMUNICATIONS AND REPORTING

8.1 Statutory Notifications and Reporting

Routine statutory reporting will include lodgement of annual environmental reports required under approvals granted under Part V of the *Environmental Protection Act 1986* and the *Mining Act 1978*. Non-compliance matters and environmental incidents will be reported in accordance with DEMIRS' *Guidance Note on Environmental Noncompliance and Incident Reporting* (2022).

8.2 Commissioning Reports

MIG will prepare a commissioning report for the gold plant pollution control system. The commissioning report will be submitted to DWER. The information contained in the commissioning report will reflect recommendations in DWER's Industry Regulation Guide to Licensing (DWER, 2019) and will include:

- A description of the environmental commissioning activities undertaken
- Evidence the premises can operate to the specification detailed in the works approval application
- Test results to show that air emissions from the scrubber meet the required specifications
- Confirmation that all environmental commissioning activities have concluded.

8.3 Non-standard Operations

In the event of unplanned emissions to the environment during commissioning, MIG will take all necessary measures to shut down the relevant areas of the Process Plant and will conduct the required level of investigation to prevent recurrence. Where required, the DWER CEO will be notified in accordance with the relevant standard condition (non-compliance notification) of the Works Approval. The same approach will be used once the Process Plant is operational.

9 REFERENCES

CMW, 2024. Design Report: Integrated Waste Landform Tailings Storage Facility (IWLTSF), Mt Ida Project (Gold), Western Australia, PER2024-0325AB Rev 1, 18 December 2024.

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Department of Water and Environmental Regulation, 2019. Guideline: Industry Regulation Guide to Licensing, June 2019.

GR Engineering Services, 2024. Mt Ida Gold Project – Options Study, prepared for Delta Lithium Limited, 15 August 2024.

CMW Geosciences, 2024. Integrated Waste Landform Tailings Storage Facility – Mt Ida Project (Gold) – Design report.

MBS, 2025. Mt Ida Lithium and Gold Project Static Tailings Characterisation – Gold Deposit, February 2025

APPENDIX 1. Tailings Characterisation Assessment

MT IDA PROJECT

STATIC TAILINGS CHARACTERISATION - GOLD DEPOSIT

March 2025

Prepared for:

DELTA LITHIUM

Prepared by:

Martinick Bosch Sell Pty Ltd
ABN: 60 102 614 478
4 Cook Street
West Perth WA 6005
Phone: (08) 9226 3166
Email: info@mbsenvironmental.com.au
Web: www.mbsenvironmental.com.au

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MT IDA PROJECT

STATIC TAILINGS CHARACTERISATION - GOLD DEPOSIT

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Executive Summary

Mt Ida Gold Pty Ltd is a wholly owned subsidiary of Delta Lithium Limited (Delta) intends mining at their Mt Ida Project located 200 km northwest of Kalgoorlie and 80 km northwest of Menzies in the Goldfields Region of Western Australia. The project comprises two open pits (Timoni and Sister Sam), a box cut between the two open pits accessing an associated underground mine, a Waste Rock Landform (WRL), and Integrated Waste Landform Tailings Storage Facility and relevant mining infrastructure.

The assessment was performed on composites of three metallurgical process trial residues from processing of the oxide/transitional ore (Comp1) and the fresh underground/MNGC (Meteor North Grade Control) ore (Comp2 and Comp3) prepared to reflect tailings compositions produced during the years of production and by geological ore domain. Oxide/transitional tailings will comprise approximately 25% of the total tailings produced (4 M tonnes).

Summary of Results

- The two tailings samples produced from the fresh material fresh contained a mineralogical composition comprising mainly inert silicates essentially in the form of amphibolite, quartz, plagioclase and mica. There were very low amounts of carbonates detected with acid-producing pyrite, pyrrhotite and chalcopyrite found in both samples.
- The tailings composite from the oxide/transitional material was classified as non-acid forming and therefore does not present risks of potential acid mine drainage.
- The fresh rock mining tailings composite samples were classified as potentially acid forming (PAF) due to high total sulfur and only moderate acid neutralisation capacity (ANC) resulting in acidic net acid generation (NAG) pH values (3.6 and 3.7).
- Geochemical enrichments were recorded in the oxide/transitional composite for silver, bismuth, copper, antimony, tellurium and tungsten. The fresh samples recorded enrichments in silver, bismuth, copper, molybdenum and tellurium with a further enriched in selenium for Comp2.
- Cobalt, mercury, manganese, molybdenum and vanadium were recorded in environmentally significant concentrations in the aqua regia digest. The most environmentally significant metal was copper with concentrations exceeding the NEPM (2013) ACL for commercial/industrial sites (in all three samples. The majority of analytes recorded environmentally available proportions greater than 70% versus absolute total.
- Water leachates of tailings material were strongly alkaline (pH values 9.3 – 9.7) exceeding the Livestock Drinking Water trigger value of pH 8.5 which is considered an artifact of the metallurgical processing reagents (lime addition). All the leachate samples also showed low salinities. Concentrations of most metals and metalloids analysed in the fresh (non-oxidised) tailings were low or below their limits of reporting. None of these elements exceeded the livestock drinking water or NPUG guideline trigger values with only sporadic exceedances of

the freshwater protection 80 and 95% guidelines observed for silver, aluminium and copper for the fresh samples only.

- Oxidation of PAF fresh rock tailings Comp2 and Comp3 using peroxide (NAG test liquor analysis indicated oxidation will result in acidification (pH 3.5) and mobilisation of aluminium, iron, copper, cobalt, nickel and zinc as key metals in addition to salts (sodium, potassium, calcium, magnesium and sulfate)., This indicates that tailings samples generated from processing of the underground and MNGC ore may generate acid metalliferous drainage (AMD) under oxidising conditions, and have potential to cause adverse environmental impacts if not effectively managed.
- No asbestiform mineral fibres were identified in both fresh composite samples following assessment by transmission electron microscopy (TEM).

Implications for Management

Overall, this geochemical assessment indicated that the gold tailings residues from the oxide/transitional ore zone is NAF and unlikely to generate AMD and elevated concentrations metals/metalloids. Fresh rock tailings (and any low grade ore which may be stockpiled before processing) from deeper in the pit and underground will need to be managed as PAF to avoid significant oxidation and AMD formation and seepage. This is intended to be achieved using a double lined (clay and plastic) integrated waste landform design (CMW Geosciences 2024).

It is anticipated that the IWLTSF will be fully lined with a HDPE liner and incorporate an underdrainage system (CMW Geosciences 2024). Therefore, seepage from the IWLTSF is unlikely to occur and impact the deep and saline water table (40 - 95 mbgl) attributed to extraction and dewatering (Rockwater 2023). However, if limited seepage is to occur and reach the water table, it is expected to be flow into the main pit which will form groundwater sink after end of dewatering (post-closure). On this basis, the risk of the PAF tailings disposal method is considered to not present a significant threat to the receiving environment.

An additional strategy to reduce potential for AMD post-closure would be to keep aside a portion of oxide/transitional ore (which is NAF) and process last prior to cessation of operations. The NAF tailings would thus become a capping layer limiting oxygen ingress to PAF tailings underneath. However provided the IWLTSF is covered at closure (post-consolidation phase) with any available low permeability clays and a suitable capping layer of competent NAF waste rock this should also prevent tailings oxidation. It is noted the tailings are pyrrhotite dominant, which in tailings tends to form a 'crust' upon oxidation, reducing water and oxygen infiltration over time. A final overlying layer of rehabilitation material for native plant growth would then be applied.

CONTENTS

TABLES

FIGURES

CHARTS

APPENDICES

1. Introduction

1.1 Project Background

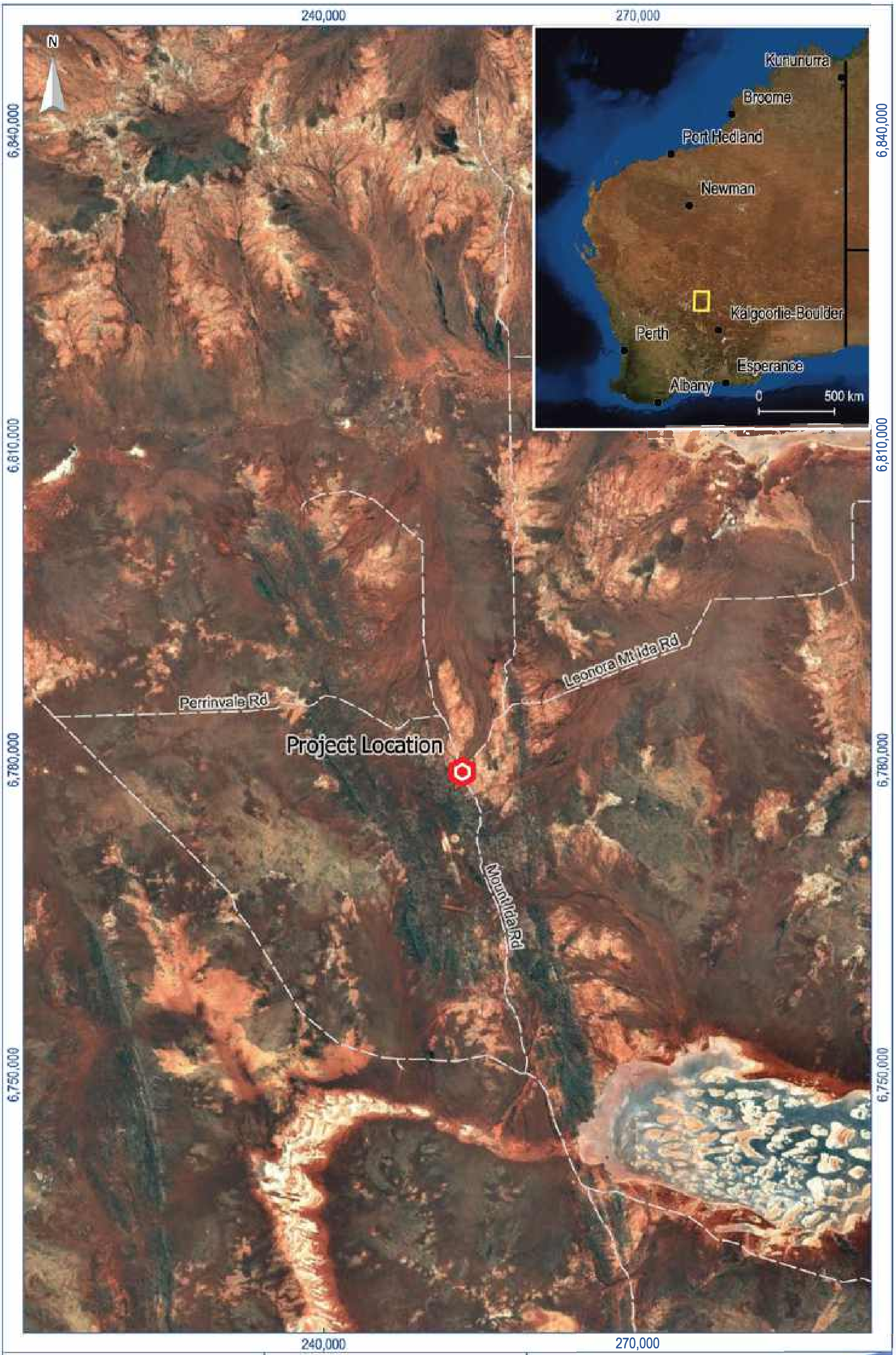
Mt Ida Gold Pty Ltd is a wholly owned subsidiary of Delta Lithium Limited (Delta) intends mining at their Mt Ida Project is located 200 km northwest of Kalgoorlie and 80 km northwest of Menzies in the Goldfields Region of Western Australia (Figure 1). The project comprises two open pits (Timoni and Sister Sam), a box cut between the two open pits accessing an associated underground mine, a Waste Rock Landform (WRL), an Integrated Waste Landform which will include the Tailings Storage Facility (IWLTSF) and relevant mining infrastructure (Figure 2). The northern deposit (pit) is referred to as the Meteor deposit and the southern deposit (pit and underground) is the Baldock deposit (Figure 2).

Delta Lithium is currently developing their gold process plant and preparing for approvals have requested a proposal by Martinick Bosch and Sell Pty Ltd (MBS) to undertake a static tailings characterisation of the gold deposit to meet the DEMIRS life of mine and post-closure requirements.

1.2 Objective and Scope of Work

The major objectives of the geochemical works included:

- Liaise with Delta metallurgists to select representative samples of metallurgical trial residues (as surrogates for process tailings) for further laboratory analysis.
- Liaise with NATA accredited laboratories, receive samples, split and prepare submissions for sample analysis.
- Assess and compile analytical data from the laboratory analysis.
- Prepare a geochemical characterisation report for the static tailings assessment, which includes:
  - Illustrating the potential for tailings to contribute to saline and/or neutral leaching of environmentally significant metals and/or metalloids to the environment. AMD properties were tested for confirmation of expected non-acid forming potential.
  - Screening assessment based on rate of NAG reaction for the relative reactivity of sulfides.
  - Discussion of the relative environmental availability of metals/metalloids under potential placement conditions.
  - Identification of asbestiform minerals in the tailings if any.
  - Discussion/review of potential metals/metalloids and cyanide toxicity in the potentially receiving environment.
  - Guidance/commentary on the compatibility/risk potential of static tailings results regards proposed disposal means – implications of results for management of the tailings.



Scale: 1: 500,000
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(EPSG:7851)

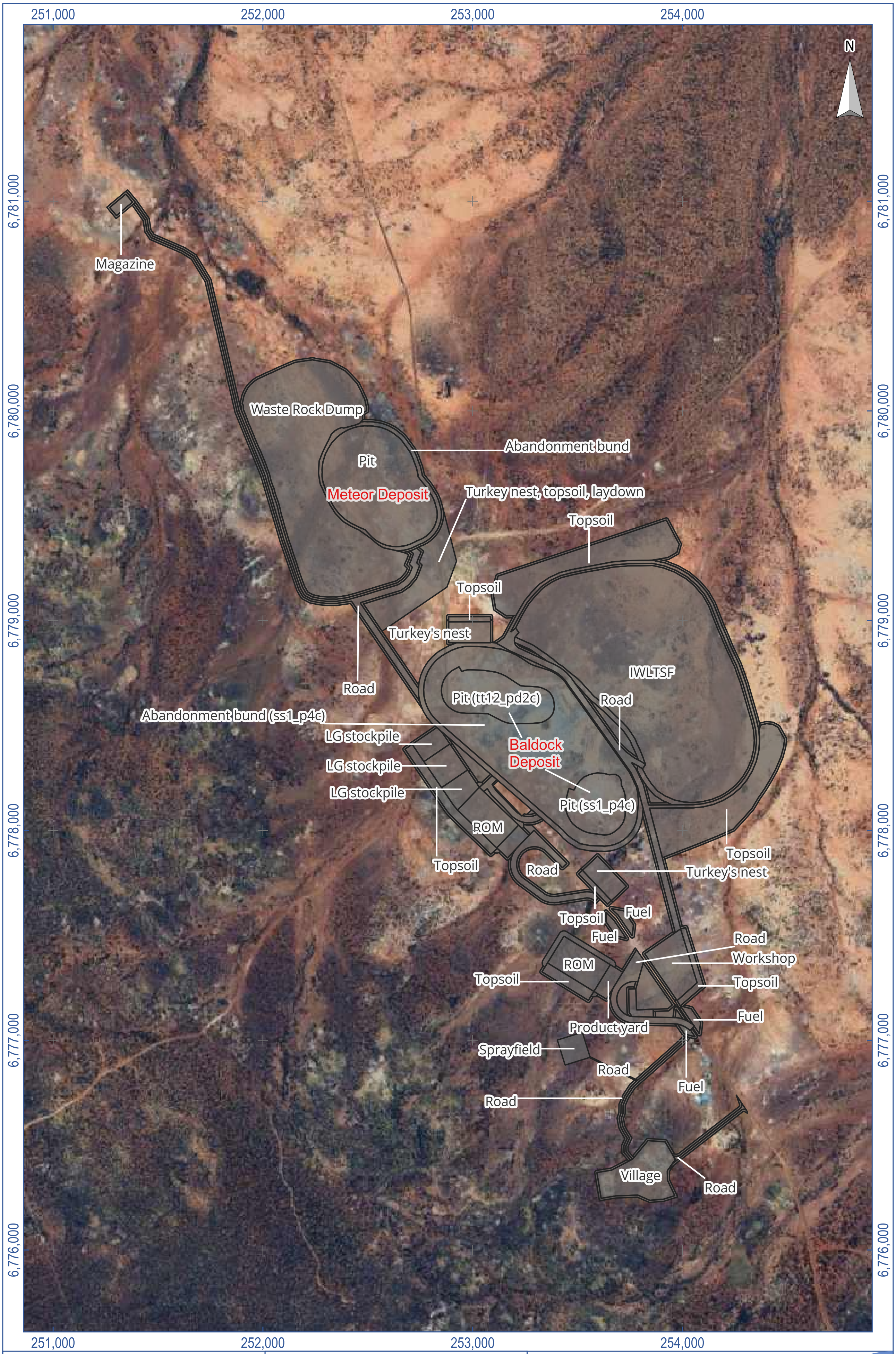
Legend

— — Local Road

Figure 1

Project Location

MBS ENVIRONMENTAL



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▨ Project Layout

Figure 2

Project Layout

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2. Environmental Setting

2.1 Climate

The Project area has a semi-arid climate with hot summers and mild winters where the average evaporation exceeds the average precipitation during every month of the year. The Leonora weather station (BoM 006027) is the closest to the project area and is located about 93 km northeast of Mt Ida (Chart 1). The mean annual rainfall in Leonora is 236 mm, the monthly rainfall varies between 9 mm (September) and 31 mm (February). Mean maximum temperatures at Leonora vary between 18°C and 37°C whilst the mean minimum temperatures vary between 6°C and 22°C (BoM 2024).

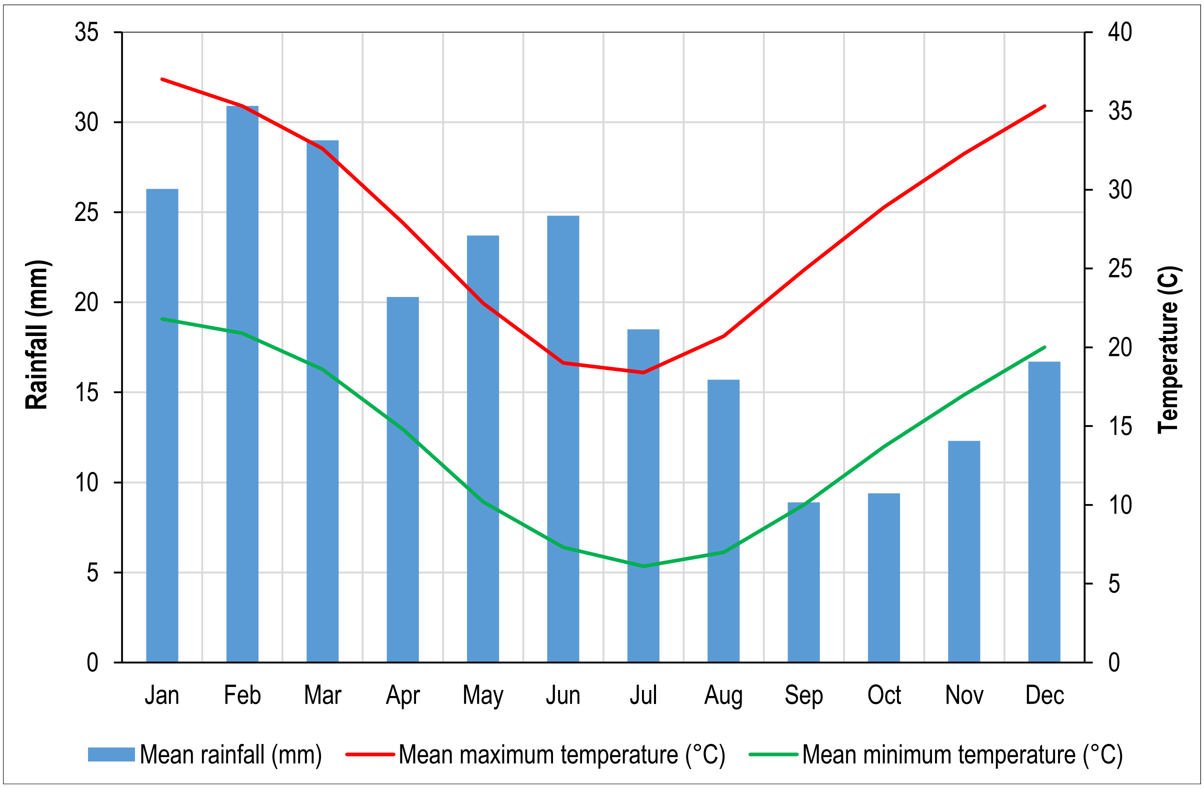

Chart 1: Monthly Climate Data for Leonora Station 012046 (BoM, 2024)

2.2 Landform and Soils

The current landform, created by mining, is dominated by waste and tailings storage facilities from the former Timoni Mining Operation (CMW Geosciences 2023). The soils are typical of those found in the undulating plain system described in the Biological Survey of the Eastern Goldfields of WA, where weathering formed a deep fractured lateritic soil profile. At the base of the soil, ferruginous gravel and duricrust is underlain by saprolite, with granite and greenstones at depth.

2.3 Geology

The Mt Ida Project is situated in the Archaean Mt Ida-Ularring Greenstone Belt within the Kalgoorlie Terrane, a structural subdivision of the Eastern Yilgarn Craton (EGL 2017). The project area comprises the Archean-aged Copperfield Monzogranite and Kalgoorlie group mafic volcanics. The stratigraphy is locally dominated by ultramafic and mafic volcanics and minor sediments (EGL 2017). There are six major stratigraphic units in the area (EGL 2017):

- Copperfield Granite (CGR) – unmineralised core of the Kurrajong Anticline.
- Dick Amphibolite (DAM) – hosts the Dick Lode and can contain magnetic dolerite and tabular granitoids and a small zone of mineralised copper.
- Anorthosite (MAN) – gradational transition from anorthosite to gabbro-anorthosite. Hosts the Dave Lode.
- Central Amphibolite (CAM) – equivalent to the DAM with anorthosite intrusion.
- Unexpected Ultramafic (UUM) – highly magnetic with mineralogy of talc-chlorite-magnetite-schist.
- Timoni Amphibolite (TAM) – contains the highly magnetic dolerite, volcanic amphibolites and sedimentary units. The gold deposit is associated with quartz veining and silica alteration of country rock and sulfide development. The sulfide species are predominantly pyrrhotite, chalcopyrite and pyrite. Pyrite in the area and within the Archean felsic and mafic materials is normally found associated with garnet-bearing sandstone and carbonaceous shale.

The mine will be established within the Kalgoorlie group volcanics, near to its eastern contact with the Copperfield Monzogranite. At the proposed mine site, the Kalgoorlie group is weathered near to the surface with saprock extending to about 40 m depth, grading into transition zone rocks which are oxidised along joints and fractures. Cross-sectional views of the two deposits (Baldock and Meteor) are shown below in Figures 3 and 4, respectively.

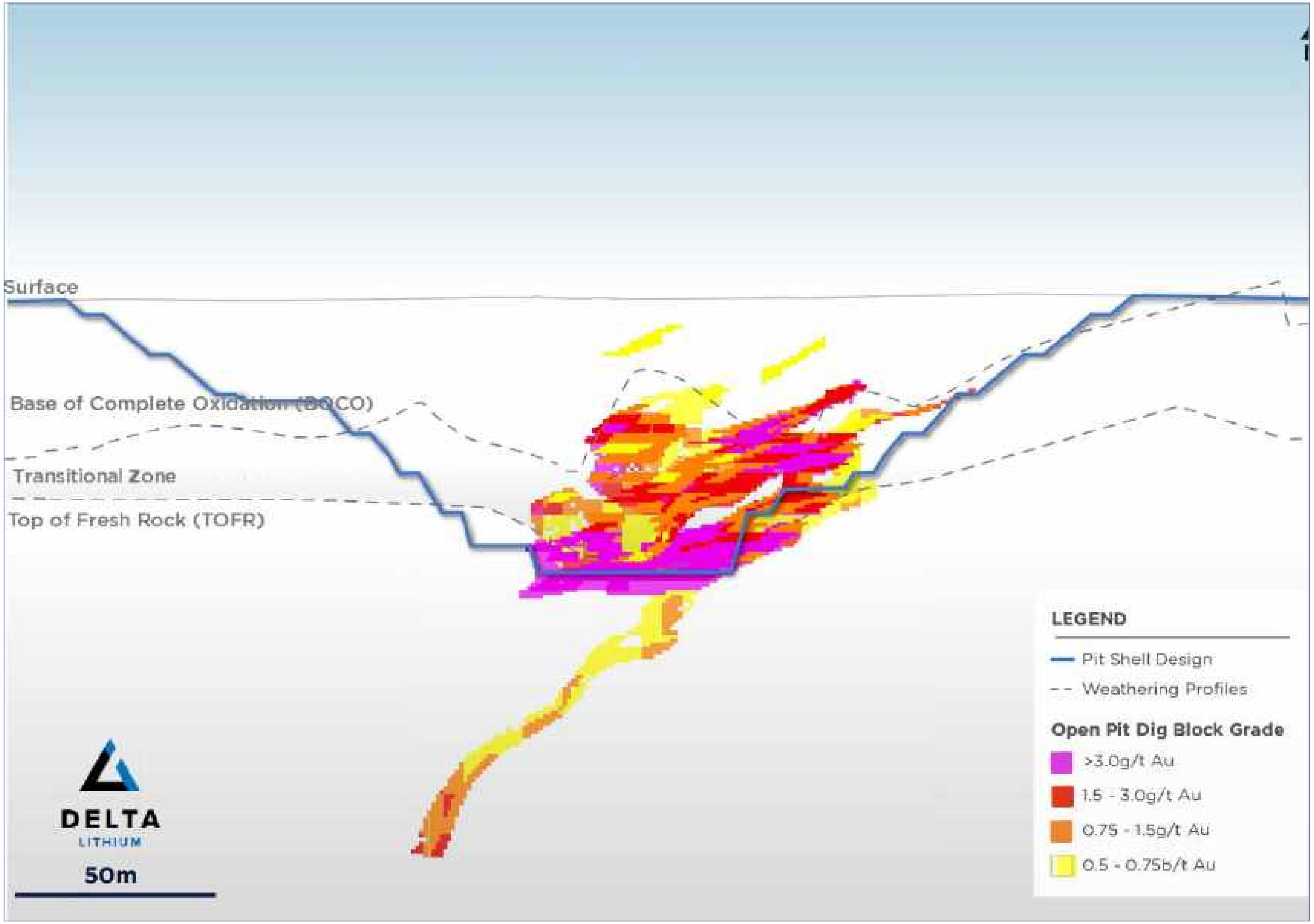

Figure 3: Baldock Pit and Underground Cross-section (Delta)

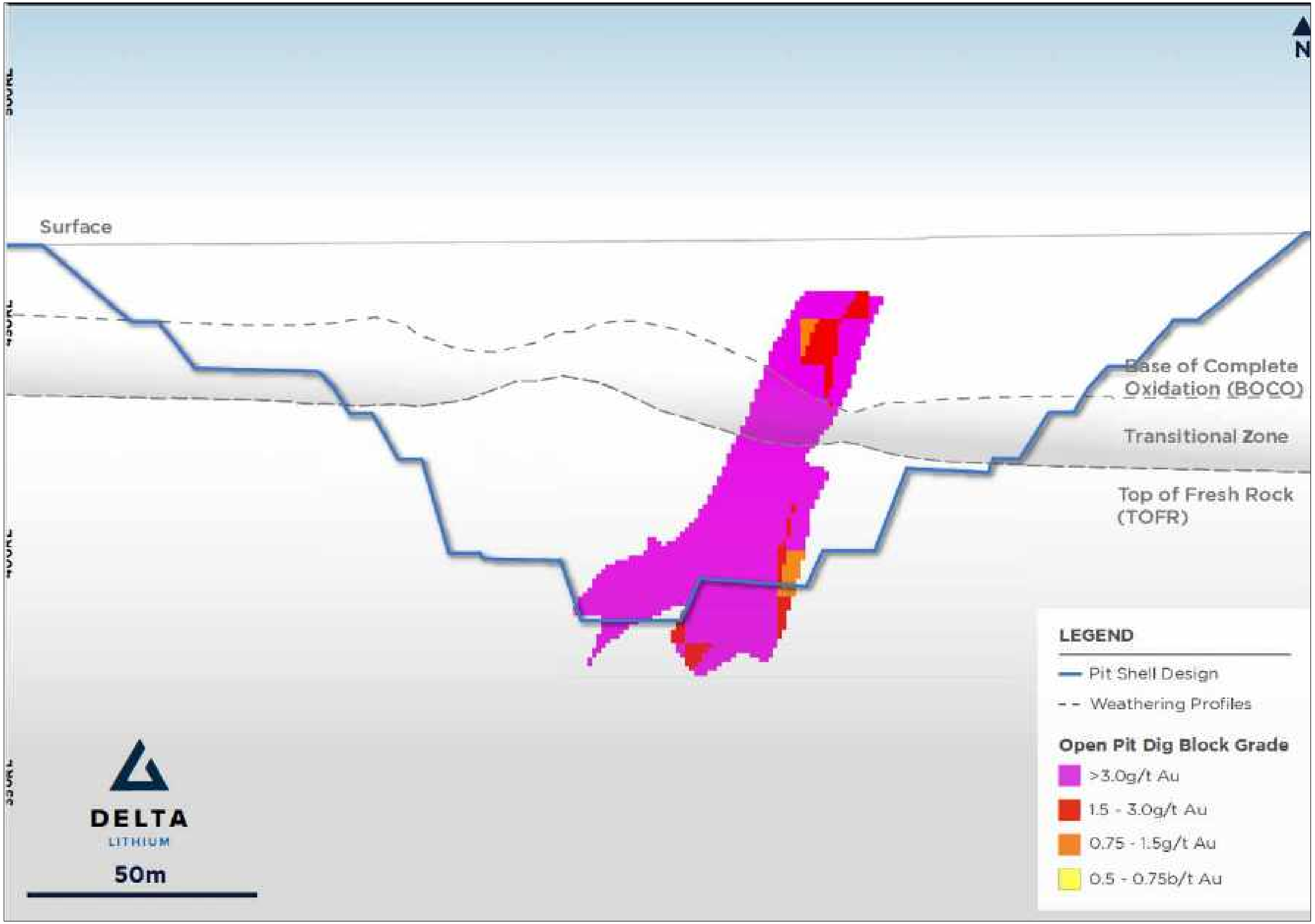

Figure 4: Meteor Pit Cross-section (Delta)

2.4 Hydrology, Hydrogeology and Groundwater Quality

The weathered profile is unsaturated, with groundwater confined to narrow elongated fractured mafic volcanic rocks (amphibolite and anorthosite) with limited storage capacity. The fractured rock aquifer is recharged by direct infiltration of rainfall or by infiltration of surface water during periodic stream-flows (Rockwater 2023). Pre mining groundwater levels in bores around Mt Ida indicate that groundwater drains eastwards and would eventually move to the southeast and then south towards Lake Ballard (some 35km southeast of Mt Ida), a saline playa and zone of groundwater discharge (Rockwater, 2023). The groundwater level recorded at the recently constructed bore, MIPB02 at the proposed Timoni pit is lower than pre-mining groundwater levels (between 40 and 95 m below surface), likely due to recent groundwater extraction and potentially previous dewatering of the Timoni shaft.

Groundwater is slightly alkaline with a pH of 7.6 and is highly saline with a Total Dissolved Solids concentration of 26,200 mg/L. The dominant ions are chloride (13,000 mg/L) and sodium (6,820 mg/L), with elevated concentrations of sulfate (4,370 mg/L), manganese (3.6 mg/L) and iron (1.01 mg/L) whilst most other metals/metalloids are below their limits of reporting (detection limits). Naturally Occurring Radioactive Material (NORM) detected low levels of uranium (0.01 mg/L) in addition to total potassium metals (111 mg/L) and rubidium (0.08 mg/L) (Rockwater, 2023).

3. Geochemical Characterisation Methods

3.1 Acid-Forming Waste Classification Methodology

There is no single method to reliably determine whether mine or process wastes containing small quantities of sulfur will produce net acidity upon field exposure to air and water. Sulfide minerals are variable in their behaviour under oxidising conditions and not all forms will produce sulfuric acid (H_2SO_4). The acid-neutralising capacity of these materials is also variable, and the relative rates of acid-forming and acid-neutralising reactions is important when considering if the materials have potential to generate acidic and metalliferous drainage.

Instead, a combination of approaches is often applied to more accurately classify mine or process waste. These approaches are listed below in order of increasing data requirements (and therefore increased reliability):

- The method of “Sulfur Analysis”, which only requires data for total sulfur content. Its adoption is based on long-term experience of hard rock wastes from Western Australian mine sites under arid and semi-arid climatic conditions. Experience has shown that waste rock containing very low sulfur contents (less than 0.3%) rarely produces significant amounts of acidic seepage (Price 1997).
- The concept of “Ratio Analysis”, which compares the relative proportions of acid neutralising minerals, measured by the Acid Neutralising Capacity (ANC), to acid generating minerals, measured by the Maximum Potential Acidity (MPA). Experience has shown that the risk of generating acidic seepage is generally low when this ratio (the Neutralisation Potential Ratio – NPR) is above a value of two (Price 2009).
- Acid Base Accounting (ABA), in which the Net Acid Producing Potential (NAPP) value, which is calculated by subtracting ANC from MPA, is used to classify the acid generating potential of mine waste. Positive NAPP values indicate that the waste has the potential to generate more acid than it can neutralise.
- Procedures recommended by AMIRA International (AMIRA 2002), which take into consideration measured values provided by the Net Acid Generation (NAG) test and calculated NAPP values.
- Kinetic leaching column test data, which provides information for the relative rates of acid generation under controlled laboratory conditions, intended to simulate those within a waste rock stockpile or tailings storage facility.

Classification of wastes in this report is based on consideration of NAPP and NAG pH results as well as total sulfur analysis/ratio analysis concepts above where this is appropriate. The following is a definition of terms as used in ABA reporting by MBS:

- Analysis for total sulfur (Tot_S) and sulfate-sulfur (SO_4_S), both reported as sulfur (%).
- Analysis for ANC (reported as kg H_2SO_4/t).

- Calculation of carbonate ANC (CC ANC), reported as kg H_2SO_4/t, from measured concentrations of total carbon (TC) or total inorganic carbon (TIC) (TIC avoids interferences for some samples such as shales from organic carbon).
- Calculation of Maximum Potential Acidity (MPA) = Tot_S * 30.6, reported as kg H_2SO_4/t.
- Calculation of Acid Production Potential (AP) = [(Tot_S – SO_4_S) * 30.6] kg H_2SO_4/t.
- Calculation of NAPP = [AP – ANC] kg H_2SO_4/t. Using AP versus MPA corrects for non-oxidisable sulfur present in the sample (i.e. sulfate).
- Calculation of Effective NAPP = [AP – CC ANC] kg H_2SO_4/t. Effective NAPP values correspond more directly to ANC associated with readily reactive carbonates, providing non-neutralising carbonates such as siderite are absent.
- Analysis for NAG potential (reported as kg H_2SO_4/t) to both pH 4.5 and pH 7.
- Analysis for NAG pH (the pH of the NAG test liquors).
- Calculation of NPR = ANC/AP (reported as kg H_2SO_4/t).

This AMIRA approach is more conservative than either the Analysis Concept or the Ratio Concept alone, although it assumes the absence of insoluble sulfur such as barite (barium sulfate), which is a non-acid producing mineral that can interfere with the results. The AMIRA approach of using NAG testing is particularly useful for PAF-LC (Potentially Acid Forming – Low Capacity) materials or where there is very low ANC in the host rock. A combined acid generation classification scheme based on NAPP and NAG determinations which is based on AMIRA 2002 and the 2016 DMP *Draft Guidance Materials Characterisation Baseline Data Requirements for Mining Proposals* (DMP 2016) and the equivalent federal guidelines (DIIS 2016), is presented in Table 1. This classification system, based on static ABA procedures and used in conjunction with geological, geochemical and mineralogical analysis can still leave materials classified as 'Uncertain' which may warrant further investigation by, for example, kinetic characterisation.

Table 1: Acid Formation Risk Classification Criteria

Primary Geochemical Waste Type Class	NAPP Value kg H_2SO_4/t	NAG pH
Potentially Acid-Forming (PAF)	≥10	<4.5
Potentially Acid-Forming – Low Capacity (PAF-LC)	0 to 10	<4.5
Uncertain (UC)	Positive	>4.5
Uncertain (UC)	Negative	<4.5
Non-Acid-Forming (NAF)	Negative	>4.5 or sulfur <0.3%*
Acid-Consuming (AC)	<−100	>4.5
Barren	≤2 and sulfur <0.05%	–

** Application of 0.3% total sulfur as a screening tool for the need for determination of NAG pH for classification may be applied on a site-specific basis in conjunction with assessment of ANC and NPR. This uses a ratio analysis approach for low-risk samples based on Western Australian conditions where extensive experience has indicated no potential for samples with* *less than 0.2% sulfur to generate net acidity in arid conditions for waste rock from hard rock mines. A negative NAPP and NPR of more than 4 (DIIS 2016) indicates no considered risk of acid generation in such instances.*

A sound knowledge of geological and geochemical processes must also be employed in the application of the above methods. In particular for the present time it should be noted that key sulfide minerals pyrite, pyrrhotite and chalcopyrite do not react to oxidation in the same fashion or produce equivalent amounts of sulfuric acid under field conditions. For more information, refer to Appendix C.

3.2 Laboratory Methods

Results of analysis are collated in Appendix A and laboratory reports provided in Appendix B. All analysis results with % indicated as the reporting unit in this report refer to % weight/weight dry basis unless otherwise specified as consistent with standard laboratory reporting. Results in mg/kg (ppm) may be converted to a % by division by 10,000.

Sample analysis was performed by Intertek Genalysis which are accredited with the National Association of Testing Authorities (NATA) for these analyses.

3.2.1 Acid Base Accounting

Preliminary analysis of ABA parameters included total sulfur, sulfate sulfur, total carbon, ANC, and NAG. Total sulfur and carbon were measured by combustion-based elemental analysis using a 'LECO' type instrument.

The ABA scheme relies on measurement of oxidisable sulfur. The value of this fraction of sulfur in mine waste samples is calculated as the difference between total sulfur and sulfate-sulfur, which is present in a fully oxidised form and therefore not capable of generating additional acidity. Sulfate-sulfur content was determined by a heated hydrochloric acid extraction followed by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES) analysis.

Sample ANC was measured by a modified Sobek procedure (AMIRA International 2002), which involves addition of dilute hydrochloric acid to the sample, followed by gentle simmering (two hours) to complete the reaction. The concentration of acid used for this procedure is first determined by testing the vigour of the reaction of the sample with hydrochloric acid, as assessed by the rate evolution of carbon dioxide gas and any colour change (a 'fizz rating'). The ANC was then determined by titrating the excess acid remaining after addition and reaction, using standardised sodium hydroxide solution.

The NAG test involves the addition of hydrogen peroxide, a strong oxidising agent, to a sample of mine waste to oxidise reactive sulfides. After cooling the sample pH is measured (NAG pH) and any acidity generated is measured by back titrating with sodium hydroxide solution to a pH of 4.5 (NAG to pH 4.5) and then pH 7 (NAG to pH 7). NAG is expressed in units of kg H_2SO_4/t. A significant NAG result (i.e. final NAG pH less than 4.5) generally indicates that the sample is PAF and the test provides a direct measure of the NAG potential. A NAG pH of 4.5 or more generally indicates that the sample is NAF but may still be capable of generating metalliferous drainage following oxidation of the sulfide minerals. Results for titrations of aliquots of the NAG solution to endpoint pH values of 4.5 and 7.0

allow estimation by the difference between these results of the relative amounts of non-acid-producing base metal (e.g. copper) and iron sulfides in the sample.

3.2.2 Elemental Composition

3.2.2.1 Total Elemental Composition

Major and trace metals and metalloids were measured following digestion of a finely ground sample with a four acid mixture of nitric, hydrochloric, perchloric and hydrofluoric acids, which is a total determination for the elements measured. Digest solutions were analysed using inductively coupled plasma mass spectrometry (ICP-MS) or optical emission spectrometry (ICP-OES). Samples were analysed for a suite of 48 metals and metalloids.

From this data, the geochemical abundance index (GAI) for each element was calculated by comparison to the average earth crustal abundance (AusIMM 2001, Smith and Huyck 1999). Where concentrations of any given element fall below the laboratory limit of reporting (LOR), an indicative value equal to the respective LOR is used to calculate GAI or the GAI is assigned as zero. The main purpose of the GAI is to provide an indication of any elemental enrichment that could be of environmental significance. The GAI (based on a log-2 scale) is expressed in integer increments from 0 to 6 (INAP 2009). A GAI of 0 indicates that the content of the element is less than or up to three times the average crustal abundance; a GAI of 1 corresponds to a three-to-six-fold enrichment; a GAI of 2 corresponds to a 6-to-12-fold enrichment and so forth, up to a GAI of 6, which corresponds to a 96-fold, or greater, enrichment above average crustal abundances. A GAI of 3 or more is generally considered 'significant' and may warrant further assessment.

3.2.2.2 Environmentally Available Composition

Environmentally significant concentrations of 53 metals and metalloids were determined following two-acid (aqua regia) digestion of nitric and hydrochloric acid in a 1:3 ratio. The results were compared to contaminated site added contaminant limits (ACL) and soil ecological investigation levels (EIL) (NEPM 2013, DEC 2010) as conservative comparison criteria (being waste rock, not soils). These criteria, if exceeded, in material left in the final outer 2 to 3 m of a waste landform considered accessible may warrant further investigation for risk.

The aqua regia digestion method is also considered effective for measuring trace element concentrations in soils and provides an estimate of the maximum element availability to plants.

3.2.3 Water Leachable Characterisation

Samples were subject to a water leach outlined by the Australian Standards Leaching Procedure (ASLP) 4439.3 Class 1 specification (Standards Australia 1997). The filtered (0.45-µm) leachate solutions were analysed using ICP-OES, ICP-MS or other methods as necessary, for a range of elements including major ions (calcium, magnesium, potassium, sodium, sulfate and chloride) and a suite of 53 environmentally significant metals and metalloids. Leachates were simultaneously tested for electrical conductivity (EC), pH, fluoride and alkalinity (bicarbonate, carbonate and hydroxide forms) using electrochemical and volumetric (titration) methods.

3.2.4 NAG Liquor Analysis

Where ABA analysis indicated that samples were PAF, the peroxide digestion solutions (i.e. ‘liquor’) generated during NAG testing (described in Section 3.2.1) were analysed (after filtration and dilution) for a suite of environmentally significant metals and metalloids using ICP-MS/OES as required. This analysis provides an indication of elemental solubility under highly oxidising conditions, and therefore useful information on potential release of metals and metalloids during sulfide oxidation.

3.2.5 Mineralogical Assessment

Selected samples were submitted to Intertek Genalysis for quantitative powder X-Ray diffraction analysis (QXRD) of the crystalline and amorphous mineral constituents. Samples were dried and ground to a very fine powder (<60 µm) using a microniser mill and sub-sampled for analysis with addition of a zinc oxide internal standard, which supports the quantification approach. XRD patterns were then collected using a PANalytical Cubix wavelength dispersive XRD with quantitative analysis performed using an automated Rietveld method of correction. Full experimental details are provided in the mineralogical laboratory report presented in Appendix B.

3.2.6 Fibrous Minerals

Samples of pulverised rock were treated to isolate the respirable fraction by means of sedimentation/elutriation – this also serves to remove gangue material which can physically interfere with identification of fibres. A small, weighed subsample of material was agitated in water and allowed to settle for a specific time. The subsampled portion of suspended respirable material was then filtered to deposit uniformly onto a clean low background filter (0.2 µm pore size nucleopore filter).

The samples were analysed by TEM-EDS (CoHlabs through Glossop Consulting). Analysis involved analysing grid openings (GO) (approximately 0.01 mm^2 per grid opening). The area of grid openings examined (in most instances) is equivalent to approximately 1/500th of the effective area of the uniformly distributed material on the filter.

Fibre identification was based on criteria as per ISO22262-1. A fibre was considered countable where the measured diameter was less than 3 µm and the length greater than 5 µm, with an aspect ratio (length:diameter) greater than 3:1. This definition aligns with the guidance note for respirable fibres published by the National Occupational Health and Safety Commission (NOHSC) on the 'Membrane Filtration Method' (NOHSC 2005). The NOHSC criterion was nationally adopted within the work health and safety (WHS) regulations in 2022.

The fibres were then visually examined and compared to known electron diffraction patterns of asbestos fibres followed by chemical composition using energy dispersive X-Ray Spectroscopy (EDS).

4. Description of Samples

Three composite samples, detailed in Table 2 and Table A-1 of Appendix A, were selected by Delta Lithium staff from outputs of metallurgical/pilot trial testings as part of the characterisation. A list of the drill holes used to compile the metallurgical composites from which these further composites are derived is given in . The current geochemically assessed samples include:

- One metallurgical tailings composite (Comp1), comprised in turn of one surface oxidised (41%) and two partially oxidised (i.e. transitional 69%) tailings samples. The oxide/transitional ore will represent 25 % (1 Mtonnes) of the overall ore (4 Mtonnes) to be mined and processed with the rest being fresh rock ore/tailings.
- Two tailings composites comprising a blend of tailings residues produced from the underground ore (Comp2) and a composite from the underground and open pit MNGC (Meteor North Grade Control) ore (Comp3).

Table 2: Summary of the Composite Tailings Samples

Sample ID	Ore Weathering Zone	Ore Type	P80 (microns)	% of Final Composite	Life of Mine Portion
Comp1	Oxide/Transitional	A25291 Oxide Gold Ore	75	41	25%
		A25291 Transitional Gold Ore	140	18	
		A25721 MNGC Transitional Gold Ore	140	41	
Comp2	Fresh	A25722 Core UG 090 Gold Ore	140	50	75%
		A25722 Core UG 100 Gold Ore	140	50	
Comp3	Fresh	A25722 Core UG 110 Gold Ore	140	50	
		A25721 MNGC Gold Ore	140	50	

5. Results and Discussion

5.1 Mineralogical Composition

Results for the mineralogical assessment of the magnetic separation and mica concentrate tailings streams, and the tailings composite samples are summarised in Table 3. The quantitative X-ray Diffraction (XRD) analysis reports are provided in Appendix B.

The following key points were noted from the XRD results:

- The mineralogical composition of both composite samples produced from the fresh rock ore were similar and was dominated by inert silicates (79% and 74% for Comp2 and Comp3 respectively) essentially in the form of amphibolite, quartz, plagioclase and mica.
- Very low amounts of carbonates were detected. That present was in the form of dolomite, magnesite and calcite across both fresh rock tailings samples.
- Acid producing pyrite, pyrrhotite and chalcopyrite were found in both samples, consistent with the high total sulfur content found in Section 5.2.1. Pyrrhotite was the dominant sulfide mineral overall, especially in underground tailings (Comp 2). As per Appendix C, these sulfides do not react in the same fashion. Whilst pyrite (which is the basis of ABA calculations) reacts fully, pyrrhotite has non-acid forming pathways under limited oxygen conditions (which is typical for fine grained tailings in a TSF). Chalcopyrite likewise can form polysulfides which prevent further oxidation or at best chalcopyrite will only produce approximately half of the sulfuric that pyrite will.

Table 3: Mineralogical Composition Summary (% by Weight)

Group	Phase	Formula	Comp2 (UG)	Comp3 (MNGC)
Silicates	Plagioclase	$(Na,Ca)(Al,Si)_2Si_2O_8$	37	34
	Mica	$(K,Ca,Na,Li)(Al,Mg,Fe)_2(Si,Al)_4O_{10}(OH)_2$	9	11
	Garnet	$(Mg,Fe,Ca,Mn,Li)_3(Al,Fe)_2(SiO4)_3$	1	1
	Kaolin	$Al_2Si_2O_5(OH)_4$	1	1
	Amphibole	e.g.$(Na,Ca,Li)_2(Fe,Mg,Al)_5(Si,Al)_8O_{22}(OH)_2$	12	10
	Chlorite	$(Fe,Al,Mg,Li,Ni)_6(Si,Al)_4O_{10}(OH)_8$	4	8
	Quartz	SiO_2	15	8
	Talc	$(Fe,Al,Mg,Ni)_3Si_4O_{10}(OH)_2$	N.D	1
	Total Silicates		**79**	**74**
Carbonates	Dolomite	$CaMg(CO_3)_2$	<0.5	1
	Magnesite	$MgCO_3$	N.D	<0.5
	Calcite	$CaCO_3$	<0.5	<0.5
	Total Carbonates		**<0.5**	**1**
Others	Pyrite	FeS_2	N.D	3
	Pyrrhotite	$Fe_{(1-x)}S_x$	4	2
	Chalcopyrite	$CuFeS_2$	1	2
	Apatite	$(Ca,Mn,Ba,Pb,REE)_5(PO_4)_3(OH,F,Cl)$	<0.5	1
	Rutile	TiO_2	<0.5	<0.5
	Amorphous Content		16	16
		Total	**100**	**99**

N.D: Not Detected

5.2 Acid and Metalliferous Drainage Characterisation

Laboratory results for total sulfur, total carbon, ANC and calculated acid base accounting parameters and NAG tests of waste rock samples are collated in Table A-2 of Appendix A.

5.2.1 Sulfur Forms and Acid Neutralisation Capacity

Based on examination of the data in Table A-2 (Appendix A) and a summary of total sulfur data provided in Table 4, the following are noted as key points:

- Total sulfur concentrations were all above the 0.3% threshold (Section 3.1, Price 1997). The composite from the oxide/transitional material contained the lowest total sulfur concentration, consistent with the degree of weathering of the ore. The two composite tailings from the fresh rock ore derived tailings contained large total sulfur concentrations (2.76% and 2.94%). As mentioned in Section 5.1, these high sulfur contents are consistent the large amount of pyrite, pyrrhotite and chalcopyrite detected within the samples.

- ANC values were moderate to high across the three samples with the oxide/transitional composite having the highest ANC of 87 kg H_2SO_4/t. The two fresh samples had lower ANC values of 25 and 32 kg H_2SO_4/t.

Table 4: Total Sulfur Content (%) Summary by Waste Type

Type	Ore Weathering Zone	Total S	SO_4 S	ANC
		%	%	kg H_2SO_4/t
Comp1	Oxide/Transitional	0.48	0.02	87
Comp2	Fresh	2.76	0.03	25
Comp3	Fresh	2.94	0.09	32

5.2.2 Acid and Metalliferous Drainage Classification

When assessing data for the MPA/AP and NAPP, it must be noted that both parameters are based on the assumption that all sulfur (or insoluble sulfates in the case of AP) contained in the sample is acid-producing, i.e. associated with pyrite (FeS_2) and other iron sulfide minerals. However, this represents a worst-case scenario as not all minerals containing sulfur will result in acid production. Conversely, the NAPP calculation also assumes that the acid-neutralising material measured as ANC is associated with rapidly reactive minerals (e.g. carbonates). In practice, some neutralising capacity is supplied by silicate and aluminosilicate minerals, which can be much slower to react. Also, iron carbonate minerals such as siderite ($FeCO_3$) have limited capacity to neutralise acid produced when they dissolve and release ferrous iron (Fe^{2+}) that may be oxidised. Despite these assumptions, NAPP remains a suitable and conservative predictor of potential acid generation when used in conjunction with mineralogical characterisation data.

Acid formation potentials of all samples were classified using methods outlined in Section 3.1 on the results of the tailings composite samples (Appendix A, Table A-2). A summary of the acid formation potential and acid mine drainage (AMD) classification is provided in Table 5 and illustrated in Chart 2.

Tailings residue from the oxide/transitional ore was classified as non-acid forming due to a negative NAPP value and NAG pH >4.5 (NAG pH of 9.2). However, the two composite samples from the fresh material contained positive NAPP values (59 and 55 kg H_2SO_4/t) and NAG pH values <4.5 (3.6 and 3.7) and, as such, are given an AMD classification of PAF.

Table 5: Acid Formation Potential Summary

Type	AP	MPA	NAPP	NAG pH	Classification
		kg H_2SO_4/t		pH Units	
Comp1	14	15	−73	9.2	NAF
Comp2	84	84	59	3.6	PAF
Comp3	87	90	55	3.7	PAF

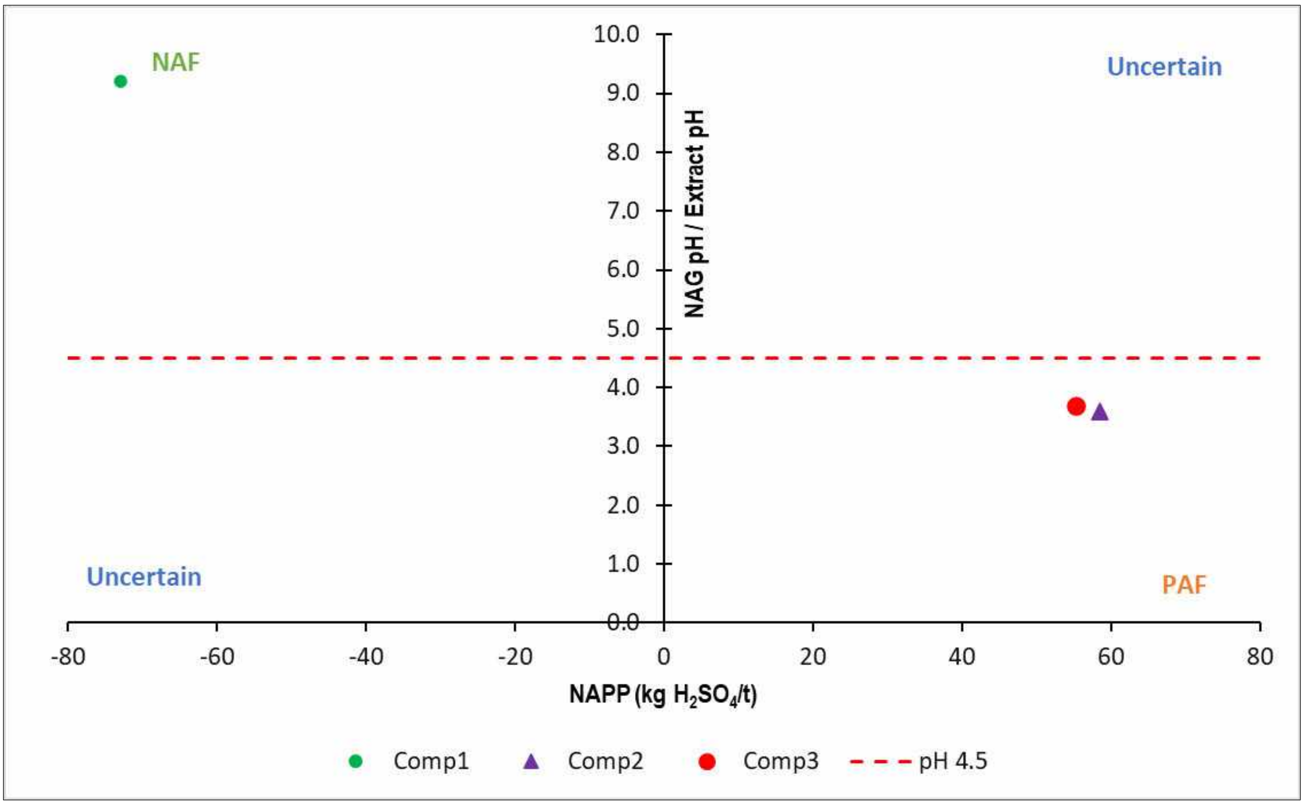

Chart 2: AMD Plot Classification of Tailings Composites

5.3 Elemental Composition

5.3.1 Total Elemental Composition

Heavy metal and metalloid concentrations of 48 selected samples, together with the calculated GAIs for these samples (as outlined in Section 3.2.2.1), are presented in Table A-3 of Appendix A.

Mineral deposits by their nature are anticipated to have some elements present in concentrations above the average crustal abundance. They do, however, provide a useful screening tool for identifying elements requiring further assessment by more specific test methods including leachates. A summary of the key elements reporting geochemical enrichment is provided below:

- The tailings composite Comp1 (oxide/transitional ore) was enriched in silver (GAI 3), bismuth (GAI 5), copper (GAI 3), antimony (GAI 5), tellurium (GAI 6) and tungsten (GAI 3).
- Tailings composites Comp2 and Comp3 were enriched in silver (GAI 4), bismuth (GAI 5 and 6), copper (5 and 6), molybdenum (GAI 3) and tellurium (GAI 6). Comp2 was further enriched in selenium (GAI 3).

5.3.2 Total Environmentally Available Composition

The two-acid / aqua regia analysis provides an estimate of the maximum element available to the environment over long-term weathering conditions and is the default method applied for assessment against environmental guidelines when they refer to 'totals'. Environmentally available (Aqua Regia) concentrations of heavy metal and metalloids were analysed by two-acid digest (aqua regia) and can be compared to default environmental investigation levels (EILs) (DEC 2010) and added contaminant limit (ACL) (NEPM 2013) for surface soils as a screening method of risk assessment (although tailings are not intended for surface soil disposal). Industrial Soil EIL/ACLs comparison indicates at a high level elements which are potentially 'significant' and would warrant further assessment of net risk as they are based on relative environmental/health toxicity levels despite being conservative for material placed in a TSF. Unlike the GAIs, aqua regia analysis also represents a fraction which could be potentially released under full oxidation/acid conditions. Full results are presented in Table A-4 of Appendix A. Table 6 provides a summary of key environmentally significant metals and metalloids and environmentally available fractions versus total elemental composition are presented in Chart 3. Key findings were:

The majority of analytes showing enrichment compared with the average crust composition recorded environmentally available proportions of total elemental composition greater than 70% with all the three samples equally showing high environmentally available proportions (Chart 3). Environmentally available fractions of manganese (55-60 %) and vanadium (55-65%) were slightly lower for tailings composites Comp2 and Comp3.

- Cobalt, copper, mercury, manganese, molybdenum and vanadium were the main elements that exceeded the NEPM/DEC EIL criteria for industrial soils. These elements therefore warrant cross-checking to determine if they are released should tailings be allowed to oxidise.
- Copper significantly exceeded the NEPM (2013) ACL for commercial/industrial sites (240 mg/kg) in all three samples with concentrations ranging from 970 mg/kg to 5,817 mg/kg. This is consistent with the presence of chalcopyrite ($CuFeS_2$) seen in the QXRD (Section 5.1).
- Concentrations of silver and bismuth ranged from 0.74 to 2.84 mg/kg and 11-26 mg/kg respectively across the composites. No guideline values are available for comparison.
- Trigger values for cobalt, mercury, manganese, molybdenum and vanadium were taken from the DEC (2010) guidelines as they were not included in the 2013 NEPM program. These values are thus likely to be conservative and may be more consistent with trigger values for sites of ecological significance rather than public open spaces.

Table 6: Summary of Environmentally Significant Metals and Metalloids (mg/kg)

Lithology	Ag	Bi	Co	Cu	Hg	Mn	Mo	V
Comp1	0.74	17	43	970	2.8	532	12	68
Comp2	2.20	11	72	5,203	4.9	325	40	72
Comp3	2.84	26	62	5,817	5.1	381	43	52
EIL / ACL*	**N/G**	**N/G**	**50 (EIL)**	**240 (ACL)**	**1.0 (EIL)**	**500 (EIL)**	**40 (EIL)**	**50 (EIL)**

** EIL (DEC 2010) / ACL (NEPM 2013) Commercial / Industrial., N/G: No Guidelines*

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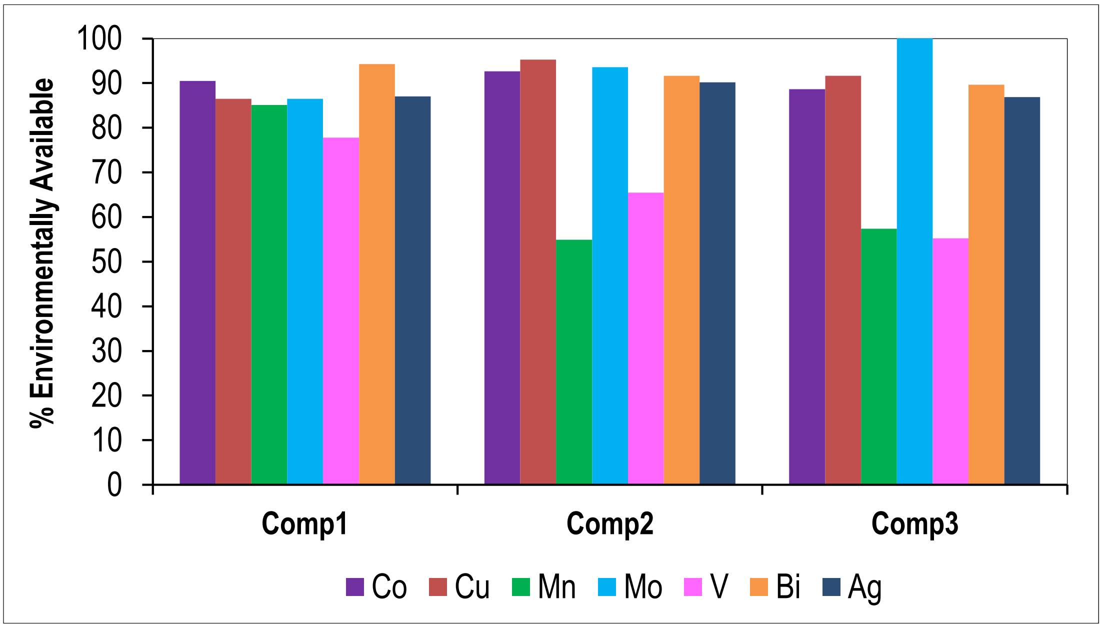
- 

Chart 3: Environmentally Available Fractions vs Total Elemental of Key Metals/Metalloids

5.4 Naturally Occurring Radionuclides

Naturally occurring radioactive materials (NORM) arise due to the presence of one or more radioactive isotopes naturally present in a material. NORM activity in particular is determined by concentrations of thorium (Th-232) and uranium (U-238), which are naturally radioactive gamma (Υ) emitting elements present in ores and concentrates. Potassium (K-40) is also a low-level gamma emitter treated separately to the above in most assessments. Potassium K-40 is a natural low-level beta (β) radiation emitter with a long half-life (slow decay rate), due to the K-40 isotope; however, β emission is a significantly lower risk to health than gamma emission and is normally only assessed in regards for internal ingestion in waters, food etc. (DMP 2010).

As per Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) guidance for assessment of NORM, the activity concentrations of the samples were calculated from their total elemental concentrations (Section 5.3.1), assuming secular equilibrium and based on specific activities for each of the four naturally occurring radioactive elements (U, Th and K). Results are outlined in Table 7, where the specific activities (relates elemental concentration to activity concentration) for naturally occurring proportions of the isotopes applied were: U (U-238) 12,500 Bq/g U, Th (Th-232) 4,090 Bq/g Th and K (K-40) 30.9 Bq/g K (DMP 2010, IAEA 2006).

Table 7: Calculated Mean Activity by Waste Type

	U		Th		Total U+Th	K (K-40)	
	mg/kg	Bq/g	mg/kg	Bq/g	Bq/g	mg/kg	Bq/g
Comp1	0.35	0.0044	0.16	0.0006	0.0050	0.64	0.00002
Comp2	0.11	0.0013	0.31	0.0013	0.0026	0.71	0.00002
Comp3	0.073	0.0009	0.13	0.0005	0.0014	1.00	0.00003
Exclusion/Exemption Limit	**N/A**	**1**	**N/A**	**1**	**1**	**N/A**	**10**

A level of 1 Bq/g head of chain activity concentration is considered ‘inherently safe’ to humans for uranium and thorium series radionuclides (IAEA 2004, IAEA 2006) and this value is set as the ‘exclusion limit’ as the resulting effective dose to workers is very unlikely to be more than 1 mSv/year. The level of 1 Bq/g for these applies individually to each radionuclide (U/Th), however the sum is often compared to this value as a conservative screening tool (Table 7). Levels of Th/U head of chain activity above 10 Bq/g are considered a dangerous good (ten times the exclusion limit) for transport purposes (ARPANSA 2019).

Overall, naturally occurring radiation levels in each of the three tailings composite samples are low and do not classify under any relevant criteria, being well below the levels of activity (exemption limits) which would trigger possible further assessment.

5.5 Water Leachate Characterisation

Observed concentrations of metals and metalloids in the extract may not represent maximum potential concentrations. This test method can be limited by the rates of dissolution, desorption and solubility, especially for sparingly soluble minerals such as gypsum (CaSO4.2H2O), barite (BaSO4) and fluorite (CaF2). Hence, an understanding of minerals present is important. Geochemical speciation modelling programs, such as PHREEQC (USGS 2021), provide a useful means for identifying mineral phases that may be responsible for controlling concentrations of water quality constituents and contaminants.

5.5.1 Major Ions, pH and Salinity

Sample pH, EC values and major ions in 1:5 extracts are summarised in Table A-5 of Appendix A.

Samples across the lithology types were found to have:

- Strongly alkaline pH values ranging from pH 9.3 to 9.7 for all samples. This is fairly common for process tailings samples (being higher than the natural pH of the raw ore) due to the addition of lime as part of metallurgical processing. The highest pH value was reported for the Comp2 sample (pH 9.7), with all samples exceeding the upper limit of Livestock Drinking Water guidelines (pH 8.5). These elevated pH values indicated that the samples did not generate net acidity during processing or under the non-exposed/non-oxidising laboratory conditions of the static testing.

- All samples were non-saline with salinities ranging from 77 to 183 µS/cm.
- The total soluble alkalinity was moderate (22 to 42 mg $CaCO_3$ /L) with the majority of the alkalinity coming in the form of carbonate.
- Concentrations of major ions were all of low concentrations and are not of any environmental concern.

5.5.2 Water Soluble Metals and Metalloids

Observed concentrations of metals and metalloids in the extract may not represent maximum potential concentrations. This test method can be limited by the rates of dissolution, desorption and solubility, especially for sparingly soluble minerals such as gypsum ($CaSO_4.2H_2O$), barite ($BaSO_4$) and fluorite (CaF_2). Hence, an understanding of minerals present is important. Geochemical speciation modelling programs, such as PHREEQC (USGS 2021), provide a useful means for identifying mineral phases that may be responsible for controlling concentrations of water quality constituents and contaminants.

Results for metals and metalloid concentrations in the 1:20 water extracts are presented in Table A-5 of Appendix A. ANZECC livestock (cattle) drinking water guidelines (ANZECC 2000) and Department of Health non-potable groundwater use guidelines (Western Australian Department of Health 2014) are provided for comparison.

Concentrations of most metals and metalloids analysed were low or below their limits of reporting. None of these elements exceeded their respective guideline trigger values for the livestock drinking water or NPUG guidelines. Only sporadic exceedances to the freshwater protection 80 and 95% guidelines were observed for silver, aluminium and copper (fresh samples only). These guidelines, however, are considered of low environmental significance as there is unlikely to be any freshwater receptors within the Project area.

5.6 NAG Liquor Analysis

Analysis of the NAG liquor produced during the NAG test (Section 3.2.1) provides an indication of elemental solubility under highly oxidising conditions. The NAG test is performed under strong heating/oxidising conditions at a high solid to liquid ratio (1:250) which is not reflective of field conditions. Hence results are reported as mg/kg in the sample material which represents the oxidisable fraction of the element. The composition of the peroxide digestion solutions (i.e. 'liquor') generated during NAG testing of the tailings composite samples Comp2 and Comp3 is presented in Table A-6 of Appendix A and oxidisable fractions of key metals and metalloids versus Aqua Regia (i.e. environmentally available) are shown in Chart 4.

Results indicated that under highly oxidative NAG test conditions for both fresh rock tailings samples:

- Samples were acidic (pH 3.3 and 3.5 for Comp2 and Comp3 respectively), consistent with their AMD classification of PAF. This typically reflects the 'worst case' acid formation pH should full oxidation occur. Actual field pH is dependent on the relative rate of acid formation and acid neutralisation reactions.

- Concentrations of major ions in the NAG liquor were high for calcium (4,266 – 4,463 mg/kg), potassium (1,755 – 2,528 mg/kg) and magnesium (2,142 – 2,858 mg/kg), moderate for sodium (429 – 479 mg/kg). These reflect acid neutralising species following reaction with the acid generated.
- Copper in the NAG liquor was found to be 100% of the aqua regia potentially environmentally available concentration. This indicates (as expected) that copper is present as an oxidisable sulfidic form (chalcopyrite) and will be a key species released should oxidation of the tailings occur. Concentrations of aluminium were also elevated (4,687 – 5,088 mg/kg) but represented only 6.5 % of the Aqua Regia concentrations. As expected under these conditions, levels of oxidisable sulfur were very high and reached 20,55-21,193 mg/kg (67 -79 % of Aqua Regia). Levels of iron in the NAG liquor were moderate (229 - 720 mg/kg).
- Concentrations of the most other metals and metalloids analysed were much lower however results indicated oxidation will result in acidification and mobilisation of aluminium, iron, copper, cobalt, nickel and zinc as key metals in addition to salts (sodium, potassium, calcium, magnesium and sulfate).
- These results are consistent AMD formation. Iron, copper and sulfur were released from oxidation of the iron sulfide minerals (Section 5.1) generating acidic leachates partially buffered by the presence of rapid-reacting carbonate minerals and formation of salts. However, it should be noted that these results are highly conservative and only indicate that AMD can potentially be generated, since only mildly oxidative conditions are expected to prevail within the IWLTSF with measures (underdrainage and liners) to prevent seepage outflow.

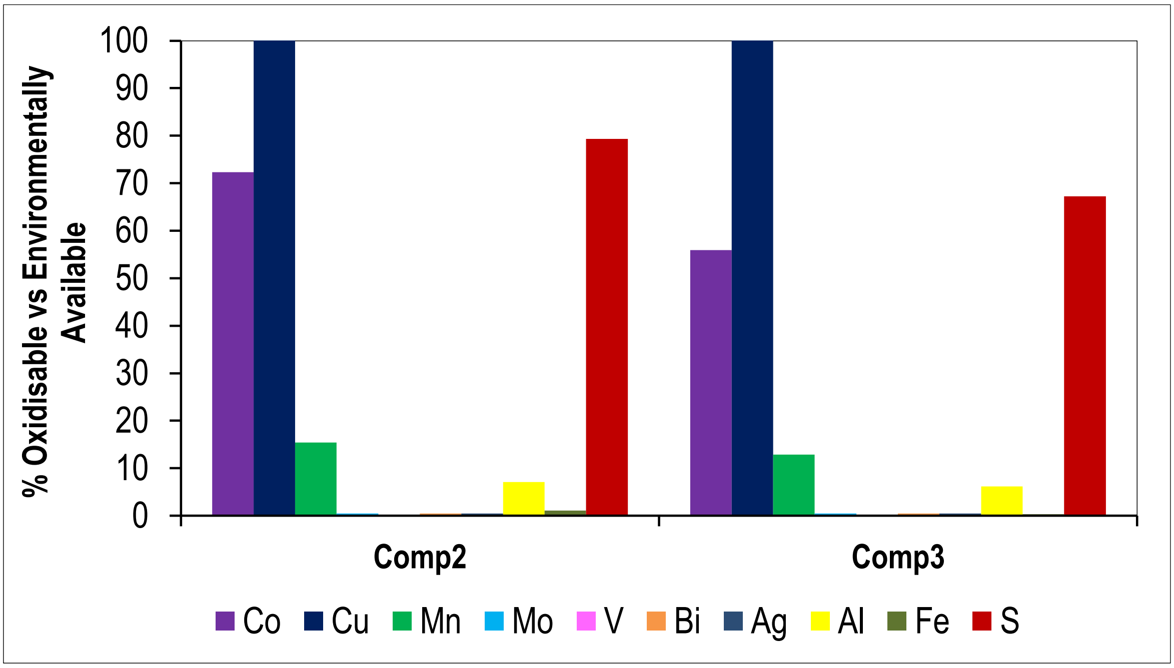


Chart 4: Oxidisable vs Aqua Regia of key Metals/Metalloids

5.7 Asbestiform Minerals

Two composite waste samples (Comp2 and Comp3) were submitted for screening using isolation of the respirable fibres and transmission electron microscopy (TEM) for the presence of fibrous asbestiform minerals. No asbestiform fibres were detected in any sample despite the presence of amphiboles and indications of serpentinization (talc presence) in the samples. The Cohlabs laboratory report is provided in Appendix B.

6. Key Findings of Geochemical Assessment

A geochemical tailings characterisation was undertaken for three composite samples of the gold tailings (two fresh and one oxide sample) to be blended and disposed in the Integrated Waste Landform Tailings Storage Facility (IWLTSF) located east of the historical tailings (CMW 2024).

The key findings of this assessment indicated the following:

- The two tailings samples produced from the fresh material fresh contained a mineralogical composition comprising mainly inert silicates essentially in the form of amphibolite, quartz, plagioclase and mica. There were very low amounts of carbonates detected with acid-producing pyrite, pyrrhotite and chalcopyrite found in both samples.
- The tailings composite from the oxide/transitional material was classified as non-acid forming and therefore does not present risks of potential acid mine drainage.
- The fresh rock mining tailings composite samples were classified as potentially acid forming (PAF) due to high total sulfur and only moderate acid neutralisation capacity (ANC) resulting in acidic net acid generation (NAG) pH values (3.6 and 3.7).
- Geochemical enrichments were recorded in the oxide/transitional composite for silver, bismuth, copper, antimony, tellurium and tungsten. The fresh samples recorded enrichments in silver, bismuth, copper, molybdenum and tellurium with a further enriched in selenium for Comp2.
- Cobalt, mercury, manganese, molybdenum and vanadium were recorded in environmentally significant concentrations in the aqua regia digest. The most environmentally significant metal was copper with concentrations exceeding the NEPM (2013) ACL for commercial/industrial sites (in all three samples. The majority of analytes recorded environmentally available proportions greater than 70% versus absolute total.
- Water leachates of tailings material were strongly alkaline (pH values 9.3 – 9.7) exceeding the Livestock Drinking Water trigger value of pH 8.5 which is considered an artifact of the metallurgical processing reagents (lime addition). All the leachate samples also showed low salinities. Concentrations of most metals and metalloids analysed in the fresh (non-oxidised) tailings were low or below their limits of reporting. None of these elements exceeded the livestock drinking water or NPUG guideline trigger values with only sporadic exceedances of the freshwater protection 80 and 95% guidelines observed for silver, aluminium and copper for the fresh samples only.
- Oxidation of PAF fresh rock tailings Comp2 and Comp3 using peroxide (NAG test liquor analysis indicated oxidation will result in acidification (pH 3.5) and mobilisation of aluminium, iron, copper, cobalt, nickel and zinc as key metals in addition to salts (sodium, potassium, calcium, magnesium and sulfate)., This indicates that tailings samples generated from processing of the underground and MNGC ore may generate acid metalliferous drainage (AMD) under oxidising conditions, and have potential to cause adverse environmental impacts if not effectively managed.

- No asbestiform mineral fibres were identified in both fresh composite samples following assessment by transmission electron microscopy (TEM).

Overall, this geochemical assessment indicated that the gold tailings residues from the oxide/transitional ore zone is NAF and unlikely to generate AMD and elevated concentrations metals/metalloids. Fresh rock tailings (and any low grade ore which may be stockpiled before processing) from deeper in the pit and underground will need to be managed as PAF to avoid significant oxidation and AMD formation and seepage. This is intended to be achieved using a double lined (clay and plastic) integrated waste landform design (CMW Geosciences 2024).

It is anticipated that the IWLTSF will be fully lined with a HDPE liner and incorporate an underdrainage system (CMW Geosciences 2024). Therefore, seepage from the IWLTSF is unlikely to occur and impact the deep and saline water table (40 - 95 mbgl) attributed to extraction and dewatering (Rockwater 2023). However, if limited seepage is to occur and reach the water table it is expected to be flow into the main pit which will form groundwater sink after end of dewatering (post-closure). On this basis, the risk of the PAF tailings disposal method is considered to not present a significant threat to the receiving environment.

An additional strategy to reduce potential for AMD post-closure would be to keep aside a portion of oxide/transitional ore (which is NAF) and process last prior to cessation of operations. The NAF tailings would thus become a capping layer limiting oxygen ingress to PAF tailings underneath. However, provided the IWLTSF is covered at closure (post-consolidation phase) with any available low permeability clays and a suitable capping layer of competent NAF waste rock this should also prevent tailings oxidation. It is noted the tailings are pyrrhotite dominant, which in tailings tends to form a 'crust' upon oxidation, reducing water and oxygen infiltration over time. A final overlying layer of rehabilitation material for native plant growth would then be applied.

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8. Glossary of Technical Terms

Term	Explanation
AC	Acid-consuming material. Defined as NAF material which has a NAPP value in excess of -100 kg H_2SO_4/t
ACM	Acid-consuming material.
alkalinity	The capability of water to neutralise acid. Alkalinity is measured in the laboratory by titrating a sample to pH 8.3 and expressing the result with units of milligrams of $CaCO_3$ equivalents per litre (mg $CaCO_3$ /L).
amorphous	Describing solid substances lacking a clearly defined crystalline lattice structure usually associated with rock minerals (e.g. iron oxyhydrogen gels and humic substances).
ANC	Acid Neutralising Capacity. A process where a sample is reacted with excess 0.5 M HCl at a pH of about 1.5, for 2–3 hours at 80–90°C followed by back-titration to pH=7 with sodium hydroxide. This determines the acid consumed by soluble materials in the sample.
AP	Acid Potential. Similar to MPA, but only is based on the amount of sulfide-sulfur (calculated at the difference between total sulfur and sulfate-sulfur (SO_4-S)) rather than total sulfur. AP (kg H_2SO_4/t) = (Total S – SO_4-S) x 30.6.
apatite	A group of phosphate minerals (e.g. hydroxylapatite, fluorapatite and chlorapatite) containing high concentrations of hydroxide, fluoride and chloride ions.
calcite	Calcium carbonate $CaCO_3$.
CC ANC	Calculated Carbonate Acid Neutralising Potential. The estimated amount of ANC provided by carbonate minerals. CC ANC (kg H2SO4/t) = TC or TIC (%) x 81.7
chalcopyrite	A copper iron sulfide mineral with the chemical formula $CuFeS_2$.
circum-neutral pH	pH value near 7.
dolomite	Calcium magnesium carbonate $CaMg(CO_3)_2$.
EC	Electrical conductivity. A measurement of solution salinity. Conversion: 1000 µS/cm = 1 dS/m = 1 mS/cm
Effective NAPP	NAPP calculated using CC ANC rather than traditional ANC. Effective NAPP (kg H_2SO_4/t) = AP – CC ANC
felsic	Silicate minerals, magma, and rocks which are enriched in the lighter elements such as silicon, oxygen, aluminium, sodium, and potassium.
granite	A coarse-grained, intrusive igneous rock composed primarily of light coloured minerals such as quartz, plagioclase, orthoclase and muscovite mica. Granite is one of the main components of continental crust.
mafic	Descriptive of igneous rock containing a high content of ferromagnesian silicate minerals, but less than those present in ultramafic rocks. Common mafic rocks include basalt, dolerite and gabbro.
MPA	Maximum Potential Acidity. A calculation where the total sulfur in the sample is assumed to all be present as pyrite. This value is multiplied by 30.6 to produce a value known as the Maximum Potential Acidity reported in units of kg H_2SO_4/t. MPA should include only the non-sulfate sulfur to avoid over-estimation of acid production in which case it may be referred to as AP.
NAF	Non-acid-forming
NAG	Net acid generation. A process where a sample is reacted with 15% hydrogen peroxide solution at pH = 4.5 to oxidise all sulfides and then time allowed for the solution to react with acid soluble

Term	Explanation
	materials. This is a direct measure of the acid-generating capacity of the sample but can be affected by the presence of organic materials.
NAGpH	The pH after the NAG test with hydrogen peroxide and heating is completed i.e. oxidation of all sulfides.
NAPP	Net Acid Producing Potential. NAPP (kg H_2SO_4/t) = AP – ANC.
oxidisable sulfur	A form of sulfur (sulfide, S^{2-}) that reacts with oxygen and water to form sulfuric acid (H_2SO_4). It is estimated as the fraction that remains when sulfate (SO_4^{2-}) is subtracted from the total sulfur. An alternative method for estimating oxidisable sulfur is by measurement of chromium-reducible sulfur.
PAF	Potentially acid-forming.
PAF-HC	Potentially acid-forming – high capacity. Waste rock classification for samples with NAPP values greater than 10 kg H_2SO_4/t.
PAF-LC	Potentially acid-forming – low capacity. Waste rock classification for samples with NAPP values less than or equal to 10 kg H_2SO_4/t.
pegmatite	Very coarse intrusive igneous rock that commonly consist of quartz, feldspar and mica.
playa	Denotes a dry lake or flat that may periodically fill with water to form a lake.
pyrite	Iron (II) sulfide, FeS_2. Pyrite is the most common sulfide minerals and the major acid-forming mineral oxidising to produce sulfuric acid.
pyrrhotite	Iron (II) sulfide, Fe_7S_8 or $Fe_{(1-x)}S$ where S = 0 to 0.2. The second most common iron sulfide mineral with produces varying amounts of sulfuric acid upon oxidation depending on the amount of oxygen available – it may react instead to produce elemental sulfur rather than sulfuric acid.
QXRD	Quantitative X-ray Diffraction analysis, a technique used to estimate relative proportions of waste rock comprising key mineral phase constituents.
saprock	A rock chemically broken down in its original place by deep weathering of the bedrock surface. It consists of partially weathered and unweathered primary minerals and maintains all of the fabric and structural features of the parent fresh rock.
siderite	Iron(II) carbonate $FeCO_3$. Oxidation of Iron(II) to iron(III) following reaction with acid results in siderite being non-net acid neutralising (unlike calcite for example).
spodumene	Lithium aluminium inosilicate [$LiAl(SiO_3)_2$] the primary source of 'hard rock' lithium.
sulfide	Minerals comprising reduced sulfur (i.e. S^{2-}), such as iron (II) sulfide, FeS_2. Pyrite is the most common sulfide minerals and the major acid forming mineral, oxidising to produce sulfuric acid.
TIC	Total Inorganic Carbon.
TSF	Tails Storage Facility.
ultramafic	An igneous rock with very low silica content and rich in minerals such as hypersthene, augite and olivine. These rocks are also known as ultrabasic rocks.

APPENDIX A:

COLLATED LABORATORY RESULTS

MBS ENVIRONMENTAL

Table A-1: Sample Descriptions

Sample ID	Weathering
Oxide_Transitional_Comp1	Oxide
Fresh_Comp2	Fresh
Fresh_Comp3	Fresh

Table A-2: Acid Base Accounting (ABA) Summary

Sample ID	Weathering	pH	EC	TDS	Total S	SO4_S	Total C	ANC	AP	NAPP	NAG pH	NAG (pH 4.5)	NAG (pH 7)	MPA	CC-ANC	Eff. NAPP (CC-ANC)	NPR	Classification
		pH Units	µS/cm	mg/L	%	%	%	kg H_2SO_4/tonne			pH Units	kg H_2SO_4/tonne					Ratio	
Oxide_Transitional_Comp1	Oxide	9.2	508	325	0.48	0.02	0.78	87	14	-73	9.2	0	0	15	64	-50	6.2	NAF
Fresh_Comp2	Fresh	9.6	156	100	2.76	0.03	0.05	25	84	59	3.6	10	32	84	4.1	79	0.30	PAF
Fresh_Comp3	Fresh	9.3	242	155	2.94	0.09	0.07	32	87	55	3.7	8.0	25	90	5.7	81	0.37	PAF

Table A-3: Summary of Elemental Composition Results and Geochemical Abundance Indices (GAIs)

Sample ID	Weathering	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	In	K	La	Li	Mg	Mn	Mo
		mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	%	mg/kg	mg/kg
Comp1	Oxide/Transitional	0.85	10	37	219	1.0	19	3.5	1.4	2.5	47	198	15	1,122	6.2	14	0.80	0.30	0.08	0.64	1.1	47	1.9	625	14
Comp2	Fresh	2.44	10	1.4	178	0.14	12	5.9	0.92	3.8	78	335	17	5,459	8.2	14	0.70	0.28	0.17	0.71	1.6	132	2.1	592	43
Comp3	Fresh	3.27	11	34	235	0.13	29	6.6	0.83	3.0	70	326	7.3	6,348	8.5	16	0.80	0.25	0.14	1.0	1.2	39	2.4	665	41

Sample ID	Weathering	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
		%	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Comp1	Oxide/Transitional	0.60	0.84	194	0.01	4.6	72	0.003	0.5	16	9.5	1.9	2.3	63	0.11	3.3	0.16	0.16	0.72	0.35	88	12	3.7	86	10
Comp2	Fresh	1.22	1.00	295	0.01	2.6	65	0.007	2.7	0.35	13	2.8	2.3	97	0.12	4.7	0.31	0.23	0.57	0.11	110	6.8	5.2	92	12
Comp3	Fresh	1.04	0.84	307	0.01	2.8	50	0.006	3.1	0.23	12	1.8	2.5	93	0.07	2.1	0.13	0.20	0.36	0.07	93	10	9.9	105	9.5

Sample ID	Weathering	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	In	K	La	Li	Mg	Mn	Mo
Comp1	Oxide/Transitional	3	0	0	0	0	5	0	2	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	2
Comp2	Fresh	4	0	0	0	0	5	0	1	0	1	0	1	5	0	0	0	0	0	0	0	1	0	0	3
Comp3	Fresh	4	0	0	0	0	6	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	3
Average Crustal Abundance		0.07	8	25	430	3	0.2	3	0.18	45	25	200	3	60	5	17	15	3	0.1	2.6	30	30	2.1	900	2
		mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	%	mg/kg	mg/kg

Sample ID	Weathering	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
Comp1	Oxide/Transitional	0	0	0	0	0	0	1	2	5	0	2	0	0	0	6	0	0	0	0	0	3	0	0	0
Comp2	Fresh	0	0	1	0	0	0	2	5	0	0	3	0	0	0	6	0	0	0	0	0	2	0	0	0
Comp3	Fresh	0	0	1	0	0	0	2	5	0	0	2	0	0	0	6	0	0	0	0	0	2	0	0	0
Average Crustal Abundance		0.07	8	25	430	3	0.2	3	0.18	45	25	200	3	60	5	17	15	3	0.1	2.6	30	30	2.1	900	2
		%	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Table A-4: Summary of Aqua Regia Digest Results

Sample ID	Weathering	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo
		µg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	%	mg/kg	mg/kg
Oxide_Transitional_Comp1	Oxide	269	0.74	4.8	32	32	80	0.77	17	2.8	1.28	2.2	43	175	12	970	5.5	7.7	0.02	0.02	2.8	0.06	0.21	0.94	30	1.7	532	12
Fresh_Comp2	Fresh	546	2.20	7.2	1.7	9.0	96	0.08	11	3.9	0.83	3.1	72	401	16	5,203	6.7	11	0.04	0.02	4.9	0.11	0.49	1.3	109	1.3	325	40
Fresh_Comp3	Fresh	571	2.84	7.6	36	11	60	0.09	26	4.4	0.75	2.2	62	411	4.9	5,817	6.8	11	0.01	0.02	5.1	0.10	0.32	0.87	32	1.5	381	43
EIL / ACL (DEC 2010 / NEPM 2013) - Ecological Significance		N/G	N/G	N/G	40	N/G	300	N/G	N/G	N/G	3	N/G	50	160	N/G	70	N/G	N/G	N/G	N/G	1	N/G	N/G	N/G	N/G	N/G	500	40
EIL / ACL (DEC 2010 / NEPM 2013) - Urban / Residential / POS		N/G	N/G	N/G	100	N/G	300	N/G	N/G	N/G	3	N/G	50	470	N/G	170	N/G	N/G	N/G	N/G	1	N/G	N/G	N/G	N/G	N/G	500	40
EIL / ACL (DEC 2010 / NEPM 2013) - Commercial / Industrial		N/G	N/G	N/G	160	N/G	300	N/G	N/G	N/G	3	N/G	50	770	N/G	240	N/G	N/G	N/G	N/G	1	N/G	N/G	N/G	N/G	N/G	500	40

Sample ID	Weathering	Na	Nb	Ni	P	Pb	Pd	Pt	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
		%	mg/kg	mg/kg	%	mg/kg	µg/kg	µg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Oxide_Transitional_Comp1	Oxide	0.26	0.004	186	0.01	3.3	2.0	2.0	45	0.003	0.60	0.06	6.3	1.7	1.2	46	<0.005	2.9	0.13	156	0.56	0.33	68	1.6	3.1	73	0.77
Fresh_Comp2	Fresh	0.61	0.033	272	0.01	1.5	2.0	<2	49	0.006	2.67	0.06	5.7	2.5	1.3	68	<0.005	4.6	0.28	911	0.45	0.08	72	3.2	1.7	77	1.20
Fresh_Comp3	Fresh	0.55	0.021	297	0.01	2.3	2.0	<2	22	0.005	3.06	0.07	4.4	1.6	1.1	66	<0.005	2.0	0.11	646	0.19	0.05	52	4.0	1.6	87	0.68
EIL / ACL (DEC 2010 / NEPM 2013) - Ecological Significance		N/G	N/G	CALC	N/G	470	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	50	N/G	N/G	N/G	N/G	N/G	N/G	N/G	50	N/G	N/G	CALC	N/G
EIL / ACL (DEC 2010 / NEPM 2013) - Urban / Residential / POS		N/G	N/G	CALC	N/G	1,100	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	50	N/G	N/G	N/G	N/G	N/G	N/G	N/G	50	N/G	N/G	CALC	N/G
EIL / ACL (DEC 2010 / NEPM 2013) - Commercial / Industrial		N/G	N/G	CALC	N/G	1,800	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	50	N/G	N/G	N/G	N/G	N/G	N/G	N/G	50	N/G	N/G	CALC	N/G

Table A-5: ASLP Water Majors and Metals

Sample ID	Weathering	pH	EC	TDS	Ca	K	Mg	Na	Sulfate	Fluoride	Chloride	Alkalinity (mg $CaCO_3$/L)			
			µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	OH-	CO3	HCO3	Total Alkalinity
Oxide_Transitional_Comp1	Oxide	9.3	183	117	4.5	2.9	1.5	30	17	0.20	21	<1	35	7.0	42
Fresh_Comp2	Fresh	9.7	77	49	7.4	0.70	2.0	3.0	9.7	0.20	5.0	11	13	<2	24
Fresh_Comp3	Fresh	9.5	107	68	9.1	0.80	3.2	5.3	23	<0.1	6.0	7.0	15	<2	22
Livestock Drinking Water DGV (ANZECC 2000/ANZG 2018)		6.5-8.5	5970	4000	1000	N/G	250	N/G	1000	2	N/G	N/G	N/G	N/G	N/G
NPUG (DER 2014)		N/G	N/G	N/G	N/G	N/G	N/G	N/G	1000	15	250	N/G	N/G	N/G	N/G
Freshwater Protection 80% DGV (ANZECC 2000/ANZG 2018)		N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
Freshwater Protection 95% DGV (ANZECC 2000/ANZG 2018)		6.5-8.5	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G

N/G : No applicable guideline value.

Sample ID	Weathering	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Hf	La	Li	Mg	Mn	Mo	Na
		µg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L
Oxide_Transitional_Comp1	Oxide	<0.01	0.01	6.7	0.23	7.71	<0.1	0.01	4.5	<0.02	<0.002	1.40	<10	<0.001	<1	<0.01	<0.005	<0.002	1.7	1.5	<0.1	1.80	30
Fresh_Comp2	Fresh	0.01	0.08	<0.1	0.11	2.36	<0.1	0.01	7.4	<0.02	<0.002	0.20	<10	<0.001	4.0	<0.01	<0.005	<0.002	6.0	2.0	<0.1	0.34	3.0
Fresh_Comp3	Fresh	0.07	0.06	0.40	0.13	0.59	<0.1	0.04	9.1	<0.02	<0.002	0.50	<10	<0.001	24	0.04	<0.005	<0.002	1.4	3.2	<0.1	0.42	5.3
Livestock Drinking Water DGV (ANZECC 2000/ANZG 2018)		N/G	5	500	5	N/G	N/G	N/G	1000	10	N/G	1000	1000	N/G	1000	No limit	N/G	N/G	N/G	250	N/G	150	N/G
NPUG (DER 2014)		1000	0.2	100	40	20000	600	N/G	N/G	20	N/G	N/G	500	N/G	20000	0.3	N/G	N/G	N/G	N/G	5000	500	N/G
Freshwater Protection 80% DGV (ANZECC 2000/ANZG 2018)		0.2	0.15	140	2.5	N/G	N/G	N/G	N/G	0.8	N/G	N/G	40	N/G	2.5	N/G	N/G	N/G	N/G	N/G	3600	N/G	N/G
Freshwater Protection 95% DGV (ANZECC 2000/ANZG 2018)		0.05	0.055	13	0.94	N/G	N/G	N/G	N/G	0.2	N/G	1.4	3.3	N/G	1.4	0.3	N/G	N/G	N/G	N/G	1900	N/G	N/G

Sample ID	Weathering	Nb	Ni	P	Pb	Rb	Re	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Tl	U	V	W	Y	Zn	Zr
		µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
Oxide_Transitional_Comp1	Oxide	<0.05	<1	<0.05	<0.5	3.2	0.003	0.08	<0.01	4.4	<0.1	19	<0.001	<0.1	<0.005	0.01	0.01	<0.01	2.1	0.043	<10	<0.02
Fresh_Comp2	Fresh	<0.05	<1	<0.05	<0.5	3.4	<0.001	0.06	<0.01	<0.5	<0.1	14	<0.001	0.30	<0.005	0.01	<0.005	<0.01	0.49	<0.005	<10	<0.02
Fresh_Comp3	Fresh	<0.05	<1	<0.05	<0.5	1.9	<0.001	0.04	<0.01	<0.5	<0.1	12	<0.001	<0.1	<0.005	<0.01	<0.005	<0.01	0.94	<0.005	<10	<0.02
Livestock Drinking Water DGV (ANZECC 2000/ANZG 2018)		N/G	1000	N/G	100	N/G	N/G	N/G	N/G	20	N/G	N/G	N/G	N/G	N/G	N/G	200	N/G	N/G	N/G	20000	N/G
NPUG (DER 2014)		N/G	200	N/G	100	N/G	N/G	30	N/G	100	N/G	N/G	N/G	N/G	N/G	N/G	170	N/G	N/G	N/G	3000	N/G
Freshwater Protection 80% DGV (ANZECC 2000/ANZG 2018)		N/G	17	N/G	9.4	N/G	N/G	9	N/G	34	N/G	N/G	N/G	N/G	N/G	N/G	0.5	0.006	N/G	N/G	31	N/G
Freshwater Protection 95% DGV (ANZECC 2000/ANZG 2018)		N/G	11	efer to guideli	3.4	N/G	N/G	9	N/G	11	N/G	N/G	N/G	N/G	N/G	0.03	0.5	0.006	N/G	N/G	8	N/G

N/G : No applicable guideline value.

Table A-6: Summary of NAG Liquor Results

Sample ID	Weathering	NAG pH	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf	K	La	Li	Mg	Mn	Mo
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Fresh_Comp2	Fresh	3.3	<0.1	5,088	<1	26	<0.1	<0.01	4,463	1.00	1.41	52	4.0	<0.005	5,655	720	<0.05	<0.01	<0.01	2,528	0.72	23	2,142	50	<0.1
Fresh_Comp3	Fresh	3.5	<0.1	4,687	<1	21	<0.1	<0.01	4,266	0.80	0.60	35	3.0	<0.005	6,137	229	<0.05	<0.01	<0.01	1,755	0.27	4.5	2,858	49	<0.1

Sample ID	Weathering	NAG pH	Na	Nb	Ni	P	Pb	Rb	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Fresh_Comp2	Fresh	3.3	429	<0.05	67	<10	<2	22	21,193	<0.05	<1	2.0	<0.1	6.5	<0.01	0.40	0.02	<1	0.15	0.37	<2	<0.1	0.21	65
Fresh_Comp3	Fresh	3.5	479	<0.05	62	<10	<2	11	20,556	<0.05	<1	<2	<0.1	6.9	<0.01	0.10	<0.01	<1	0.06	0.05	<2	<0.1	0.19	71

APPENDIX B:

LABORATORY RESULTS

544 Bickley Road, Maddington
Western Australia 6109
Telephone: +61 8 9263 0100

intertek.com
ABN: 32 008 787 237

QUANTITATIVE X-RAY DIFFRACTION ANALYSIS

REPORT PREPARED FOR	MARTINICK BOSCH SELL PTY LTD
CLIENT CODE	282.00
JOB CODE	2420072
No. of SAMPLES	2
CLIENT O/N	DLMITSF
SAMPLE SUBMISSION No.	
PROJECT	DELTA LITHIUM PTY
STATE	
DATE RECEIVED	10/01/2025
DATE COMPLETED	21/01/2025
DATE WRITTEN	21/01/2025
[redacted]	
ANALYSING LABORATORY	Perth

SAMPLE DETAILS

DISCLAIMER

This report relates specifically to the sample(s) that were drawn and/or provided by the client or their nominated third party. The reported result(s) provide no warranty or verification on the sample(s) representing any specific goods and/or shipment and only relate to the sample(s) as received and tested. This report is prepared solely for the use of the client named in this report. Intertek accepts no responsibility for any loss, damage or laibility suffered by a third party as a result of any reliance upon or use of this report.

The results provided are not intended for commercial settlement purposes.

SIGNIFICANT FIGURES

The detection limit for most crystalline phases is approximately 0.5 wt%. However, this is dependent on instrument conditions, matrix, crystallinity and whether the pattern for the phase has been sufficiently deconvoluted in the presence of overlapping reflections.

Uncertainty in the analysis should reflect errors (absolute) of no greater than: +/-10% for phases 50-95%, +/- 5% for phases 10-50% and +/- 2% for phases <10%.

Please note that results are rounded off to integer values

LEGEND

ND	Not Detected
EMPTY CELL	Phase not included in refinement

JOB INFORMATION

PREPARATION

XRD16 (dry 50C, mill < 60um, micronised)

ANALYTICAL METHOD

XRDQUANT01 - Quantitative analysis, crystalline and amorphous content

SAMPLING

Sample(s) coned and quartered, then grab(s) taken

AMORPHOUS CONTENT DETERMINATION

Internal standard single scan

ADDITIONS

Internal standard CaF2 (fluorite)

SAMPLE PRESENTATION

Sample(s) packed and presented as unoriented powder mount(s) of the total sample

JOB INFORMATION

INSTRUMENTATION AND PARAMETERS

INSTRUMENT:

PANalytical Cubix^3 XRD
Cobalt radiation (operating at 40 kV and 40 mA)
BBHD monochromator (incident beam)

PARAMETERS:

Parameter	Setting
Start angle (deg 2θ)	5
End angle (deg 2θ)	95
Step size (deg 2θ)	0.02
Time/active length (secs)	30
Active length (deg 2θ)	4.01

SOFTWARE:

Qualitative analysis:	Bruker Diffrac.EVA 6.0 Search/Match ICDD PDF-2 (2023) database
Quantitative analysis:	SIROQUANT Version 4 ICSD (2023) database

RESULTS

The quantitative analysis of the crystalline and amorphous content of each sample is given in the file, **282.00_2420072 XRD RESULTS.xlsx**, attached to the report email.

Calculation of the phase abundances has been based on the Brindley contrast corrections using a particle diameter of 10 µm.

NOTES

1

The amorphous content may contain some of the more poorly crystalline clay phases and conversely the clay phase content may contain some poorly crystalline or amorphous material. Where there is a significant presence of clay material, the distinction between poorly crystalline material and amorphous content can be imprecise.

2

For confirmation of the clay mineralogy, a clay separation followed by analysis of oriented clay mounts (glycol and heat treated) would be required.

QUALITY CONTROL

A standard is used for quality control on the instrument and software.

A standard reference material (SRM) is a powder which consists of sub-micrometre, equi-axed, non-aggregated grains that do not display the effects of absorption contrast, extinction, or preferred orientation.

An aliquot of the NIST SRM656 reference material, spiked with 10% Al2O3 (SRM 676a) for the amorphous content determination, was prepared as un-oriented powder mount of the total sample.

Sample ID **NIST SRM656 (High α Phase Powder)**

		2420072	method std dev	SRM certified	SRM uncert
Phase	**Formula**	**wt%**	**wt%**	**wt%**	**wt%**
Amorphous content		9.4	0.5	9.6	0.6
Si3N4, alpha	Si3N4	87.6	0.5	87.4	0.6
Si3N4, beta	Si3N4	3.0	0.1	3.0	0.1

Each interval defined by the certified value and its uncertainty is a 95% confidence interval for the true value of the mean in the absence of systematic error.

METHOD DESCRIPTION

A diffraction pattern is calculated using the Rietveld method[1,2], and the difference between the calculated and measured diffraction patterns is minimised. The total calculated pattern is the sum of the calculated patterns of the individual crystalline phases.

Results are given as the weight percentages of the individual crystalline phases and total amorphous content, as described overleaf.

The total amorphous content includes amorphous material and unanalysed materials, such as unknown minerals, or known minerals for which there is not a suitable crystal structure.

Corrections are incorporated into the process that allows for a more accurate description of the mineral's contribution to the measured pattern and to allow for variation due to atomic substitution, layer disordering, preferred orientation, and other factors that affect the acquisition of the XRD scan.

Some limitations of qualitative XRD analysis are as follows:

There is a limit of detection of approximately 0.5 wt% on the crystalline phases. The detection of a phase may be dependent on its crystallinity. Where there exist multiple phases, overlap of diffracted reflections can occur, thus rendering some ambiguity into the interpretation. Overlapping reflections of a major phase can mask the presence of minor or trace phases.

Some phases cannot be unambiguously identified, as they are present in minor or trace amounts.

Some limitations of quantitative XRD analysis by a full-profile Rietveld method are as follows:

The limitations for qualitative XRD analysis apply.

The method as described is standardless: it relies solely on the published crystallographic data available for each phase. Some data may not exactly describe the phases present.

Particle size is important with respect to the absorption of the X-rays by the sample. Micronising reduces the particle size to that more suitable for quantitative analysis.

The accuracy of the analysis is dependent on sampling and sample preparation in addition to the calculated profiles being exactly representative of the chemistry of the component phases and their crystallinity. Some preferred orientation effects and reflection overlaps may occur which cannot be adequately resolved.

References:

1. Rietveld, H. M. (1969). A profile refinement method for nuclear and magnetic structures. J. Appl. Cryst. 2, 65-71.

2. Loopstra, B. O. & Rietveld, H. M. (1969). The structure of some alkaline-earth metal uranates. Acta Cryst. B25, 787-791.

AMORPHOUS CONTENT

INTERNAL STANDARD METHOD

The amorphous content is determined from the addition of a known amount of a well-characterised, crystalline reference material (spike) to each sample[1,2].

Single scan

When amorphous material is present, the calculated weight percentage of the spike is larger than actually weighed out. The amount of amorphous material is calculated by scaling the calculated spike's weight percentage to be equal to its known addition.

Double scan

Diffraction data are collected from both unspiked and spiked specimens. The weight percentages calculated from an unspiked specimen are often more accurate as the intensities are not diluted by the spike addition. The weight percentages from the unspiked sample are normalised by the amorphous content calculated from the spiked specimen.

EXTERNAL STANDARD METHOD

The amorphous content is determined by the comparison of the diffracted intensities of an unspiked specimen with a specimen of a well-characterised, crystalline reference material[3].

References:

1. Hill, R. J. & Howard, C. J. (1987). Quantitative phase analysis from neutron powder diffraction data using the Rietveld method. J. Appl. Cryst. 20, pp. 467–474.

2. I. C. Madsen, N. V. Y. Scarlett, R. Kleeberg and K. Knorr (2019) “Quantitative phase analysis”, in International Tables for Crystallography Volume H Powder Diffraction, eds. C. J. Gilmore, J. A. Kaduk and H. Schenk, Chapter 3.9, pp.344 – 373, London: Wiley.

3. O’Connor, B.H., and Raven, M.D. (1988), “Application of the Rietveld refinement procedure in assaying powdered mixtures”, Powder Diffraction 3, pp. 2-6.

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b) the cost of having those services supplied again.

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MINERALS
TEST REPORT

CLIENT

Michael NORTH
MARTINICK BOSCH SELL PTY LTD
4 Cook Street
WEST PERTH, W.A. 6005
AUSTRALIA

JOB INFORMATION

JOB CODE	:	282.0/2420071
NO. SAMPLES	:	3
NO. ELEMENTS	:	87
CLIENT ORDER NO.	:	DLMITSF (Job 1 of 2)
SAMPLE SUBMISSION NO.	:	
PROJECT	:	DELTA LITHIUM PTY
SAMPLE TYPE	:	Tailings
DATE RECEIVED	:	05/11/2024
DATE TESTED	:	10/01/2025 - 30/01/2025
DATE REPORTED	:	30/01/2025
DATE PRINTED	:	30/01/2025

REPORT NOTES

[redacted]

SIGNIFICANT FIGURES

It is common practice to report data derived from analytical instrumentation to a maximum of two or three significant figures. Some data reported herein may show more figures than this. The reporting of more than two or three figures in no way implies that figures beyond the least significant digit have significance.

For more information on the uncertainty on individual reported values, please contact the laboratory.

MEASUREMENT OF UNCERTAINTY

Measurement of uncertainty estimates are available for most tests upon request.

SAMPLE STORAGE

All solid samples (assay pulps, bulk pulps and residues) will be stored for 60 days without charge. Following this samples will be stored at a daily rate until clients written advice regarding return, collection or disposal is received. If storage information is not supplied on the submission, or arranged with the laboratory in writing the default will be to store the samples with the applicable charges. Storage is charged at $4.00 per m3 per day, expenses related to the return or disposal of samples will also be charged. Current disposal costs including packaging in a Class2 waste disposal facility is charged at $175.00 per m3.

Samples received as liquids, waters or solutions will be held for 60 days free of charge then disposed of, unless written advice for return or collection is received.

LEGEND

X = Less than Detection Limit
SNR = Sample Not Received
LNR = Lab Not Received
DTF = Result still to come
I/S = Insufficient Sample for Analysis

NA = Not Analysed
UA = Unable to Assay
\> = Value beyond Limit of Method
\+ = Extra Sample Received Not Listed
HJ = Photon assay pot is < 50% full, will not analyze

UNITS

ppm for Solid Samples = mg/Kg
ppb for Solid Samples = µg/Kg
ppm for Liquid Samples = mg/L
ppb for Liquid Samples = µg/L

ELEMENTS	Au	Au	Ag	Ag	Ag	Ag
UNITS	ppb	ug/l	ppm	ppm	ug/l	mg/Kg
DETECTION LIMIT	0.1	0.01	0.05	0.01	0.01	0.1
DIGEST	AR005/	ASLP/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	268.8	0.38	0.85	0.74	X	
0002 Fresh_Comp2	546.2	0.24	2.44	2.20	0.01	X
0003 Fresh_Comp3	571.2	0.68	3.27	2.84	0.07	X
CHECKS						
0001 Fresh_Comp3	682.4	0.69	3.14	2.86	0.06	
0002 Fresh_Comp3						X
STANDARDS						
0001 AMIS0170			0.30			
0002 OREAS 45f	18.3			0.05		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7						X
BLANKS						
0001 Control Blank	X	X	X	X	X	
0002 Control Blank						X

ELEMENTS	Al	Al	Al	Al	ANC	As
UNITS	ppm	%	mg/l	mg/Kg	kgH2SO4/t	ppm
DETECTION LIMIT	10	0.0001	0.01	1	1	0.2
DIGEST	4A/	AR005/	ASLP/	KNAGx/	ANCx/	4A/
ANALYTICAL FINISH	MS	MS	OE	OE	VOL	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	10.16%	4.7855	0.01		87	37.1
0002 Fresh_Comp2	10.23%	7.1939	0.08	5088	25	1.4
0003 Fresh_Comp3	11.49%	7.6305	0.06	4687	32	34.3
CHECKS						
0001 Fresh_Comp3	11.35%	7.5368	0.05		33	35.3
0002 Fresh_Comp3				4644		
STANDARDS						
0001 AMIS0170	2.03%					1.9
0002 OREAS 45f		4.8546				
0003 ANC-6					99	
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6			100.15			
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				135		
BLANKS						
0001 Control Blank	X	X	X		0	X
0002 Control Blank				X		

ELEMENTS	As	As	As	B	B	B
UNITS	ppm	ug/l	mg/Kg	ppm	mg/l	mg/Kg
DETECTION LIMIT	0.03	0.1	1	0.5	0.01	1
DIGEST	AR005/	ASLP/	KNAGx/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	MS	MS	MS	OE	OE
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	32.18	6.7		31.9	0.23	
0002 Fresh_Comp2	1.73	X	X	9.0	0.11	7
0003 Fresh_Comp3	35.62	0.4	X	10.9	0.13	8
CHECKS						
0001 Fresh_Comp3	36.37	0.4		11.0	0.14	
0002 Fresh_Comp3			X			8
STANDARDS						
0001 AMIS0170						
0002 OREAS 45f	2.09			3.3		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6					100.49	
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7			X			X
BLANKS						
0001 Control Blank	X	X		X	X	
0002 Control Blank			X			X

ELEMENTS	Ba	Ba	Ba	Ba	Be	Be
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ppm
DETECTION LIMIT	0.1	0.05	0.05	0.1	0.05	0.005
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	AR005/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	218.7	79.68	7.71		0.95	0.769
0002 Fresh_Comp2	178.3	95.62	2.36	26.3	0.14	0.084
0003 Fresh_Comp3	234.5	60.41	0.59	21.0	0.13	0.087
CHECKS						
0001 Fresh_Comp3	231.1	60.06	0.53		0.14	0.106
0002 Fresh_Comp3				20.7		
STANDARDS						
0001 AMIS0170	39.1				0.13	
0002 OREAS 45f		147.22				0.918
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				2.0		
BLANKS						
0001 Control Blank	17.5	X	X		X	X
0002 Control Blank				0.1		

ELEMENTS	Be	Be	Bi	Bi	Bi	Bi
UNITS	ug/l	mg/Kg	ppm	ppm	ug/l	mg/Kg
DETECTION LIMIT	0.1	0.1	0.01	0.005	0.005	0.01
DIGEST	ASLP/	KNAGx/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	X		18.54	17.481	0.013	
0002 Fresh_Comp2	X	X	11.85	10.859	0.014	X
0003 Fresh_Comp3	X	X	29.41	26.370	0.043	X
CHECKS						
0001 Fresh_Comp3	X		28.81	30.886	0.034	
0002 Fresh_Comp3		X				X
STANDARDS						
0001 AMIS0170			0.38			
0002 OREAS 45f				0.168		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7		X				X
BLANKS						
0001 Control Blank	X		X	X	X	
0002 Control Blank		X				X

ELEMENTS	C	CO3	Ca	Ca	Ca	Ca
UNITS	%	mgCaCO3/L	ppm	%	mg/l	mg/Kg
DETECTION LIMIT	0.01	1	20	0.0001	0.01	1
DIGEST		ASLP/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	/CSA	VOL	MS	MS	OE	OE
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.78	35	3.50%	2.7529	4.45	
0002 Fresh_Comp2	0.05	13	5.87%	3.8660	7.39	4463
0003 Fresh_Comp3	0.07	15	6.65%	4.4054	9.13	4266
CHECKS						
0001 Fresh_Comp3	0.07	18	6.67%	4.4904	9.26	
0002 Fresh_Comp3						4199
STANDARDS						
0001 AMIS0170			6.76%			
0002 OREAS 45f				0.0719		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b	1.15					
0008 GWS-6					100.12	
0009 GWS-6		X				
0010 OREAS 277						
0011 NAG Std 7						33
BLANKS						
0001 Control Blank	X	X	X	0.0002	X	
0002 Control Blank						X

ELEMENTS	Cd	Cd	Cd	Cd	Ce	Ce
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ppm
DETECTION LIMIT	0.01	0.002	0.02	0.1	0.01	0.002
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	AR005/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	1.40	1.284	X		2.52	2.230
0002 Fresh_Comp2	0.92	0.826	X	1.0	3.79	3.076
0003 Fresh_Comp3	0.83	0.747	X	0.8	3.00	2.230
CHECKS						
0001 Fresh_Comp3	0.83	0.728	X		3.01	2.241
0002 Fresh_Comp3				0.8		
STANDARDS						
0001 AMIS0170	0.12				8.34	
0002 OREAS 45f		0.010				20.768
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				X		
BLANKS						
0001 Control Blank	X	X	X		X	X
0002 Control Blank				X		

ELEMENTS	Ce	Ce	Cl	Co	Co	Co
UNITS	ug/l	mg/Kg	mg/L	ppm	ppm	ug/l
DETECTION LIMIT	0.002	0.01	2	0.1	0.01	0.1
DIGEST	ASLP/	KNAGx/	ASLP/	4A/	AR005/	ASLP/
ANALYTICAL FINISH	MS	MS	COL	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	X		21	47.3	42.79	1.4
0002 Fresh_Comp2	X	1.41	5	77.9	72.19	0.2
0003 Fresh_Comp3	X	0.60	6	70.4	62.39	0.5
CHECKS						
0001 Fresh_Comp3	X		7	69.6	61.61	0.5
0002 Fresh_Comp3		0.63				
STANDARDS						
0001 AMIS0170				53.3		
0002 OREAS 45f					38.48	
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6			38			
0010 OREAS 277						
0011 NAG Std 7		0.11				
BLANKS						
0001 Control Blank	X		X	X	X	X
0002 Control Blank		X				

ELEMENTS		CoolourChange	Cr	Cr	Cr	Cr
UNITS	mg/Kg	NONE	ppm	ppm	ug/l	mg/Kg
DETECTION LIMIT	0.1	0	0.2	0.1	10	1
DIGEST	KNAGx/	ANCx/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	QUAL	MS	MS	MS	OE
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		Yes	198.0	175.2	X	
0002 Fresh_Comp2	52.2	No	334.6	401.0	X	4
0003 Fresh_Comp3	34.9	No	326.2	410.7	X	3
CHECKS						
0001 Fresh_Comp3		No	302.0	386.8	X	
0002 Fresh_Comp3	34.5					X
STANDARDS						
0001 AMIS0170			683.4			
0002 OREAS 45f				352.6		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	21.8					2
BLANKS						
0001 Control Blank			X	X	X	
0002 Control Blank	0.0					X

ELEMENTS	Cs	Cs	Cs	Cs	Cu	Cu
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ppm
DETECTION LIMIT	0.05	0.01	0.001	0.005	0.5	0.05
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	AR005/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	15.27	11.85	X		1122.0	970.42
0002 Fresh_Comp2	17.30	15.69	X	X	5459.2	5202.73
0003 Fresh_Comp3	7.25	4.91	X	X	6348.0	5817.07
CHECKS						
0001 Fresh_Comp3	6.86	4.99	X		6256.7	5808.66
0002 Fresh_Comp3				X		
STANDARDS						
0001 AMIS0170	0.80				711.1	
0002 OREAS 45f		1.72				323.38
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				X		
BLANKS						
0001 Control Blank	X	X	X		0.7	X
0002 Control Blank				X		

ELEMENTS	Cu	Cu	Dy	EC	EC	Er
UNITS	ug/l	mg/Kg	ppm	uS/cm	uS/cm	ppm
DETECTION LIMIT	1	1	0.01	10	10	0.005
DIGEST	ASLP/	KNAGx/	4A/	Ws5/	ASLP/	4A/
ANALYTICAL FINISH	MS	OE	MS	MTR	MTR	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	X		0.74	508	183	0.483
0002 Fresh_Comp2	4	5655	1.08	156	77	0.708
0003 Fresh_Comp3	24	6137	1.02	242	107	0.664
CHECKS						
0001 Fresh_Comp3	23		1.02	260	109	0.670
0002 Fresh_Comp3		6237				
STANDARDS						
0001 AMIS0170			1.10			0.647
0002 OREAS 45f						
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6				333		
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6					322	
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7		187				
BLANKS						
0001 Control Blank	X		X	X	X	X
0002 Control Blank		X				

ELEMENTS	Eu	F	Fe	Fe	Fe	Fe
UNITS	ppm	mg/L	%	%	mg/l	mg/Kg
DETECTION LIMIT	0.005	0.1	0.001	0.0002	0.01	1
DIGEST	4A/	ASLP/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	SIE	MS	MS	OE	OE
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.303	0.2	6.220	5.5285	X	
0002 Fresh_Comp2	0.336	0.2	8.211	6.6704	X	720
0003 Fresh_Comp3	0.344	X	8.541	6.7789	0.04	229
CHECKS						
0001 Fresh_Comp3	0.342	X	8.379	6.7222	0.04	
0002 Fresh_Comp3						199
STANDARDS						
0001 AMIS0170	0.249		4.651			
0002 OREAS 45f				13.3676		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6					99.85	
0009 GWS-6		0.6				
0010 OREAS 277						
0011 NAG Std 7						5136
BLANKS						
0001 Control Blank	X	X	X	0.0002	X	
0002 Control Blank						X

ELEMENTS	Final-pH	Fizz-Rate	Ga	Ga	Ga	Ga
UNITS	NONE	NONE	ppm	ppm	ug/l	ppm
DETECTION LIMIT	0.1	1	0.01	0.005	0.02	0.05
DIGEST	ANCx/	ANCx/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MTR	QUAL	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	1.5	2	14.00	7.730	X	
0002 Fresh_Comp2	3.3	X	14.41	10.520	0.03	X
0003 Fresh_Comp3	3.2	X	15.92	10.590	0.03	X
CHECKS						
0001 Fresh_Comp3	3.1	X	15.58	10.664	0.03	
0002 Fresh_Comp3						X
STANDARDS						
0001 AMIS0170			4.67			
0002 OREAS 45f				19.209		
0003 ANC-6	1.6	X				
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7						X
BLANKS						
0001 Control Blank	1.3	X	X	X	X	
0002 Control Blank						X

ELEMENTS	Gd	Ge	Ge	Ge	Ge	HCO3
UNITS	ppm	ppm	ppm	ug/l	ppm	mgCaCO3/L
DETECTION LIMIT	0.005	0.1	0.01	0.1	0.01	2
DIGEST	4A/	4A/	AR005/	ASLP/	KNAGx/	ASLP/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	VOL
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.702	0.8	0.02	X		7
0002 Fresh_Comp2	0.919	0.7	0.04	X	X	X
0003 Fresh_Comp3	0.868	0.8	0.01	X	X	X
CHECKS						
0001 Fresh_Comp3	0.897	0.7	0.02	X		X
0002 Fresh_Comp3					X	
STANDARDS						
0001 AMIS0170	1.053	0.8				
0002 OREAS 45f			0.02			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						100
0010 OREAS 277						
0011 NAG Std 7					0.01	
BLANKS						
0001 Control Blank	X	X	X	X		2
0002 Control Blank					X	

ELEMENTS	Hf	Hf	Hf	Hf	Hg	Hg
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ug/l
DETECTION LIMIT	0.01	0.002	0.005	0.01	0.002	0.1
DIGEST	4A/	AR005/	ASLP/	KNAGx/	AR005/	ASLP/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.30	0.023	X		2.831	X
0002 Fresh_Comp2	0.28	0.019	X	X	4.856	X
0003 Fresh_Comp3	0.25	0.015	X	X	5.067	X
CHECKS						
0001 Fresh_Comp3	0.23	0.018	X		5.335	X
0002 Fresh_Comp3				X		
STANDARDS						
0001 AMIS0170	1.12					
0002 OREAS 45f		0.634			0.238	
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				X		
BLANKS						
0001 Control Blank	X	X	X		X	X
0002 Control Blank				X		

ELEMENTS	Hg	Ho	In	In	In	K
UNITS	mg/Kg	ppm	ppm	ppm	ug/l	ppm
DETECTION LIMIT	0.01	0.005	0.01	0.002	0.002	10
DIGEST	KNAGx/	4A/	4A/	AR005/	ASLP/	4A/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		0.157	0.08	0.059	X	6360
0002 Fresh_Comp2	X	0.220	0.17	0.111	X	7061
0003 Fresh_Comp3	X	0.218	0.14	0.104	X	1.00%
CHECKS						
0001 Fresh_Comp3		0.224	0.14	0.100	X	9999
0002 Fresh_Comp3	X					
STANDARDS						
0001 AMIS0170		0.220	0.03			1237
0002 OREAS 45f				0.081		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	X					
BLANKS						
0001 Control Blank		X	X	X	X	X
0002 Control Blank	X					

ELEMENTS	K	K	K	La	La	La
UNITS	%	mg/l	mg/Kg	ppm	ppm	ug/l
DETECTION LIMIT	0.0005	0.1	10	0.01	0.002	0.002
DIGEST	AR005/	ASLP/	KNAGx/	4A/	AR005/	ASLP/
ANALYTICAL FINISH	MS	OE	OE	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.2134	2.9		1.07	0.942	X
0002 Fresh_Comp2	0.4926	0.7	2528	1.60	1.340	X
0003 Fresh_Comp3	0.3225	0.8	1755	1.19	0.874	X
CHECKS						
0001 Fresh_Comp3	0.3231	0.8		1.18	0.879	X
0002 Fresh_Comp3			1656			
STANDARDS						
0001 AMIS0170				3.97		
0002 OREAS 45f	0.0750				10.177	
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6		99.7				
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7			25			
BLANKS						
0001 Control Blank	X	X		X	X	X
0002 Control Blank			X			

ELEMENTS	La	Li	Li	Li	Li	Lu
UNITS	mg/Kg	ppm	ppm	ug/l	mg/Kg	ppm
DETECTION LIMIT	0.01	0.1	0.02	0.05	0.1	0.01
DIGEST	KNAGx/	4A/	AR005/	ASLP/	KNAGx/	4A/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		47.3	29.87	1.74		0.06
0002 Fresh_Comp2	0.72	131.8	108.96	6.02	23.4	0.09
0003 Fresh_Comp3	0.27	38.6	32.36	1.43	4.5	0.09
CHECKS						
0001 Fresh_Comp3		37.6	31.92	1.34		0.09
0002 Fresh_Comp3	0.30				4.4	
STANDARDS						
0001 AMIS0170		8.5				0.09
0002 OREAS 45f			8.76			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	0.05				X	
BLANKS						
0001 Control Blank		X	X	X		X
0002 Control Blank	X				X	

ELEMENTS	Mg	Mg	Mg	Mg	Mn	Mn
UNITS	ppm	%	mg/l	mg/Kg	ppm	ppm
DETECTION LIMIT	10	0.0005	0.01	1	0.5	0.2
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	AR005/
ANALYTICAL FINISH	MS	MS	OE	OE	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	1.87%	1.6765	1.47		624.8	531.8
0002 Fresh_Comp2	2.09%	1.3270	1.98	2142	592.2	325.1
0003 Fresh_Comp3	2.36%	1.5406	3.20	2858	664.6	381.4
CHECKS						
0001 Fresh_Comp3	2.32%	1.5207	3.28		668.6	377.5
0002 Fresh_Comp3				2837		
STANDARDS						
0001 AMIS0170	7.09%				1600.7	
0002 OREAS 45f		0.1391				140.8
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6			100.07			
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				101		
BLANKS						
0001 Control Blank	X	X	X		X	X
0002 Control Blank				X		

ELEMENTS	Mn	Mn	Mo	Mo	Mo	Mo
UNITS	ug/l	mg/Kg	ppm	ppm	ug/l	mg/Kg
DETECTION LIMIT	0.1	1	0.05	0.01	0.05	0.1
DIGEST	ASLP/	KNAGx/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	OE	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	X		13.86	11.99	1.80	
0002 Fresh_Comp2	X	50	42.97	40.21	0.34	X
0003 Fresh_Comp3	X	49	40.88	42.73	0.42	X
CHECKS						
0001 Fresh_Comp3	X		40.79	40.53	0.48	
0002 Fresh_Comp3		48				X
STANDARDS						
0001 AMIS0170			1.81			
0002 OREAS 45f				1.07		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7		29				X
BLANKS						
0001 Control Blank	X		X	X	X	
0002 Control Blank		X				X

ELEMENTS	MPA	Na	Na	Na	Na	NAG
UNITS	kgH2SO4/t	ppm	%	mg/l	mg/Kg	kgH2SO4/t
DETECTION LIMIT	1	10	0.0005	0.1	10	1
DIGEST		4A/	AR005/	ASLP/	KNAGx/	NAGx/
ANALYTICAL FINISH	/CALC	MS	MS	OE	OE	VOL
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	15	5970	0.2620	29.8		0
0002 Fresh_Comp2	84	1.22%	0.6110	3.0	429	32
0003 Fresh_Comp3	90	1.04%	0.5524	5.3	479	25
CHECKS						
0001 Fresh_Comp3	90	1.02%	0.5538	5.5		24
0002 Fresh_Comp3					444	
STANDARDS						
0001 AMIS0170		1645				
0002 OREAS 45f			0.0294			
0003 ANC-6						
0004 NAG Std 7						37
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b	97					
0008 GWS-6				99.5		
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7					14	
BLANKS						
0001 Control Blank	X	X	X	X		6
0002 Control Blank					X	

ELEMENTS	NAG	NAGpH	NAGpH	NAG(4.5)	NAG(4.5)	NAPP
UNITS	kgH2SO4/t	NONE	NONE	kgH2SO4/t	kgH2SO4/t	kgH2SO4/t
DETECTION LIMIT	1	0.1	0.1	1	1	1
DIGEST	KNAGx/	NAGx/	KNAGx/	NAGx/	KNAGx/	
ANALYTICAL FINISH	VOL	MTR	MTR	VOL	VOL	/CALC
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		9.2		0		-72
0002 Fresh_Comp2	39	3.6	3.3	10	18	59
0003 Fresh_Comp3	35	3.7	3.5	8	14	58
CHECKS						
0001 Fresh_Comp3		3.7		6		57
0002 Fresh_Comp3	36		3.5		14	
STANDARDS						
0001 AMIS0170						
0002 OREAS 45f						
0003 ANC-6						
0004 NAG Std 7		2.8		34		
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	35		2.5		32	
BLANKS						
0001 Control Blank		5.2		0		0
0002 Control Blank	10		5.2		0	

ELEMENTS	Nb	Nb	Nb	Nb	Nd	Ni
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ppm
DETECTION LIMIT	0.01	0.002	0.05	0.05	0.01	0.5
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	4A/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.84	0.004	X		1.92	193.8
0002 Fresh_Comp2	1.00	0.033	X	X	2.61	294.7
0003 Fresh_Comp3	0.84	0.021	X	X	2.32	306.5
CHECKS						
0001 Fresh_Comp3	0.81	0.019	X		2.33	311.3
0002 Fresh_Comp3				X		
STANDARDS						
0001 AMIS0170	0.94				4.33	1077.4
0002 OREAS 45f		0.080				
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				X		
BLANKS						
0001 Control Blank	X	X	X		X	X
0002 Control Blank				X		

ELEMENTS	Ni	Ni	Ni	OH	P	P
UNITS	ppm	ug/l	mg/Kg	mgCaCO3/L	ppm	ppm
DETECTION LIMIT	0.04	1	1	1	50	2
DIGEST	AR005/	ASLP/	KNAGx/	ASLP/	4A/	AR005/
ANALYTICAL FINISH	MS	MS	OE	VOL	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	186.26	X		X	90	84
0002 Fresh_Comp2	272.33	X	67	11	113	109
0003 Fresh_Comp3	296.63	X	62	7	105	95
CHECKS						
0001 Fresh_Comp3	284.92	X		5	101	92
0002 Fresh_Comp3			60			
STANDARDS						
0001 AMIS0170					103	
0002 OREAS 45f	188.15					222
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6				X		
0010 OREAS 277						
0011 NAG Std 7			126			
BLANKS						
0001 Control Blank	X	X		X	X	X
0002 Control Blank			X			

ELEMENTS	P	P	Pb	Pb	Pb	Pb
UNITS	mg/l	mg/Kg	ppm	ppm	ug/l	mg/Kg
DETECTION LIMIT	0.05	10	0.5	0.005	0.5	2
DIGEST	ASLP/	KNAGx/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	OE	OE	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	X		4.6	3.317	X	
0002 Fresh_Comp2	X	X	2.6	1.542	X	X
0003 Fresh_Comp3	X	X	2.8	2.268	X	X
CHECKS						
0001 Fresh_Comp3	X		2.7	2.346	X	
0002 Fresh_Comp3		X				X
STANDARDS						
0001 AMIS0170			11.7			
0002 OREAS 45f				12.227		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6	100.11					
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7		X				X
BLANKS						
0001 Control Blank	X		0.7	X	X	
0002 Control Blank		X				X

ELEMENTS	Pd	Pd	pH	pH	pH Drop	Pr
UNITS	ppb	ug/l	NONE	NONE	NONE	ppm
DETECTION LIMIT	1	0.01	0.1	0.1	0.1	0.005
DIGEST	AR005/	ASLP/	Ws5/	ASLP/	ANCx/	4A/
ANALYTICAL FINISH	MS	MS	MTR	MTR	MTR	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	2	X	9.2	9.3	3.8	0.354
0002 Fresh_Comp2	2	X	9.6	9.7	3.0	0.525
0003 Fresh_Comp3	2	X	9.3	9.5	3.2	0.443
CHECKS						
0001 Fresh_Comp3	X	X	9.3	9.5	3.2	0.451
0002 Fresh_Comp3						
STANDARDS						
0001 AMIS0170						1.036
0002 OREAS 45f	40					
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6			9.0			
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6				8.9		
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7						
BLANKS						
0001 Control Blank	X	X	5.6	5.9		X
0002 Control Blank						

ELEMENTS	Pt	Pt	Rb	Rb	Rb	Rb
UNITS	ppb	ug/l	ppm	ppm	ug/l	mg/Kg
DETECTION LIMIT	2	0.01	0.05	0.005	0.02	0.05
DIGEST	AR005/	ASLP/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	2	X	71.58	45.419	3.18	
0002 Fresh_Comp2	X	X	64.66	48.558	3.37	22.32
0003 Fresh_Comp3	X	X	50.24	21.545	1.91	10.63
CHECKS						
0001 Fresh_Comp3	X	X	49.36	21.622	1.86	
0002 Fresh_Comp3						10.41
STANDARDS						
0001 AMIS0170			7.84			
0002 OREAS 45f	35			13.262		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7						X
BLANKS						
0001 Control Blank	X	X	X	X	X	
0002 Control Blank						X

ELEMENTS	Re	Re	Re	S	S	S
UNITS	ppm	ppm	ug/l	%	%	ppm
DETECTION LIMIT	0.002	0.0002	0.001	0.001	0.01	2
DIGEST	4A/	AR005/	ASLP/	4A/		AR005/
ANALYTICAL FINISH	MS	MS	MS	MS	/CSA	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.003	0.0029	0.003	0.547	0.48	6034
0002 Fresh_Comp2	0.007	0.0057	X	2.716	2.76	2.67%
0003 Fresh_Comp3	0.006	0.0049	X	3.092	2.94	3.06%
CHECKS						
0001 Fresh_Comp3	0.005	0.0049	X	3.014	2.93	3.02%
0002 Fresh_Comp3						
STANDARDS						
0001 AMIS0170	0.003			0.460		
0002 OREAS 45f		X				290
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b					3.16	
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7						
BLANKS						
0001 Control Blank	X	X	X	X	X	X
0002 Control Blank						

ELEMENTS	S	S	S-SO4	SO4	Sb	Sb
UNITS	mg/l	mg/Kg	%	mg/l	ppm	ppm
DETECTION LIMIT	0.1	10	0.01	300	0.002	0.005
DIGEST	ASLP/	KNAGx/	S71/		4A/	AR005/
ANALYTICAL FINISH	OE	OE	OE	/CALC	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	5.6		0.02	14380	15.690	0.061
0002 Fresh_Comp2	3.2	21193	0.03	82684	0.346	0.058
0003 Fresh_Comp3	7.6	20556	0.09	88077	0.228	0.071
CHECKS						
0001 Fresh_Comp3	8.3		0.07	87777	0.199	0.072
0002 Fresh_Comp3		20450				
STANDARDS						
0001 AMIS0170					4.261	
0002 OREAS 45f						0.188
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b				94667		
0008 GWS-6	0.2					
0009 GWS-6						
0010 OREAS 277			0.15			
0011 NAG Std 7		11556				
BLANKS						
0001 Control Blank	X		X	X	0.003	0.006
0002 Control Blank		X				

ELEMENTS	Sb	Sb	Sc	Sc	Sc	Sc
UNITS	ug/l	mg/Kg	ppm	ppm	mg/l	mg/Kg
DETECTION LIMIT	0.01	0.05	0.05	0.005	0.01	1
DIGEST	ASLP/	KNAGx/	4A/	AR005/	ASLP/	KNAGx/
ANALYTICAL FINISH	MS	MS	MS	MS	OE	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.08		9.50	6.264	X	
0002 Fresh_Comp2	0.06	X	13.11	5.709	X	X
0003 Fresh_Comp3	0.04	X	12.11	4.356	X	X
CHECKS						
0001 Fresh_Comp3	0.04		12.03	4.398	X	
0002 Fresh_Comp3		X				X
STANDARDS						
0001 AMIS0170			13.56			
0002 OREAS 45f				28.321		
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6					X	
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7		X				X
BLANKS						
0001 Control Blank	X		X	X	X	
0002 Control Blank		X				X

ELEMENTS	Se	Se	Se	Se	Sm	Sn
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ppm
DETECTION LIMIT	0.05	0.01	0.5	2	0.01	0.1
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	4A/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	1.92	1.73	4.4		0.56	2.3
0002 Fresh_Comp2	2.84	2.54	X	2	0.72	2.3
0003 Fresh_Comp3	1.79	1.59	X	X	0.67	2.5
CHECKS						
0001 Fresh_Comp3	1.77	1.60	X		0.70	2.5
0002 Fresh_Comp3				X		
STANDARDS						
0001 AMIS0170	1.40				0.95	1.1
0002 OREAS 45f		0.33				
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				2		
BLANKS						
0001 Control Blank	X	X	X		X	X
0002 Control Blank				X		

ELEMENTS	Sn	Sn	Sn	Sr	Sr	Sr
UNITS	ppm	ug/l	mg/Kg	ppm	ppm	ug/l
DETECTION LIMIT	0.02	0.1	0.1	0.1	0.01	0.02
DIGEST	AR005/	ASLP/	KNAGx/	4A/	AR005/	ASLP/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	1.24	X		62.6	46.14	19.19
0002 Fresh_Comp2	1.27	X	X	97.3	68.10	14.19
0003 Fresh_Comp3	1.12	X	X	93.3	65.97	12.18
CHECKS						
0001 Fresh_Comp3	1.11	X		93.1	65.94	12.31
0002 Fresh_Comp3			X			
STANDARDS						
0001 AMIS0170				24.9		
0002 OREAS 45f	1.78				12.47	
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7			X			
BLANKS						
0001 Control Blank	X	X		X	X	X
0002 Control Blank			X			

ELEMENTS	Sr	Ta	Ta	Ta	Ta	Tb
UNITS	mg/Kg	ppm	ppm	ug/l	mg/Kg	ppm
DETECTION LIMIT	0.05	0.01	0.005	0.001	0.01	0.005
DIGEST	KNAGx/	4A/	AR005/	ASLP/	KNAGx/	4A/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		0.11	X	X		0.107
0002 Fresh_Comp2	6.47	0.12	X	X	X	0.149
0003 Fresh_Comp3	6.88	0.07	X	X	X	0.154
CHECKS						
0001 Fresh_Comp3		0.09	X	X		0.149
0002 Fresh_Comp3	6.77				X	
STANDARDS						
0001 AMIS0170		0.10				0.159
0002 OREAS 45f			X			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	0.11				X	
BLANKS						
0001 Control Blank		X	X	X		X
0002 Control Blank	X				X	

ELEMENTS	TDSEva	Te	Te	Te	Te	Th
UNITS	mg/Kg	ppm	ppm	ug/l	mg/Kg	ppm
DETECTION LIMIT	20	0.005	0.002	0.1	0.1	0.01
DIGEST	ASLP/	4A/	AR005/	ASLP/	KNAGx/	4A/
ANALYTICAL FINISH	GR	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	125	3.279	2.887	X		0.16
0002 Fresh_Comp2	50	4.683	4.576	0.3	0.4	0.31
0003 Fresh_Comp3	60	2.073	1.952	X	0.1	0.13
CHECKS						
0001 Fresh_Comp3		2.099	1.902	X		0.14
0002 Fresh_Comp3					0.1	
STANDARDS						
0001 AMIS0170		0.370				1.42
0002 OREAS 45f			0.033			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7					X	
BLANKS						
0001 Control Blank		0.006	X	X		X
0002 Control Blank					X	

ELEMENTS	Th	Th	Th	Ti	Ti	Ti
UNITS	ppm	ug/l	mg/Kg	ppm	ppm	mg/l
DETECTION LIMIT	0.001	0.005	0.01	1	1	0.01
DIGEST	AR005/	ASLP/	KNAGx/	4A/	AR005/	ASLP/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	OE
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	0.128	X		1579	156	X
0002 Fresh_Comp2	0.284	X	0.02	2260	911	X
0003 Fresh_Comp3	0.112	X	X	1966	646	X
CHECKS						
0001 Fresh_Comp3	0.099	X		1906	645	X
0002 Fresh_Comp3			X			
STANDARDS						
0001 AMIS0170				1135		
0002 OREAS 45f	7.065				747	
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						X
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7			0.02			
BLANKS						
0001 Control Blank	X	X		X	X	X
0002 Control Blank			X			

ELEMENTS	Ti	Tl	Tl	Tl	Tl	Tm
UNITS	mg/Kg	ppm	ppm	ug/l	mg/Kg	ppm
DETECTION LIMIT	1	0.01	0.005	0.01	0.02	0.005
DIGEST	KNAGx/	4A/	AR005/	ASLP/	KNAGx/	4A/
ANALYTICAL FINISH	OE	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		0.72	0.561	0.01		0.069
0002 Fresh_Comp2	X	0.57	0.447	0.01	0.15	0.091
0003 Fresh_Comp3	X	0.36	0.186	X	0.06	0.099
CHECKS						
0001 Fresh_Comp3		0.34	0.185	X		0.097
0002 Fresh_Comp3	X				0.06	
STANDARDS						
0001 AMIS0170		0.19				0.088
0002 OREAS 45f			0.110			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	2				X	
BLANKS						
0001 Control Blank		X	X	X		X
0002 Control Blank	X				X	

ELEMENTS	TotAlk	U	U	U	U	V
UNITS	mgCaCO3/L	ppm	ppm	ug/l	mg/Kg	ppm
DETECTION LIMIT	5	0.005	0.001	0.005	0.01	0.05
DIGEST		4A/	AR005/	ASLP/	KNAGx/	4A/
ANALYTICAL FINISH	/CALC	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	42	0.354	0.325	0.010		87.96
0002 Fresh_Comp2	24	0.105	0.076	X	0.37	110.27
0003 Fresh_Comp3	22	0.073	0.052	X	0.05	93.33
CHECKS						
0001 Fresh_Comp3	23	0.071	0.052	X		92.79
0002 Fresh_Comp3					0.10	
STANDARDS						
0001 AMIS0170		1.871				68.21
0002 OREAS 45f			1.015			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6	100					
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7					0.08	
BLANKS						
0001 Control Blank	X	X	X	X		X
0002 Control Blank					X	

ELEMENTS	V	V	V	W	W	W
UNITS	ppm	mg/l	mg/Kg	ppm	ppm	ug/l
DETECTION LIMIT	0.02	0.01	2	0.05	0.01	0.02
DIGEST	AR005/	ASLP/	KNAGx/	4A/	AR005/	ASLP/
ANALYTICAL FINISH	MS	OE	OE	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	68.44	X		12.25	1.63	2.05
0002 Fresh_Comp2	72.19	X	X	6.82	3.23	0.49
0003 Fresh_Comp3	51.54	X	X	10.06	3.97	0.94
CHECKS						
0001 Fresh_Comp3	51.17	X		9.80	3.83	1.00
0002 Fresh_Comp3			X			
STANDARDS						
0001 AMIS0170				0.66		
0002 OREAS 45f	222.55				0.02	
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6		101.80				
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7			X			
BLANKS						
0001 Control Blank	X	X		X	X	X
0002 Control Blank			X			

ELEMENTS	W	Y	Y	Y	Y	Yb
UNITS	mg/Kg	ppm	ppm	ug/l	mg/Kg	ppm
DETECTION LIMIT	0.1	0.01	0.001	0.005	0.05	0.01
DIGEST	KNAGx/	4A/	AR005/	ASLP/	KNAGx/	4A/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1		3.74	3.131	0.043		0.48
0002 Fresh_Comp2	X	5.16	1.651	X	0.21	0.66
0003 Fresh_Comp3	X	9.88	1.617	X	0.19	0.64
CHECKS						
0001 Fresh_Comp3		4.94	1.623	X		0.68
0002 Fresh_Comp3	X				0.19	
STANDARDS						
0001 AMIS0170		5.46				0.61
0002 OREAS 45f			6.293			
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7	X				0.08	
BLANKS						
0001 Control Blank		X	X	X		X
0002 Control Blank	X				X	

ELEMENTS	Zn	Zn	Zn	Zn	Zr	Zr
UNITS	ppm	ppm	ug/l	mg/Kg	ppm	ppm
DETECTION LIMIT	1	0.2	10	1	0.05	0.01
DIGEST	4A/	AR005/	ASLP/	KNAGx/	4A/	AR005/
ANALYTICAL FINISH	MS	MS	MS	OE	MS	MS
SAMPLE NUMBERS						
0001 Oxide_Transitional_Comp1	86	73.3	X		10.36	0.77
0002 Fresh_Comp2	92	77.4	X	65	11.66	1.20
0003 Fresh_Comp3	105	86.9	X	71	9.50	0.68
CHECKS						
0001 Fresh_Comp3	102	86.2	X		9.07	0.67
0002 Fresh_Comp3				70		
STANDARDS						
0001 AMIS0170	51				32.18	
0002 OREAS 45f		20.7				25.19
0003 ANC-6						
0004 NAG Std 7						
0005 GWS-6						
0006 GWS-6						
0007 OREAS 135b						
0008 GWS-6						
0009 GWS-6						
0010 OREAS 277						
0011 NAG Std 7				29		
BLANKS						
0001 Control Blank	X	X	X		0.06	X
0002 Control Blank				X		

ELEMENTS	Zr
UNITS	ug/l
DETECTION LIMIT	0.02
DIGEST	ASLP/
ANALYTICAL FINISH	MS
SAMPLE NUMBERS	
0001 Oxide_Transitional_Comp1	X
0002 Fresh_Comp2	X
0003 Fresh_Comp3	X

CHECKS	
0001 Fresh_Comp3	X
0002 Fresh_Comp3	

STANDARDS	
0001 AMIS0170	
0002 OREAS 45f	
0003 ANC-6	
0004 NAG Std 7	
0005 GWS-6	
0006 GWS-6	
0007 OREAS 135b	
0008 GWS-6	
0009 GWS-6	
0010 OREAS 277	
0011 NAG Std 7	

BLANKS	
0001 Control Blank	X
0002 Control Blank	

METHOD CODE DESCRIPTION

Method Code **Date Tested** **Package**	**Analysing Laboratory** **NATA Laboratory Accreditation**	**NATA Scope of Accreditation**
/CALC **30/01/25 14:56**	Intertek Genalysis Perth **3244 3237** No digestion or other pre-treatment undertaken. Results Determined by calculation from other reported data.	*
/CALC **30/01/25 14:56** **ASLP/VOL09**	Intertek Genalysis Perth **3244 3237** No digestion or other pre-treatment undertaken. Results Determined by calculation from other reported data.	*
/CSA **30/01/25 15:18** **ARD01**	Intertek Genalysis Perth **3244 3237** Induction Furnace Analysed by Infrared Spectrometry	**ENV_W061(Per)**
4A/MS **10/01/25 21:30** **4A/MSQ48**	Intertek Genalysis Perth **3244 3237** Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Tubes. Analysed by Inductively Coupled Plasma Mass Spectrometry.	**MPL_W002, MS_IM_001(Per)**
4A/MS **10/01/25 21:30** **4A/MSQ48R**	Intertek Genalysis Perth **3244 3237** Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Tubes. Analysed by Inductively Coupled Plasma Mass Spectrometry.	**MPL_W002, MS_IM_001(Per)**
ANCx/MTR **13/01/25 06:38** **ARD01**	Intertek Genalysis Perth **3244 3237** Acid Neutralizing Capacity Digestion Procedure. Analysed with Electronic Meter Measurement	**ENV_W035**
ANCx/QUAL **13/01/25 06:38** **ARD01**	Intertek Genalysis Perth **3244 3237** Acid Neutralizing Capacity Digestion Procedure. Analysed by Qualitative Inspection	**ENV_W035**
ANCx/VOL **13/01/25 06:38** **ARD01**	Intertek Genalysis Perth **3244 3237** Acid Neutralizing Capacity Digestion Procedure. Analysed by Volumetric Technique.	**ENV_W035**

METHOD CODE DESCRIPTION

Method Code **Date Tested** **Package**	**Analysing Laboratory** **NATA Laboratory Accreditation**	**NATA Scope of Accreditation**
AR005/MS **11/01/25 12:02** **AR005/MSQ53**	Intertek Genalysis Perth **3244 3237** 0.5 gram mini Aqua-Regia digest. Analysed by Inductively Coupled Plasma Mass Spectrometry.	*
ASLP/COL **24/01/25 13:07** **ASLP/COL01**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed by UV-Visible Spectrometry.	**ENV_W037**
ASLP/GR **30/01/25 11:07** **ASLP/GR01**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed by Gravimetric Technique	**ENV_W037**
ASLP/MS **30/01/25 15:19** **ASLP/MS**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed by Inductively Coupled Plasma Mass Spectrometry.	**ENV_W037, MS_IM_001**
ASLP/MTR **29/01/25 20:50** **ASLP/MTR**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed with Electronic Meter Measurement	**ENV_W037**
ASLP/OE **24/01/25 13:07** **ASLP/OE**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.	**ENV_W037, ICP_IM_001**
ASLP/SIE **30/01/25 15:18** **ASLP/SIE01**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed by Specific Ion Electrode.	**ENV_W037**
ASLP/VOL **30/01/25 15:18** **ASLP/VOL09**	Intertek Genalysis Perth **3244 3237** AS4439.3-1997: Australian Standard Leachates Protocol for Wastes, Sediments & Contaminated Soils. Analysed by Volumetric Technique.	**ENV_W037**

METHOD CODE DESCRIPTION

Method Code Date Tested Package	Analysing Laboratory NATA Laboratory Accreditation	NATA Scope of Accreditation
KNAGx/MS **21/01/25 10:03** **KNAGx/MS**	Intertek Genalysis Perth **3244 3237** Kinetic Net Acid Generation Extraction of samples with H2O2 Analysed by Inductively Coupled Plasma Mass Spectrometry.	
KNAGx/MTR **21/01/25 10:03** **Kinetic NAG**	Intertek Genalysis Perth **3244 3237** Kinetic Net Acid Generation Extraction of samples with H2O2 Analysed with Electronic Meter Measurement	*****
KNAGx/OE **21/01/25 10:03** **KNAGx/OE**	Intertek Genalysis Perth **3244 3237** Kinetic Net Acid Generation Extraction of samples with H2O2 Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.	
KNAGx/VOL **21/01/25 10:03** **Kinetic NAG**	Intertek Genalysis Perth **3244 3237** Kinetic Net Acid Generation Extraction of samples with H2O2 Analysed by Volumetric Technique.	*****
NAGx/MTR **30/01/25 15:18** **ARD01**	Intertek Genalysis Perth **3244 3237** Net Acid Generation Extraction of samples with H2O2 Analysed with Electronic Meter Measurement	**ENV_W036**
NAGx/VOL **30/01/25 15:18** **ARD01**	Intertek Genalysis Perth **3244 3237** Net Acid Generation Extraction of samples with H2O2 Analysed by Volumetric Technique.	**ENV_W036**
S71/OE **13/01/25 11:15** **S71/OE**	Intertek Genalysis Perth **3244 3237** Digestion to eliminate sulphides. Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.	**ENV_W062, ICP_IM_001**

METHOD CODE DESCRIPTION

Method Code Date Tested Package	Analysing Laboratory NATA Laboratory Accreditation	NATA Scope of Accreditation
Ws5/MTR **30/01/25 15:18** **ARD01**	Intertek Genalysis Perth **3244 3237** Water Extraction using a sample:water ratio of 1:5. Analysed with Electronic Meter Measurement	*

* Denotes not on Scope of Accreditation

Suite 2, 92 Cleveland Street
Greenslopes, QLD 4120
PO Box 635, Coorparoo QLD 4151
Tel. +61 (0)7 3015 7555

CERTIFICATE OF ANALYSIS

Asbestos Identification - TEM

4-0249

[redacted]

Date Sampled:	Unknown
Date Received:	14/11/2024
Date Analysis Complete:	19/11/2024
Date Issued:	19/11/2024
Order No.:	242519
Sampled By:	As Received

Samples analysed by Transmission Electron Microscopy (TEM) at COHLABS Greenslopes laboratory based on the principles of standard ISO 22262-1 — "International Standard, Part 1: Air quality — Bulk materials: Sampling and qualitative determination of asbestos in commercial bulk materials."

Lab ID	Sample ID	Sample Details	Sample Type	Size / Weight cm/g	Analysis Result
TEM001	Sample 1	Delta Lithium Fresh Comp2 Tailings Composite	Powder	14g	NAD
TEM002	Sample 2	Delta Lithium Fresh Comp3 Tailings Composite	Powder	10g	NAD

Identification Legend

CHR - Chrysotile Asbestos
AMO - Amosite Asbestos
ACT - Actinolite Asbestos
ANT - Anthophyllite Asbestos

[redacted]

COHLABS accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons.

Sample material descriptions and results reported may be limited by the size and condition of the sample submitted for analysis. Sizes and weights stated are approximate only.

All analytical data such as analytical sensitivity, number of grid openings analysed, average grid opening size, micrograph and EDS spectra identification is available on request.

Samples are routinely disposed of approximately 1 month from receipt. Requests for longer term sample storage must be received in writing.

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T24-0249 TEM DETAILED ANALYSIS REPORT

Transmission Electron Microscopy (TEM)

COHLABSTEM Ref:	T24-0249
Order No.	242519 (MBS Project Delta Lithium DLMITSF)
Client:	Glossop Consultancy

[redacted]

Site / Sample Location:	MBS Project Delta Lithium DLMITSF
No. of Samples Received:	2
Sample(s) Type:	2 pulp samples
Date Sample(s) Received:	14/11/2024
Date Sample(s) Analysed:	18/11/2024
Date Report Issued:	19/11/2024

[redacted]

Table of Contents

1 Introduction

1.1 Samples received

Table 1 Samples received.

CLIENT ID	LAB ID	SAMPLE AND BAG TOTAL WEIGHT (G)	DESCRIPTION
DELTA LITHIUM FRESH COMP2 TAILINGS COMPOSITE	T24-0249-01	14	GREY POWDER
DELTA LITHIUM FRESH COMP3 TAILINGS COMPOSITE	T24-0249-02	10	GREY POWDER

1.2 Sample preparation and analysis

- Elutriation procedure: The powder samples were initially examined by stereomicroscopy to determine homogeneity. The samples were prepared as described herein. Approximately 20mg of sample was weighed with a microbalance, transferred into a 500mL beaker, diluted with distilled water and placed in a 100W ultrasonic bath. A surface aliquot of 10 mL was filtered on a polycarbonate membrane (25mm diameter, 0.2um pore size) and transferred onto TEM grids. A total of 20 structures were examined or a total of 36 grid openings were counted depending on which limit was reached first over 2 TEM grids.
- The TEM fibre identification analysis was based on three (3) criteria as per ISO 22262-1:
    1. FIBRE DEFINITION AS PER ISO 22262-1: *"elongated particle which has parallel or stepped sides. For the purposes of this part of ISO 22262-1, a fibre is defined to have an aspect ratio equal to or greater than 3:1".* An Elongated Mineral Particle (EMP) – also called CLEAVAGE FRAGMENT - is the same definition as a fibre with the exception that it has no parallel or stepped sides. As per client requirements, only fibres greater than 5 um in length were identified.
    2. QUALITATIVE ELECTRON DIFFRACTION DEFINITION AS PER ISO 22262-1: *"Qualitative ELECTRON DIFFRACTION (ED) consists of visual examination, without detailed measurement, of the general characteristics of the ED pattern obtained on the TEM viewing screen from a randomly oriented fibre. ED patterns obtained from fibres with cylindrical symmetry, such as chrysotile, do not change when the fibres are tilted about their axes, and patterns from randomly oriented fibres of these minerals can be interpreted quantitatively. For fibres which do not have cylindrical symmetry, only those ED patterns obtained when the fibre is oriented with a principal crystallographic axis closely parallel with the incident electron-beam direction can be interpreted quantitatively."*
    3. The chemical composition using Energy Dispersive X-Ray Spectroscopy (EDX).

2 Analysis results

2.1 Summary table

The purpose of the analysis was to find / observe fibres and EMPs (Elongated Mineral Particles or "Cleavage Fragments"), assess their crystallinity by electron diffraction and assess their chemical composition by EDX.

Table 2 Summary table of fibres and elongated mineral particles detected within the samples[1]

ID		#GO SCANNED		STRUCTURES DETECTED / RESULTS		
CLIENT ID	LAB ID	TOTAL	TOTAL AREA (MM2)	PARTICLES	ELONGATED MINERAL PARTICLES	FIBRES
DELTA LITHIUM FRESH COMP2 TAILINGS COMPOSITE	T24-0249-01	36	0.288	- ALUMINOSILICATE PARTICLES (NaAlSiO/AlSiKO)	- ALUMINOSILICATE EMPS (NaAlSiO/MgAlSiKFeO/AlSiCaO/AlSiKO) 5[2] - MAGNESIOHORNBLENDE EMP 2 - ACTINOLITE EMP 1*	- NO FIBRE DETECTED
DELTA LITHIUM FRESH COMP3 TAILINGS COMPOSITE	T24-0249-02	36	0.288	- ALUMINOSILICATE PARTICLES (MgAlSiKFeO/AlSiKO)	- ALUMINOSILICATE EMPS (MgAlSiKFeO/AlSiKO) 2	- NO FIBRE DETECTED

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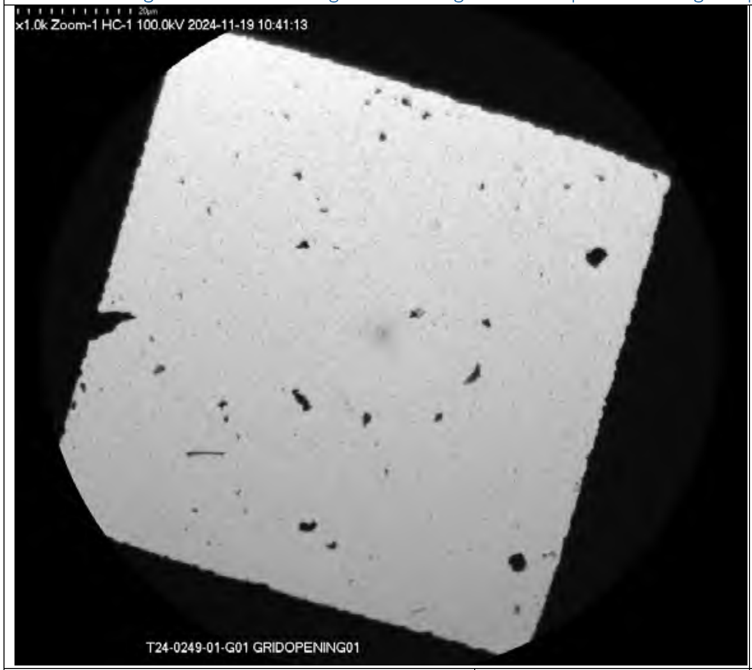
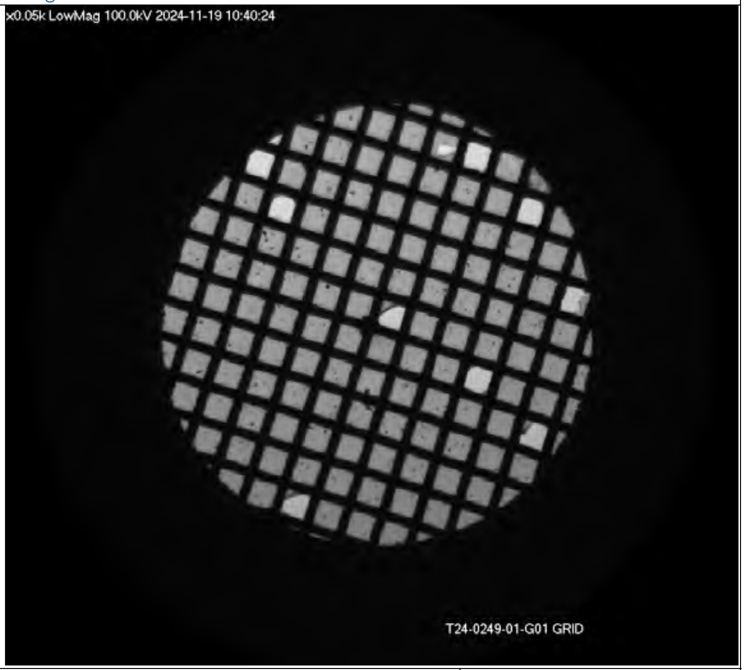
[1] Explanatory notes to the table:

- GO: Grid Opening (or "field")
- GOA: Grid Opening Area (in mm^2)

[2] * Details of fibres and elongated mineral particles identification shown in pages below. Additional TEM images and EDX spectrums can be provided upon request.

2.2 Low magnification TEM images of a TEM grid and a representative grid opening





Standard / Display Magnification:[3]	X01.00K / X02.00K	Standard / Display Magnification:	X00.05K / X00.10K
Reference:	T24-0249-01-G01	Reference:	T24-0249-01-G01

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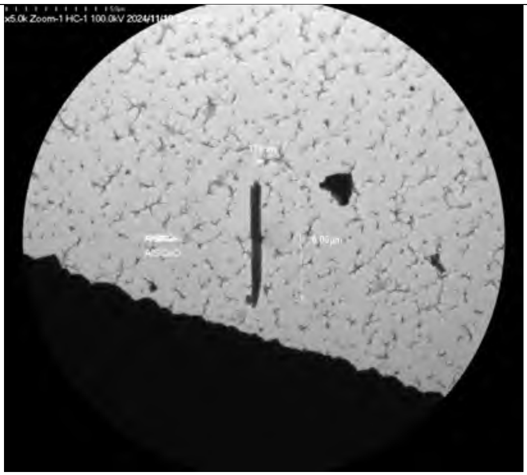
[3] Extracted from HT7700 Software Manual: *"Standard Magnification: in an instrument model equipped with the integration CCD camera, the magnification of an image projected at the CCD (scintillator) position is taken as a magnification standard.*
Display Magnification: Display magnification refers to a magnification factor on the display monitor."

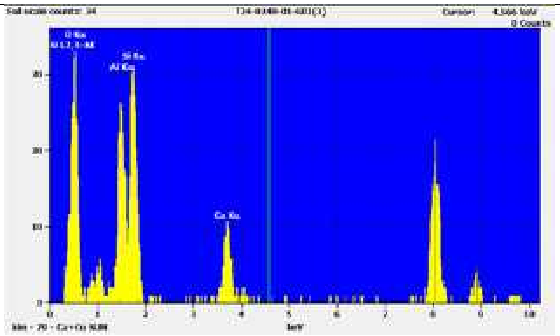
2.3 Examples of structures identified

2.3.1 Sample T24-0249-01 [Client ID: DELTA LITHIUM FRESH COMP2 TAILINGS COMPOSITE]: Example of Aluminosilicate Elongated Mineral Particles identified

2.3.1.1 TEM OBSERVATION



2.3.1.2 EDX SPECTRUM



Quantitative Results for: T24-0247-01-G02(2)

Element Line	*Net Counts*	*Net Counts Error*		*K-Factor*	*Weight %*	*Weight % Error*	*Atom %*	*Atom % Error*	*Formula*	*Compnd %*
O K	0		0	---	48.10S	---	62.28	± 0.00	(null)	---
Al K	397	±	21	0.975	22.06	---	16.94	± 0.90	Al2O3	41.69
Si K	420	±	22	1.000	23.94	---	17.66	± 0.92	SiO2	51.21
K K	94	±	12	1.100	5.89	---	3.12	± 0.40	K2O	7.10
Total					100.00		100.00			100.00

Standard / Display Magnification:[4]	X05.00K / X10.00K	Tilt angle	20 deg
Emission current:	10 uA	Acquisition time	30-60 sec
Acceleration voltage:	100 kV		

FIBRE DEFINITION AS PER ISO 22262-1:
"elongated particle which has parallel or stepped sides, For the purposes of this part of ISO 22262-1, a fibre is defined to have an aspect ratio equal to or greater than 3:1."

OBSERVATION: The structure DOES NOT meet the criteria of a fibre as per ISO 22262-1.

The EDX spectrum identifies the presence of OXYGEN, ALUMINIUM, SILICON, and CALCIUM and IS NOT qualitatively similar to the EDX spectrum of Asbestos. Other minor elements are neglectable.

RESULT: NON-ASBESTOS ALUMINOSILICATE ELONGATED MINERAL PARTICLE IDENTIFIED.

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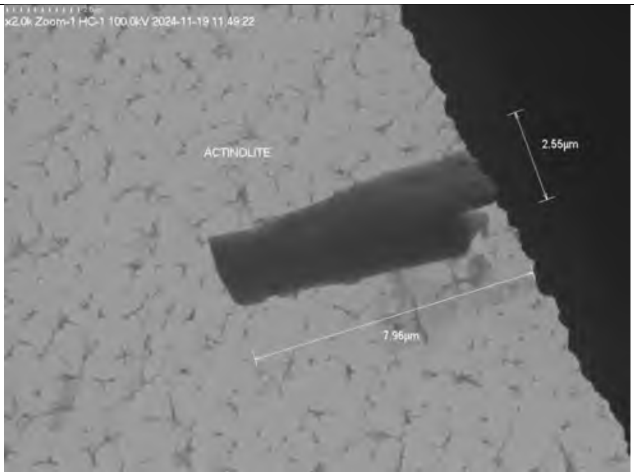
[4] Extracted from HT7700 Software Manual: *"Standard Magnification: in an instrument model equipped with the integration CCD camera, the magnification of an image projected at the CCD (scintillator) position is taken as a magnification standard.*
Display Magnification: Display magnification refers to a magnification factor on the display monitor."

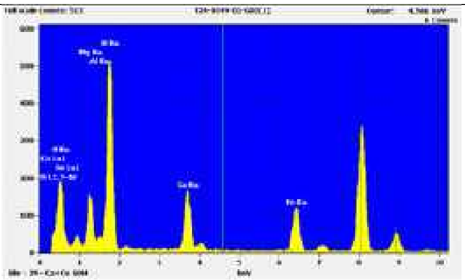
2.3 Examples of structures identified

2.3.2 Sample T24-0249-01 [Client ID: DELTA LITHIUM FRESH COMP2 TAILINGS COMPOSITE]: Actinolite Elongated Mineral Particle identified

2.3.2.1 TEM OBSERVATION



2.3.2.2 EDX SPECTRUM



Quantitative Results for: T24-0249-01-G02(3)

Element Line	Net Counts	Net Counts Error		K-Factor	Weight %	Weight % Error	Atom %	Atom % Error	Formula	Compnd %
O K	0		0	---	42.89S	---	60.40	± 0.00	(null)	---
Mg K	2143	±	51	1.150	7.93	---	7.35	± 0.17	MgO	13.15
Al K	469	±	29	0.975	1.47	---	1.23	± 0.08	Al2O3	2.78
Si K	7825	±	93	1.000	25.17	---	20.19	± 0.24	SiO2	53.85
Ca K	3095	±	60	1.100	10.95	---	6.16	± 0.12	CaO	15.32
Fe K	2573	±	55	1.400	11.59	---	4.67	± 0.10	FeO	14.91
Total					100.00		100.00			100.00

Standard / Display Magnification:[5]	X02.00K / X15.00K	Tilt angle	20 deg
Emission current:	10 uA	Acquisition time	30-60 sec
Acceleration voltage:	100 kV		

FIBRE DEFINITION AS PER ISO 22262-1:

"elongated particle which has parallel or stepped sides, For the purposes of this part of ISO 22262-1, a fibre is defined to have an aspect ratio equal to or greater than 3:1."

OBSERVATION: The structure DOES NOT meet the criteria of a fibre as per ISO 22262-1.

The EDX IS qualitatively similar to the EDX spectrum of Actinolite. Other minor elements are neglectable.

RESULT: ACTINOLITE ELONGATED MINERAL PARTICLE IDENTIFIED.

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[5] Extracted from HT7700 Software Manual: *"Standard Magnification: in an instrument model equipped with the integration CCD camera, the magnification of an image projected at the CCD (scintillator) position is taken as a magnification standard.*
Display Magnification: Display magnification refers to a magnification factor on the display monitor."

Table B-1: Quantitative Mineralogical Composition (%)

Phase name	Amorphous Content*	Amphibole	Apatite	Calcite	Chalcopyrite	Chlorite**	Dolomite	Garnet	Kaolin**
Formula		e.g.(Na,Ca,Li)2(Fe,Mg,Al)5(Si,Al)8O22(OH)2	(Ca,Mn,Ba,Pb,REE)5(PO4)3(OH,F,Cl)	CaCO3	CuFeS2	(Fe,Al,Mg,Li,Ni)6(Si,Al)4O10(OH)8	CaMg(CO3)2	(Mg,Fe,Ca,Mn,Li)3(Al,Fe)2(SiO4)3	Al2Si2O5(OH)4
Sample ID / Units	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%
Fresh_Comp2	16	12	<0.5	<0.5	1	4	<0.5	1	1
Fresh_Comp3	16	10	1	<0.5	2	8	1	1	1

Phase name	Magnesite	Mica**	Pyrite	Pyrrhotite	Quartz	Rutile	Sodium Calcium Plagioclase	Talc**	Total
Formula	MgCO3	(K,Ca,Na,Li)(Al,Mg,Fe)2(Si,Al)4O10(OH)2	FeS2	Fe(1-x)Sx (x=0-0.2)	SiO2	TiO2	(Na,Ca)(Al,Si)2Si2O8	(Fe,Al,Mg,Ni)3Si4O10(OH)2	
Sample ID / Units	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%
Fresh_Comp2		9		4	15	<0.5	37		100
Fresh_Comp3	<0.5	11	3	2	8	<0.5	34	1	99

* Please see Note 1 in the main report.

** Please see Note 2 in the main report.

APPENDIX C:

ACID FORMING WASTE CLASSIFICATION

1. Oxidation of Sulfides

There is no simple method of defining whether mine waste containing small quantities of sulfur will produce net acid release upon field exposure to air and water. Sulfide minerals containing ferrous iron such as pyrite (FeS_2), marcasite (FeS_2) and pyrrhotite (Fe(1-x)S) normally oxidise to produce sulfuric acid and ferric oxy-hydroxide. Whilst sulfur in pyrite will always form sulfuric acid, a portion of the sulfur in marcasite and pyrrhotite forms highly soluble sulfite, thiosulfate, more complex polythionate ions and elemental sulfur, some or all of which may never form acid (discussed in more details in Section 4). Similarly, sulfur in chalcopyrite and arsenopyrite rarely forms sulfuric acid due to simultaneous oxidation of copper and/or arsenic resulting in formation of non-acid forming copper sulfides and soluble sulfates (Section 5). Sulfur in galena (PbS), sphalerite (ZnS), molybdenite (MoS_2), stibnite (Sb_2S_3) and other iron-free sulfides is non-acid producing. Sulfur present as sulfate in minerals such as barite ($BaSO_4$), anhydrite ($CaSO_4$), gypsum ($CaSO_4.2H_2O$), epsomite ($MgSO_4.7H_2O$) and alkali sulfates is also non-acid producing.

There is also a group of iron and aluminium sulfate minerals that fall into a special category as acid releasing sulfates. An example is the mineral jarosite ($KFe_3(OH)_6(SO_4)_2$) or natrojarosite ($NaFe_3(OH)_6(SO_4)_2$), an oxidation product of pyrite formed under certain environmental conditions. Substitution of aluminium for iron results in the common aluminium sulfate mineral, alunite ($KAl_3(OH)_6(SO_4)_2$). Although sulfur in jarosite/natrojarosite (and alunite) is fully oxidised and therefore cannot produce further acidity under oxidising conditions, it can release acidity by hydrolysis as indicated by the chemical Equation 1:

Equation 1

$$KFe_3(OH)_6(SO_4)_2 + 3H_2O \rightarrow 3Fe(OH)_3 + K^+ + 3H^+ + 2SO_4^{2-}$$

This form of acidity is commonly referred to as “stored acidity” or “residual acidity” and does not fit in within traditional acid base accounting (ABA) which are designed to consider acid generation capacity from sulfides. This aspect of acidity in discussed further in Section 6 of this Appendix.

Potential for acid production relies on determination of total sulfur content (Tot_S), and non-sulfide sulfur content (commonly described as sulfate sulfur (SO_4_S)). Where necessary, determination of sulfur in the acid insoluble minerals barite (barium sulfate) and celestite (strontium sulfate), may be undertaken.

2. Acid Neutralisation

Acid Neutralising Capacity (ANC) is a measure of the natural ability of the sample to neutralise acid. It is normally determined in the laboratory by measuring the amount of residual acidity following reaction of a finely ground sample of mine waste with an excess of dilute hydrochloric acid. The concentration of acid used for the ANC method is first determined by testing the vigour of the reaction of the sample with hydrochloric acid, as assessed by the rate evolution of carbon dioxide gas and any colour change (a 'fizz rating'). This method captures all minerals, including carbonates, oxides, hydroxides, phosphates and some silicate minerals that are capable of neutralising hydrochloric acid. Iron carbonates such as siderite ($FeCO_3$) and ferroan ankerite ($CaFe[CO_3]_2$) do not overall contribute to neutralisation of acid due to oxidation of the ferrous iron (Fe^{2+}) to ferric iron (Fe^{3+}) which in turn releases acid due to hydrolysis of the ferric ion. To correct for presence of these iron carbonate minerals, ANC is generally determined by a modified method (Sobek *et al.* 1978). This uses an indicator (phenanthroline) to show presence ferrous ions following reaction with hydrochloric acid (reported as a colour change in laboratory reports), followed by forced oxidation of the ferrous ions (hydrogen peroxide) prior to back titration with sodium hydroxide.

The standard ANC results are based on the assumption that all acid-neutralising materials are rapid-acting – which is generally only true for reactive carbonates such as calcite ($CaCO_3$) and dolomite ($CaMg(CO_3)_2$). In practice, some neutralising capacity is supplied by silicate and alumino-silicate minerals which can have slow to very slow reaction kinetics which is also only capable of buffering to a pH of approximately 3 to 4 which may be insufficient to prevent metalliferous drainage. Measurement of total carbon content (or total inorganic carbon) provides a simple method of estimating the contribution of the former, more reactive, carbonate minerals to the ANC although iron carbonates (if present) will interfere with this calculation (bias high). The reactivity of common silicate and carbonate neutralising minerals (at pH 5) are shown in Table A1-1 (Sverdrup 1990). Minerals in the dissolving, fast and intermediate weathering mineral groups (relative reactivity between 0.4 and 1, Table A1-1) are considered to have practical neutralising capacity in the field (Kwong 1993).

The Acid Buffering Characteristic Curve (ABCC) test can be employed in cases where the proportion of readily available ANC needs to be assessed. The ABCC test involves slow titration of a sample with acid while continuously monitoring the solution pH. While silicate based ANC will continue to react for a long period, the neutralising capacity to pH 4.5 from the ABCC is a useful indicator of the readily available ANC.

Table A1-1: Common Acid Consuming Silicate and Carbonate Minerals

Mineral Group	Typical Minerals	Relative Reactivity at pH 5
Dissolving	calcite, aragonite, dolomite, magnesite, brucite	1.0
Fast weathering	anorthite, nepheline, olivine, garnet, jadeite, leucite, spodumene, diopside, wollastonite, forsterite	0.6

Mineral Group	Typical Minerals	Relative Reactivity at pH 5
Intermediate weathering	epidote, zoisite, enstatite, hypersthene, augite, hedenbergite, hornblende, glaucophane, serpentine, amphibole, chlorite, biotite	0.4
Slow weathering	albite, oligoclase, labradorite, montmorillonite, vermiculite, gibbsite, kaolinite	0.02
Very slow weathering	K-feldspars, muscovite	0.01
Inert	quartz, rutile, zircon	0.004

3. Waste Classification

3.1 Background

The Department of Mines, Industry Regulation and Safety (DMIRS) has issued draft procedures for geochemical characterisation of mine waste materials *Draft Guidance Materials Characterisation Baseline Data Requirements for Mining Proposals* (DMP 2016). These guidelines have not yet been finalised following feedback from industry (including MBS) and other departments. The 2016 DMIRS recommends that characterisations of subsurface materials and processing waste include the following information:

- A description of the host geology and mineralisation of the project area.
- The indicative volume of ore and waste materials that will be mined.
- The indicative tonnages and proportion of each waste lithology.
- Adequate characterisation of the subsurface materials (including overburden) and processing waste to ensure that the risk(s) posed by adverse components can be determined.
- Diagram(s) and map(s) of the sampling locations sufficient to indicate, the location of key mine activities and the 3D spatial distribution of samples.
- A description of the methodology used to characterise the materials.
- Interpretation of baseline data and broad implications for risk assessment and treatments.

Whilst these guidelines remain as draft, this report has been prepared in accordance with the draft guidelines and equivalent federal guidelines (DIIS 2016) where possible. The main deviation from DMP 2016 guidelines in MBS assessment is that only selected samples below 0.2 % total sulfur are analysed for Net Acid Generation (NAG) testing based on alternative assessment and previous experience in WA (DMP 2016 proposed all samples above 0.05 % sulfur should be tested).

3.2 Acid Forming Classification

There is no single method to reliably determine whether mine or process wastes containing small quantities of sulfur will produce net acidity upon field exposure to air and water. Sulfide minerals are variable in their behaviour under oxidising conditions and not all forms will produce sulfuric acid (H_2SO_4). The acid neutralising capacity of these materials is also variable, and the relative rates of acid-forming and acid-neutralising reactions is important when considering if the materials have potential to generate acidic and metalliferous drainage.

Instead, a combination of approaches is often applied to more accurately classify mine or process waste. These approaches are listed below in order of increasing data requirements (and therefore increased reliability):

- The method of "Sulfur Analysis", which only requires data for total sulfur content. Its adoption is based on long term experience of hard rock wastes from Western Australian mine sites under arid and semi-arid climatic conditions. Experience has shown that waste rock containing very low sulfur contents (less than 0.2 to 0.3 %) rarely produces significant amounts of acidic seepage (Price 1997).

- The concept of "Ratio Analysis", which compares the relative proportions of acid neutralising minerals, measured by the Acid Neutralising Capacity (ANC), to acid generating minerals, measured by the Maximum Potential Acidity (MPA). Experience has shown that the risk of generating acidic seepage is generally low when this ratio (the Neutralisation Potential Ration – NPR) is above a value of two and considered non-existent above a value of four (Price 2009, DIIS 2016).
- Acid-Base Accounting (ABA), in which the Net Acid Producing Potential (NAPP) value, which is calculated by subtracting ANC from MPA, is used to classify the acid generating potential of mine waste. Positive NAPP values indicate that the waste has the potential to generate more acid than it can neutralise.
- Procedures recommended by AMIRA International (AMIRA 2002), which take into consideration measured values provided by the Net Acid Generation (NAG) test and calculated NAPP values.
- Kinetic leaching column test data, which provides information for the relative rates of acid generation under controlled laboratory conditions, intended to simulate those within a waste rock stockpile or tailings storage facility.

The "analysis concept" methodology is suitable to characterise mine waste during the early stages of feasibility drilling to ensure potentially acid forming materials are not missed - total sulfur should always be included as an element within assay data collection for resource drilling and insufficient sulfur assays of waste rock may hinder later approvals (DMP 2016). Ratio concept classification can be incorrect due to SO_4_S and barium sulfate content, particularly in manganese ores and most zinc-copper stratiform sulfide horizons where barite is often a substantial rock forming mineral. The ratio concept often gives incorrect results when used with acid sulfate soils and in conditions of very high salinity. It will also give incorrect results if applied to waste dumps that have not been rehabilitated and where the dominant residual sulfides in the wastes are base metal sulfides. This includes the iron-bearing sulfides chalcopyrite, bornite and arsenopyrite which all have high sulfur content but generate little or no acid.

Classification of wastes in this report uses procedures recommended by AMIRA (2002) based on NAPP and NAG pH results as well as total sulfur analysis/ratio analysis concepts above where this is appropriate. The following is a definition of terms as used in ABA reporting by MBS:

- Analysis for total sulfur (Tot_S) and sulfate-sulfur (SO4_S), both reported as sulfur. Sulfate sulfur is conventionally determined by a heated 4 molar hydrochloric acid digestion followed by ICP-OES finish. In some circumstances, however, an alkaline extraction method using sodium carbonate may be appropriate to resolve interferences with high barium/strontium sulfate minerals as these are substantially more soluble under alkaline conditions. Chromium Reducible Sulfur (CRS) may also be used in conjunction with total sulfur and sulfate sulfur, which provides a direct analysis for sulfide sulfur. However, it should be noted that CRS was developed for finely divided acid sulfate soils specific to framboidal pyrite and without careful controls by the laboratory may not yield reliable results for waste rock, particularly when crystalline sulfide minerals are not micro-crystalline.

- Analysis for ANC (reported as kg H2SO4/t).
- Calculation of carbonate ANC (CC ANC), reported as kg H2SO4/t, from measured concentrations of total carbon (TC) or total inorganic carbon (TIC) (TIC avoids interferences for some samples such as shales from organic carbon).
- Calculation of Maximum Potential Acidity (MPA) = Tot_S * 30.6, reported as kg H2SO4/t.
- Calculation of Acid Production Potential (AP) = [(Tot_S – SO4_S) * 30.6] kg H2SO4/t.
- Calculation of NAPP = [AP – ANC] kg H2SO4/t. Using AP versus MPA corrects for non-oxidisable sulfur present in the sample (i.e. sulfate).
- Calculation of Effective NAPP = [AP – CC ANC] kg H2SO4/t. Effective NAPP values correspond more directly to ANC associated with readily reactive carbonates, providing non-neutralising carbonates such as siderite are absent.
- Analysis for NAG potential (reported as kg H2SO4/t) to both pH 4.5 and pH 7.
- Analysis for NAG pH (the pH of the NAG test liquors).
- Calculation of NPR = ANC/AP (reported as kg H2SO4/t).

This AMIRA approach is more conservative than either the Analysis Concept or the Ratio Concept alone, although it assumes the absence of insoluble sulfur such as barite (barium sulfate), which is a non-acid producing mineral that can interfere with the results. The AMIRA approach of using NAG testing is particularly useful for PAF-LC (Potentially Acid Forming – Low Capacity) materials or where there is very low ANC in the host rock. A combined acid generation classification scheme based on NAPP and NAG determinations which is based on AMIRA 2002 and the 2016 DMIRS *Draft Guidance Materials Characterisation Baseline Data Req*uirements for Mining Proposals (DMP 2016) and the equivalent federal; guidelines (DIIS 2016), is presented in Table A1-2.

Table A1-2: Acid Formation Risk Classification Criteria

Primary Geochemical Waste Type Class	NAPP Value kg H2SO4/t	NAG pH
Potentially Acid Forming (PAF)	≥10	< 4.5
Potentially Acid Forming – Low Capacity (PAF-LC)	0 to 10	< 4.5
Uncertain (UC)	Positive	> 4.5
Uncertain (UC)	Negative	< 4.5
Non-Acid Forming (NAF)	Negative	> 4.5 or sulfur < 0.2 %*
Acid Consuming (AC)	< -100	> 4.5
Barren	≤2 and sulfur < 0.05 %	-

** Application of 0.2% sulfur cut-off as a screening tool for the need for determination of NAG pH for classification may be applied on a site specific basis in conjunction with assessment of ANC and NPR). This uses a ratio analysis approach for low* *risk samples based on WA conditions where extensive experience has indicated no potential for samples with less than 0.2% sulfur to generate net acidity in arid conditions for waste rock from hard rock mines. A negative NAPP and NPR of more than 4 (DIIS 2016) indicates no considered risk of acid generation in such instances.*

This classification system, based on static ABA procedures and used in conjunction with geological, geochemical and mineralogical analysis can still leave materials classified as 'Uncertain' which may warrant further investigation by, for example, kinetic characterisation. An optional NAF subclassification of 'Barren' is included to account for materials which have neither acid forming nor acid generating potential. Samples which are 'Uncertain' due to conflicting NAPP versus NAG pH values may be tentatively assigned as NAF or PAF based on a NAG pH value above or below pH 4.5 respectively, however further examination/justification may be warranted. A sound knowledge of geological and geochemical processes must also be employed in the application of the above methods.

4. Pyrrhotite Oxidation Reactions

As indicated in Section 1, the oxidation chemistry of pyrrhotite is more complicated than that of pyrite, which forms the basis of standardised acid base accounting procedures. The nature of the oxidation products of pyrrhotite and the associated amount of acid produced will depend on several factors, the most important being the availability of oxygen (or redox potential), pH and the presence of specialised bacteria (sulfide oxidising and/or sulfate reducing).

There are many possible reaction products that can be formed by the oxidation of pyrrhotite, depending on the oxidation state of both iron and sulfur in the reaction products. In the case of iron, the reaction products contain either ferrous iron (Fe^{2+}) or ferric iron (Fe^{3+}). Ferrous iron is readily oxidised and so it can only be formed as a major reaction product under conditions of very low redox potential (*i.e.*, extremely low available oxygen). Ferric ion is soluble only at low pH values, typically < 1.5. At pH values > 4.5, it is rapidly precipitated as hydroxide/oxide minerals such as ferrihydrite ($Fe(OH)_3$) or goethite (FeOOH). At pH values between 1.5 and 4.5, it can form various sulfate minerals such as jarosite ($KFe_3(SO_4)_2(OH)_6$), copiapite ($(Fe,Mg)Fe_4(SO_4)_6(OH)_2.20H_2O$) or schwertmannite ($Fe_8O_8(OH)_6SO_4$).

The situation with the sulfur reaction products from pyrrhotite is much more complex. Table A1-3 lists some, but not all, of the various sulfur reaction products produced by oxidation of pyrrhotite under varying conditions, the most important of which is the degree of oxygen availability. Other important factors that influence the reactivity of pyrrhotite in tailings are the size and morphology of the pyrrhotite minerals. The crystal structure of pyrrhotite changes with different values of 'x' in the chemical formula for pyrrhotite, $Fe_{(1-x)}S$. When the value of 'x' is close to zero, the crystal structure is hexagonal. At higher values of 'x', pyrrhotite adopts a monoclinic structure.

Table A1-3: Sulfur Species Produced by Reaction of Pyrrhotite with Oxygen and Water

Sulfur Species	Chemical Formula	Oxidation Number of S	Increasing Oxidation Potential
Sulfide	S^{2-}, e.g. FeS	-2	↓
Hydrogen sulfide	H_2S	-2	
Disulfide	S_2^{2-}, e.g. FeS_2	-1	
Elemental sulfur	S, S_8	0	
Thiosulfate	$S_2O_3^{2-}$	+2	
Tetrathionate	$S_4O_6^{2-}$	+2.5	
Trithionate	$S_3O_6^{2-}$	+3.33	
Sulfite	SO_3^{2-}	+4	
Dithionate	$S_2O_6^{2-}$	+5	
Sulfate	SO_4^{2-}	+6	

The dithionate, trithionate and tetrathionate are the first three members of a group of sulfur oxy-anions referred to as 'polythionates'. In acid mine drainage context, the combination of the polythionate ions with thiosulfate and the sulfite ion is referred to as the 'sulfite' group.

The following discussion can be considered as an understanding of the following generalised (unbalanced) reaction equation (Equation 2) for the oxidation of iron sulfides with oxygen and water:

Equation 2

$$Fe_{(1-x)}S + H_2O + O_2 \rightarrow Fe^{2+}/Fe^{3+} + S_aO_b^{c-} + H^+$$

Note: 'x' = 0.5 corresponds to pyrite.

'x' = 0.0 corresponds to 'pyrrhotite' for this discussion.

a = 1, b = 0, c = 0 corresponds to elemental sulfur.

a = 1, b = 4, c = 2 corresponds to sulfate.

From this knowledge, it is possible to determine the theoretical amounts of acid that can be produced by oxidation of the iron sulfides. Table A1-4 lists the maximum amounts of acidity that can be generated by the oxidation of the sulfide in pyrrhotite. The final oxidation state of the sulfur-containing reaction product is determined by the availability of oxygen, as indicated by the O2:FeS ratio in increasing value listed in Table A1-3. Three scenarios for acid generation for each sulfur species are considered, depending on the oxidation state of the iron-containing reaction product. If only the sulfur in FeS is oxidised, the oxidation state of iron remains at +2 and so the acid generated is only sourced by the oxidation reaction of the sulfide component. If the Fe2+ is oxidised and precipitated as Fe(OH)3, then two moles of acid will be produced from every mole of oxidised Fe2+. However, if the ferric hydroxide subsequently reacts with sulfuric acid to form jarosite according to Equation 3, then the net result is that only one mole of free acid is generated for every mole of Fe2+ oxidised. Minerals such as jarosite are said to represent 'stored' acidity, *i.e.* their formation consumes some of the acidity generated by the oxidation of the iron sulfides, but addition of alkali is required to increase the pH to neutral or higher.

Equation 3

$$K^+ + 3Fe(OH)_3 + 3H^+ + 2SO_4^{2-} \rightarrow [KFe_3(SO_4)_2(OH)_6] + 3H_2O$$

Although the discussion provided above may prove difficult to understand by people with a limited understanding of chemistry, the information provided below in Table A1-4 is extremely important in the understanding of the implications for acid generation by the oxidation of iron sulfides. Table A1-4 lists the theoretical amounts of acid that can be produced, depending on the end-products of the reactions with both iron and sulfur.

Thus, depending on the reaction conditions, the reaction of pyrrhotite with oxygen and water may be either acid-consuming or acid-generating. The maximum amount of acid consumption occurs under conditions of limited oxygen supply when elemental sulfur (plus pyrite) is formed. Note that the reaction described by Equation 4 usually occurs at very low pH values (pH < 2) which are rarely achieved in the field. Maximum acid generation occurs when sulfate and Fe^{3+} hydrolysis products including ferrihydrite are the reaction products. In these situations, associated with high oxygen availability, up to 2 moles of H^+ (1 mole of sulfuric acid H_2SO_4) can be produced from every mole of pyrrhotite. Overall however, the oxidation of pyrrhotite only becomes net acid producing if the hydrolysis of released Fe^{3+} is a major reaction and this is often in practice prevented by precipitation reactions from fully occurring.

Table A1-4: Amount of Acid Produced by the Oxidation of Pyrrhotite as Determined by the Nature of the Iron and Sulfur Reaction Products

Sulfur oxidation product(s)	Number of moles of acidity ($H^{+)}$ produced per mole of sulfur				Increasing Oxygen Availability
	O_2:FeS ratio	Fe^{2+} product	Jarosite product	Ferric hydroxide product	
H_2S	Nil	2 moles consumed (Equation 4)	1 mole consumed	None	↓
Pyrite + S	0.25	1 mole consumed (Equation 5)	None	1 mole produced	
Elemental S	0.5	2 moles consumed (Equation 6)	1 mole consumed	None	
Sulfite	1.5	Nil (Equation 7)	1 mole produced	2 moles produced	
Dithionate	1.75	1 mole consumed (Equation 8)	None	1 mole produced	
Sulfate	2.0	None (Equation 9)	1 mole produced	2 moles produced	
		Acidic	pH Stability Range →	Neutral	

Equation 4

$$FeS + 2H^{+} \rightarrow Fe^{2+} + H_2S$$

Equation 5

$$3FeS + 4H^{+} + O_2 \rightarrow FeS_2 + S + 2Fe^{2+} + 2H_2O$$

Equation 6

$$2FeS + 4H^{+} + 3O_2 \rightarrow 2Fe^{2+} + 2S + 2H_2O$$

Equation 7

$$2FeS + 3O_2 \rightarrow 2Fe^{2+} + 2SO_3^{2-}$$

Equation 8

$$4FeS + 7O_2 + 4H^{+} \rightarrow 4Fe^{2+} + 2S_2O_6^{2-} + 2H_2O$$

Equation 9

$$FeS + 2O_2 \rightarrow Fe^{2+} + SO_4^{2-}$$

5. Acid Generation from Other Sulfide Minerals

The principle of Acid Base Accounting procedures described above is based on the acid generating properties of the iron sulfide mineral pyrite (FeS_2). Pyrite reacts with oxygen and water to produce acidity (H^+) according to Equation 10:

Equation 10

$$4FeS_2 + 15O_2 + 14H_2O \rightarrow 4Fe(OH)_3 + 16H^+ + 8SO_4^{2-}$$

The stoichiometry of this reaction indicates that oxidation of one mole of pyrite will produce two moles of sulfuric acid or alternatively, 30.6 kg of sulfuric acid will be produced by oxidation of one tonne of mine waste containing 1% by weight of sulfur.

Other iron sulfides, such as pyrrhotite ($Fe_{(1-x)}S$), marcasite (FeS_2) and mackinawite ($Fe_{(1+x)}S$) react by different mechanisms, but all have a maximum potential production capacity of one mole of sulfuric acid per mole of sulfur. This gives a factor of 30.6 kg of sulfuric acidic potentially produced by oxidation of one tonne of mine waste containing 1% by weight of sulfur.

Copper sulfide minerals also react with oxygen, however the amount of acid produced depends on the composition of the mineral, and in particular the iron content. Chemical equations for the oxidation of copper sulfide minerals such as chalcocite (Cu2S), covellite (CuS), chalcopyrite (CuFeS2) and bornite (Cu5FeS4) are presented in Equation 11 to Equation 14 (inclusive):

Equation 11

$$2Cu_2S + 2H_2O + 5O_2 \rightarrow 2Cu(OH)_2 + 2Cu^{2+} + 2SO_4^{2-}$$

Equation 12

$$CuS + 2O_2 \rightarrow Cu^{2+} + SO_4^{2-}$$

Equation 13

$$4CuFeS_2 + 17O_2 + 10H_2O \rightarrow 4Cu^{2+} + 4Fe(OH)_3 + 8SO_4^{2-} + 8H^+$$

Equation 14

$$4Cu_5FeS_4 + 18H_2O + 37O_2 \rightarrow 12Cu^{2+} + 8(Cu(OH)_2 + 4Fe(OH)_3 + 16SO_4^{2-} + 8H^+$$

Other base metal sulfides containing metals including cobalt, nickel, lead and zinc indicate similar behaviour to those of copper sulfides. Chemical equations for the oxidation of common nickel sulfide minerals such as millerite (NiS), pentlandite (FexNi(9-x)S8), and violarite (FeNi2S4) are presented in Equation 15 to Equation 17 (inclusive):

Equation 15

$$NiS + 2O_2 \rightarrow Ni^{2+} + SO_4^{2-}$$

Equation 16

$$Fe_xNi_{(9-x)}S_8 + {}^{(5x-2)}/_2H_2O + {}^{(36-7x)}/_2O_2 \rightarrow (9-x)Ni^{2+} + xFe(OH)_3 + 8SO_4^{2-} + (2x-2)H^+$$

Equation 17

$$4FeNi_2S_4 + 14H_2O + 31O_2 \rightarrow 8Ni^{2+} + 4Fe(OH)_3 + 16SO_4^{2-} + 16H^+$$

The predicted maximum amounts of sulfuric acid that can be produced by complete oxidation of various iron, copper and nickel sulfide minerals are listed in Table A1-5. These values indicate that acid generation is only possible if the sulfide mineral contains iron. Chalcopyrite, a common iron-copper sulfide mineral, has potential to generate acidity upon complete oxidation, but the maximum amount of potential acidity per percentage unit of sulfur in the mine waste is only half that of pyrite (or marcasite or pyrrhotite).

Table A1-5: Predicted Sulfur Acid Generation Potential from Oxidation of Iron, Copper and Nickel Sulfide Minerals

Mineral Name	Formula	Acid Generation Potential (kg H_2SO_4/t)	
		Per tonne of Mineral	Per 1% Sulfur
Pyrite	FeS_2	1,633	30.6
Marcasite	FeS_2	1,633	30.6
Pyrrhotite	$Fe_{(1-x)}S$	1,115	30.6
Chalcocite	Cu_2S	Nil	Nil
Covellite	CuS	Nil	Nil
Chalcopyrite	$CuFeS_2$	267	15.3
Bornite	Cu_5FeS_4	49	7.6
Millerite	NiS	Nil	Nil
Pentlandite	$Fe_xNi_{(9-x)}S_8$	Variable, depending on the value of x.	
Violarite	$FeNi_2S_4$	650	15.3

It should also be noted that oxidation of copper and nickel sulfide minerals can form soluble copper (Cu^{2+}) and nickel (Ni^{2+}) ions. Both metals form slightly soluble hydroxides (($Cu(OH)_2$) and $Ni(OH)_2$)), which significantly reduces the concentration of free metal ions in solution if the pH remains above 6.5. However, oxidation of copper and nickel sulfide minerals containing iron (e.g. chalcopyrite and violarite) can result in very low pH values, typically below 4.5 if there are insufficient carbonate minerals present to consume the generated acidity. For this reason, it is recommended that NAG measurements for mine waste containing copper and/or nickel sulfides be conducted to endpoint pH values of 4.5 and 7.0:

- NAG acidity to pH 4.5 includes hydrogen (H^+), ferric (Fe^{3+}), manganese (Mn^{2+}) and aluminium (Al^{3+}) ion acidity, but not copper ions (Cu^{2+}) or nickel (Ni^{2+}) ions.
- NAG acidity to pH 7.0 also includes the amount of alkalinity required to precipitate all of the soluble copper ions as $Cu(OH)_2$ and nickel ions as $Ni(OH)_2$. The difference between NAG acidity to pH 4.5 and NAG acidity to pH 7.0 is a measure of the amount of oxidisable copper and nickel sulfides in the sample.

The potential for mixed element iron sulfides to generate variable amounts of acidity is further complicated by the presence of arsenic. Arsenopyrite (FeAsS) is a common sulfide mineral often associated with gold mineralisation in the Western Australian goldfields.

Oxidation of arsenopyrite may be described by Equation 18 and Equation 19:

Equation 18

$$4FeAsS + 21O_2 + 16H_2O \rightarrow 4Fe(OH)_3 + 4SO_4^{2-} + 4AsO_4^{3-} + 20H^+$$

Equation 19

$$2FeAsS + 7O_2 + 2H_2O \rightarrow 2\text{"}FeAsO_4\text{"} + 2SO_4^{2-} + 4H^+$$

"$FeAsO_4$" may vary from crystalline ferric arsenate minerals such as scorodite ($FeAsO_4.2H_2O$) to arsenate anions adsorbed onto hydrous iron oxide surfaces. Regardless of the actual form of "FeAsO4", oxidation of arsenopyrite results in formation of 30.6 kg of sulfuric acid from one tonne of mine waste containing 1% by weight of sulfur, as for pyrite, marcasite and pyrrhotite (Table A1-5). If, however, the iron end product is $Fe(OH)_3$, then the resulting amount of acid (in the form of both sulfuric acid, H_2SO_4, and arsenic acid, H_3AsO_4) will be 2.5 times higher. Oxidation of arsenopyrite by this reaction results in formation of 76.5 kg of sulfuric acid equivalents from one tonne of mine waste containing 1% by weight of sulfur.

In conclusion, using a factor of 30.6 to calculate the amount of acidity as kg H_2SO_4/t is only valid if all of the sulfur is present as iron sulfide minerals. If mixed copper, nickel and other base metals are present, use of the 30.6 conversion factor will over-estimate the amount of acidity produced. If arsenopyrite is present, use of the 30.6 conversion factor may under-estimate the amount of acidity produced.

6. Residual Acidity

It is important to note that material classified as NAF by acid-base accounting methodology described above may not have circum-neutral or alkaline pH values. For reasons outlined in this section, it is possible for NAF waste to be moderately to highly acidic as a result of existing “residual” or “natural” acidity. Conversely, it is common for PAF waste to be slightly to moderately alkaline. Laterite waste rock is an example of material that usually classifies as NAF by acid-base accounting procedures described above, but often records moderate to highly acidic pH values.

As discussed in Section 1 of this Appendix, most of the “residual” or “natural” acidity of these materials is explained by the presence of iron and aluminium sulfate minerals including jarosite and alunite. Additional acidity may be associated with cation exchange properties of highly weathered clay minerals. The sum of the concentrations of “acidic” cations including H^+, Al^{3+} and Mn^{2+} (present in acidic clays and expressed in units of centimoles of positive charge per kilogram) is referred to as “exchangeable acidity”. The contribution of “exchangeable acidity” in acidic, clay-rich lateritic waste rock may be as high as 5 kg H_2SO_4/t (depending on clay mineralogy).

It is important to note that leachate from materials containing only “exchangeable acidity” usually contain low levels of soluble acidity, which presents a low risk to the receiving environment. However, elevated levels of “exchangeable acidity” are toxic to plants (phytotoxic), meaning that such materials are unsuitable as a growth medium or as a subsoil water storage for plants.

A summary of typical pH conditions associated with different waste types is presented in Table A1-6. It should be noted that standard ABA classification of clay rich laterites and saprock may result in ‘PAF’ classification if the NAG pH is < 4.5, however this ignores the initial 1:5 pH (which may be as low as pH 4 for these materials). Such naturally acidic laterites/subsoils have no further potential for acid generation (no sulfides) and are perhaps better termed ‘Actual Acid Sulfate Soils’ when considering management.

Table A1-6: pH Control of Various Waste Rock Types by Significant Minerals

Typical pH Values	Significant Minerals	Typical Waste Rock Types
Greater than 9.0	Sodium and potassium carbonate, reactive silicates such as forsterite (Mg_2SiO_4), wollastonite ($CaSiO_3$) and cordierite $(Mg,Fe)_2Al3(Si_5AlO_{18})$.	Mafic and ultramafic volcanics.
8.0 to 9.0	Calcium and magnesium carbonates such as calcite ($CaCO_3$), magnesite ($MgCO_3$), dolomite ($CaMg(CO_3)_2$) and ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$).	Mafic and ultramafic volcanics, calcareous sedimentary rocks.
5.0 to 9.0	Many common silicate and aluminosilicate minerals such as feldspars, micas and pyroxenes.	Many igneous, non-calcareous sedimentary and metamorphic rock types.
4.0 to 5.0	Highly weathered clay minerals including kaolinite ($Al_2Si_2O_5(OH)_4$), goethite (FeOOH) and gibbsite ($Al(OH)_3$).	Laterite and saprock developed over acidic igneous rock types.
Less than 4.0	Alunite, jarosite and related minerals.	Gossans, acid sulfate soils, oxidised sulfidic wastes.

7. References

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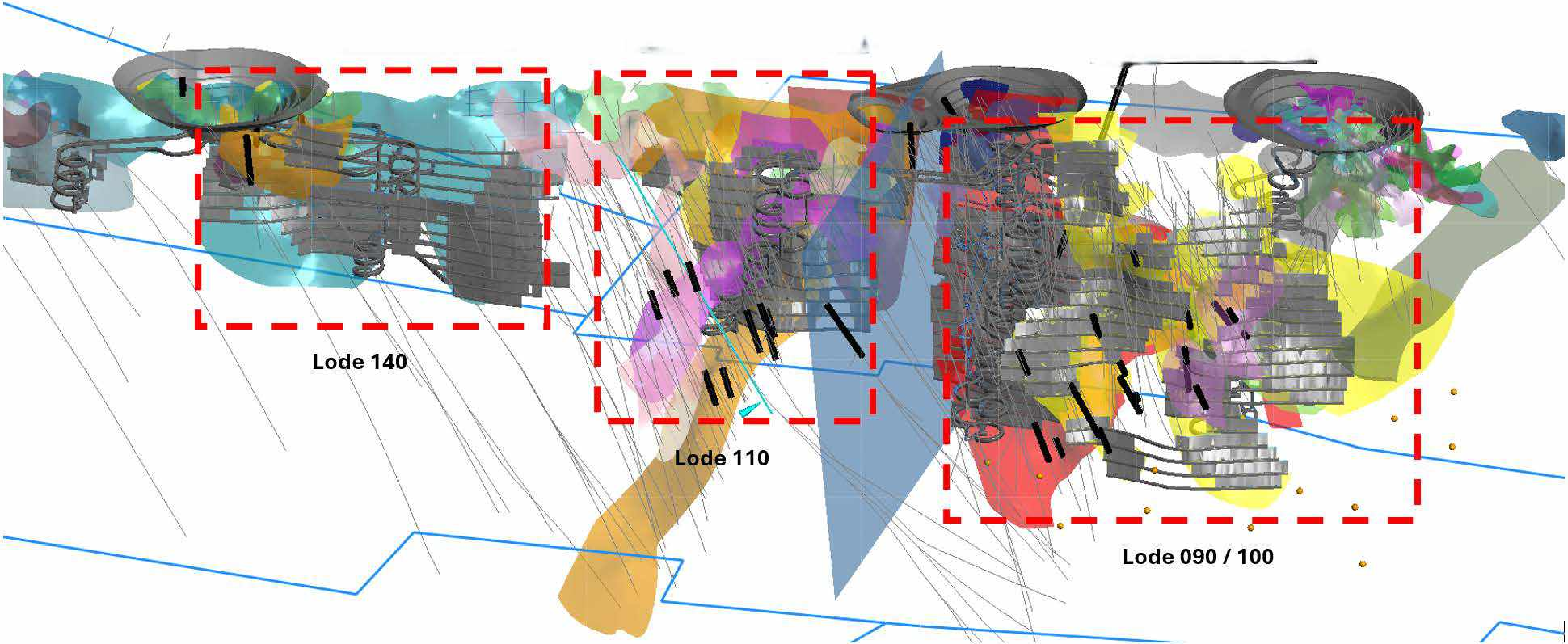
APPENDIX D:

DEPOSIT CROSS SECTIONS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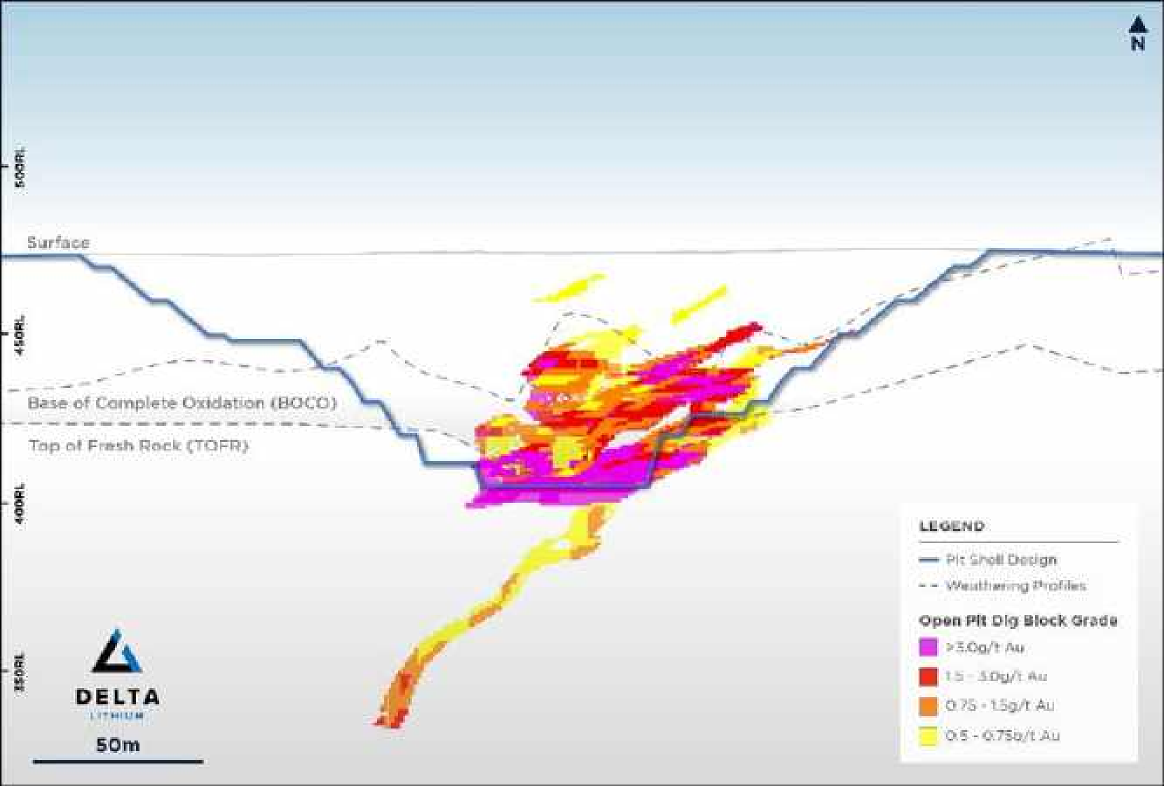
Lode 090 / 100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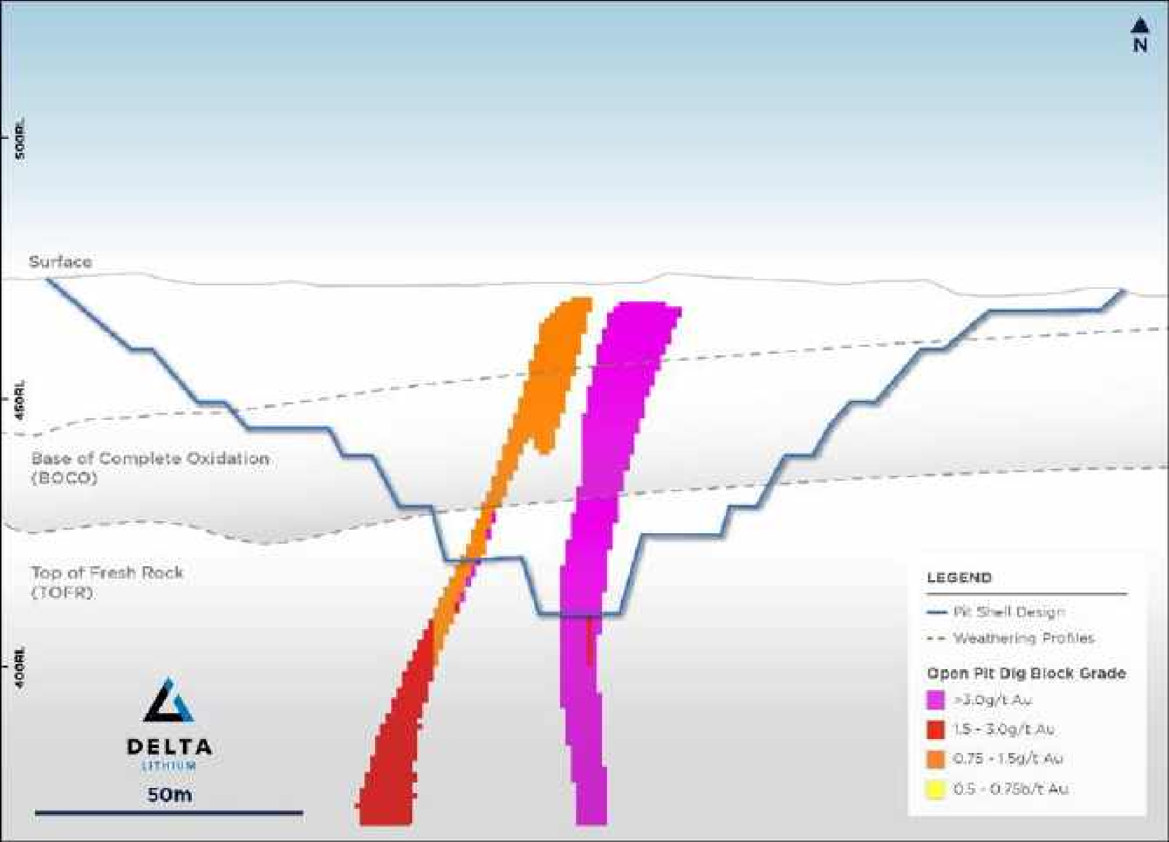
450RL
400RL
350RL
Surface
Base of Complete Oxidation (BOCO)
Top of Fresh Rock (TOFR)
DELTA
LITHIUM
50m
LEGEND
Pit Shell Design
Weathering Profiles
Open Pit Dig Block Grade
>3.0g/t Au
1.5 - 3.0g/t Au
0.75 - 1.5g/t Au
0.5 - 0.75g/t Au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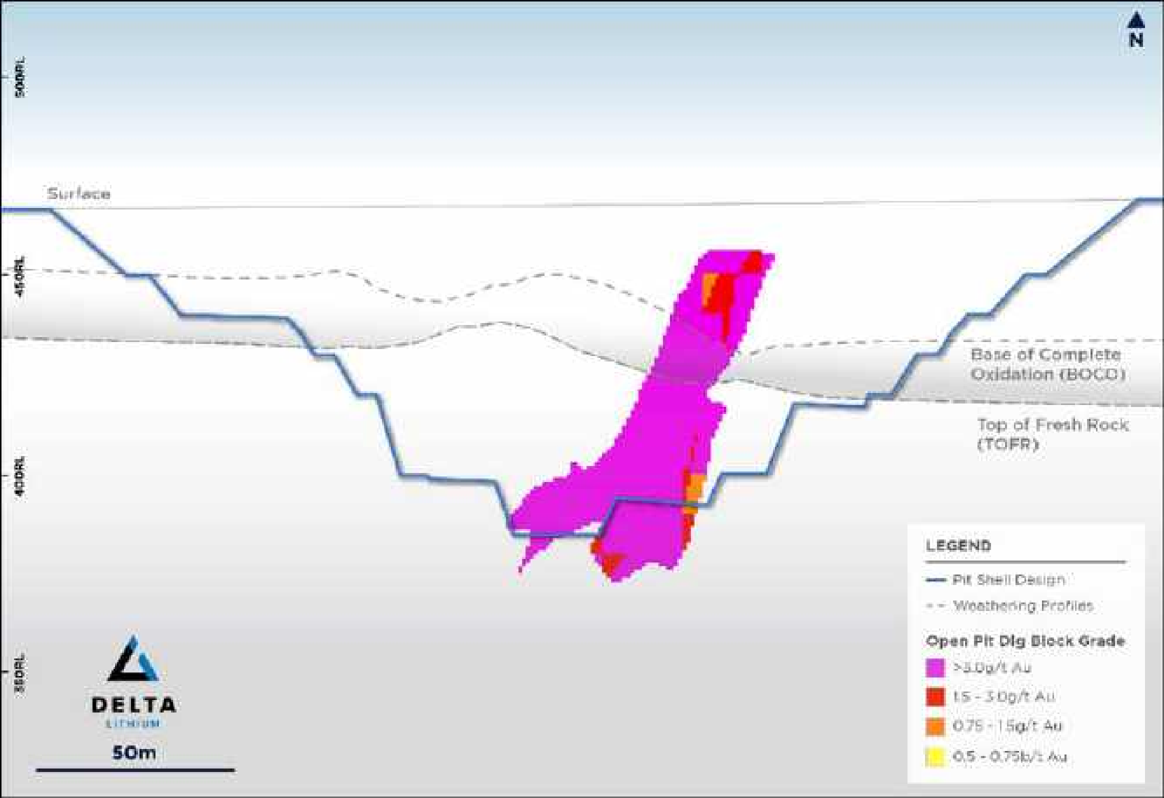
400RL
Surface
Base of Complete Oxidation (BOCO)
Top of Fresh Rock (TOFR)
DELTA LITHIUM
50m
LEGEND
Pit Shell Design
Weathering Profiles
Open Pit Dig Block Grade
>3.0g/t Au
1.5 - 3.0g/t Au
0.75 - 1.5g/t Au
0.5 - 0.75b/t Au


N
500RL
450RL
400RL
350RL
Surface
Base of Complete
Oxidation (BOCO)
Top of Fresh Rock
(TOFR)
LEGEND
Pit Shell Design
Weathering Profiles
Open Pit Dig Block Grade
>3.0g/t Au
1.5 - 3.0g/t Au
0.75 - 1.5g/t Au
0.5 - 0.75b/t Au
DELTA
LITHIUM
50m

APPENDIX E

APPENDIX E:

METALLURGICAL HOLE LIST

MBS ENVIRONMENTAL

Table 1: Summary of the Composite Tailings Samples

Hole ID	Met ID	From	To	Easting	Northing	Weathering
GWV086_005	086MT001	26	27	253550	6778353	Oxidised
GWV086_046	086MT002	28	29	253583	6778315	Oxidised
GWV086_046	086MT003	36	37			Oxidised
GWV086_047	086MT004	32	33	253574	6778310	Oxidised
GWV086_048	086MT005	29	30	253565	6778305	Oxidised
GWV086_049	086MT006	41	42	253557	6778300	Transitional
GWV086_054	086MT007	24	25	253540	6778289	Oxidised
GWV086_058	086MT008	32	33	253583	6778304	Oxidised
GWV086_060	086MT009	48	49	253556	6778286	Transitional
GWV086_061	086MT010	32	33			Transitional
GWV086_061	086MT011	47	48			Transitional
GWV086_063	086MT012	77	78	253553	6778283	Fresh
GWV086_075	086MT013	43	44			Transitional
GWV086_078	086MT014	55	56	253557	6778265	Transitional
GWV086_079	086MT015	49	50	253549	6778258	Transitional
GWV086_079	086MT016	59	60			Transitional
GWV086_091	086MT017	38	39	253635	6778286	Transitional
GWV086_096	086MT018	62	63	253580	6778245	Transitional
GWV086_098	086MT019	65	66	253558	6778243	Transitional
GWV086_100	086MT020	24	25	253639	6778294	Oxidised
GWV086_065	086MT021	32	33	253596	6778301	Oxidised
GWV086_067	086MT022	48	49	253567.29	6778282.1	Transitional
GWV086_069	086MT023	36	37	253554.29	6778275.2	Transitional
GWV086_083	086MT024	30	31	253630	6778296	Oxidised
GWV086_086	086MT025	50	51			Transitional
GWV086_088	086MT026	59	60	253565	6778264	Transitional
GWV086_088	086MT027	71	72			Fresh
GWV086_090	086MT028	51	52	253552.51	6778251.2	Transitional
GWV086_090	086MT029	63	64			Transitional
GWV086_121	086MT030	23	24	253616	6778245	Oxidised
GWV086_122	086MT031	68	69			Transitional

Hole ID	Met ID	From	To	Easting	Northing	Weathering
GWV086_123	086MT032	68	69	253576.24	6778240.6	Transitional
GWV086_125	086MT033	70	71	253566.86	6778233.4	Transitional
GWV086_130	086MT034	20	21	253637	6778260	Oxidised
GWV086_132	086MT035	29	30	253613.48	6778241.5	Oxidised
GCS0029	086MT037	85	87	253568.65	6778223.4	Fresh
GCS0045	086MT038	70	74	253568.65	6778223.4	Transitional
GCS0047	086MT039	30	32	253585.79	6778232.7	Transitional
GCS0047	086MT040	66	72			Fresh
GCS0050	086MT042	76	78	253581.31	6778209.5	Fresh
GCS0052	086MT043	66	69	253599.57	6778219.8	Transitional
GCS0059	086MT044	80	83	253575.48	6778194.9	Fresh
GCS0061	086MT045	61	62	253592.21	6778205	Transitional
GCS0061	086MT046	73	76			Transitional
GCS0066	086MT047	18	19	253636.59	6778229.1	Oxidised
GCS0066	086MT048	38	40			Transitional
GCS0069	086MT049	60	61	253599.27	6778196.5	Transitional
GCS0072	086MT050	38	39	253623.17	6778212	Transitional
GCS0072	086MT051	57	60			Transitional
GCS0074	086MT052	44	46	253640.79	6778222	Transitional
GCS0076	086MT053	77	79	253573.65	6778174.6	Fresh
GCS0080	086MT054	75	76	253613.17	6778187.2	Fresh
GCS0081	086MT055	43	44	253624.86	6778201.1	Transitional
GCS0213	086MT056	63	64	253553.87	6778229.4	Transitional
GCS0213	086MT057	69	70			Transitional
GCS0306	086MT058	69	73	253581	6778221	Transitional
GCS0318	086MT059	72	78	253570	6778212	Transitional
GCS0318	086MT060	94	95			Fresh
GCS0004	086MT061	85	99	253588.4	6778157.92	Fresh
GCS0007	086MT062	104	105	253566	6778177	Fresh
GCS0011	086MT063	89	91	253576	6778130	Fresh
GCS0020	086MT064	125	126	253551	6778169	Fresh
GCS0030	086MT065	129	131	253529.004	6778204.79	Fresh
GCS0005	086MT066	99	106	253591	6778150	Fresh
GCS0006	086MT067	87	94	253578	6778180	Fresh

Hole ID	Met ID	From	To	Easting	Northing	Weathering
GCS0035	086MT068	107	111	253525	6778129	Fresh
GCS0278	086MT069	169	172	253467	6778106	Fresh
GCS0281	086MT070	164	167	253477	6778101	Fresh
GCS0299	086MT071	109	111	253596	6778086	Fresh
GCS0310	086MT072	132	135	253602.94	6778050.64	Fresh
GCS0315	086MT073	118	126	253607	6778069	Fresh
GCS314	086MT074	71	74	253616	6778074	Fresh

APPENDIX 2. Tailings Storage Facility Design Report

18 December 2024

INTEGRATED WASTE LANDFORM TAILINGS STORAGE FACILITY (IWLTSF)

MT IDA PROJECT (GOLD)

WESTERN AUSTRALIA

DESIGN REPORT

Delta Lithium Limited

PER2024-0325AB Rev 1

PER2024-0325AB Rev 1		
Date	**Revision**	**Comments**
6 December 2024	A	Initial draft for internal review
16 December 2024	0	Issued for review by DLI
18 December 2024	1	Issued for submission

[redacted]

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

CMW Geosciences Pty Limited (CMW) has prepared documentation to support an application by Delta Lithium Limited (DLI) to the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) and the Department of Water and Environment Regulation (DWER) for approval to the construction of an Integrated Waste Landform Tailings Storage Facility (IWLTSF) at the Mt Ida Project (Gold) (MTI) in Western Australia (WA).

MTI is located about 85 km northwest of Menzies and 200 km northwest of Kalgoorlie in the Goldfields region of WA. It includes Mining Lease M29/165 where the proposed IWLTSF will be located. The IWLTSF has an approximate centre located at (MGA, Zone 51J) coordinates 6,778,897 m North and 253,792 m East. Future mine pit, process plant and site office areas will likely be located at the higher elevations to the west of the TSF.

The IWLTSF was selected as the preferred option given the early availability of mine waste, the bulk of which could be transported and placed directly in the final location, without the need for double handling the material. The concept of the IWLTSF comprises a tailings storage facility surrounded by the waste rock landform. It is formed by placing controlled, compacted earthworks to form a containment embankment to retain the tailings. Mine waste is placed around the outer edge of this containment embankment such that a void is formed inside the storage. This void allows for further controlled, compacted earthworks around its circumference, which forms the perimeter containment boundary between the tailings and the mine waste.

This style of TSF offers notable environmental and economic advantages. Environmental benefits include progressive rehabilitation of the embankments using nearby waste materials, and reducing rehandling costs during final surface rehabilitation. Economically, it optimises mine waste for embankment construction, reducing capital and operational expenses. Tailings distribution lines can remain in place during construction, unlike conventional methods. Additionally, the design enhances embankment stability due to the waste mass surrounds.

Embankment stability, embankment deformation, seepage, dam break and water balance analyses have been performed to support the design for a maximum crest embankment height of 22 m (RL485 m) above the natural ground levels.

Based on Tables 1 and 2 of the DMP (2013) code, The IWLTSF is assigned a hazard rating of ‘Category 1 - Medium’ based on a maximum embankment height of 21 m (RL483 m). It is assigned a ‘Significant’ consequence category based on ANCOLD (2019) which, for the purposes of design, is upgraded to a ‘High C’ consequence category.

The probability of an embankment failure during the life of the IWLTSF has been assessed as low provided construction and operation guidelines are adhered to, and monitoring and QA/QC analyses are carried out using the proposed instrumentation (monitoring well, vibrating wire piezometer (VWP) and survey prism).

The closure objectives for the IWLTSF are to leave the facility in a safe, stable, erosion resistant and non-polluting state. These will be achieved through the following in the design:

- Downstream slopes of the IWLTSF perimeter embankments will be rehabilitated. The maximum slope angle will be approximately 18^0 or 1(V): 3(H) with no intermediate bench.
- The decant structure will be decommissioned, and the areas ‘sealed’.
- The tailings top-surface will be covered with a layer of non-acid forming (NAF) oxide, transition or fresh mine waste for a minimum thickness of 0.5 m (to be validated with field trials).
- Topsoil to suit local flora species will be applied as part of the cover works.

DLI as the operator of the IWLTSF makes the following commitments:

- The IWLTSF will be constructed in accordance with the specifications and drawings.

- Reference to the Operations Manuals must be made for the operation, maintenance, and monitoring of the IWLTSF. This should include the instrumentation monitoring program associated with the IWLTSF.
- Construction will be supervised and monitored by personnel with experience in this type of construction. Details of construction will be provided in a construction report.
- All investigation and exploration drill holes within the footprint of the IWLTSF are to be sealed prior to construction.
- Independent audits will be performed annually as a minimum.
- A detailed rehabilitation/decommissioning plan will be prepared prior to the decommissioning of the facility. The plan will include where appropriate other studies made in consultation with relevant stakeholders.

The following appendices complete this report:

- Appendix A – Tailings Storage Data Sheet (TSDS) and Explanatory Notes
- Appendix B – Drawings
- Appendix C – Stability, Seepage and Deformation Analyses
- Appendix D – Dam Break Assessment
- Appendix E – Water Balance Analyses
- Appendix F – Geotechnical Investigation Report
- Appendix G – Tailings Testwork
- Appendix H – Hydrogeological Assessment Report
- Appendix I – Scope of Works and Technical Specification Document
- Appendix J – Operations Manual – Staff
- Appendix K – Operations Manual – Management

1.1 Tenure

MTI covers approximately 170 km^2 of the Mt Ida – Ularring Greenstone Belt with multiple granted prospecting, exploration, and mining licences. The majority of the mineral resources are located within Mining Leases M29/2 and M29/165, with the proposed IWLTSF to be located in M29/165 that is valid until 20 December 2036.

1.2 Location

The IWLTSF has an approximate centre located at (MGA, Zone 51J) coordinates 6,778,897 m North and 253,792 m East. It will be located to the east of the historical tailings. Future mine pit, process plant and site office areas will likely be located at the higher elevations to the west of the IWLTSF.

Site location and tenement plans showing the location of the project in WA and IWLTSF in relation to site boundaries are presented on Figure 1.

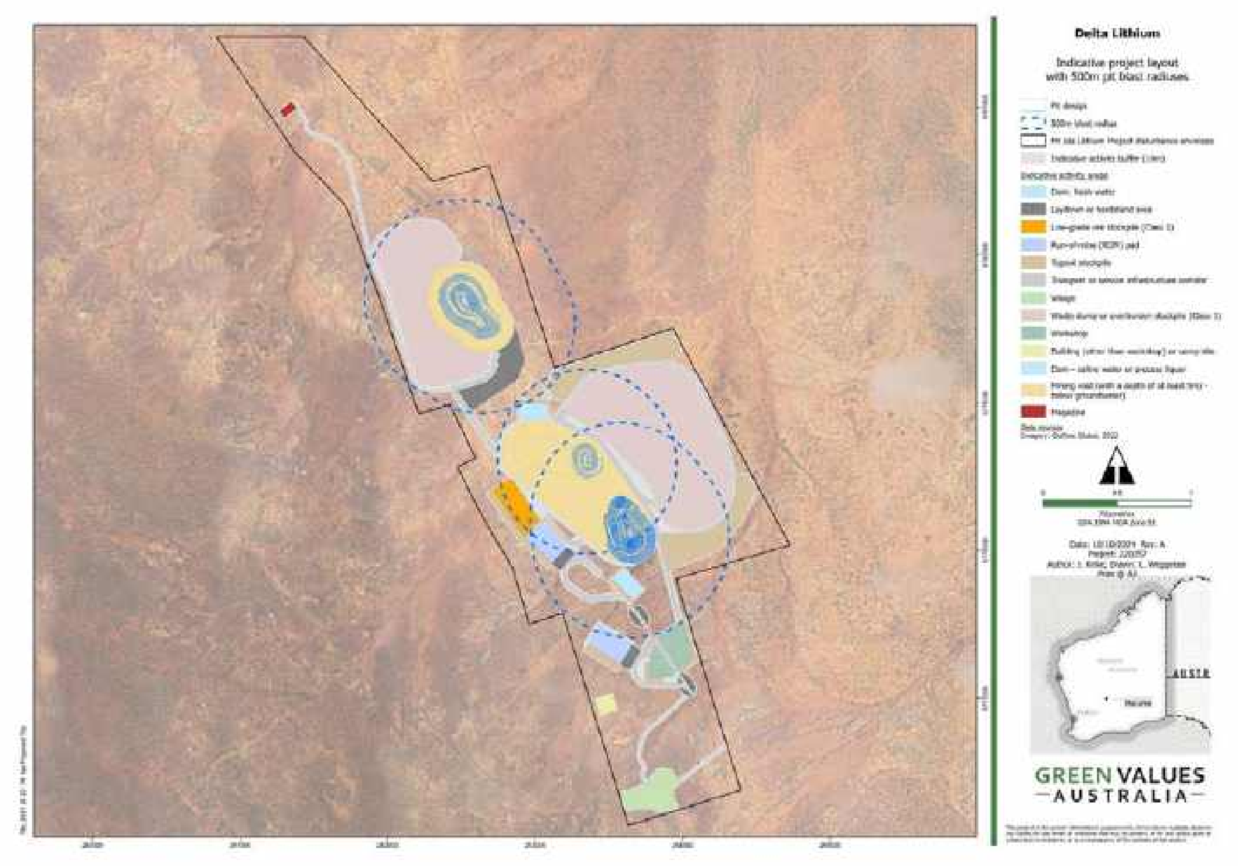


Figure 1: Site and Tenement Plan

1.3 Ownership

MTI is 100% owned by Delta Lithium Limited (ASX: DLI).

1.4 Proposed Operation

MTI is a 'shovel ready' permitted gold project with defined JORC resources. It has the potential for 10+ years of mining operation. The project will have a tailings production of 4 Mt over a life of approximately 6 years.

1.5 History

MTI was acquired from Ora Banda Mining Limited (ASX: OBM) on 3 September 2021.

2 TSF DESIGN CONSIDERATIONS

2.1 Introduction

Details contained in this report were compiled to DEMIRS requirements and in accordance with the following guidelines:

- Department of Mines and Petroleum (2013), '*Code of practice: tailings storage facilities in Western Australia*'.
- Department of Mines and Petroleum (2015), '*Guide to the preparation of a design report for tailings storage facilities (TSFs)*'.

In addition to the DEMIRS documents above, the design presented in this report has been undertaken using ANCOLD guidelines (2019) '*Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure*'. The consequence category will determine the water management (e.g. freeboard and stormwater storage capacity required) and geotechnical embankment design requirements.

2.2 Storage Capacity

Factors that are considered in the IWLTSF design:

- Tailings density of 1.3 t/m^3 (dry);
- Tailings production of 4.0 Mt;
- Storage life for 6 years;
- Tailings deposited at 44.5% solids by weight;
- Tailings beach slope of between 1% to 2%;
- Minimum total freeboard of 0.5 m;

Details of the storage characteristics are further discussed in Section 3.1.3.

2.3 Site Conditions

2.3.1 Climate

The project area has a semi-arid climate with hot summers and mild winters. The following data has been utilised in the design:

- Mean annual rainfall of 151 mm (interpolated from the Bureau of Meteorology (BOM) data for Walling Rock Station 12318 in the year 2020 and Sturt Meadows Station 12176 in 2023).
- Mean annual evaporation of about 2,800 mm (BOM 2005, data for 1975 to 2005).
- Average annual evapotranspiration of about 1,300 mm (BOM 2005, data for 1961 to 1990).
- 1:100 years Annual Exceedance Probability (AEP) event of 72-hour duration, 227 mm (BOM 2016 data for Latitude 29.0875 South and Longitude 120.4625 East).

- Probable Maximum Precipitation (PMP) storm event, 4-hour duration of 630 mm (BOM (2002) '*The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method*').

2.3.2 Flora and Fauna

An RDM (2023c) study indicated that MTI lies within the Eastern Murchison subregion of the Murchison bioregion as outlined by the Interim Biogeographic Regionalisation for Australia (IBRA). The Eastern Murchison subregion covers over 7 million ha and is described as internally draining, with extensive areas of elevated red desert sandplains with minimal dune development (Native Vegetation Solutions, 2022). The bioregion includes broad plains with red-brown soils and breakaway complexes as well as red sandplains. Vegetation is dominated by Mulga woodlands often with ephemerals, hummock grasslands, saltbush shrublands and halosarcia shrublands (Cowan et al. 2001). The region also contains several Salt Lake systems, such as Lake Ballard.

The study concluded that no Priority Flora or Threatened Flora were recorded in MTI. The Department of Biodiversity, Conservation and Attractions (DBCA) database indicated no Threatened and four Priority Flora species to occur within a 10 km radius of the project area. The closest Priority Flora was *Hemigenia exilis*, located approximately 180 m west of the project area.

The study also concluded that no threatened species of fauna existed in MTI. One broad fauna habitat was identified from the assessments within MTI, and this was described as mixed mulga, acacia, and chenopod shrubland. The density of trees and shrubs varies across the area with denser vegetation evident along drainage lines. Disturbed areas are largely devoid of terrestrial vertebrate fauna.

2.3.3 Geology

2.3.3.1 Regional Geology

Regionally, the project area is part of the northern Mount Ida – Ularring Greenstone Belt within the Kalgoorlie Terrance of the Yilgarn Craton.

The area has undergone strong folding and deformation with two large anticlines present within the area; the Mt Ida Anticline and the Kurrajong Anticline with major shear zones located between the anticlines and a noticeable absence of a syncline.

2.3.3.2 Local Geology

The geology of MTI comprises the Copperfield Monzogranite and Kalgoorlie group mafic volcanics. The proposed IWLTSF location will lie within the Kalgoorlie group volcanics, near to its eastern contact with the Copperfield Monzogranite, a large granitoid structure intruded into the centre of a regionally significant anticlinal structure of the Mount Ida greenstone belt.

The Kalgoorlie group is weathered near the surface with saprock extending to about 40 m depth, grading into transition zone rocks which are oxidised along joints and fractures. Stratigraphically westwards, away from the Copperfield granite, the sequence comprises the Meta-amphibolite, Mafic Anorthosite, and Meta-amphibolite; The stratigraphic sequence dips to the west and plunges to the south.

2.3.4 Topography

2.3.4.1 Regional Topography

The regional topography is closely related to the underlying geology. Undulating sandplain areas with occasional granite outcrops are intersected by northerly trending ridges of the greenstone belts. Low-lying valleys carry alluvial sediments and playa lakes. The playa lakes are dry and inundated only during larger rainfall events or rare cyclonic occurrences (RDM 2023c).

2.3.4.2 Local Topography

The general topography of MTI comprises scattered bushland with occasional undulating hills and pit voids from historical mining activities. Elevation ranges from around RL450 m to RL530 m in the southwest and in the middle of the Project area, respectively, with low to moderate relief ridges present to the west from it with elevations rising up to RL560 m. The topographical depressions are associated with the presence of paleochannels occupying relatively expansive and shallow valleys gently undulating from approximately RL440 m to RL370 m towards the local drainage basins north and east of the project site.

2.3.5 Surface Water and Hydrology

MTI is located within the Lake Raeside catchment with a local catchment area of approximately 2.74 km^2 (RDM 2023c). The ground surface slopes gently to the north where a network of ephemeral creeks form. There are no permanent water courses or other surface water features in the area. A small dry watercourse trends northeasterly across the project area. Streamflow occurs only after heavy storms or after persistent low-intensity rainfall. The estimated maximum peak flows for 20%, 5% and 1% Annual Exceedance Probability (AEP) are 5.2 m^3/s, 16.3 m^3/s and 33.4 m^3/s, respectively, based on the Regional Flood Frequency Procedure (RFFP) for the Goldfields by Flavell (2012).

Surface drainage is generally contained in the local creek systems, which eventually flow in years of high rainfall to the salt lakes of Lake Raeside to the northeast and Lake Ballard to the southeast. These lakes are located approximately 40 km from MTI thus due to distance and infiltration only the high rainfall events and years reach the regional lakes. Disturbance in the project area is unlikely to have a significant impact on the regional drainage systems.

2.3.6 Hydrogeology

2.3.6.1 Groundwater Flow and Levels

The Conceptual Hydrogeological Model (CHM) from assessments by CMW (Appendix H) indicates the project location is near the groundwater recharge zone with downward vertical gradients and northerly groundwater flow. The inferred groundwater levels within the project location are approximately 40 m below ground level (mbgl) at between RL430 m to RL420 m and occurring within the bedrock strata.

Given that the IWLTSF will be fully lined with HDPE and will have an underdrainage system, the impact on groundwater from the facility is unlikely. It is expected that should a seepage is to occur from the IWLTSF, which is considered unlikely given it will be lined with HDPE liner at the Stage 1 and Stage 2 Raises, would likely be towards the west as the mine dewatering in the pits will form a groundwater sink.

2.3.6.2 Groundwater Quality

The groundwater of the bedrock aquifer is characterised by high salinity and neutral pH (~7.2). The samples collected as a part of field investigation for potential water supply wells showed high electrical conductivity values and therefore salinity levels calculated to be ranging between 21,000 mg/L (MIPB03) to 22,000 mg/L (MIPB01). Because of high salinity, desalination may be required before being useable for regular industrial and utility purposes.

Sodium and chloride ions are dominant in the groundwater, which also has elevated concentrations of sulphate, manganese and iron.

2.3.6.3 Monitoring Network

A groundwater monitoring network is proposed to comprise four (4) monitoring wells to identify any seepage mounding cross-gradient and downgradient from the IWLTSF (refer to Section 4.3.2). An upgradient location is included to provide a background groundwater quality reference point.

A monitoring program will be developed and include regular assessment of groundwater levels and quality over time, including 6-monthly groundwater sampling to analyse groundwater quality parameters such as pH, electrical conductivity, major ions, and metals. An annual review of the monitoring program will be undertaken to optimise its effectiveness based on observed data and any evolving project conditions.

2.3.7 Seismicity

The project area is located in a region of low seismic risk. The Operating Basis Earthquake (OBE) of 0.09 g, as derived from AS 1170.4 (2007) for 1:475 years AEP of the 'High C' consequence category (refer to Section 3.1.1), has been used in the seismic design of the IWLTSF embankment. The corresponding Maximum Design Earthquake (MDE) / Safety Evaluation Earthquake (SEE) is 0.15 g for 1:2,000 years AEP with a probability factor k_p of 0.17. Further seismic hazard analysis is required to determine the Maximum Credible Earthquake (MCE) related to post-closure of IWLTSF.

2.4 Retaining Structure Properties

The concept of the IWLTSF comprises a tailings storage facility surrounded by the waste rock landform. It is formed by placing controlled and compacted earthworks to form a containment embankment to retain the tailings. Mine waste is placed around the outer edge of this containment embankment such that a void is formed inside the storage. This void allows for further controlled, compacted earthworks around the circumference of the void to form a perimeter containment boundary between the tailings and the mine waste.

The IWLTSF is therefore a robust structure where the primary compacted containment embankment (Zone 1), on which the HDPE liner is to be placed, is independent of the deposited tailings and the IWLTSF derives its structural support from the large mass of mine waste placed around the facility. The inclusion of the HDPE liner to contain the tailings and any leachate, means that the perimeter containment embankments should remain in an unsaturated condition for the life of the facility. Based on the features incorporated into the design it is considered that embankment failure and/or uncontrolled tailings or seepage release, resulting in consequences for the area around the IWLTSF, has a low probability of occurrence.

Appendix I provides the Scope of Works and Technical Specification Document (SoW) which outlines the required properties for the construction materials. The physical properties of the upstream clayey mine waste should be confirmed by laboratory testing as part of the construction.

2.5 Material Properties

2.5.1 Geotechnical

The geotechnical profiles related to the IWLTSF design were established based on the investigation and laboratory testing monitored by L&MGSPL in January 2023 and CMW in December 2023. The findings from the investigations are presented in the geotechnical investigation report ref. PER2023-0213AB Rev 0 (refer to Appendix F) and summarised in the subsections below. The results of the tailings testwork undertaken on an ex-laboratory gold tailings sample are presented in Appendix G and summarised in Section 2.5.1.4.

The stockpiled tailings in the historical tailings location were investigated in December 2023, however these tailings will no longer form a source of borrow/construction materials. Mine waste from the Golden Vale Pit was sampled as these materials are expected to be similar to oxide materials used in IWLTSF construction.

2.5.1.1 TSF Foundation

The subsurface condition at the IWLTSF site can be described as Silty SAND (Unified Soil Classification System or USCS of 'SM') overlying Calcrete, and Saprolite that was retrieved as orange-brown low plasticity CLAY with fine-grained Sand.

Infiltration testing undertaken at the IWLTSF site indicated an average permeability of 6.5×10^{-6} m/s within the upper 15 m of horizon, with an actual range of between 2.0×10^{-5} m/s to 1.5×10^{-6} m/s. It is hence expected that the permeability coefficient of the IWLTSF foundation and basin could be improved to approximately 1 x 10^{-7} to 1 x 10^{-8} m/s by the compaction of the subgrade.

2.5.1.2 Mine Waste

Mine waste materials collected from the Golden Vale Pit, to the south of the proposed IWLTSF site, were assessed to comprise materials that would be described as high plasticity CLAY and medium plasticity Clayey GRAVEL. The materials have a low potential for dispersive behaviour based on an Emerson Class Numbers (ECN) of between 4 and 5. The test results indicate some blending would be required of the mine waste materials with the clay sample having a high clay content and the other samples being gravelly with a fines content of less than 20%.

2.5.1.3 Tailings Slurry

Tailings testwork was performed on a slurry sample at 44.5% solids created in a laboratory. The sample was provided as a 3 kg of Oxide-Transitional tailings sample, and 2 kg of Fresh Tailings sample. These samples were combined to form a combined sample. The testwork included Particle Size Distribution (PSD) with Hydrometer, soil particle density, air drying test, and undrained and drained settling density tests. The tests were undertaken by Western Geotechnical and Laboratory Services (WGLS), a NATA-registered laboratory in November 2024, and the laboratory certificates are presented in Appendix G.

The result of the tests and the implications for the operation of the IWLTSF are summarised as follows:

- The results of the PSD with hydrometer test indicate that the tailings would be classified as SILT with Sand and Clay. The sand particles made up about 20% of the tailings by weight and were noted to be predominantly fine-grained.
- Particle density of 2.76 t/m^3.
- Undrained settling test (UST) inferred up to 44% supernatant water, as a percentage by weight of the slurry water, could become available for recovery after about 2.5 days, with the solids achieving approximately 0.93 t/m^3 dry density over the same period.
- Drained settling test (DST) inferred that the maximum dry density the tailings can achieve would be 1.19 t/m^3. The time it takes for the tailings to settle and achieve the maximum dry density would be about 1.5 days. The DST also inferred up that 24.5 to 33.5% of slurry water could be recovered in decant and underdrainage systems.
- Air drying test (ADT) was carried out to monitor the tailings density subject to a drying temperature of 19^0C to simulate drying of the tailings. The maximum dry density indicated by the ADT was 1.12 t/m^3, achieved from an initial dry density of about 0.62 t/m^3, and a bulk density of 1.39 t/m^3, after about 4 days.

2.5.2 Geochemistry

2.5.2.1 Mine Waste

A geochemistry study has been undertaken for the key rock units to be mined for lithium from the proposed Timoni Pit and Sister Sam Pit (collectively referred to as Baldock Open Pits), which include oxide and transitional materials, and fresh felsic (pegmatites), mafic (anorthosite) and metamorphic (amphibolite) lithotypes. The findings were summarised in a CMW report ref. PER2023-0213AD Rev 0 dated 14 May 2024 (CMW 2024).

It is expected that DLI will commission a new geochemistry study for the gold-bearing ores, and the results of this study will be provided to CMW.

2.5.2.2 Tailings Slurry

DLI has commissioned MBS Environmental to undertake geochemical characteristics analysis for laboratory gold tailings slurry. The tests were carried out using the combination of approximately 3 kg sample of the tailings slurry derived from the Oxide/Transitional deposits, and 2 kg sample from the Fresh deposits.

The results of the geochemistry study will be made available to CMW.

3 TAILINGS STORAGE FACILITY DESIGN

3.1 Introduction

The design objectives for this facility are:

- Optimising the removal of water from the facility and return to the process plant for re-use in processing, which will assist in maximising the in-situ dry density of the deposited tailings.
- Optimising tailings storage capacity by maximising the deposited tailings density (i.e. undertaking cyclic tailings deposition between different locations of spigot) and reducing tailings drying time.
- Reducing environmental impact and maximising water recovery by incorporating an HDPE liner and underdrainage in the design.
- The IWLTSF will also be operated to maximise water recovery.

Drawings PER2023-0325-01 to PER2023-0325-04 provide the general arrangements for the IWLTSF and typical sections and details for the design. The drawings are presented in Appendix B. The Scope of Works and Technical Specification Document (SoW) for construction including the schedules of quantities is included in Appendix I.

3.1.1 Hazard / Consequence Rating

Based on the DMP Code of Practice (2013), the hazard ratings for The IWLTSF have been assessed as ‘Category 1 – Medium’ based on the following:

- An ultimate embankment height of approximately 21 m above the existing ground levels;
- Loss of human life is possible although not expected;
- Temporary loss of assets is possible and economic repairs can be made. No loss of public infrastructure is expected. Operational controls in the IWLTSF Operations Manuals (Appendix J and Appendix K) account for a dam break;
- Loss of IWLTSF storage capacity is possible and repair is practicable;
- Temporary damage to the natural environment including possible adverse effects on flora and fauna;
- Temporary damage to items of heritage or historical value is possible.

Based on the above considerations and Table 1 of ANCOLD (2019), a ‘Medium’ damage is assigned. It is characterised by loss of infrastructure of the order \$10M to \$100M, significant impacts to business, impact area of 5 km^2 or less, impact duration of less than 5 years, and limited effects to heritage items and native flora and fauna. The consequence category for the ‘Medium’ damage with a Population at Risk (PAR) of ≥1 to <10 is ‘Significant’, however, ANCOLD (2019) requires that where there is a potential of one or more lives being lost, the consequence category is to be upgraded to ‘High C’.

3.1.2 Drawings

The following drawings are presented in Appendix B.

Table 1: Drawings	
Title	**Drawing No.**
IWLTSF Plan	PER2024-0325-01
Sections and Details Sheet 1	PER2024-0325-02
Sections and Details Sheet 2	PER2024-0325-03
Sections and Details Sheet 3	PER2024-0325-04

3.1.3 TSF Storage Characteristics

The IWLTSF has been designed to store a minimum of 4 Mt of tailings. At an estimated slurry dry density of 1.3 t/m^3, a storage volume of 3.48 Mm^3 the facility will have a storage capacities of 4.52 Mt which is sufficient to store the gold resource of 4 Mt.

The footprint areas, storage volumes and storage capacities of IWLTSF are shown in Table 2.

Table 2: Storage Capacities

Stage	Crest RL (m AHD)	Area (Ha) of IWLTSF in Lease	Basin Area (ha)	Storage Volume (Mm^3)	Storage Capacity (Mt)
Final	485.0	28.9	25.9	3.48	4.52

3.1.4 Embankment Geometry

The IWLTSF will be formed by the construction of two (2) zones within the waste dump. From the inside, the materials will comprise two zones nominated as 1 and 2. Zone 1 would typically consist of oxide mine waste, moisture conditioned and compacted ‘clayey’ material placed in discrete layers, nominally 300 mm thick, which will form the inner liner. This zone will be nominally 6 m wide with some possible variation in width dependent on the type of construction equipment that is used and any controlling safety criteria. The internal batter slope will be formed at 1:2.5 (V:H). The internal finished surface of Zone 1 has to be suitable to accept the placement of the 1 mm HDPE liner.

The next zone (Zone 2), nominally 30 m wide, supports Zone 1 and will comprise run of mine waste placed in 1 m lifts with a rock limit of 750 mm with sufficient fines to fill any voids. Zone 2 and general run of mine waste provide support for the overall structure.

The general run of mine waste will be constructed based on the adopted mining plan and waste dump configuration, with no particular controls provided by the IWLTSF, with the external batter slopes at a maximum of 1:3.0 (V:H).

The natural subgrade over the base of the facility, after topsoil and any unsuitable materials are removed, will be shaped to form a crossfall across the base to facilitate flows within the underdrainage system. A compacted layer of low permeability clayey material (Zone 1) will then be placed over the base of the IWLTSF prior to placement of the HDPE base liner.

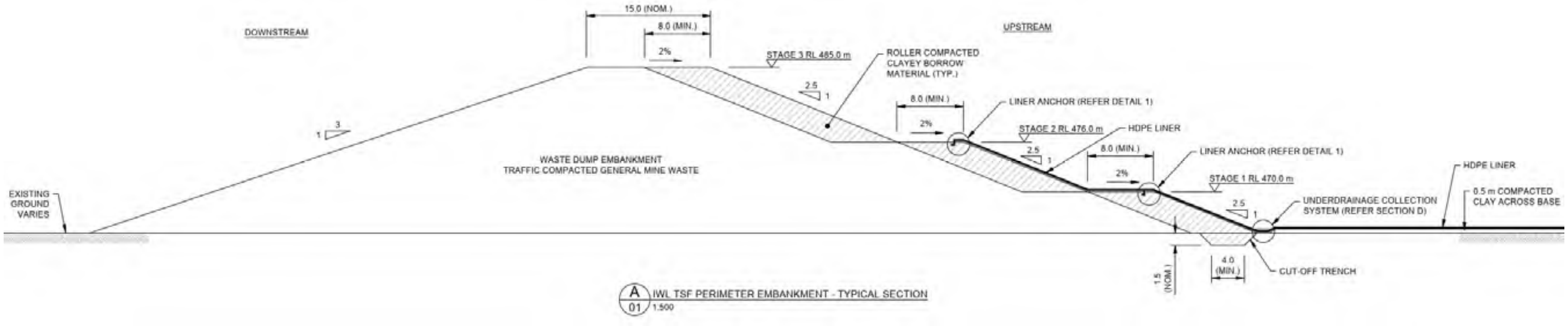


Figure 2: Typical Perimeter Embankment Cross-Section

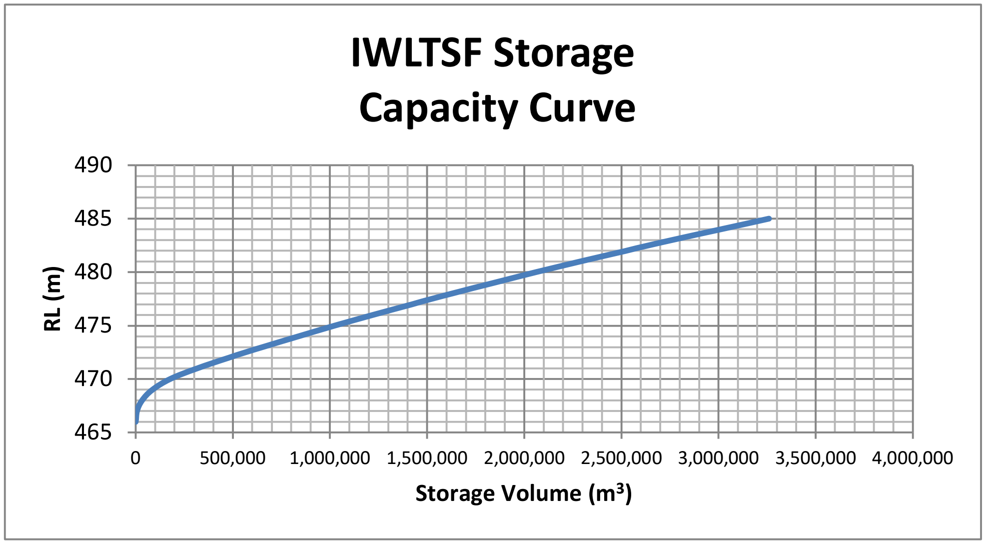


Figure 3: Storage Capacity Curve

3.1.5 Geomembrane

The compacted clay in the starter embankment, Zone 1, which is overlain by the geomembrane (HDPE liner), effectively forms a double liner system.

3.1.6 Underdrainage

The underdrainage water collection system is comprised of Flownet and a protective layer of Bidim A44 geotextile and associated slotted collection pipes placed over the HDPE liner to capture water that percolates through the tailings stack during the operation of the facility.

The underdrainage has been designed with a system capacity of 1.5 L/s or 90 L/min.

3.1.7 Water Recovery System

The decant filter (Zone 3) will ideally comprise hard durable competent rock with a maximum particle size not exceeding 500 mm, preferably 70% passing 200 mm, 20% passing 75 mm and non-plastic fines (silt and clay finer than 0.075 mm), < 3% with a soil particle density greater than 2.5 t/m^3 and preferably geochemically inert. The rock is to be loose placed in lift thicknesses not exceeding 2 m and spread to form a uniform layer. The sizing and performance of the rock ring is governed by several relationships based around the following:

- Cross-sectional area of the rock ring filter (length, height and width of the filter).
- Maximum operating capacity of the water recovery pump, which in turn determines the velocity or flow rate through the filter.
- Internal storage volume of the rock ring which determines the residence time of the water in the filter.

The key to success for an efficient decant filter is having a large cross-sectional area to reduce the flow, such that the sand, silt and clay fractions are unable to remain in suspension. In other words, the flow through the filter has to be very low. Water clarity inside the rock ring and through the rock ring filter is a function of the velocity of the water flow through the rock.

The rock filter can be backfilled with tailings and buried when the IWLTSF is decommissioned/rehabilitated.

3.2 Modelling and Design Studies

3.2.1 Structural Stability

3.2.1.1 Method of Analysis

Stability analyses were undertaken to assess the stability of the IWLTSF embankment up to the maximum Stage 1 and Stage 3 (Final Stage) crest heights of RL 470.0 m and RL 485.0 m (i.e. at the 7 m and 22 m embankment heights, respectively). The analyses were undertaken in general accordance with ANCOLD (2019).

The computer software package ‘Slide’ was utilised to undertake the analyses. Slide is a two-dimensional slope stability program for evaluating the safety factor of circular and non-circular failure surfaces in soil and rock slopes. The stability of the slip surfaces for static and pseudo static (Seismic) loadings was assessed using vertical slice limit equilibrium methods. The GLE/Morgenstern Price method was used in the analyses of circular slip failures.

The design earthquake loads for the IWLTSF embankment (Safety Evaluation Earthquake, SEE (previously MDE) and Operational Basis Earthquake, OBE) were determined by consideration of the consequence category of the tailings storage and are selected as earthquakes with given AEP. ANCOLD (2019) gives guidance in selecting the AEP of the OBE and SEE. This guidance considers ‘defensive’ earthquake design through the use of IWLTSF principles.

Since the IWLTSF is considered as a “High C” consequence category storage, the OBE is 1 in 475 years AEP and SEE is 1: 2,000 years AEP.

The following cases were examined in the stability analyses:

Case 1: Static Analysis - Downstream failure of the northwest (tallest) IWLTSF embankment with crest levels of RL 470.0 m (Stage 1) and RL 485.0 m (Final Stage) under drained conditions based on the limit equilibrium method.

Case 2: Static Analysis - As for Case 1, but with the undrained condition.

Case 3*: Pseudo-Static Earthquake Case - As for case 1, but under seismic loading of PGA of 0.09 g (OBE) corresponds to 1:475 year AEP.

Case 4*: Pseudo-Static Earthquake Case - As for case 1, but under seismic loading of PGA of 0.15 g (SEE) corresponds to 1:2,000 year AEP.

Case 5: Post seismic Case - As for case 1, but embankment strength parameters have been reduced by 20%.

* ANCOLD (2019) recommended deformation analysis, and this is presented in Section 3.5.3. Analyses of Case 3 and Case 4 are presented for screening/completeness. It should be noted that the IWLTSF embankment foundations are not liquefiable and hence post-seismic analyses are not applicable.

The phreatic surfaces adopted in all of the cases were based on the seepage analysis results. Slide uses a 2D finite element analysis to determine groundwater seepage for saturated, steady-state flow conditions. Seepage analyses have considered the scenario with a maximum pond level of 0.3 m below the final crest level, and worst-case phreatic conditions where decant pond is at the embankment and there is damage to the liner resulting in a phreatic surface within the embankment.

The downstream boundary condition was assumed based on the groundwater located at the ground surface level at the downstream toe of the embankment.

3.2.1.2 Parameters

The stability analyses of the embankment were carried out using the effective (c’, Ø’) and undrained (S_u) strength parameters with pore pressures derived from the seepage analyses. The parameters were derived, with a level of conservatism, from the results of past geotechnical investigations and the subsequent laboratory test results. Parameters for the tailings are assumed based on testing of other tailings in the northeast of the Goldfields Region in WA. Table 3 provides a summary of the strength parameters used in the stability analyses.

Table 3: Summary of Strength Parameters (1)

Material Type	ϒ (kN/m^3)	Effective Strength		Undrained Strength
		c’ (kPa)	Ø’ (^{0})	S_u (kPa)
Foundation, upper (soil), compacted	18	0	34	-
Foundation, lower (saprolite)	20	-	-	350
Clayey Mine Waste, compacted	18	5	35	100
Mine Waste, traffic compacted	20	0	40	-
Tailings	20	0	32	$S_u/\sigma_v = 0.25$ (min. 20)
Tailings (liquefied)	20	-	-	$S_u/\sigma_v = 0.1$

Table 3: Summary of Strength Parameters $^{(1)}$

Material Type	ϒ (kN/m^3)	Effective Strength		Undrained Strength
		c’ (kPa)	Ø’ (^{0})	S_u (kPa)

Notes:

1. ϒ – soil unit weight; c’- cohesion; Ø’ - angle of internal soil friction; S_u – undrained shear strength.
2. Vertical stress ratio Su/σ'_v from the assumed top surface of the layer.

3.2.1.3 Results of Stability Analyses

The results of the stability analyses are summarised in Table 4 and the Slide calculation printouts are presented in Appendix C.

Table 4: Results of Stability Analyses

Case	Factor of Safety (FoS) Stage 1	FoS Final Stage	Recommended Min. FoS as per ANCOLD (2019)
1	> 3.00	2.47	1.5
2	> 3.00	2.55	1.5
3	2.39	1.85	1.2
4	1.94	1.56	1.2
5	2.74	1.84	> 1.0

The stability analyses indicate adequate factors of safety for the drained, undrained, pseudo-static and post-seismic conditions when compared with the recommended minimum factors of safety in ANCOLD (2019).

It is to be noted that the extent of the decant pond directly affects the stability of the embankment, especially for long-term cases, and thus it is paramount that tailings deposition be managed so as to prevent prolonged ponding near the embankment (i.e. pond at normal operating conditions of ≥125 m from the perimeter embankment).

3.2.1.4 Deformation Analyses

A preliminary assessment of embankment deformation due to an earthquake was estimated using the Swaisgood (2003) method. This method utilises an empirical formula based on observed crest settlement resulting from analysed ‘real’ earthquakes, with no liquefaction of foundation and embankment materials.

The permanent displacements and settlements expected for a 22 m high embankment were estimated under a magnitude 7.5 earthquake, corresponding with a PGA loading of 0.15 g (site factor of 1.7 x 0.09 g) for 1: 2,000 years AEP for the safety evaluation (SEE) event, appropriate for the consequence category of High C. From the analysis, it was estimated that for the highest embankment section, the deformation due to an SEE event is likely to be in the order of 13 mm. Such deformation is insignificant when compared with a minimum total freeboard of 0.5 m.

3.2.1.5 General Comments with Respect to Stability

An IWLTSF is a robust structure and the factors of safety, which are presented in Table 4, are above the required minimum and reflect this style of the structure.

Stability is significantly influenced by the position of the phreatic surface within the deposited tailings and confining embankment.

The IWLTSF has been designed to provide temporary water storage following extreme storm events. If water does extend to the embankment, which is considered very unlikely, it is anticipated this will be a temporary occurrence given continuous water removal from the IWLTSF. The tailings storage should be operated in such a manner as to ensure that the `normal' supernatant pond is kept well away (≥125 m) from the embankment during normal operating conditions.

3.2.2 Design Acceptance Criteria

The design of the IWLTSF is based on the ANCOLD guidelines (2019) '*Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure*'. The consequence category will determine the water management (e.g. freeboard and stormwater storage capacity required) and geotechnical embankment design requirements. Classification of the IWLTSF, at its ultimate height of 22 m (RL4853 m), in accordance with Tables 1 and 2 of the DMP (2013) code results in a hazard rating of 'Category 1 – Medium' (refer to Section 3.1.1). The ANCOLD (2019) consequence rating is 'Significant' (refer to Tables 1 and 2 of ANCOLD (2019).

Embankment Design analysis should consider:

Operations Phase

- Operating Basis Earthquake (OBE) is 1 in 475 years annual exceedance probability (AEP).
- Safety Evaluation Earthquake (SEE) (previously MDE) is 1 in 2,000 years AEP.

Post Closure

- Maximum credible earthquake (MCE).

Freeboard and Water Management in accordance with ANCOLD guidelines (2019):

- Maximum credible earthquake (MCE).
- Storage of 1:100 years AEP event of 72-hour duration, plus an allowance for wave run-up for 1:10 AEP and 0.3 m of additional freeboard.
- No spillway will be required during operations. Stormwater during operations will be largely reused in the process plant over several weeks to months. Stormwater from large storm events (current PMP of 630 mm) at closure will be primarily disposed of on the top-surface of IWLTSF by evaporation. The requirement for a spillway must be reviewed as part of the closure planning.
- Minimum frequency of IWLTSF inspections in accordance with DEMIRS guidelines.

The results of the design assessments for the IWLTSF indicate that the facility can be safely operated on the basis that:

- Liberated water is continually removed from the surface of the tailings.
- Tailings deposition is cycled around the facility to maximise tailings density and therefore the storage volume.
- The facility will be operated in accordance with the details contained in the IWLTSF Operations Manual (Appendix J and Appendix K).
- The safe operation of the storage relies upon the implementation of the tailings operation, management inspection and maintenance procedures.

The probability of major embankment failure during the life of the IWLTSF is assessed as being extremely low provided that it is constructed and operated in accordance with the design, and the SoW for construction in Appendix I.

3.2.3 Dam Break Assessment

A dam break assessment using energy methods as referenced in K D Seddon (2010) was used to estimate tailings run-out distance. The method presented in the paper assumes the tailings and the embankment are assumed to liquefy and move as a block downstream. This type of dam break has been assessed as much more likely than an embankment breach caused by over topping. The IWLTSF should have sufficient capacity on top of the facility to store the PMP 4 hour event (630 mm).

The height of the block was assumed to be 22 m and the run-out distance a function of the residual shear strength and material density. For a residual shear strength of 7 kPa, the run-out distance was estimated to be up to 450 m.

A Muck 3D dam break assessment was also performed. The tailings run-out was assessed based on:

- Tailings dam break volume of 1.3 Mm^3 (approx. 33% of tailings storage and PMP stormwater volume).
- Tailings slopes of 5%.
- Breach height of 15 m and a minimum breach width of 15m.

Based on the analyses performed using energy methods or Muck 3D, a 'sunny day' dam break could reach the pits to the southwest of the IWLTSF but is not likely to reach the plant site. A 'worst case' dam break involving tailings and storm water is likely to flow the north away from the pit and plant areas. The most likely dam break is shown in Figure 4, below.

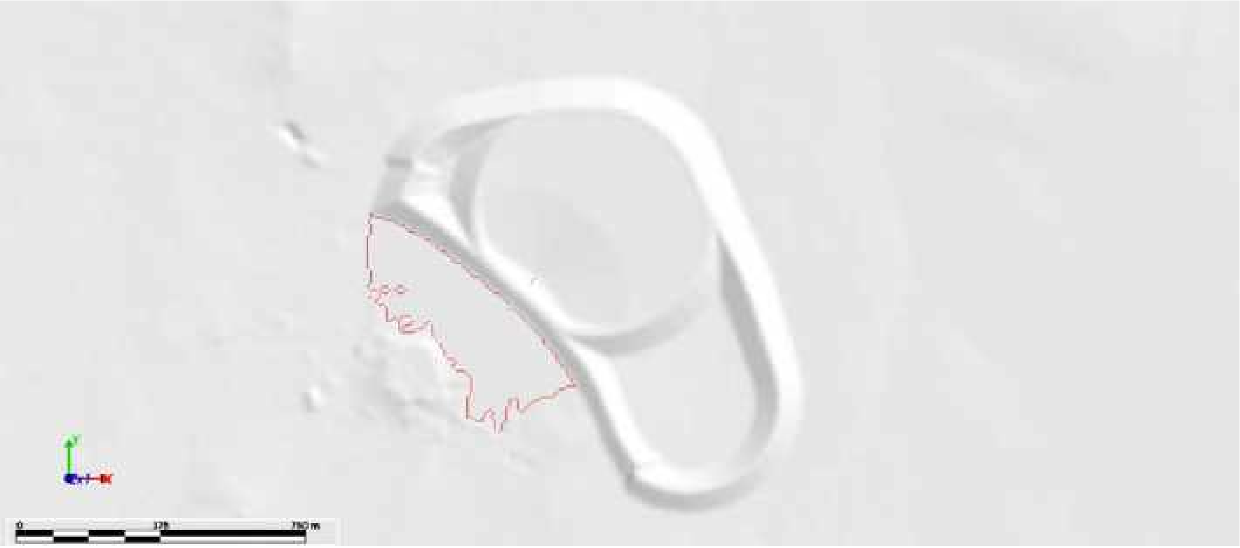


Figure 4: IWLTSF Dam Break Run Out (from Muck 3D)

The calculations of the run-out distances for a sunny day case are presented in Appendix D, along with a detailed plan version of the above figure.

The following consequences of a dam break are considered most likely:

- Loss of human life is possible although not expected. There is potential for loss of life of mining personnel visiting the IWLTSF. The PAR is expected to be below <1.
- Environmental impact with the breach being expected to flow towards the east and north, resulting in the contamination of soils and vegetation, requiring environmental 'clean-up'.

- Economic loss due to mine and plant shutdown, production loss, and repairs of damaged section of IWLTSF and local access roads.

3.2.3.1 Controls

The conditions for the IWLTSF embankment failure to occur would be driven largely by the embankment mass and crest width adopted, the size and extent of the decant pond on the facility, and the magnitude of a trigger seismic event, embankment deformation, the grading of the tailings and saturation of the tailings adjacent to the embankment. Effective management of the decant pond to ensure excess water is continually removed from the IWLTSF will minimise the risk of a perimeter embankment breach and release of saturated tailings.

TSF embankment failure is not expected provided the facility is operated in accordance with the IWLTSF Operations Manual (Appendix J and Appendix K).

The water recovery system, pumps and piping must be designed for a minimum recovery of not less than 83 tph (54% water return plus removal of a 1:100 years AEP 72-hour storm) for the IWLTSF including the additional capacity needed to recover water from design storm events.

In the event that the IWLTSF is in imminent danger of failure and breach, the Emergency Response Action Plan (ERAP), in the IWLTSF Operations Manuals, would need to be enacted.

3.2.4 Erosion Control

The risk of erosion of internal walls is negligible, as the IWLTSF is to have HDPE-lined embankments. There is potential for erosion from the external embankment, although this is likely to be negligible, given that these embankments will be shaped and rehabilitated during the operation.

3.2.5 Seepage Analyses

The IWLTSF will be HDPE lined in the first and second stages of construction. Seepage from a HDPE lined storage is typically through defects in the liner with minor leakage through the liner due to permeation. Based on North American standards for waste impoundment liners of 20 gallons per acre per day (or approximately 190 L/ha/day), the IWLTSF with a basal area would have a leakage of 2,850 L/day (CMW 2023). Based on a paper by Giroud and Bonaparte (1989) this leakage rate would be caused by 7, 2 mm defects in the basal liner or 57, pin holes (0.3 mm size defects) (CMW 2023). With the adoption of adequate QA/QC procedures for liner installation, leakage through the liner due to defects is expected to be significantly less than 2,850 L/day.

3.2.6 Water Balance

Water balance analysis for the proposed IWLTSF operation has been undertaken using a spreadsheet to examine expected inflows and outflows.

Inflows and outflows for the facility were estimated on a monthly basis. Inflows include rainfall and slurry water. Outflows include evaporation, seepage losses and water retained in tailings (pore water). Water balance calculations are included in Appendix E.

Assumptions and other data adopted for the water balance are listed below:

- Rainfall data interpolated from the Walling Rock and Sturt Meadows stations, WA totalling 151 mm.
- Evaporation data of approximately 2,800 mm.
- Evapotranspiration of approximately 1,300 mm.
- Tailings areas of approximately 20 ha.
- Runoff coefficients of 1.0 (tailings) and 0.6 (catchment).
- Pool area approximately 100 m radius.

- Running beaches equal to approximately 5% of the tailings area.
- Evaporation pan factor of 0.7.
- Tailings residual moisture content of 40% corresponding to average in-situ density of 1.3 t/m^3 (dry).
- Tailings slurry density of 44.5% solids.
- Tailings production rate of 0.67 Mtpa.
- Seepage rate through IWLTSF flow <1 m^3/day.

The results of the analysis indicate potential annual average water returns of about 54% of the tailings slurry water deposited into the facility can be expected under average climatic conditions during the operation of the IWLTSF.

The results also indicate that water recovery will vary according to the management of the facility, specifically the size of the pond and running beaches. The actual quantity of water available for return to the plant may vary from the figures presented based on the following factors:

- Variations in slurry density.
- Continuity of tailings discharge.
- Distance between the discharge point and decant pond.
- Size of the decant pond and running beaches from where evaporation is greatest.
- Climatic conditions at the time of operation.
- The efficiency of the decant system during operation.

The efficacy of the water return system is the key to achieving a higher in-situ tailings dry density within the IWLTSF. The minimum capacities of the water recovery system should be not less than 83 tph including the additional capacity needed to recover water from the IWLTSF due to design storm events.

3.3 Design and Construction Details

The footprint of the IWLTSF embankments and adjacent waste dump footprint area will be cleared of vegetation. The topsoil from the expanded embankment footprint will be stripped to a nominal depth of 100 mm.

The downstream waste zone (i.e. the downstream zone or waste dump) will be built continuous to the final height utilising the mining fleet. The design provides for the IWLTSF upstream zone and liner works to be built in stages. A civil contractor would likely construct the upstream clayey waste zone from materials within the waste dump footprint (i.e. this will provide the mine with flexibility as the clayey waste zone materials can be scheduled for specific construction periods). Timing of the staged works should be scheduled in order to meet the mine waste movement requirements and construction is well ahead of tailings deposition with the embankments having adequate freeboard. Construction of the IWLTSF embankment should be integrated with ongoing mine planning, to ensure that use of mine waste in the construction of the downstream zone is optimised as materials are available in accordance with the scheduled mine waste movements. Figure 5 shows the movement of waste in tonnes over the first year or so of mining. A total of 7.3 Mt or approximately 3 Mm^3 of oxide/transitional waste will be mined in approximately 15 months.

Figure 5: Mine Waste Cumulative Tonnes

It will also be necessary to ensure that planning of upstream (or inner) clayey zone embankment lifts, is coordinated with planned downstream (or outer) mine waste zone embankment construction as the waste zone has to be in place prior to the placement of any upstream (inner) clay zone materials since the downstream mine waste zone provides support for the inner, upstream low permeability zone.

The construction will also include the following items:

- Construction of a decant accessway and tower structure including a cushion layer over the HDPE liner.
- Installation of the liner over the IWLTSF basin and on the embankment batters (Stages 1 and 2 only).
- Installation of underdrainage system, and a lined sump in Stage 1 construction.
- Safety windrows and sheeting of the embankment crests.
- Installation of instrumentation including groundwater monitoring wells.
- Following embankment completion (each stage):
    - Installation of slurry pipelines and spigots.
    - Installation of return water pipeline and decant pump.
    - Ancillary systems such as electrical systems and telemetry etc.

The drawings for the IWLTSF are attached in Appendix B and the Scope of Works / Technical specifications for Construction is attached in Appendix I.

3.4 Tailings Discharge and Water Management

The following operational considerations have been incorporated into the design:

- Tailings in the form of slurry will be discharged sub-aerially and cyclically into the IWLTSF in thin discrete layers, not exceeding 0.3 m thickness, in order to allow optimum density and strength gain by subjecting each layer to a drying cycle. Deposition will take place via multiple spigots located on the upstream perimeter embankment crest.
- The tailings have rapid settling characteristics hence some experimentation will be required on the number of spigots to be utilised during deposition. If too many spigots are open, the tailings will tend to deposit near the embankment. If this occurs, single-point discharge practices may be required from time to time to force the tailings away from the embankment.
- Spigotting of tailings is to be carried out such that a beach is developed to force the supernatant pond to be maintained within and around the decant structure. The pond is to be maintained away from the perimeter embankments at all times.
- Water will be removed from the facility and pumped back to the processing plant via a decant structure comprised of slotted concrete well liners with select filter rock surround. The recommended average water recovery should not be less than 83 tph.
- The tailings basin will assume the form of a truncated prism with a depressed cone on the top surface. The facility will have the capacity to store a considerable volume of water during a storm event. The minimum freeboard for the IWLTSF under normal operating conditions is 0.5 m, plus an allowance for the temporary storage of the 1:100 years or 1% average exceedance probability (AEP) storm event of 72-hour duration whilst maintaining the required total freeboard (Section 4.1.2).
- On eventual decommissioning, the facility will remain as a permanent feature of the landscape and drain to an increasingly stable mass. The top surface and batters will be stabilised and rehabilitated as described in Section 5.

3.5 Design Floods

The IWLTSF will have water inflow into its basin by incidental rainfall only. It has been designed such that a 1:100 years AEP, 72-hour duration rainfall depth of 227 mm can be temporarily stored within the facility.

Additionally, diversion bunds to the south and east of the IWLTSF will divert surface runoff away from the IWLTSF site and into the existing drainage path to the east and north of the IWLTSF site (refer to drawing PER2023-0213-01 in Appendix B), thus the embankments will not require additional erosion protection against the probable maximum flood (PMF) and the estimated maximum peak flows for 20%, 5% and 1% Annual Exceedance Probability (AEP) are 5.2 m^3/s, 16.3 m^3/s and 33.4 m^3/s, respectively.

3.6 Quality Assurance

The SoW document for the IWLTSF is attached as Appendix I. This document specifies the responsibilities, procedures, and quality control tests which verify that the IWLTSF retaining structure has been constructed in accordance with the design intent.

4 OPERATIONAL REQUIREMENTS

4.1 Management of Tailings Deposition and Water

4.1.1 Discharge Management and Decant Control

A summary of the operations design for the IWLTSF is presented in Section 3. DLI must implement the IWLTSF Operations Manuals (Appendix J and Appendix K) for MTI which include the operating procedures, inspection criteria, monitoring requirements and log sheets for the facility.

The following routine inspection and maintenance procedures are to be carried out for the various components of the system. A minimum of one inspection is to be undertaken during each shift by an operator or shift supervisor.

The inspections should cover:

- The pipelines (tailings delivery line and water return lines) to and from the IWLTSF.
- Leak detection.
- Pumps.
- Valves.
- Discharge locations.
- Location and size of the decant pond.
- Decant and return water pumps.
- Seepage collection pipe flow and pumps.
- Seepage downstream of IWLTSF.
- The general integrity of the embankment i.e. any new cracking (daily).
- Any changes to existing cracking or seepage.

A monthly independent inspection should also be performed by senior site management. The operation, safety and environmental aspects should be periodically reviewed during an annual audit inspection by a suitably experienced and qualified engineer.

4.1.2 Freeboard

The following considerations for the IWLTSF were made regarding freeboard criteria and requirements for the 'High C' consequence category IWLTSF (Section 3.1.1) based on ANCOLD (2019):

- The proposed IWLTSF has been designed such that a 1:100 years AEP, 72-hour duration storm event can be temporarily stored on top of the facility. The design, however, assumes correct operational controls are adhered to and that water is continually removed from the facility, such that minimum freeboard allowances are maintained.
- Provision of a minimum of 0.5 m freeboard comprising a minimum operational freeboard (vertical height between the tailings beach and embankment crest) of 0.3 m plus a minimum beach freeboard of 0.2 m and the allowance for the 1:100 years AEP, 72-hour event of 0.3 m.

ANCOLD guidelines (2019) also recommend an allowance for wave run-up for 1:10 AEP wind for a 'High C' consequence category IWLTSF (refer to Section 3.2). However, it is expected that with perimeter tailings deposition and an expected beach slope of 1% to 2%, the separation distance between the perimeter embankments and the design storm pond will be adequate to prevent wave action reaching the embankments.

Freeboard nomenclature is illustrated in Figure 6. Intensity-frequency-duration (IFD) data pertaining to the site is presented in Figure 7. From the chart presented in Figure 7, a 1:100 years AEP, 72-hour duration rainfall depth of 227 mm was adopted for the design. Temporary storage of stormwater volumes of approximately 56,750 m^3 (i.e. approx. 25 ha x 227 mm) on top of IWLTSF, were considered in the design. These stormwater volumes will occupy less than 25% of the IWLTSF basin. The IWLTSF also has sufficient capacity to contain the probable maximum flood (PMF) of approximately 157,500 m^3 (i.e. 25 ha x 630 mm).

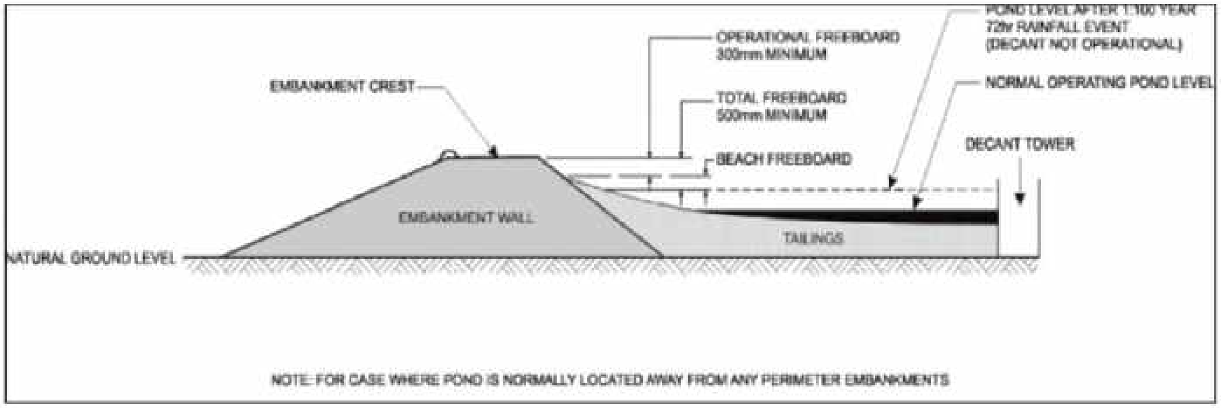


Figure 6: Freeboard Nomenclature

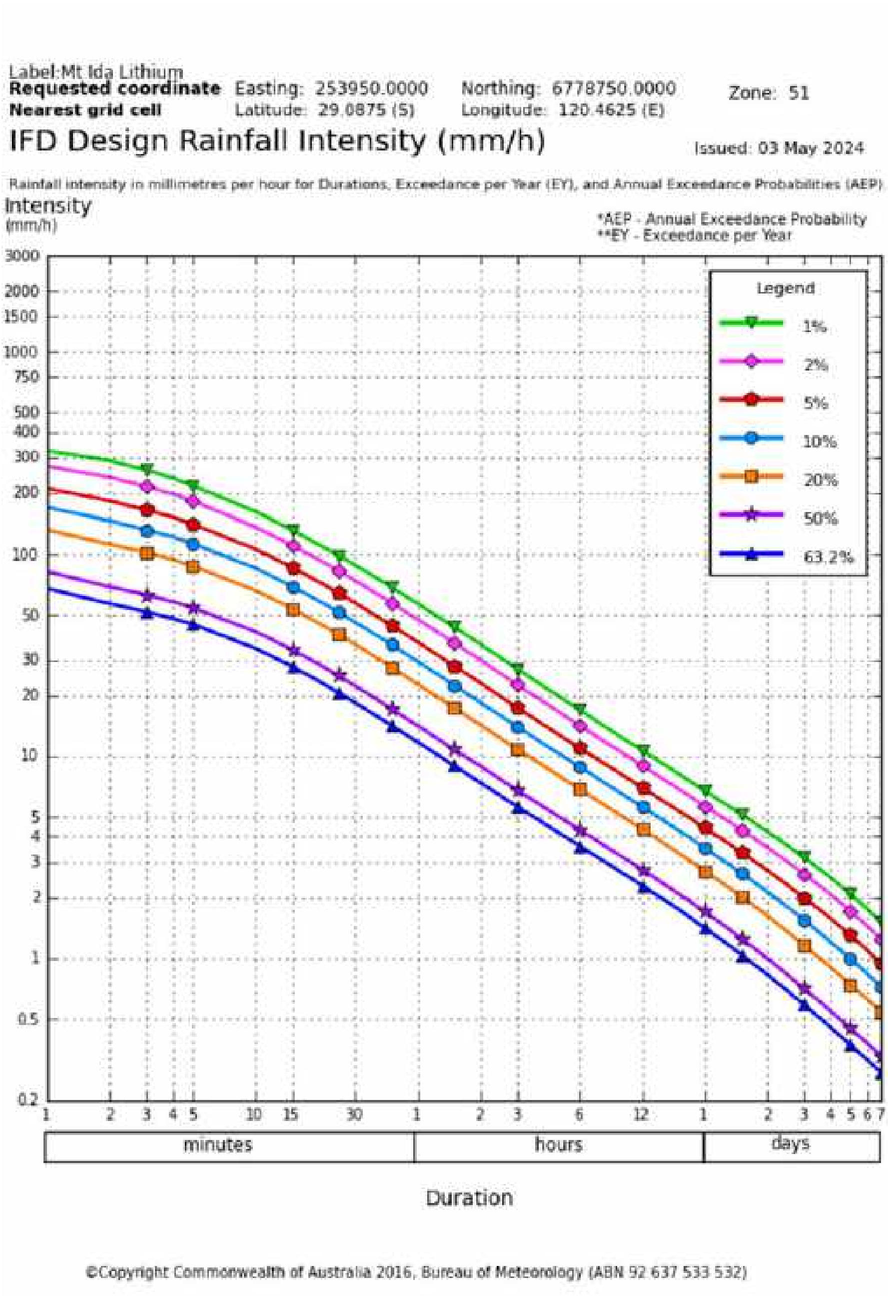


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Figure 7: IFD Data

4.2 Dust Control

Provision for the construction work will include a water cart on location to provide dust suppression as required. This control measure will prevent dust from becoming airborne and subsequently being mobilised into the surrounding environment, from becoming a visibility issue, or from becoming a respiratory hazard for construction personnel.

If dust generation becomes an issue (i.e. in periods the IWLTSF may be inactive), the tailings beach could be irrigated (i.e. by discharge from spigots, with sprinklers or similar) or tailings deposition managed such that beach areas do not dry back to such an extent that dust generation occurs.

4.3 Performance Monitoring and Instrumentation

The existing monitoring/recovery bores may be supplemented with additional bores along strike to monitor the potential flow paths which are controlled structurally and lithologically by fractured rock.

The standing water levels in the bores will continue to be monitored on a monthly basis. Water samples will be taken every six (6) months from the monitoring bores located around the facilities to check pH, TDS and WADCN.

4.3.1 Emergency Response Action Plan

TSF Operations Manuals provide a description of the operating procedures for the facility and include an Emergency Response Action Plan (ERAP). The ERAP for the process plant and IWLTSF is to be established based on the dam break assessment presented in Section 3.2.3. The ERAP will be reviewed and updated as a minimum on a yearly basis.

The ERAP should include but not be limited to:

- Management responsibilities and emergency coordination.
- Muster points.
- Seeking specialist geotechnical advice.
- Emergency Plan Triggers:
  - Freeboard less than design values;
  - Elevated levels in VWP and monitoring well;
  - Excessive movement of the survey prism (i.e. more than 20 mm in a month).
  - Significant embankment distress;
  - Imminent overtopping.

5 CLOSURE CONSIDERATIONS

5.1 Overview

Once the tailings surface in the IWLTSF has reached the proposed design tailings level, RL485 m, rehabilitation of the facility may start. The primary consolidation process will be reasonably quick, taking place as the tailings are deposited (refer to Section 2.5.1)

The closure objectives for the IWLTSF are to leave the facility as a safe, stable, erosion resistant and non-polluting landform.

5.2 Decommissioning

At the completion of the project, the tailings lines will be flushed and removed. The decant water recovery pump and the water return lines will also be removed.

5.3 Rehabilitation

Environmental management and rehabilitation plans to be implemented at the completion of the project or the ultimate filling of the IWLTSF at a later stage, will include:

- Monitoring of the level of the tailings surface following the completion of the last tailings deposition cycle.

- Monitoring the formation of the crust following the completion of the last tailings cycle. This monitoring may comprise moisture and density monitoring, as well as shear strength testing as appropriate, to ensure cover placement can be safely executed.
- The top surface of the storage may be capped with a layer of competent fresh mine waste rock (0.5 m nominal thickness) to prevent dust generation.

The source of the capping materials will comprise NAF mine waste from the adjacent waste rock dumps, where the volume of available materials available is significantly greater than the volume of materials required for capping.

Cover construction can be commenced once the tailings surface has sufficiently consolidated to safely permit access to earthmoving equipment. Rehabilitation/decommissioning (closure) plans will be continually updated by NGFL to incorporate successful procedures identified in site-specific trials throughout the life of the project.

5.4 Performance Monitoring Against Closure Criteria

Settlement monitors will be installed and checked on an annual basis to track surface settlement against predictions.

Rehabilitated areas will be monitored to ensure vegetation is establishing and the area is tracking towards closure.

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Appendix A:
Tailings Storage Data Sheet (TSDS) and Explanatory Notes

TAILINGS STORAGE DATA SHEET

Project operator: Delta Lithium Limited (DLI)			
Project name: Mt Ida Project (Gold) (MIT)		Date: December 2024	
TSF name: IWLTSF		Commodity: Gold	
Name of data provider: DLI / CMW		Phone: +61 8 6109 0104	
TSF centre co-ordinates: (WGS84) 29° 5' 55'' South , 120° 27' 44'' East and 29.09 South and 120.47 East			
Mining Tenement and Holder(s) details: M29/165			
TSF data			
TSF status: Proposed			
Type of TSF: [1] Integrated Waste Landform		Number of cells: [2] 1	
Hazard rating: [3] Medium		TSF category: [4] 1	
Catchment area: [5] 29 ha		Nearest water course: None – ephemeral flows	
Date deposition started (mm/yy): 2025 (planned)		Date deposition completed (mm/yy): 2030 (planned)	
Tailings discharge method: [6] multi-spigots		Water recovery method: [7] pumped central decants	
Bottom of facility sealed or lined? [✓ Y] / N		Type of seal or liner: [8] HDPE lined	
Depth to original groundwater level m below GL: ≥40		Original groundwater TDS mg/l: -	
Ore process: [9] -		Tailings Deposition rate Mtpa: [10] 0.67	
Impoundment volume (present) m^3: -		Expected maximum m^3: 3.5 M approx.	
Mass of solids stored (present) tonnes: -		Expected maximum tonnes: 4.5 M approx.	
Above ground facilities			
Foundation soils: silty sand over calcrete/schist		Foundation rocks: granite / greenstones	
Starter bund construction materials: [11] oxide mine waste		Wall lifting by: mechanical	
Wall construction method/materials: -		Wall lifting material: [12] oxide mine waste	
Present maximum wall height agl m: [13] -		Expected maximum m: 25	
Crest length (present) km: -		Expected maximum km: 1.9	
Impoundment area (present) ha: -		Expected maximum ha: 28	
Below ground (in-pit) facilities N/A			
Initial pit depth (maximum) m:		Area of pit base ha:	
Thickness of tailings (present) m:		Expected maximum m:	
Current surface area of tailings ha:		Final surface area of tailings ha:	
Properties of tailings and return water			
TDS mg/l: 10,000 (average)	pH: 10 – 11	Solids content: 44.5%	Deposited density t/m^3: 1.3
Potentially hazardous substances: [14] None	WAD CN mg/l: -		Total CN mg/l: -
Any other NPI listed substances in the TSF? [15] Y / N: N			

Explanatory notes for completing tailings storage data sheet

The following notes are provided to assist the proponent to complete the tailings storage data sheet.

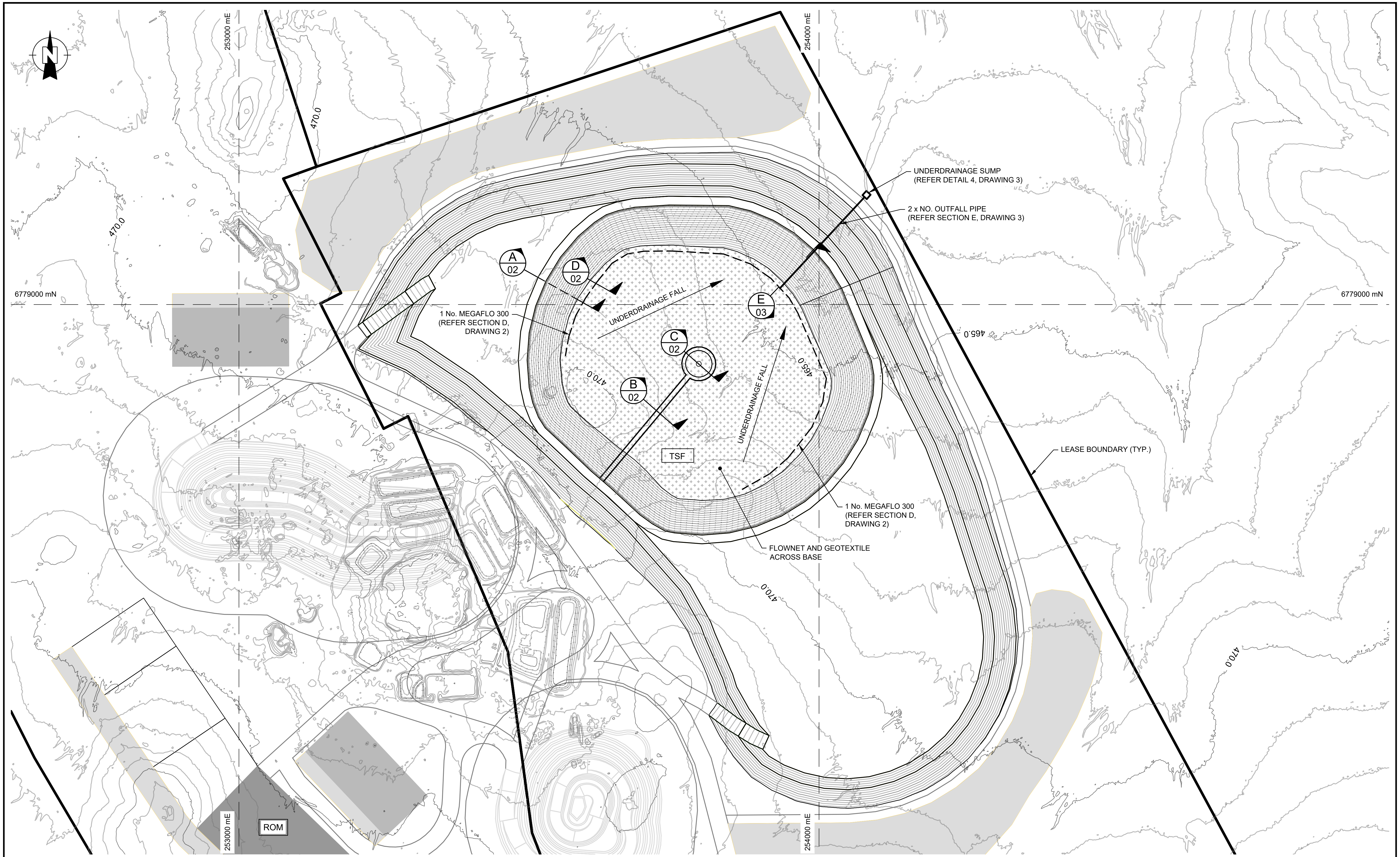
1. Paddock (ring-dyke), cross-valley, side-hill, in-pit, depression, waste fill, central thickened discharge, stacked tailings
2. Number of cells operated using the same decant arrangement
3. See Table 1 – Hazard rating system in the Code of practice
4. See Table 2 – Matrix of hazard ratings in the Code of practice
5. Internal for paddock (ring-dyke) type, internal plus external catchment for other facilities
6. End of pipe, (fixed), end of pipe (movable) single spigot, multi-spigots, cyclone, central thickened discharge (CTD)
7. Gravity feed decant, pumped central decant, floating pump, wall/side mounted pump
8. Clay, synthetic
9. See list below for ore process method
10. Tonnes of solids per year
11. Record only the main material(s) used for construction, e.g. clay, sand, silt, gravel, laterite, fresh rock, weathered rock, tailings, clayey sand, clayey gravel, sandy clay, silty clay, gravelly clay or any combination of these materials
12. Any one or combination of the materials listed under item 11 above
13. Maximum wall height above the ground level (not AHD or RL)
14. Arsenic, Asbestos, Caustic soda, Copper sulphide, Cyanide, Iron sulphide, Lead, Mercury, Nickel sulphide, Sulphuric acid, Xanthates, radioactive elements
15. NPI – National pollution inventory (contact Department of Environmental Protection for information on NPI listed substances)

Ore process methods

The ore process methods may be recorded as follows:

Acid leaching (Atmospheric)
Acid leaching (Pressure)
Alkali leaching (Atmospheric)
Alkali leaching (Pressure)
Bayer process
Becher process
BIOX
Crushing and screening
CIL/CIP
Flotation
Gravity separation
Heap leaching
Magnetic separation
Ore sorters
Pyromet
SX/EW (Solvent extraction/Electro wining)
Vat leaching
Washing and screening

Appendix B: Drawings



NOTES:

1. CONTOURS GENERATED FROM CLIENT SUPPLIED FILE: Menzies_50cmContours
2. COORDINATE SYSTEM: MGA ZONE 51, GDA94

1:6000 0 60 120 180 240 300 m

Land & Marine Geological
Services Pty Ltd (L&MGSPL)

CMW Geosciences

CLIENT: **DELTA LITHIUM LIMITED (DLI)**

PROJECT: **MT IDA PROJECT - GOLD**

TITLE: **TSF PLAN**

DRAWN: DE

CHECKED: CL

REVISION: 0

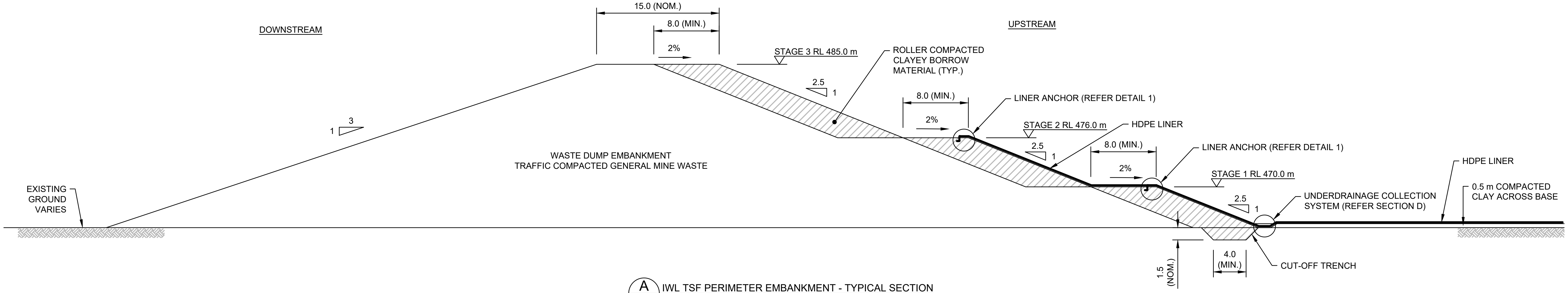
DATE: 18.12.24

PROJECT: PER2024-0325

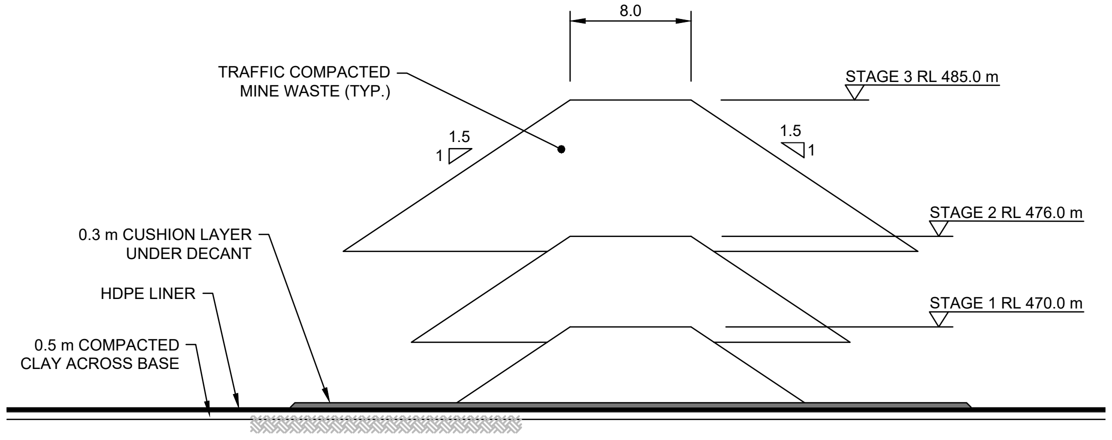
DRAWING: 01

SCALE: 1:6000

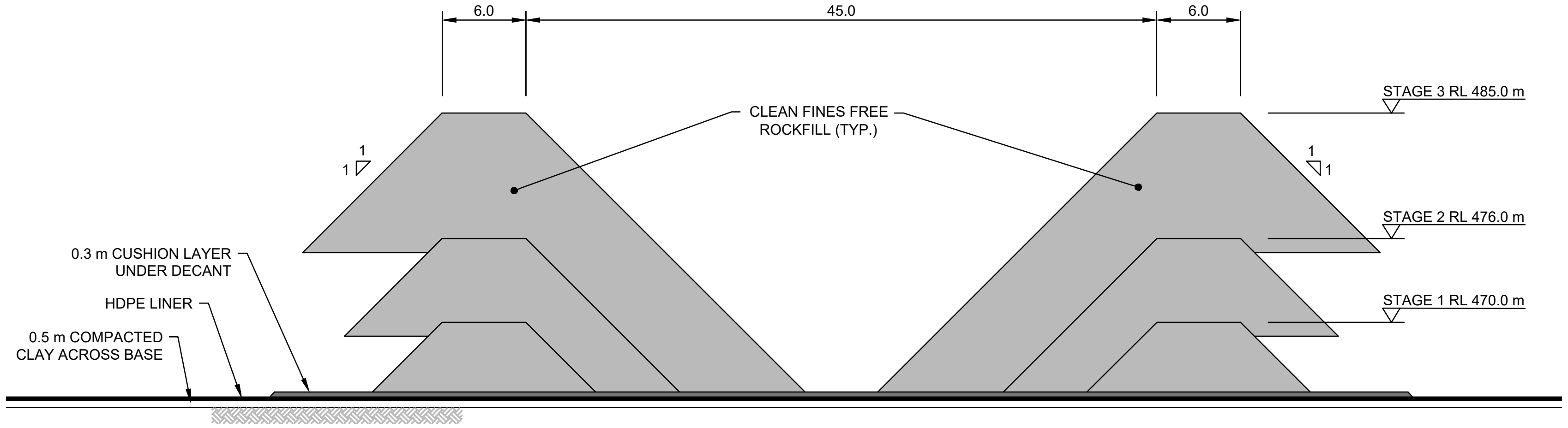
SHEET: A3 L



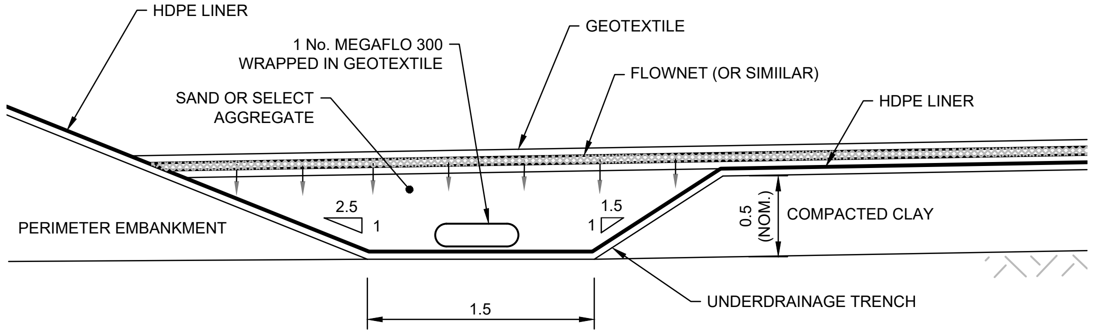
A IWL TSF PERIMETER EMBANKMENT - TYPICAL SECTION
01 1:500



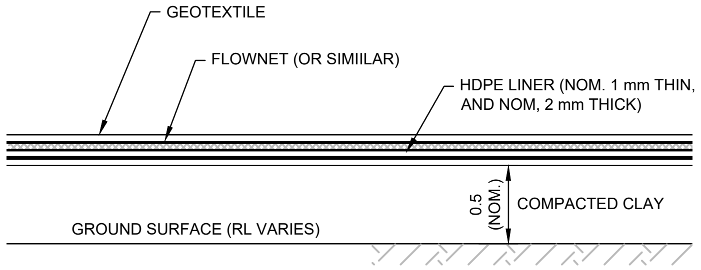
B DECANT ACCESSWAY - TYPICAL SECTION
01 1:500



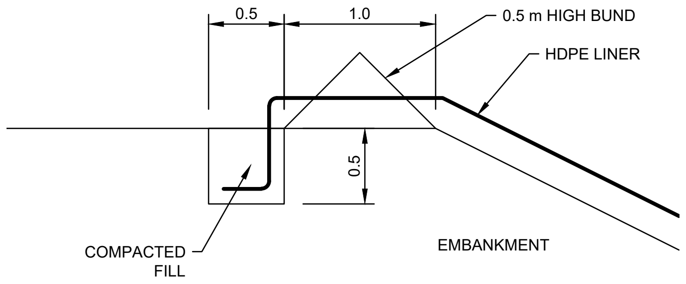
C ROCK RING DECANT - TYPICAL SECTION
01 1:500



D UNDERDRAINAGE COLLECTION SYSTEM - TYPICAL SECTION
01 1:50



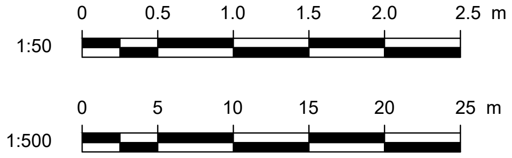
2 LINER AND FLOWNET SYSTEM - TYPICAL SECTION DETAIL
- 1:50



1 HDPE ANCHOR - TYPICAL DETAIL
- 1:50

NOTES:

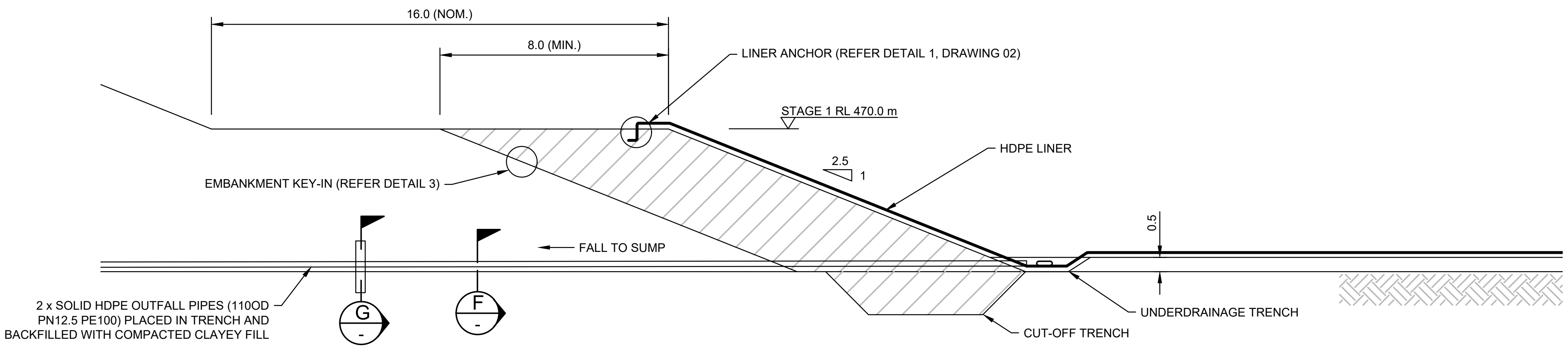
1. ALL DIMENSIONS IN METRES UNO



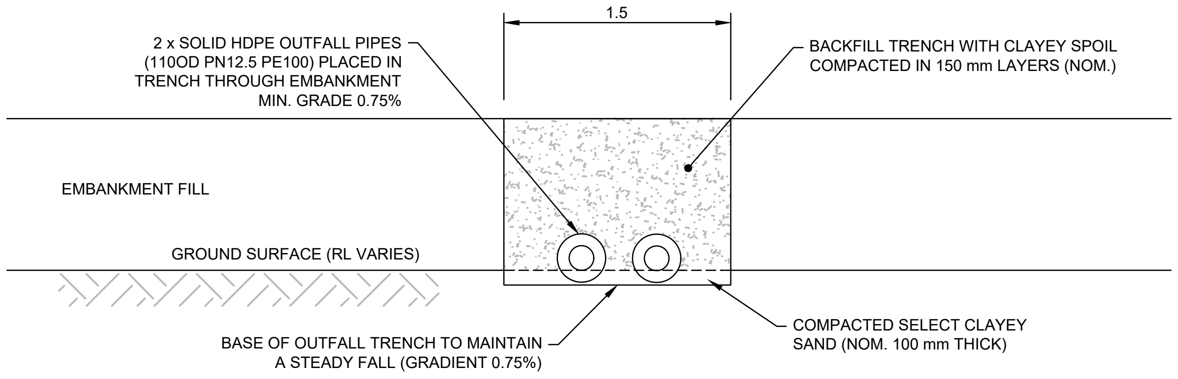
Land & Marine Geological Services Pty Ltd (L&MGSPL)

CMW Geosciences

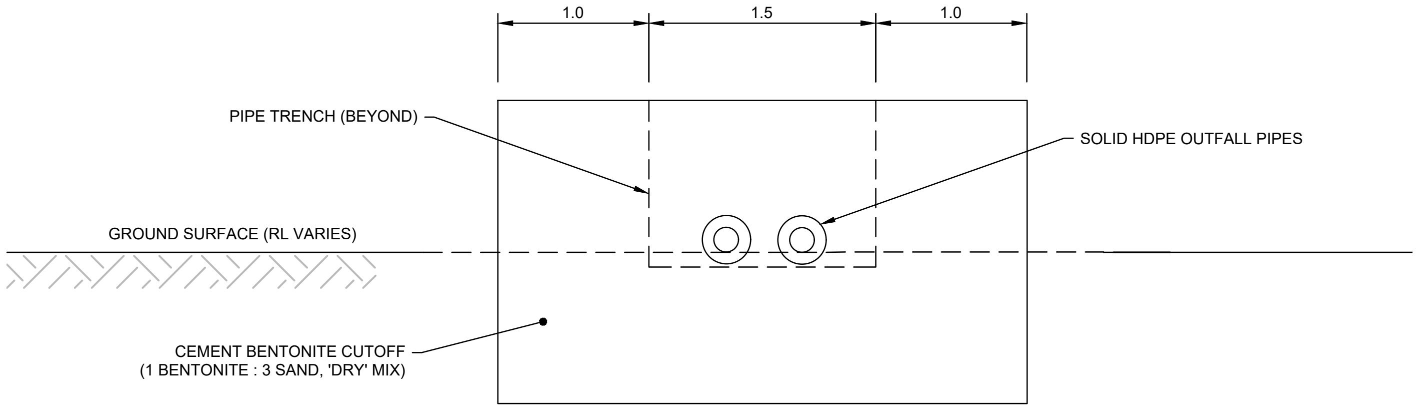
CLIENT: **DELTA LITHIUM LIMITED (DLI)**		DRAWN: DE	PROJECT: PER2024-0325
PROJECT: **MT IDA PROJECT - GOLD**		CHECKED: CL	DRAWING: 02
		REVISION: 0	SCALE: AS SHOWN
TITLE: **TSF SECTIONS AND DETAILS - SHEET 1**		DATE: 18.12.24	SHEET: A3 L



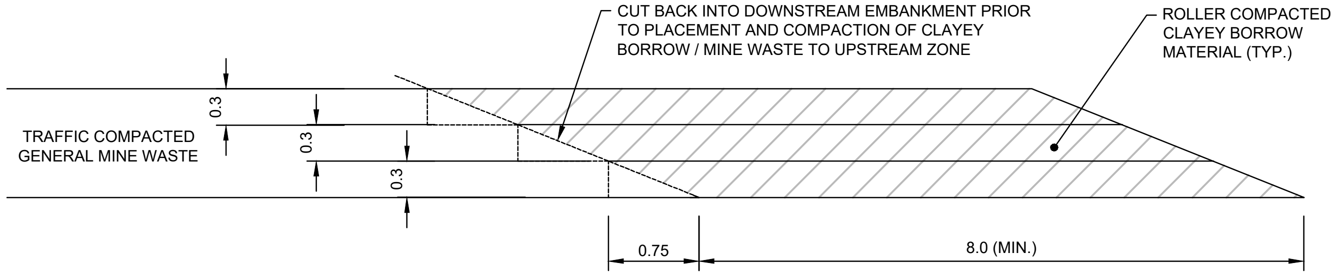
E 01 UNDERDRAINAGE OUTFALL PIPE THROUGH EMBANKMENT - TYPICAL SECTION
1:200



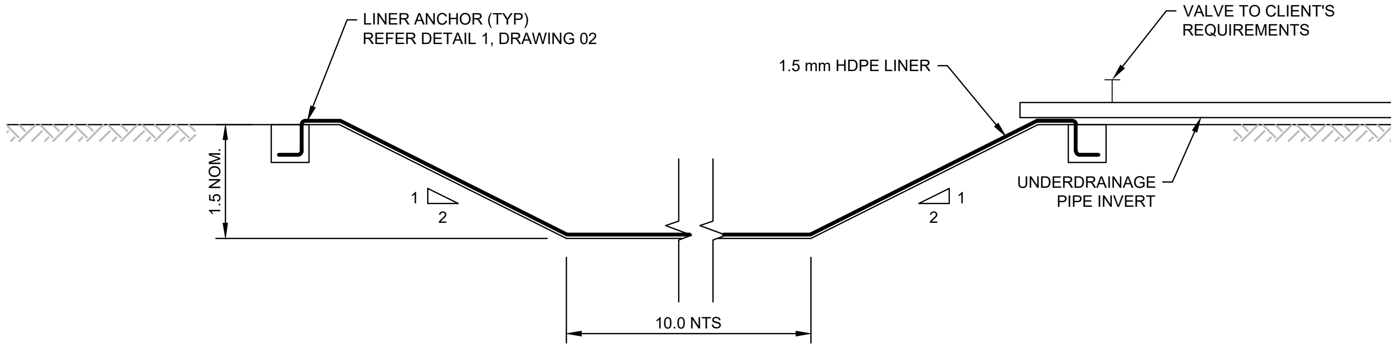
F 03 OUTFALL PIPE TRENCH (THROUGH EMBANKMENT) - TYPICAL SECTION
1:50



G 03 CEMENT BENTONITE CUTOFF - TYPICAL SECTION
1:50



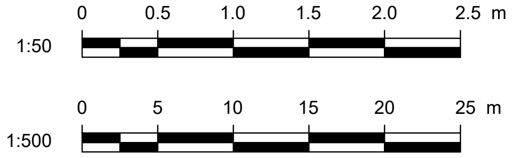
3 - EMBANKMENT KEY-IN - TYPICAL SECTION DETAIL
1:100



4 - UNDERDRAINAGE SUMP - TYPICAL DETAIL
1:100

NOTES:

1. ALL DIMENSIONS IN METRES UNO



Land & Marine Geological Services Pty Ltd (L&MGSPL)

CMW Geosciences

CLIENT: **DELTA LITHIUM LIMITED (DLI)**

PROJECT: **MT IDA PROJECT - GOLD**

TITLE: **TSF SECTIONS AND DETAILS - SHEET 2**

DRAWN: DE

CHECKED: CL

REVISION: 0

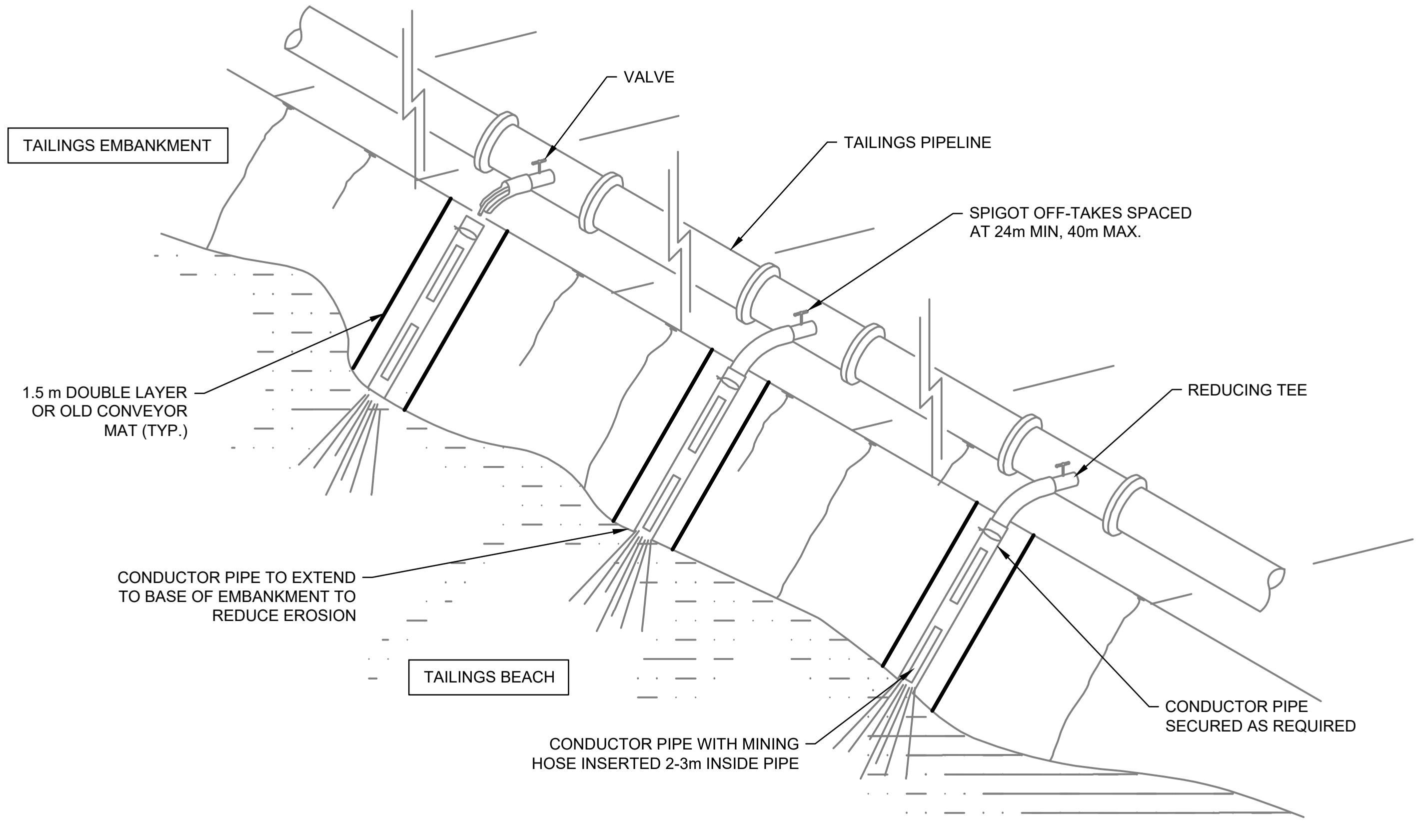
DATE: 18.12.24

PROJECT: PER2024-0325

DRAWING: 03

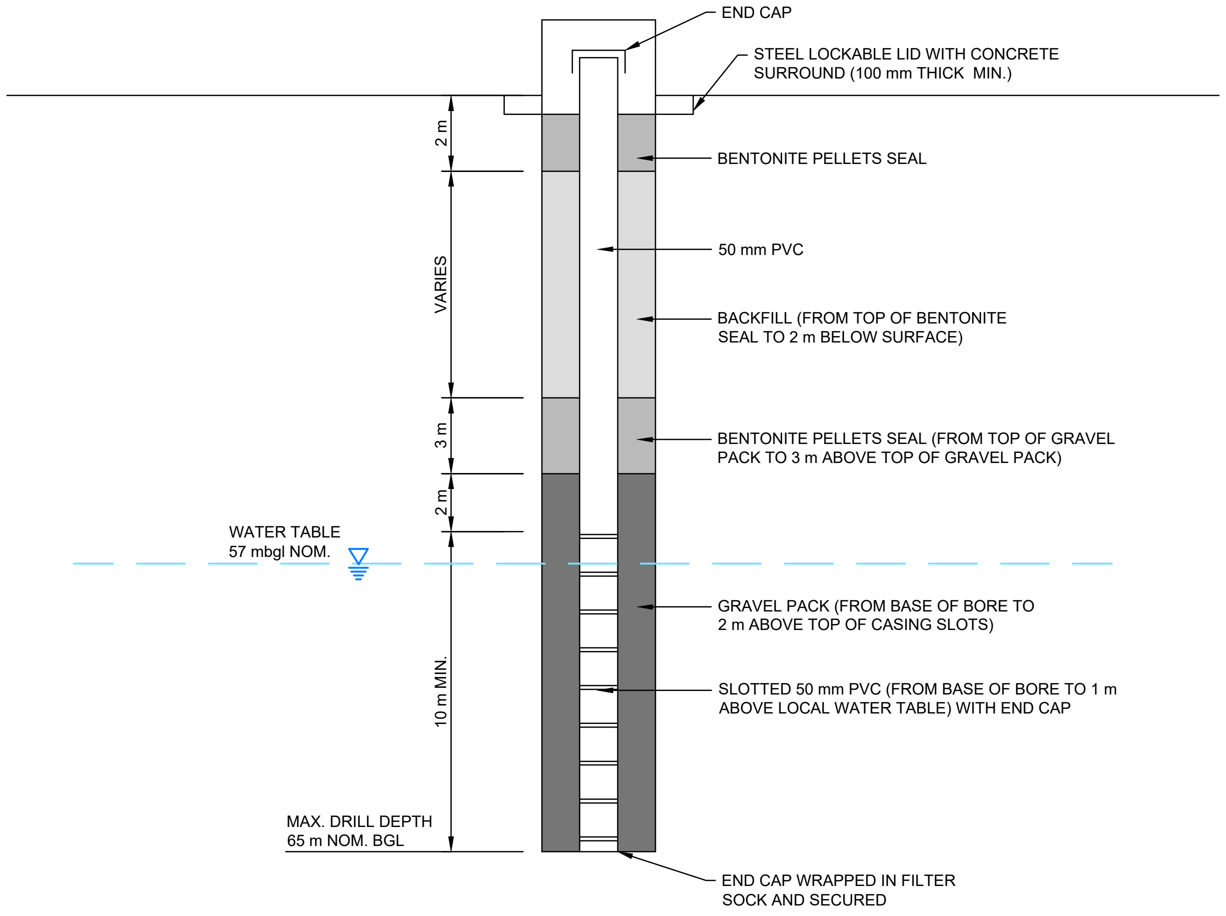
SCALE: AS SHOWN

SHEET: A3 L

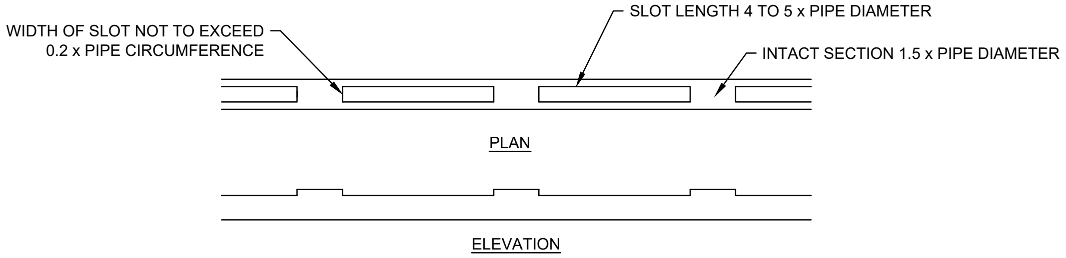


PROPOSED SPIGOT ARRANGEMENT
ISOMETRIC VIEW (NTS)

NOTE - MONITORING BORE LOCATIONS TO BE DETERMINED BY PROJECT HYDROGEOLOGIST



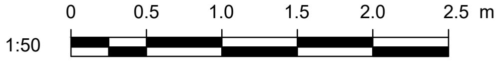
MONITORING BORE - TYPICAL DETAIL
NTS



CONDUCTOR PIPE (SLOTTED PVC) - TYPICAL DETAIL
1:50

NOTES:

1. ALL DIMENSIONS IN METRES UNO

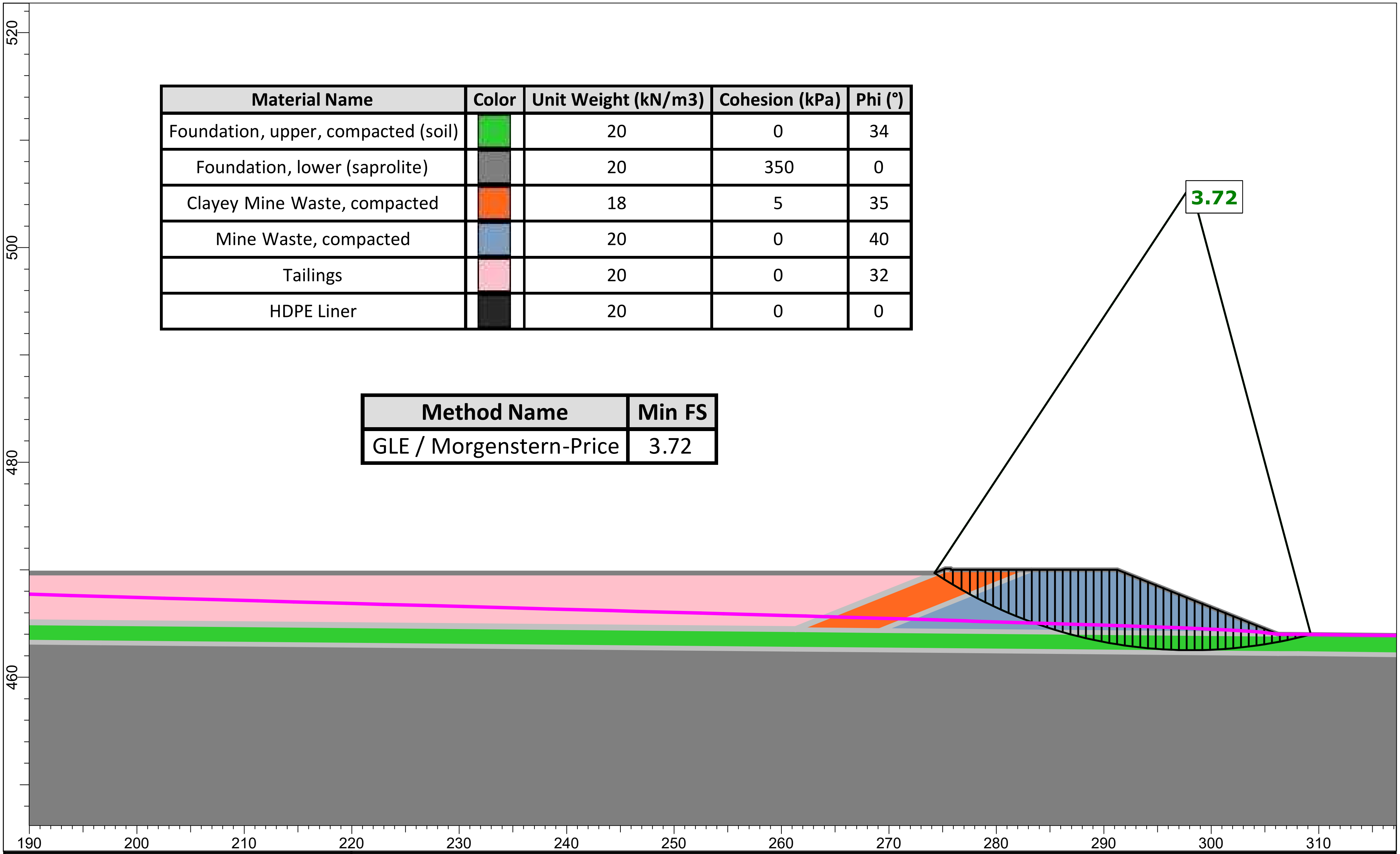


Land & Marine Geological Services Pty Ltd (L&MGSPL)

CMW Geosciences

CLIENT: **DELTA LITHIUM LIMITED (DLI)**	DRAWN: DE	PROJECT: PER2024-0325
PROJECT: **MT IDA PROJECT - GOLD**	CHECKED: CL	DRAWING: 04
	REVISION: 0	SCALE: AS SHOWN
TITLE: **TSF SECTIONS AND DETAILS - SHEET 3**	DATE: 18.12.24	SHEET: A3 L

Appendix C:
Stability, Seepage and Deformation Analyses

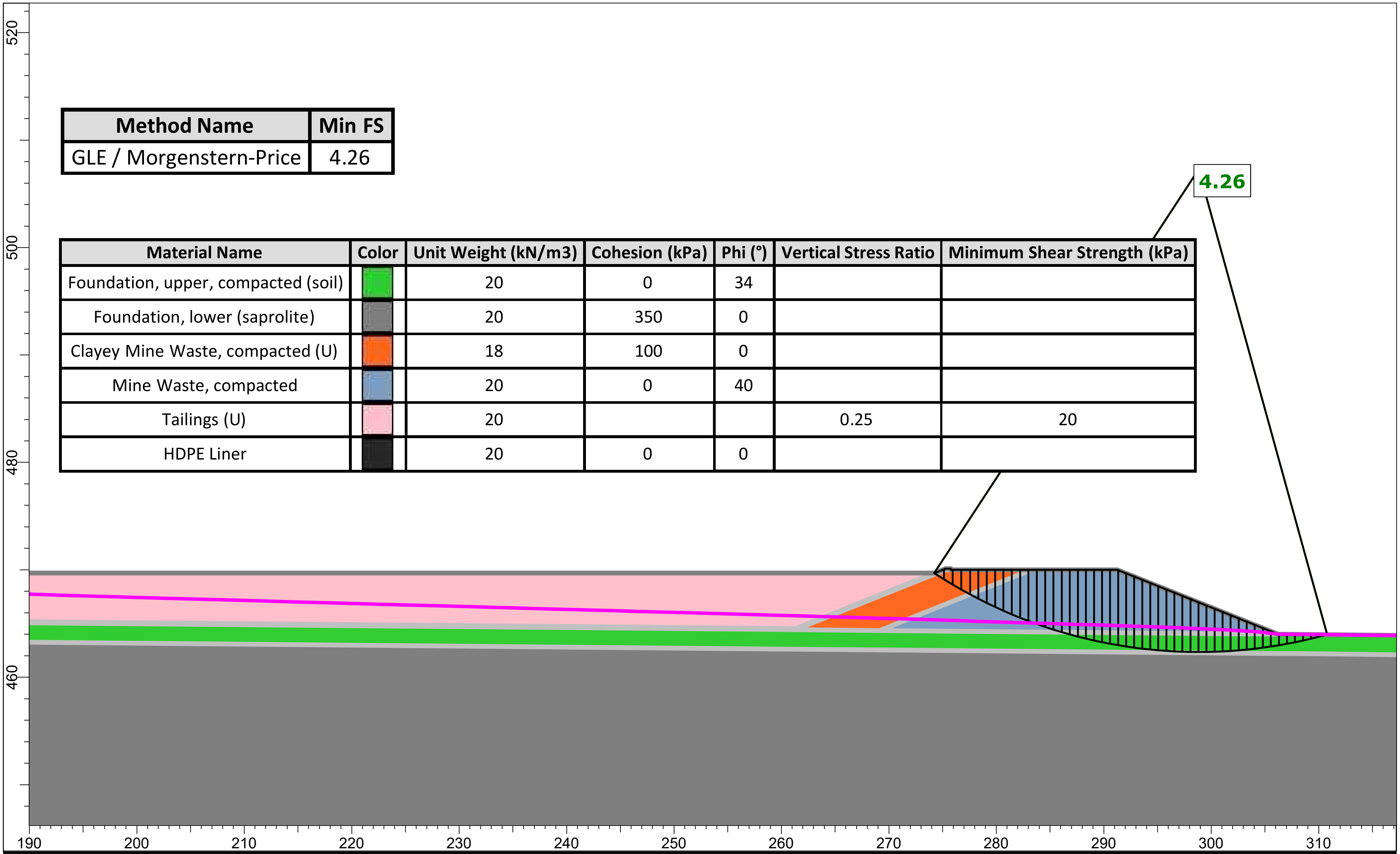


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)
Foundation, upper, compacted (soil)	🟩	20	0	34
Foundation, lower (saprolite)	▨	20	350	0
Clayey Mine Waste, compacted	🟧	18	5	35
Mine Waste, compacted	🟦	20	0	40
Tailings	🟪	20	0	32
HDPE Liner	⬛	20	0	0

Method Name	Min FS
GLE / Morgenstern-Price	3.72

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL470 m - Stability Analyses Case 1
Drawn By	PA
Scale	1:500
Company	CMW Geosciences Pty Ltd
Date	18/12/2024
File Name	PER2024-0325 - RL470 m Seepage and Stability.slmd

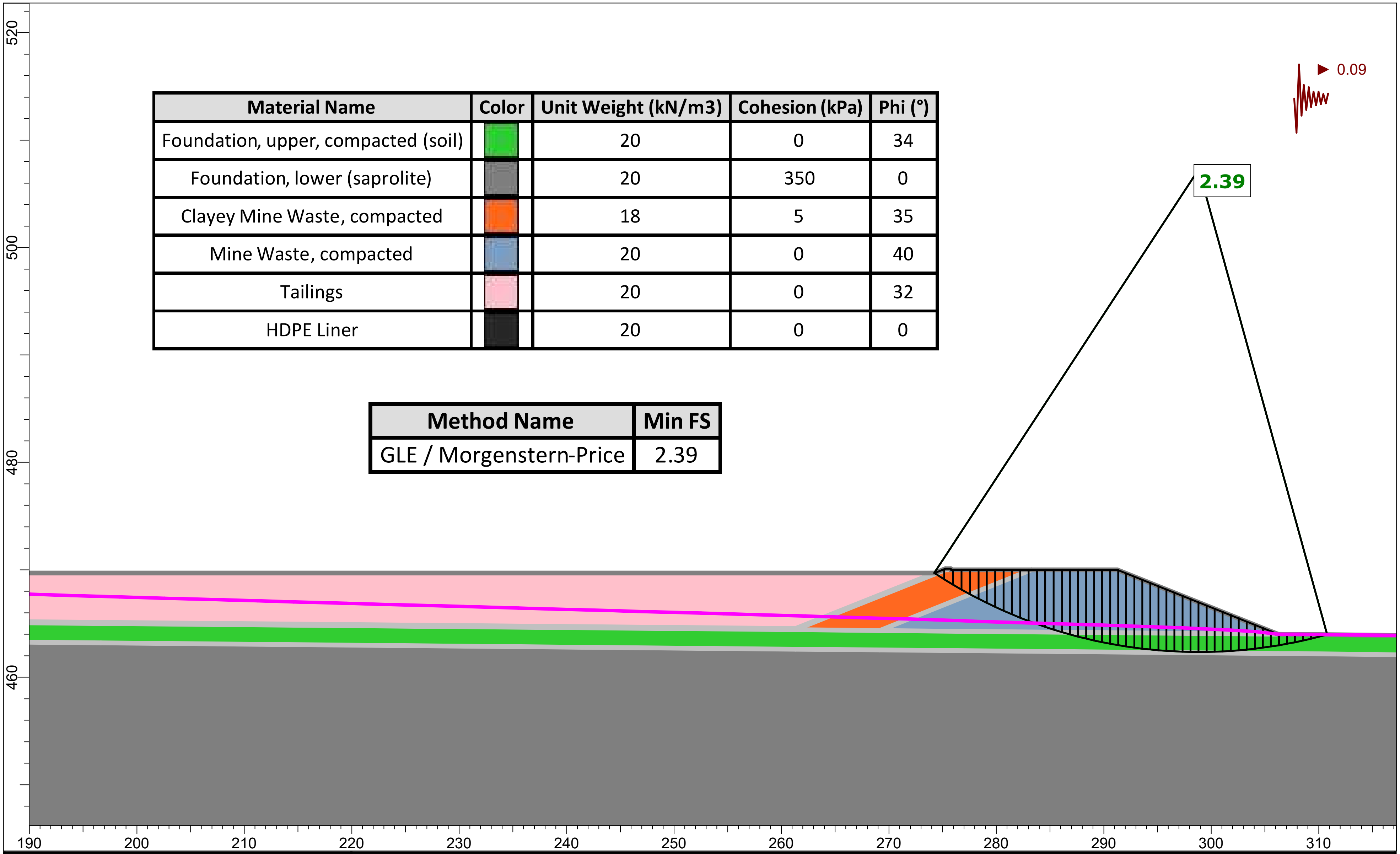


Method Name	Min FS
GLE / Morgenstern-Price	4.26

Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)	Vertical Stress Ratio	Minimum Shear Strength (kPa)
Foundation, upper, compacted (soil)	🟩	20	0	34		
Foundation, lower (saprolite)	▨	20	350	0		
Clayey Mine Waste, compacted (U)	🟧	18	100	0		
Mine Waste, compacted	🟦	20	0	40		
Tailings (U)	🟪	20			0.25	20
HDPE Liner	⬛	20	0	0		

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL470 m - Stability Analyses Case 2
Drawn By	PA
Scale	1:500
Company	CMW Geosciences Pty Ltd
Date	18/12/2024
File Name	PER2024-0325 - RL470 m Seepage and Stability.slmd



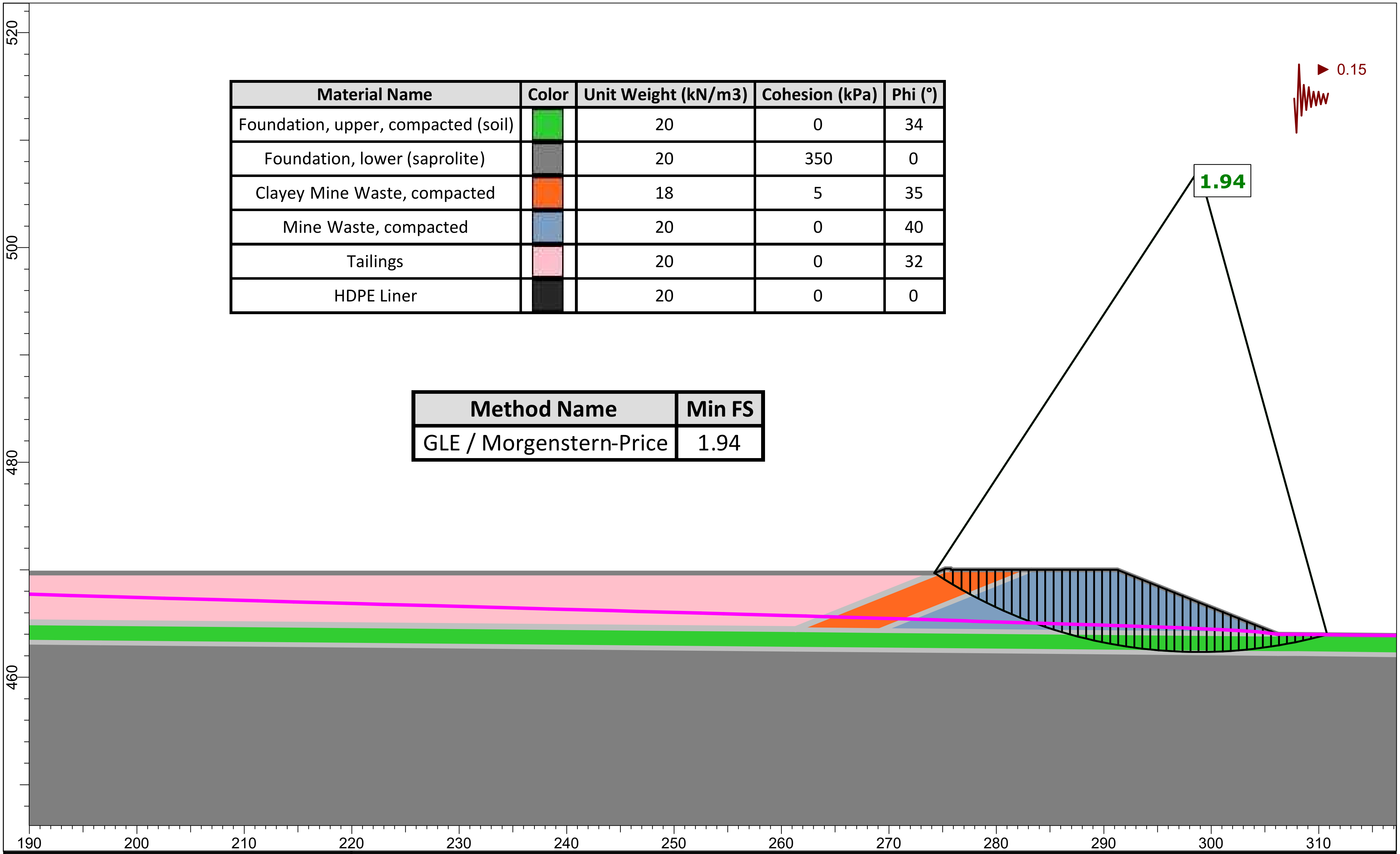
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)
Foundation, upper, compacted (soil)	🟩	20	0	34
Foundation, lower (saprolite)	◼	20	350	0
Clayey Mine Waste, compacted	🟧	18	5	35
Mine Waste, compacted	🟦	20	0	40
Tailings	◻	20	0	32
HDPE Liner	⬛	20	0	0

Method Name	Min FS
GLE / Morgenstern-Price	2.39

CMW Geosciences

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL470 m - Stability Analyses Case 3
Drawn By	PA
Scale	1:500
Company	CMW Geosciences Pty Ltd
Date	18/12/2024
File Name	PER2024-0325 - RL470 m Seepage and Stability.slmd



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)
Foundation, upper, compacted (soil)	🟩	20	0	34
Foundation, lower (saprolite)	▩	20	350	0
Clayey Mine Waste, compacted	🟧	18	5	35
Mine Waste, compacted	🟦	20	0	40
Tailings	▢	20	0	32
HDPE Liner	⬛	20	0	0

Method Name	Min FS
GLE / Morgenstern-Price	1.94

CMW Geosciences

SLIDEINTERPRET 9.034

Project TSF Design, Mt Ida Project - Gold

Analysis Description RL470 m - Stability Analyses Case 4

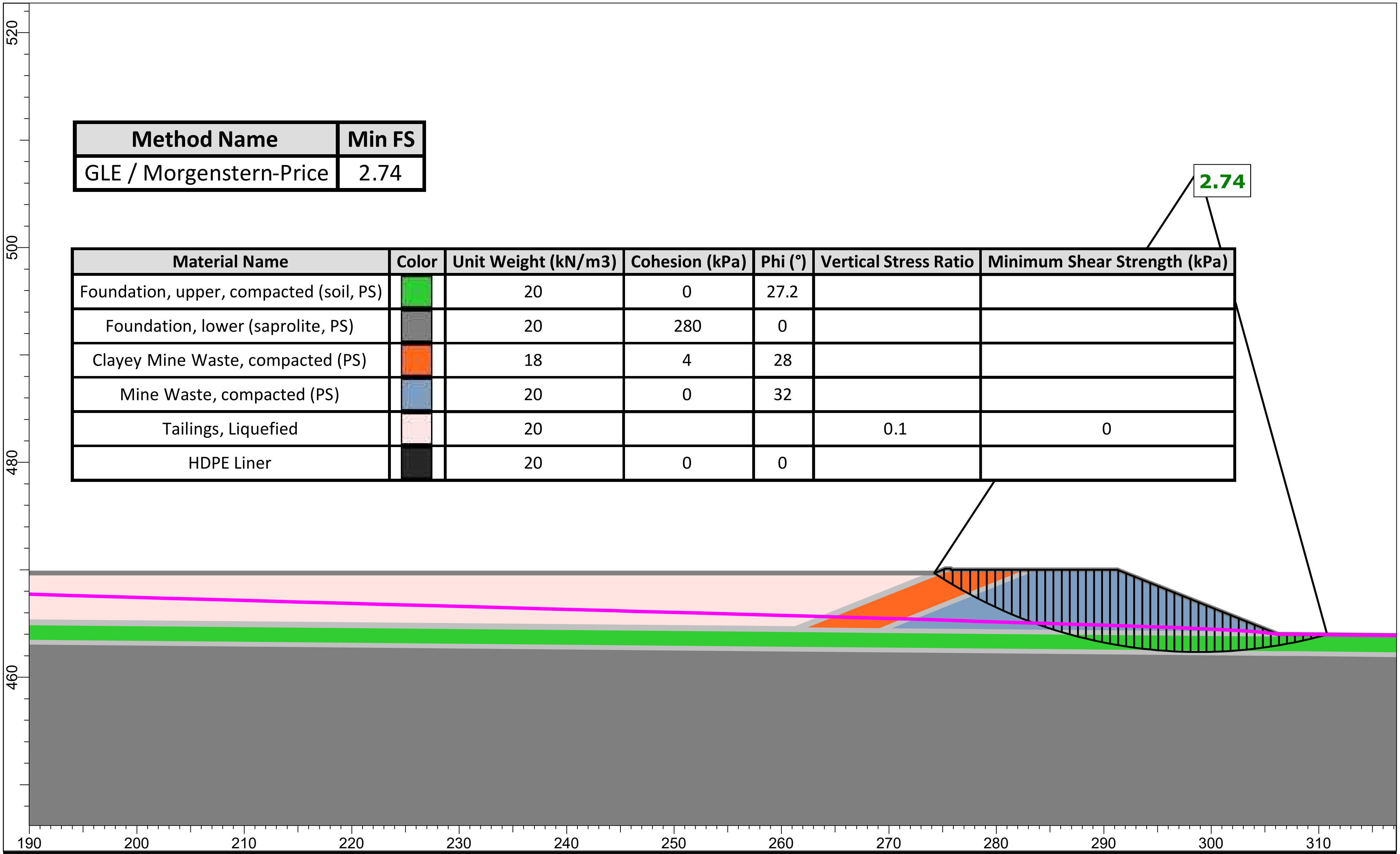
Drawn By PA

Scale 1:500

Company CMW Geosciences Pty Ltd

Date 18/12/2024

File Name PER2024-0325 - RL470 m Seepage and Stability.slmd



Method Name	Min FS
GLE / Morgenstern-Price	2.74

Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)	Vertical Stress Ratio	Minimum Shear Strength (kPa)
Foundation, upper, compacted (soil, PS)	🟩	20	0	27.2		
Foundation, lower (saprolite, PS)	◼	20	280	0		
Clayey Mine Waste, compacted (PS)	🟧	18	4	28		
Mine Waste, compacted (PS)	🟦	20	0	32		
Tailings, Liquefied	⬜	20			0.1	0
HDPE Liner	⬛	20	0	0		

SLIDEINTERPRET 9.034

Project TSF Design, Mt Ida Project - Gold

Analysis Description RL470 m - Stability Analyses Case 5

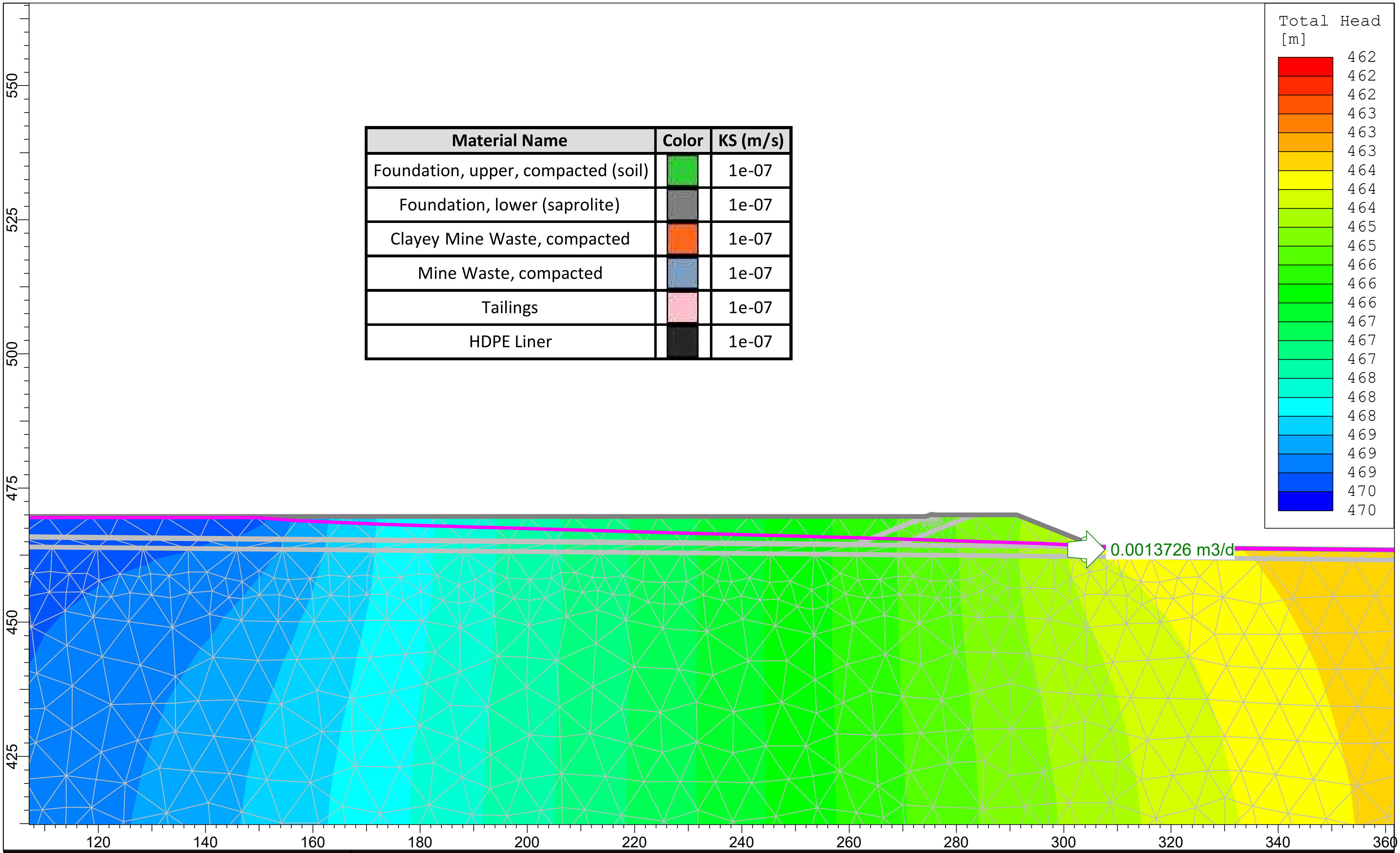
Drawn By PA

Scale 1:500

Company CMW Geosciences Pty Ltd

Date 18/12/2024

File Name PER2024-0325 - RL470 m Seepage and Stability.slmd

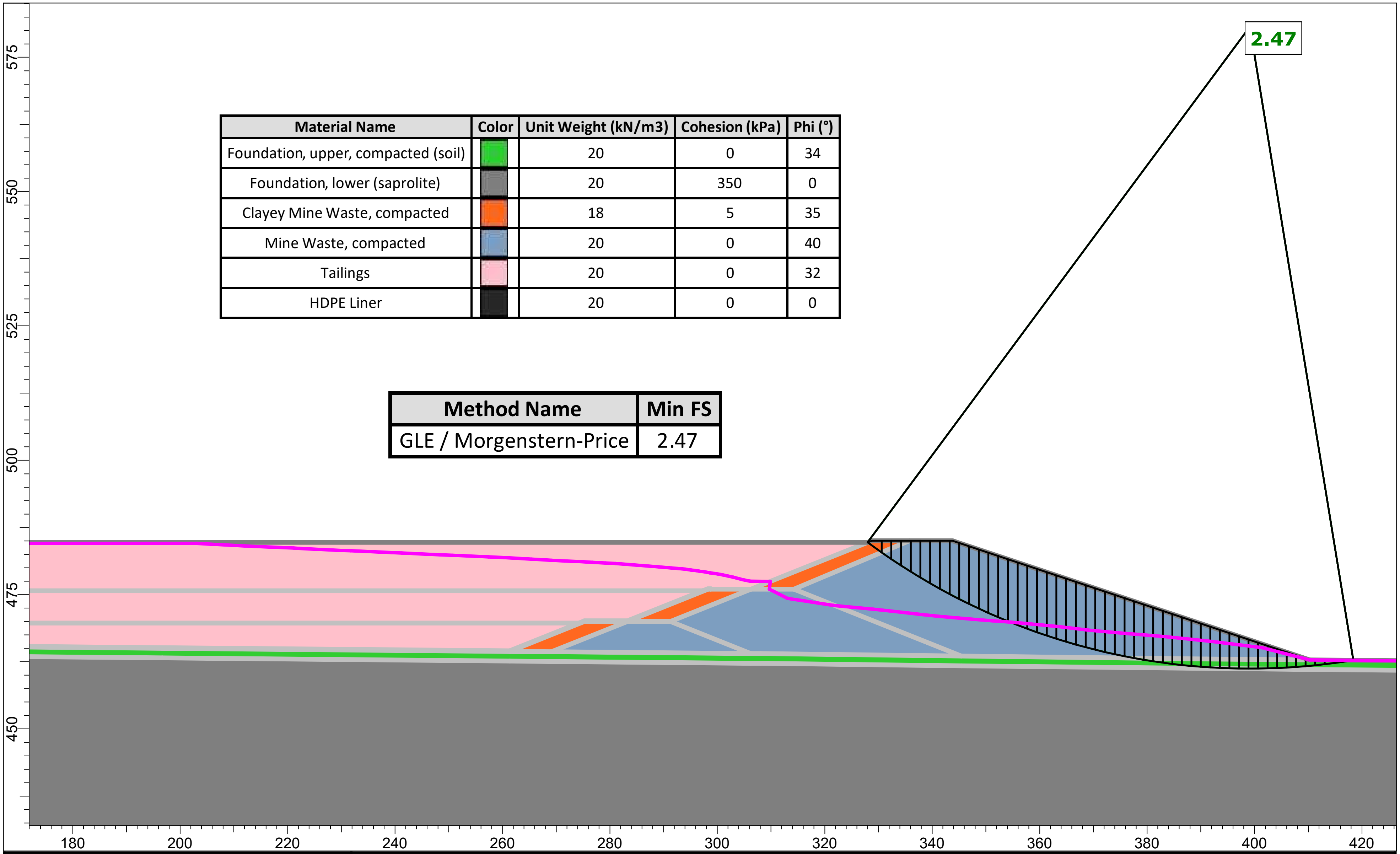


Material Name	Color	KS (m/s)
Foundation, upper, compacted (soil)	🟩	1e-07
Foundation, lower (saprolite)	▩	1e-07
Clayey Mine Waste, compacted	🟧	1e-07
Mine Waste, compacted	🟦	1e-07
Tailings	◻	1e-07
HDPE Liner	⬛	1e-07

CMW Geosciences

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL470 m - Seepage Analyses
Drawn By	PA
Scale	1:1000
Company	CMW Geosciences Pty Ltd
Date	18/12/2024
File Name	PER2024-0325 - RL470 m Seepage and Stability.slmd

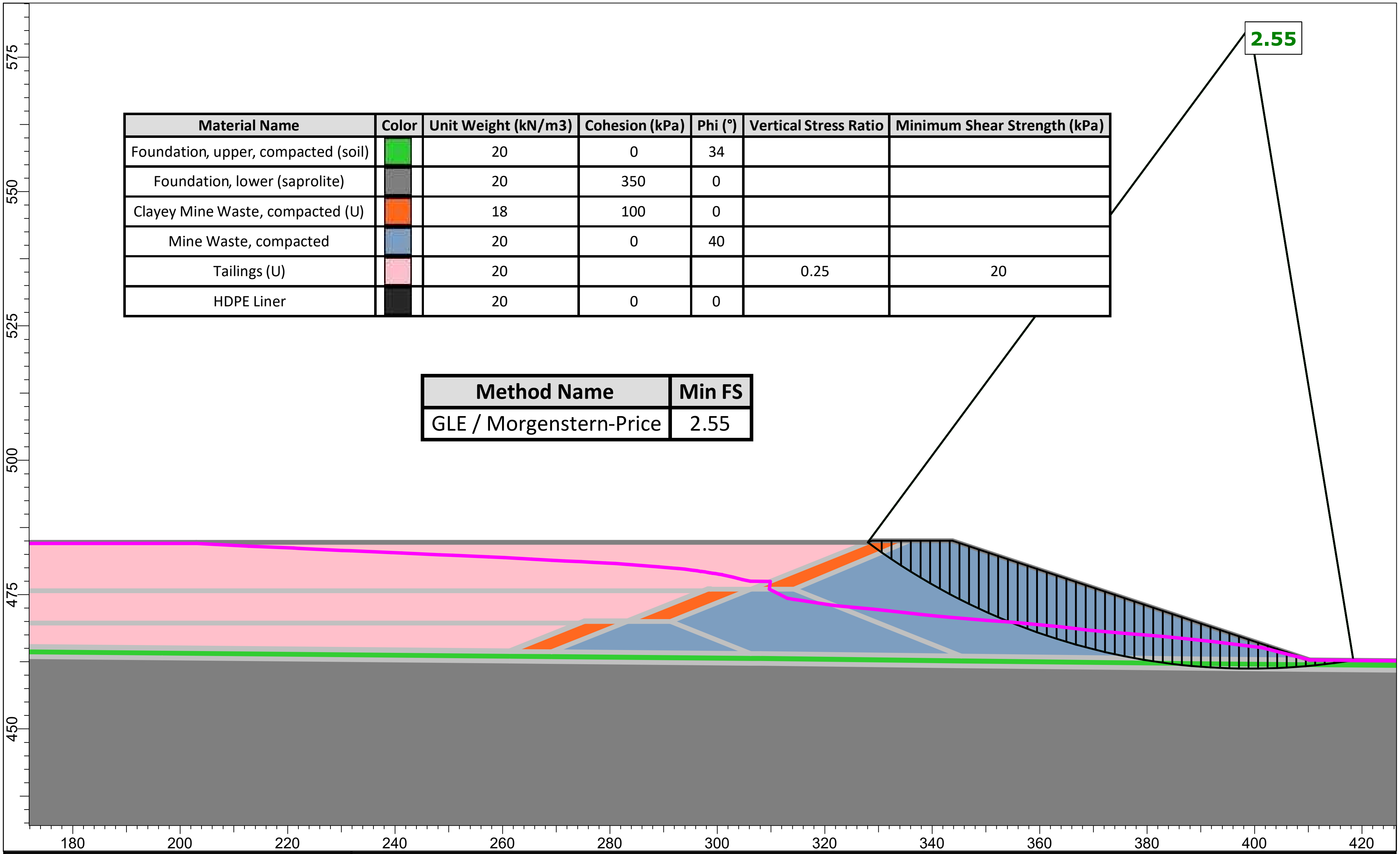


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)
Foundation, upper, compacted (soil)	🟩	20	0	34
Foundation, lower (saprolite)	◼	20	350	0
Clayey Mine Waste, compacted	🟧	18	5	35
Mine Waste, compacted	🟦	20	0	40
Tailings	◻	20	0	32
HDPE Liner	⬛	20	0	0

Method Name	Min FS
GLE / Morgenstern-Price	2.47

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL485 m - Stability Analyses Case 1
Drawn By	PA
Scale	1:1000
Company	CMW Geosciences Pty Ltd
Date	18/12/2024
File Name	PER2024-0325 - RL485 m Seepage and Stability.slmd

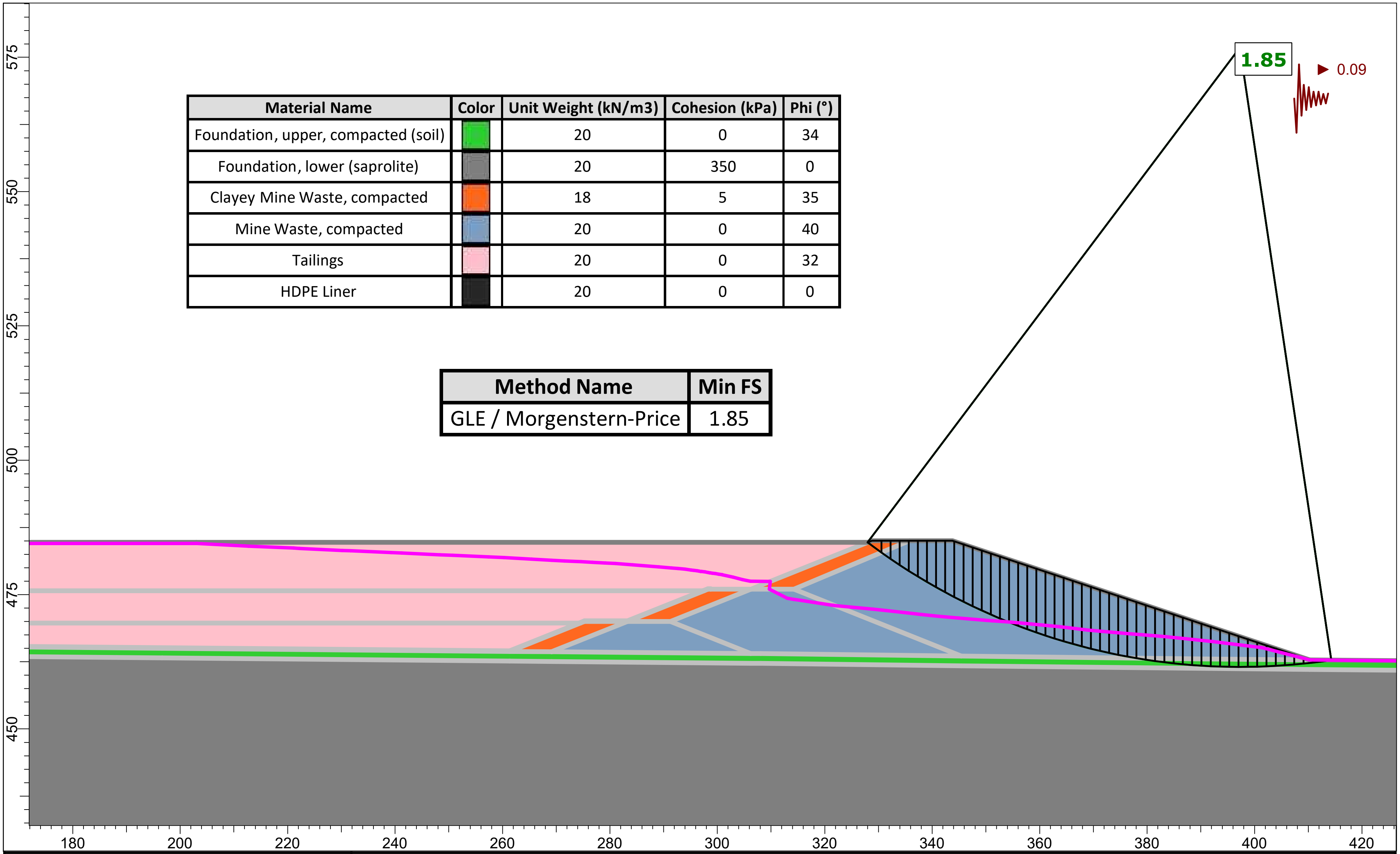


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)	Vertical Stress Ratio	Minimum Shear Strength (kPa)
Foundation, upper, compacted (soil)	🟩	20	0	34		
Foundation, lower (saprolite)	⬛	20	350	0		
Clayey Mine Waste, compacted (U)	🟧	18	100	0		
Mine Waste, compacted	🟦	20	0	40		
Tailings (U)	🟪	20			0.25	20
HDPE Liner	⬛	20	0	0		

Method Name	Min FS
GLE / Morgenstern-Price	2.55

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL485 m - Stability Analyses Case 2
Drawn By	PA
Scale	1:1000
Company	CMW Geosciences Pty Ltd
Date	18/12/2024
File Name	PER2024-0325 - RL485 m Seepage and Stability.slmd



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)
Foundation, upper, compacted (soil)	🟩	20	0	34
Foundation, lower (saprolite)	▨	20	350	0
Clayey Mine Waste, compacted	🟧	18	5	35
Mine Waste, compacted	🟦	20	0	40
Tailings	▢	20	0	32
HDPE Liner	⬛	20	0	0

Method Name	Min FS
GLE / Morgenstern-Price	1.85

CMW Geosciences

SLIDEINTERPRET 9.034

Project TSF Design, Mt Ida Project - Gold

Analysis Description RL485 m - Stability Analyses Case 3

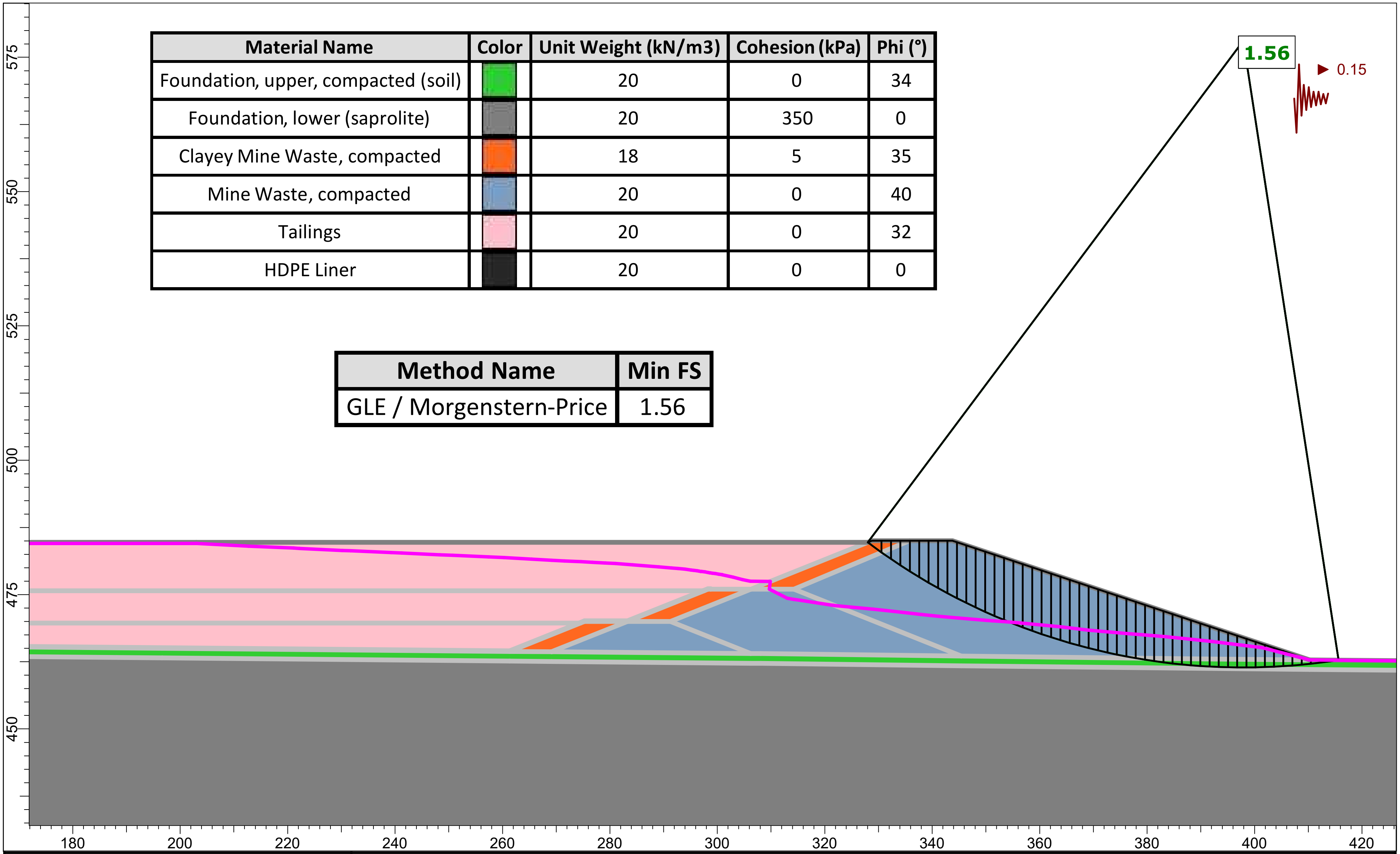
Drawn By PA

Scale 1:1000

Company CMW Geosciences Pty Ltd

Date 18/12/2024

File Name PER2024-0325 - RL485 m Seepage and Stability.slmd



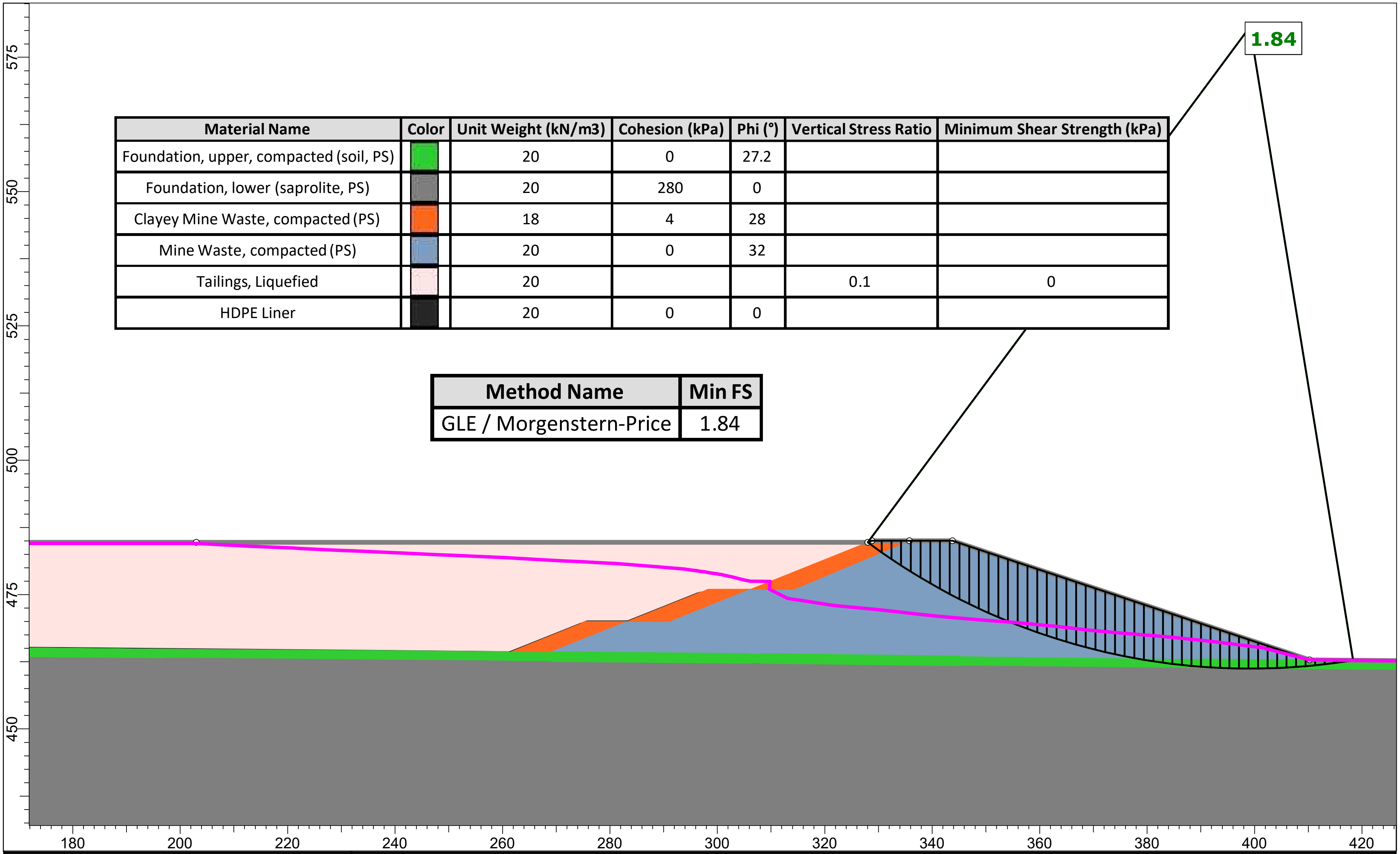
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)
Foundation, upper, compacted (soil)	🟩	20	0	34
Foundation, lower (saprolite)	◼	20	350	0
Clayey Mine Waste, compacted	🟧	18	5	35
Mine Waste, compacted	🟦	20	0	40
Tailings	▨	20	0	32
HDPE Liner	⬛	20	0	0

Method Name	Min FS
GLE / Morgenstern-Price	1.56

Project	TSF Design, Mt Ida Project - Gold
Analysis Description	RL485 m - Stability Analyses Case 4

Drawn By	PA	Scale	1:1000	Company	CMW Geosciences Pty Ltd
Date	18/12/2024			File Name	PER2024-0325 - RL485 m Seepage and Stability.slmd

SLIDEINTERPRET 9.034



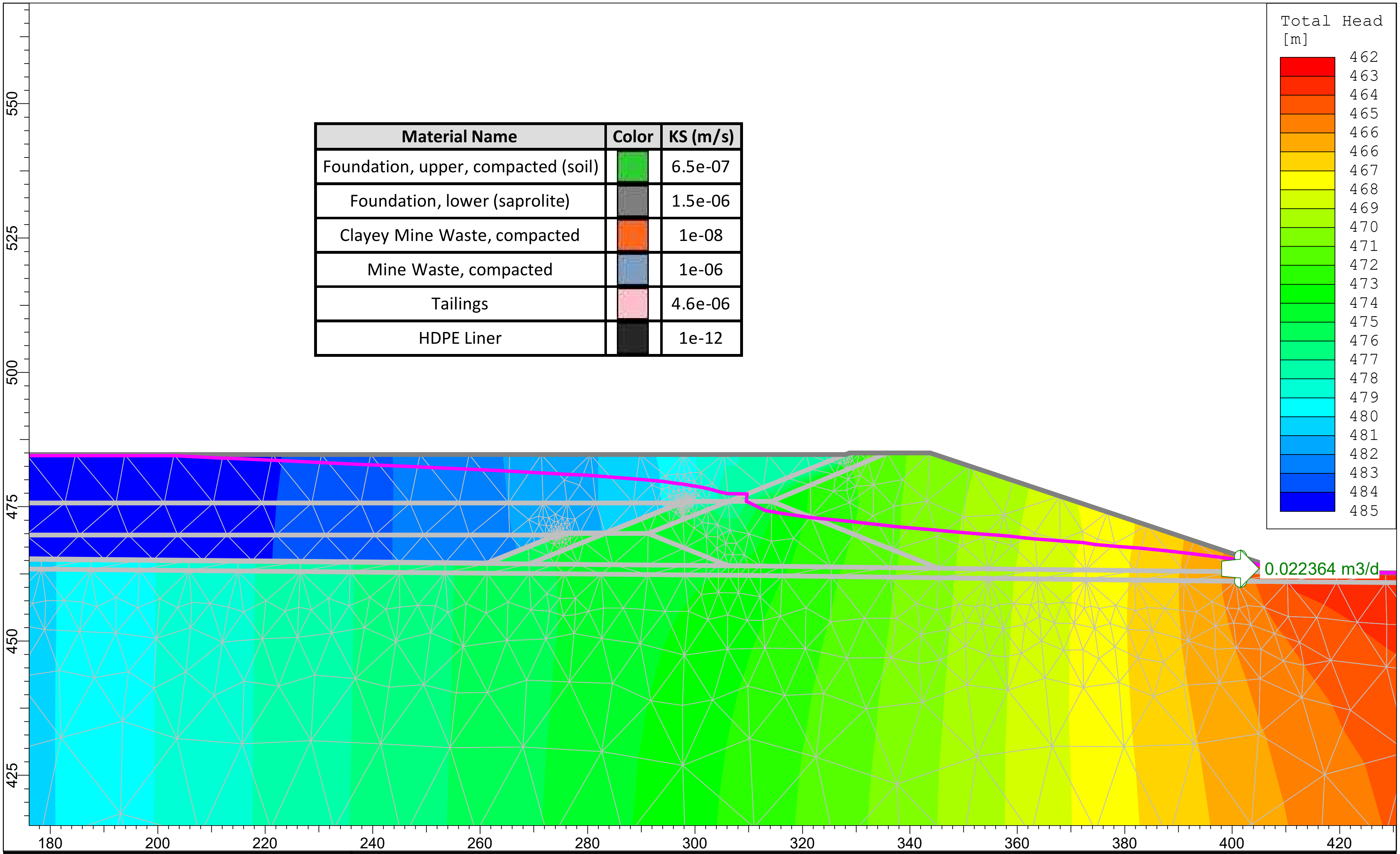
Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (°)	Vertical Stress Ratio	Minimum Shear Strength (kPa)
Foundation, upper, compacted (soil, PS)	🟩	20	0	27.2		
Foundation, lower (saprolite, PS)	▨	20	280	0		
Clayey Mine Waste, compacted (PS)	🟧	18	4	28		
Mine Waste, compacted (PS)	🟦	20	0	32		
Tailings, Liquefied	⬜	20			0.1	0
HDPE Liner	⬛	20	0	0		

Method Name	Min FS
GLE / Morgenstern-Price	1.84

CMW Geosciences

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold		
Analysis Description	RL485 m - Stability Analyses Case 5		
Drawn By	PA	Scale	1:1000
Company	CMW Geosciences Pty Ltd		
Date	18/12/2024	File Name	PER2024-0325 - RL485 m Seepage and Stability.slmd

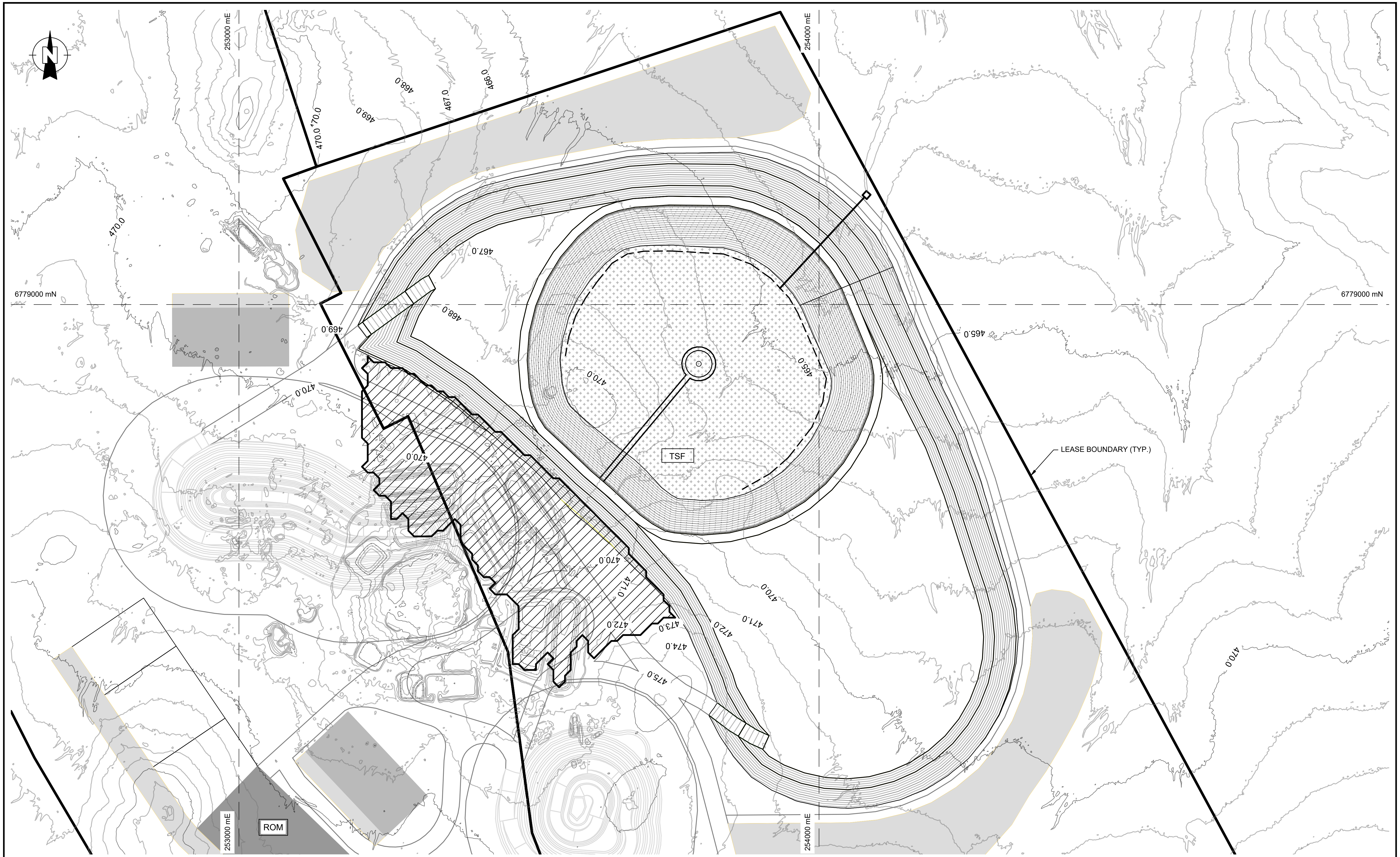


Material Name	Color	KS (m/s)
Foundation, upper, compacted (soil)	🟩	6.5e-07
Foundation, lower (saprolite)	▨	1.5e-06
Clayey Mine Waste, compacted	🟧	1e-08
Mine Waste, compacted	🟦	1e-06
Tailings	▢	4.6e-06
HDPE Liner	⬛	1e-12

SLIDEINTERPRET 9.034

Project	TSF Design, Mt Ida Project - Gold		
Analysis Description	RL485 m - Seepage Analyses		
Drawn By	PA	Scale	1:1000
Company	CMW Geosciences Pty Ltd		
Date	18/12/2024	File Name	PER2024-0325 - RL485 m Seepage and Stability.slmd

Appendix D:
Dam Break Assessment



NOTES:

1. CONTOURS GENERATED FROM CLIENT SUPPLIED FILE: Menzies_50cmContours
2. COORDINATE SYSTEM: MGA ZONE 51, GDA94

0 60 120 180 240 300 m

1:6000

CMW Geosciences

Great People | Practical Solutions

CLIENT: **DELTA LITHIUM LIMITED (DLI)**	DRAWN: DE	PROJECT: PER2024-0325
PROJECT: **MT IDA PROJECT - GOLD**	CHECKED: PA	SKETCH: 01
	REVISION: 0	SCALE: 1:6000
TITLE: **DAM BREAK**	DATE: 18.12.24	SHEET: A3 L

Appendix E:
Water Balance Analyses

PROJECT : IWLTSF, GOLD TAILINGS

CLIENT : DELTA LITHIUM LTD (DLI)

LOCATION : MT IDA PROJECT, WA

SUBJECT : WATER BALANCE, CALENDAR YEAR

Date	4-Dec-24
Job No	PER2024-0325
File	PER2024-0325AB
Subject	Water Balance
Revision	0

	Month	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**TOTAL**
INFLOWS	Days per month	31	28.25	31	30	31	30	31	31	30	31	30	31	
RAINFALL														
Rainfall (mm)		13	53.1	13.7	13.8	1.7	8.3	4.5	22.4	1.1	0.1	17.7	1.4	151
Average Daily Rainfall (mm)		0.42	1.88	0.44	0.46	0.05	0.28	0.15	0.72	0.04	0.00	0.59	0.05	
Tailings Dam Storage Area (m2)		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	
Runoff Coefficient Tailings		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Catchment Area above Storage (m2)		70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	
Runoff Coefficient Catchment		0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	
Pool Area (m2)		30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	
Running Beaches (m2)		10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	10,800	
Rainfall Inflow Total Volume (m3/day)		101.5	454.9	106.9	111.3	13.3	67.0	35.1	174.9	8.9	0.8	142.8	10.9	
SLURRY WATER														
Tonnes per year	666,667													
Total tonnes per month		55,556	55,556	55,556	55,556	55,556	55,556	55,556	55,556	55,556	55,556	55,556	55,556	666,667
% Solids =	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	
Tailings Output Solids (tpd)		1,792.1	1,966.6	1,792.1	1,851.9	1,792.1	1,851.9	1,792.1	1,792.1	1,851.9	1,792.1	1,851.9	1,792.1	
Volume of Water (m3/day)		2,235.1	2,452.7	2,235.1	2,309.6	2,235.1	2,309.6	2,235.1	2,235.1	2,309.6	2,235.1	2,309.6	2,235.1	831,461.1
OTHER WATER INFLOWS														
Pit Dewatering (m3/day)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Other		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Other Water Inflow Total (m3/day)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL INFLOW (m3/day)		**2,337**	**2,908**	**2,342**	**2,421**	**2,248**	**2,377**	**2,270**	**2,410**	**2,318**	**2,236**	**2,452**	**2,246**	
OUTFLOW-LOSSES FROM TAILINGS DAM		**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**TOTAL**
EVAPORATION (from pond and beaches)														
Evaporation Rate (mm)		238	217	238	230	238	230	238	238	230	238	230	238	2,800
Pan Factor		0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	
Monthly Dam Evaporation Rate (mm)		166.4	151.6	166.4	161.0	166.4	161.0	166.4	166.4	161.0	166.4	161.0	166.4	
Average Daily Evaporation Rate (mm)		5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.37	
Pool Area & Running Beaches (m2)		40,800	40,800	40,800	40,800	40,800	40,800	40,800	40,800	40,800	40,800	40,800	40,800	
Daily Evaporation Loss/Outflow (m3/day)		218.9	218.9	218.9	218.9	218.9	218.9	218.9	218.9	218.9	218.9	218.9	218.9	
EVAPO-TRANSPIRATION (from drying tailings)														
Evaporation Rate (mm)		110	101	110	107	110	107	110	110	107	110	107	110	1,300
Evapo-transpiration Rate (Pan/3)		36.8	33.5	36.8	35.6	36.8	35.6	36.8	36.8	35.6	36.8	35.6	36.8	
Average Daily Evapo-transpiration Rate (mm)		1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	
Area Transpiring (m2)		159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	159,200.0	
Daily transpiration Loss (m3/day)		188.9	188.9	188.9	188.9	188.9	188.9	188.9	188.9	188.9	188.9	188.9	188.9	
SEEPAGE														
Downstream Embankment (m3/day)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Upstream Embankment (m3/day)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Seepage Rate m/sec	6.50E-07													
Dam Floor (m3/day).		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Total Seepage Outflow (m3/day)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
RETENTION														
Tailings Output (tpd)		1,792.1	1,966.6	1,792.1	1,851.9	1,792.1	1,851.9	1,792.1	1,792.1	1,851.9	1,792.1	1,851.9	1,792.1	
Assumed Moisture Content of Tailings (average)	40%													
Volume Retained in Tailings (m3/day)		716.8	786.6	716.8	740.7	716.8	740.7	716.8	716.8	740.7	716.8	740.7	716.8	
TOTAL OUTFLOW-LOSSES FROM TAILINGS DAM		**1,124.8**	**1,194.6**	**1,124.8**	**1,148.7**	**1,124.8**	**1,148.7**	**1,124.8**	**1,124.8**	**1,148.7**	**1,124.8**	**1,148.7**	**1,124.8**	
BALANCE INFLOW-OUTFLOW/LOSSES (m3/day)		1,211.8	1,713.0	1,217.3	1,272.2	1,123.6	1,227.9	1,145.4	1,285.2	1,169.8	1,111.1	1,303.7	1,121.2	
BALANCE INFLOW-OUTFLOW/LOSSES (m3/month)		37,565.9	48,391.9	37,735.3	38,167.4	34,831.3	36,836.4	35,508.9	39,840.7	35,094.0	34,444.1	39,111.2	34,758.7	
RETURN WATER TO THE PLANT (if available)														
Total Water Return per month (balance of inflow -outflow for planning)		37,565.9	48,391.9	37,735.3	38,167.4	34,831.3	36,836.4	35,508.9	39,840.7	35,094.0	34,444.1	39,111.2	34,758.7	
Volume of Water (m3/day),estimated at		1,211.8	1,713.0	1,217.3	1,272.2	1,123.6	1,227.9	1,145.4	1,285.2	1,169.8	1,111.1	1,303.7	1,121.2	
Average water return		54%	70%	54%	55%	50%	53%	51%	57%	51%	50%	56%	50%	**54%**
		JAN	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	
Summary of Water Balance														
Water shortfall (make up water) or excess of requirements (m3/day)		**-1,023**	**-740**	**-1,018**	**-1,037**	**-1,112**	**-1,082**	**-1,090**	**-950**	**-1,140**	**-1,124**	**-1,006**	**-1,114**	
Total water in excess of requirements (m3/month)		**-31,723**	**-20,896**	**-31,553**	**-31,121**	**-34,457**	**-32,452**	**-33,780**	**-29,448**	**-34,194**	**-34,844**	**-30,177**	**-34,530**	**-379,175**
Total water in excess of requirements (m3/year) =		**-379,175**												

Appendix F:
Geotechnical Investigation Report

28 February 2024

MT IDA LITHIUM PROJECT

WESTERN AUSTRALIA

TAILINGS STORAGE FACILITY (TSF) GEOTECHNICAL INVESTIGATION REPORT

Delta Lithium Ltd

PER2023-0213AB Rev 0

PER2023-0213AB		
Date	**Revision**	**Comments**
13 February 2024	A	Issued for Internal Review
28 February 2024	0	Issued for Submission

[redacted]

TABLE OF CONTENTS

APPENDICES

1 INTRODUCTION

CMW Geosciences Pty Ltd (CMW) was authorised by Delta Lithium Ltd (DLI) to carry out a geotechnical investigation for the proposed Tailings Storage Facility (TSF) at the Mt Ida Lithium Project (MILP). A site location plan is included in Appendix A.

This work was commissioned by way of a Purchase Order referenced MI-0166 dated 29 September 2023. The scope of work and associated terms and conditions of our engagement were detailed in our services proposal letters referenced PER2023-0213AA Rev 0 dated 28 September 2023.

MILP is located about 85 km northwest of Menzies and 200 km northwest of Kalgoorlie in the Goldfields region of WA. It includes Mining Lease M29/165 where the proposed TSF will be located. The TSF has an approximate centre located at (MGA, Zone 51J) coordinates 6,778,750 m North and 253,950 m East, and will lie to the east of an existing waste dump and 'old' tailings dump. Future mine pit, process plant and site office areas will likely be located at the higher elevations to the west of the TSF.

2 BACKGROUND

An integrated waste landform (IWL) TSF concept was developed in early 2023.

The tailings storage requirements have since changed with additional tailings required to be stored and a lack of waste from open pits available for the construction of an IWL. The investigations were undertaken for a two-cell paddock storage TSF design concept.

A previous preliminary geotechnical investigation was conducted by L&MGSPL in early 2023 in the vicinity of the TSF site. This investigation involved the excavation of 21 no. of test pits with the results discussed in a technical memorandum issued by L&MGSPL dated 6 February 2023.

This report describes the scope and results of a supplementary geotechnical investigation at the TSF site aimed at providing additional information such that the current design of the TSF can proceed.

3 FIELD INVESTIGATION

The supplementary geotechnical investigation was carried out between 1 December 2023 and 4 December 2023 following confirmation by DLI that permits were in place for ground disturbance works covering the area of the investigation.

All fieldwork was carried out under the direction of an Engineering Geologist from CMW and in general accordance with the requirements of AS1726 (2017): *Geotechnical Site Investigations*. The test locations are shown by the geotechnical investigation plan in Appendix B.

The scope of fieldwork completed was as follows:

- Undertake a site walkover survey to assess the general landform, site conditions and adjacent infrastructure.
- Geotechnical logging of eight (8) boreholes to depths of 10 m and 15 m in the TSF site. The subject boreholes were part of exploration boreholes drilled using the rotary air-blast (RAB) technique. Borehole logs were established from mounds of drill arisings left adjacent to the respective boreholes with depths indicated by the driller. Engineering logs of boreholes are presented in Appendix C.
- Permeability testing in all of the above eight (8) boreholes. A Heron DipperLog diver was lowered to the base of the borehole and the borehole was subsequently filled with water. The dipper logger recorded the change in pressure head at 15-second intervals over a period of about two hours. In select boreholes, the

test was repeated. The collected data was analysed to estimate the soil permeabilities – refer to Appendix F.

- Thirteen (13) test pits in an 'old' tailings dump to the northwest of the TSF site, where the dried tailings will be reviewed for potential utilisation in the TSF construction. The test pits, denoted TP01 to TP13, were excavated using a 30-tonne Sumitomo SH330 excavator to depths of up to 5 m, or shallower refusal. Twenty-two (22) representative bulk samples were collected from twelve (12) test pit locations at various depth intervals for geotechnical laboratory testing. The engineering logs of the test pits are presented in Appendix D.
- Dipping of nine (9) historic groundwater monitoring wells across MILP.
- Collection of four (4) bulk mine waste samples from a historical Golden Vale Pit to the southeast of the proposed TSF location.

Test pit locations were initially proposed by DLI and were pegged in the field. However, test pit locations TP01, TP02, TP03, TP09, TP10 and TP12 (6 no.) were not excavated at their target locations because they were either situated on a relatively steep slope or were situated within an access track. In these instances, an adjacent location was chosen and the prefix 'a' was added to the name of the test pit. TP01 had to be relocated twice, hence it has a 'b' prefix.

The location of each test was measured using hand-held GPS. Elevation was inferred from the feature survey plan provided. A site plan showing test pit locations is presented in Appendix B.

3.1 Laboratory Testing

Laboratory testing was carried out in accordance with the requirements of the current edition of AS1289: *Methods of Testing Soils for Engineering Purposes.*

Laboratory testing was scheduled by CMW. Soil index testing was carried out by Western Geotechnical and Laboratory Services (WGLS) while tailings-specific testing was carried out by E-Precision Laboratory. Both laboratories are NATA-registered testing authorities based in Perth.

The scope of the laboratory testing is presented in Table 1.

Table 1: Laboratory Test Schedule Summary

Type of Test	Test Method/s	Quantity	
		Tailings	Mine Waste
Particle Size Distribution (PSD)	AS1289.3.6.1	13	3
Particle Density	AS1289.3.5.1	2	2
Atterberg Limits	AS1289.3.1.1, 3.2.1, 3.3.1	13	2
Compaction (Standard)	AS1289.5.1.1	2	0
Falling Head Permeability	AS 1289 6.7.2	6	0
Triaxial CIU Multi-Stage	AS 1289.6.4.2	2	0
Emerson Class	AS 1289.3.8.1	2	2

Test certificates are presented in Appendix E.

4 GROUND MODEL

4.1 Geology

4.1.1 Regional

Regionally, the project area is part of the northern Mount Ida – Ularring Greenstone Belt within the Archean-aged Kalgoorlie Terrane of the Eastern Yilgam Craton.

Lithium mineralisation is hosted within shallow to moderate north-west dipping pegmatites which intrude a thick package of upper greenschist-lower amphibolite facies with metamorphosed, steeply south-west dipping, mafic volcanics and intrusive. Pegmatites within the area of interest are preferentially hosted within a thick anorthosite-leucogabbro unit. This has occurred due to the brittle nature of the coarse-grained stratigraphy which has allowed existing structures to be exploited and hydraulically fractured creating optimal conditions for pegmatite development and subsequent emplacement.

The area has undergone strong folding and deformation with two large anticlines present within the area; the Mt Ida Anticline and the Kurrajong Anticline with major shear zones located between the anticlines and a noticeable absence of a syncline. The Copperfield granite intrudes into and is folded by the Kurrajong Anticline and is potentially a pegmatite-related granite.

4.1.2 Local

The geology of MILP comprises the Copperfield Monzagranite and Kalgoorlie group mafic volcanics. The proposed TSF location will lie within the Kalgoorlie group volcanics, near its eastern contact with the Copperfield Monzagranite, a large granitoid structure intruded into the centre of a regionally significant anticlinal structure of the Mount Ida greenstone belt.

The Kalgoorlie group is weathered near the surface with saprock extending to about 40 m depth, grading into transition zone rocks which are oxidised along joints and fractures. Stratigraphically westwards, away from the Copperfield granite, the sequence comprises the Meta-amphibolite, Mafic Anorthosite, and Meta-amphibolite; The stratigraphic sequence dips to the west and plunges to the south.

4.2 Subsurface Conditions

4.2.1 Historical Investigations

Fieldwork comprising test pit investigation for geotechnical assessment of the IWLTSF site was performed by L&MGSPL on 30 and 31 January 2023. The scope of work completed comprised the excavation of 21 test pits to depths from 0.2 to 1.8 m using a 30-tonne Sumitomo SH330 excavator fitted with a 1,200 mm wide-toothed bucket.

The test pit locations are shown in Figure 1 below while the ground conditions encountered in the test pits are summarised in Table 2.

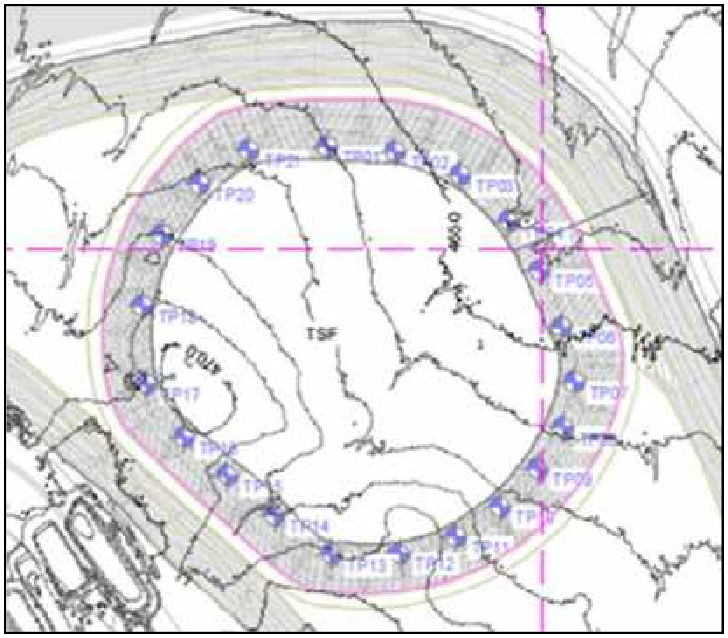


Figure 1: Test pit locations – January 2023 investigation

Table 2: **L&MGSPL Summary of Ground Conditions**

Test pit	Horizon 1	Depth (m)	Horizon 2	Comments	Excavated Depth (m)
TP01	Silty Sand (SM)	0.35	Schist	Terminated on Schist	0.35
TP02	Silty Sand (SM)	0.30	Calcrete	Terminated on Calcrete	0.30
TP03	Silty Sand (SM)	0.20	Calcrete	Terminated on Calcrete	0.20
TP04	Silty Sand (SM)	0.40	Calcrete	Terminated on Calcrete	0.40
TP05	Silty Sand (SM)	0.30	Calcrete	Terminated on Calcrete	0.30
TP06	Silty Sand (SM)	0.45	Calcrete	Terminated on Calcrete	0.45
TP07	Silty Sand (SM)	0.20	Calcrete	Terminated on Calcrete	1.20
TP08	Silty Sand (SM)	0.40	Calcrete	Terminated on Calcrete	0.40
TP09	Silty Sand (SM)	0.30	Calcrete	Terminated on Calcrete	0.30
TP10	Silty Sand (SM)	0.15	Calcrete	Terminated on Calcrete	0.15
TP11	Silty Sand (SM)	0.08	Calcrete	Terminated on Calcrete	0.08

Table 2: **L&MGSPL Summary of Ground Conditions**

Test pit	Horizon 1	Depth (m)	Horizon 2	Comments	Excavated Depth (m)
TP12	Colluvium	0.15	Calcrete	Terminated on Calcrete	0.15
TP13	Colluvium	0.15	Calcrete	Terminated on Calcrete	0.15
TP14	Colluvium	0.20	Calcrete	Terminated on Calcrete	0.20
TP15	Silty Sand (SM)	0.15	Calcrete Gravel (GM) to 1.8		1.80
TP16	Silty Sand (SM)	0.20	Laterite Gravel (GM) to 1.4 m then clayey Gravel (GM) to		1.6
TP17	Silty Sand (SM)	0.20	Calcrete Gravel (GM) to 1.8		1.80
TP18	Silty Sand (SM)	0.10	Calcrete Gravel (GM) to 1.6		0.10
TP19	Silty Sand (SM)	0.25	Calcrete	Terminated on Calcrete	0.25
TP20	Silty Sand (SM)	0.15	Calcrete	Terminated on Calcrete	0.15
TP21	Silty Sand (SM)	0.20	Schist	Terminated on Schist	0.20

The results of the previous investigation indicated the ground conditions at the subject site comprise Silty SAND (SM) overlying Calcrete. Deeper Calcrete Gravel deposits (recorded thickness of 1.8 m) were intersected in the region TP15 to TP18.

4.2.2 Current Investigation

The logs of the boreholes (Appendix C) indicate that the deeper geology comprised of orange-brown low plasticity CLAY with fine-grained Sand (Saprolite).

4.3 Groundwater

Groundwater was not encountered in the eight (8) exploratory boreholes logged by CMW. Inspection of the deeper historical monitoring wells did encounter groundwater as shown in Table 3 below.

Table 3: **Groundwater in Historical Monitoring Wells**

Location ID	Depth to water (m bgl)	Base of Well (m bgl)
GVMB001	27.40	41.10
GVMB002	30.45	61.65
GVMB003	29.20	43.45

Table 3: **Groundwater in Historical Monitoring Wells**

Location ID	Depth to water (m bgl)	Base of Well (m bgl)
WT06	Decommissioned	
WT11	Decommissioned	
WT17	28.10	43.70
MIPB01	38.70	Not determined
MIPB02*	Not determined	Not determined
MIPB03	39.4	Not determined

Note that the wells were dipped using a 100 m tape measure fitted with an electronic sensor at its end. Where the depth to water and/or the depth to the base of the well exceeded a depth of 100 m, data is shown as 'not determined' in Table 3.

4.4 Laboratory Test Results

Results of the laboratory tests for the dried tailings in the ‘old’ tailings dump and the near-surface soil and rock at the foundation of the TSF site are presented in Appendix E and summarised in Table 4.

Table 4: Summary of Laboratory Classification Tests

Location ID	Depths (mbgl)	Particle Size Distribution			k (m/s)	Atterberg Limits				SMDD			ECN	Multi-Stage CU Triaxial		
		Gravel (%)	Sand (%)	Fines (%)		LL (%)	PL (%)	PI (%)	LS (%)	OMC (%)	SMDD (t/m^3)	ρ_b (t/m^3)		c’ (kPa)	φ’ (0)	cv (cm^2/s)
MW01	0.3 - 0.5	4	7	89	-	61	23	38	14	-	-	-	5	-	-	-
MW02	0.0 - 0.5	80	8	12	-	46	23	23	9	-	-	-	4	-	-	-
MW03	0.0 - 0.5	76	8	16	-	-	-	-	-	-	-	-	-	-	-	-
TP01B	1 - 2, 3 - 4	-	30	70	4.00E-08	NO	NP	NP	0.5	13.5	1.84	-	-	-	-	-
TP02A/ TP03A	1 - 2, 0.6 - 1.5	-	38	62	-	NO	NP	NP	0.0	-	-	-	-	-	-	-
TP02A/ TP03A	3 - 4	-	29	71	6.01E-08	NO	NP	NP	0.0	13	1.94	-	-	-	-	-
TP04/ TP05	1 - 2	-	32	68	9.12E-08	NO	NP	NP	0.5	14.5	1.8	-	5	18.59	36.16	0.225
TP04/ TP05	3 - 4	-	26	74	9.39E-08	NO	NP	NP	0.0	14	1.91	-	-	-	-	-
TP06	1 - 2	-	34	66	-	NO	NP	NP	0.0	-	-	-	-	-	-	-
TP07/ TP08	0.5 - 1.5, 1.5 - 2.5	-	36	64	2.76E-08	NO	NP	NP	0.0	16	1.72	-	-	19.47	38.87	0.437
TP07/ TP08	3 - 4, 3.5 - 4.5	-	28	72	3.15E-08	NO	NP	NP	0.0	13	1.87	-	5	-	-	-

Table 4: Summary of Laboratory Classification Tests

Location ID	Depths (mbgl)	Particle Size Distribution			k (m/s)	Atterberg Limits				SMDD			ECN	Multi-Stage CU Triaxial		
		Gravel (%)	Sand (%)	Fines (%)		LL (%)	PL (%)	PI (%)	LS (%)	OMC (%)	SMDD (t/m^3)	ρ_b (t/m^3)		c' (kPa)	φ' (0)	cv (cm^2/s)
TP09A/ TP12A	1 - 2	-	27	73	-	NO	NP	NP	0.0	-	-	-	-	-	-	-
TP09A/ TP12A	4 - 5, 2 - 3	-	35	65	-	NO	NP	NP	0.0	-	-	-	-	-	-	-
TP10A	1 - 2	-	60	40	-	NO	NP	NP	0.0	-	-	-	-	-	-	-
TP10A	3 - 4	-	36	64	-	NO	NP	NP	0.0	-	-	-	-	-	-	-
TP11	1 - 2	-	37	63	-	NO	NP	NP	0.0	-	-	-	-	-	-	-

Gravel, sand, fines (silt - clay) percentages are by weight, ρ_b = apparent (bulk) density, LL = liquid limit, PL = plasticity limit, PI = plasticity index, LS = linear shrinkage, NO = Not obtainable, NP = Non-Plastic, MC = Natural Moisture Content, OMC = Optimum Moisture Content, SMDD = Standard Maximum Dry Density, ρ_b = bulk unit weight, ECN = Emerson Class Number, c' = cohesion, ϕ' = angle of shear resistance, cv = coefficient of consolidation, k = coefficient of permeability.

4.5 Infiltration Testing

Analyses of the falling head tests conducted in the exploratory boreholes are presented in Appendix F.

The inverse auger method is used to assess the permeability which provides only an approximate estimate of the permeability noting that rigorous analytical techniques relating to falling head tests in boreholes that terminate above the water table do not exist.

The results of the analysis are summarised in Table 5 below.

Table 5: **Summary of Infiltration Results**

Location ID	Permeability (m/s)
BH01	Test 1: 5.5×10^{-6} Test 2: 5.6×10^{-6}
BH02	Test 1: 2.8×10^{-6} Test 2: 2.7×10^{-6}
BH03	Not completed due to borehole collapsing
BH04	Test 1: 4.8×10^{-6} Test 2: 4.9×10^{-6}
BH05A	Test 1: 8.5×10^{-6} Test 2: 7.5×10^{-6}
BH06	Test 1: 2.0×10^{-5} Test 2: 1.5×10^{-6}
BH07	Not completed due to borehole collapsing
BH08	Test 1: 7.4×10^{-6} Test 2: 6.2×10^{-6}

From the above data, the average calculated permeability is 6.5×10^{-6} m/sec. This permeability is higher than expected for the low plasticity CLAY (Saprolite) ground profile that the exploratory holes were drilled into. Note however that the clays were likely to be dry to moist at the time of the testing and probably the permeability would drop after many test cycles as a greater thickness of clay at the borehole walls became fully saturated.

5 GEOTECHNICAL ASSESSMENT AND RECOMMENDATIONS

5.1 Materials

5.1.1 Old Tailings Stockpile

Based on the laboratory tests, the stockpiled tailings in the old waste dumps can be classified as non-plastic Sandy SILT (Unified Soil Classification System or USCS of ‘ML’). The optimum moisture content (OMC) and maximum dry density (Standard, SMDD) of the materials were between 13.0% to 15.0% and 1.72 t/m^3 to 1.94

t/m^3, respectively. The permeability of the materials, when compacted to 95% of the SMDD, was between approximately 2.76 x 10^{-8} m/s to 9.39 x 10^{-8} m/s.

The Triaxial tests of the tailings indicated effective strength parameters with estimated cohesions (c') of between 18.6 kPa to 19.5 kPa, angle of internal frictions (ϕ') of 36.2^0 to 38.9^0, and coefficient of consolidations (c_v) of between 0.225 cm^2/s (~710 m^2/yr) to 0.437 cm^2/s (~1,380 m^2/yr).

5.1.2 Mine Waste

The mine waste materials, collected from the Golden Vale Pit, comprised materials described as high plasticity CLAY and medium plasticity Clayey GRAVEL. The materials have a low potential for dispersive behaviour based on an ECN of 4 and 5. The test results indicate some blending would be required of the mine waste materials with the clay sample having a high clay content and the other samples being gravelly with a fines content of less than 20%.

5.2 Design Parameters

For the purposes of geotechnical design calculations, the strength/stiffness parameters have been interpreted for the generalised in-situ geological units encountered at the proposed TSF location, and for the dried tailings in the 'old' tailings dump. The interpretations were based on the results of the geotechnical investigation and the subsequent laboratory test results, published literature on similar soils, empirical correlations, case histories and past design works on similar projects. Table 6 provides the design parameters for bulk density, elastic density, Poisson's ratio, shear modulus, small-strain shear modulus and the coefficients of at rest, active and passive earth pressures.

Table 6: Summary of Recommended Strength / Stiffness Parameters

Geological Unit	ρ (kN/m^3)	S_u (kPa)	Ø' (^{0})	c' (kPa)	E (MPa)	v	G (MPa)	G_0 (MPa)	K_0	No Wall Friction	
										K_a	K_p
Foundation, upper (soil), compacted	18	-	34	0	70	0.3	25	150	0.47	0.31	3.2
Foundation, lower (saprolite)	20	150	-	-	300	0.1	130	650	0.38	0.24	4.2
'Old' Tailings, compacted	18	75	36	5	50	0.3	20	100	0.41	0.26	3.9
Mine Waste, traffic compacted	20	-	40	0	200	0.2	80	600	0.36	0.22	4.5
Mine Waste, capping	20	-	35	0	150	0.2	60	450	0.43	0.27	3.7

ρ = unit weight, Su = Undrained Shear Strength, Ø' = Effective Angle of Friction in degrees, c' = cohesion, E = elastic modulus, v = Poisson's Ratio, G = shear modulus, Go = small strain shear modulus, K_0 = coefficient of earth pressure at rest, K_a = coefficient of active earth pressure, K_p = coefficient of passive earth pressure.

6 CLOSURE

The findings contained within this report are the result of limited discrete investigations conducted in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, can it be considered that these findings represent the actual state of the ground conditions away from our investigation locations.

If the ground conditions encountered during construction are significantly different from those described in this report and on which the conclusions and recommendations were based, then we must be notified immediately.

Additional important information regarding the use of your CMW report is provided in the '*Using your CMW Report*' document attached to this report.

This report has been prepared for use by Delta Lithium Ltd in relation to the Mt Ida Lithium Project, Western Australia in accordance with the scope, proposed uses and limitations described in the report. Should you have further questions relating to the use of your report please do not hesitate to contact us.

Where a party other than Delta Lithium Ltd seeks to rely upon or otherwise use this report, the consent of CMW should be sought prior to any such use. CMW can then advise whether the report and its contents are suitable for the intended use by the other party.

USING YOUR CMW GEOTECHNICAL REPORT

Geotechnical reporting relies on interpretation of facts and collected information using experience, professional judgement, and opinion. As such it generally has a level of uncertainty attached to it, which is often far less exact than other engineering design disciplines. The notes below provide general advice on what can be reasonably expected from your report and the inherent limitations of a geotechnical report.

Preparation of your report

Your geotechnical report has been written for your use on your project. The contents of your report may not meet the needs of others who may have different objectives or requirements. The report has been prepared using generally accepted Geotechnical Engineering and Engineering Geology practices and procedures. The opinions and conclusions reached in your report are made in accordance with these accepted principles. Specific items of geotechnical or geological importance are highlighted in the report.

In producing your report, we have relied on the information which is referenced or summarised in the report. If further information becomes available or the nature of your project changes, then the findings in this report may no longer be appropriate. In such cases the report must be reviewed, and any necessary changes must be made by us.

Your geotechnical report is based on your project’s requirements

Your geotechnical report has been developed based on your specific project requirements and only applies to the site in this report. Project requirements could include the type of works being undertaken; project locality, size and configuration; the location of any structures on or around the site; the presence of underground utilities; proposed design methodology; the duration or design life of the works; and construction method and/or sequencing.

The information or advice in your geotechnical report should not be applied to any other project given the intrinsic differences between different projects and site locations. Similarly geotechnical information, data and conclusions from other sites and projects may not be relevant or appropriate for your project.

Interpretation of geotechnical data

Site investigations identify subsurface conditions at discrete locations. Additional geotechnical information (e.g. literature and external data source review, laboratory testing etc) are interpreted by Geologists or Engineers to provide an opinion about a site specific ground models, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist due to the variability of geological environments. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. Interpretation of factual data can be influenced by design and/or construction methods. Where these methods change review of the interpretation in the report may be required.

Subsurface conditions can change

Subsurface conditions are created by natural processes and then can be altered anthropically or over time. For example, groundwater levels can vary with time or activities adjacent to your site, fill may be placed on a site, or the consistency of near surface conditions might be susceptible to seasonal changes. The report is based on conditions which existed at the time of investigation. It is important to confirm whether conditions may have changed, particularly when large periods of time have elapsed since the investigations were performed.

Interpretation and use by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical report. To help avoid misinterpretations, it is important to retain the assistance of CMW to work with other project design professionals who are affected by the contents of your report. CMW staff can explain the report implications to design professionals and then review design plans and specifications to see that they have correctly incorporated the findings of this report.

Your report's recommendations require confirmation during construction

Your report is based on site conditions as revealed through selective point sampling. Engineering judgement is then applied to assess how indicative of actual conditions throughout an area the point sampling might be. Any assumptions made cannot be substantiated until construction is complete. For this reason, you should retain geotechnical services throughout the construction stage, to identify variances from previous assumption, conduct additional tests if required and recommend solutions to problems encountered on site.

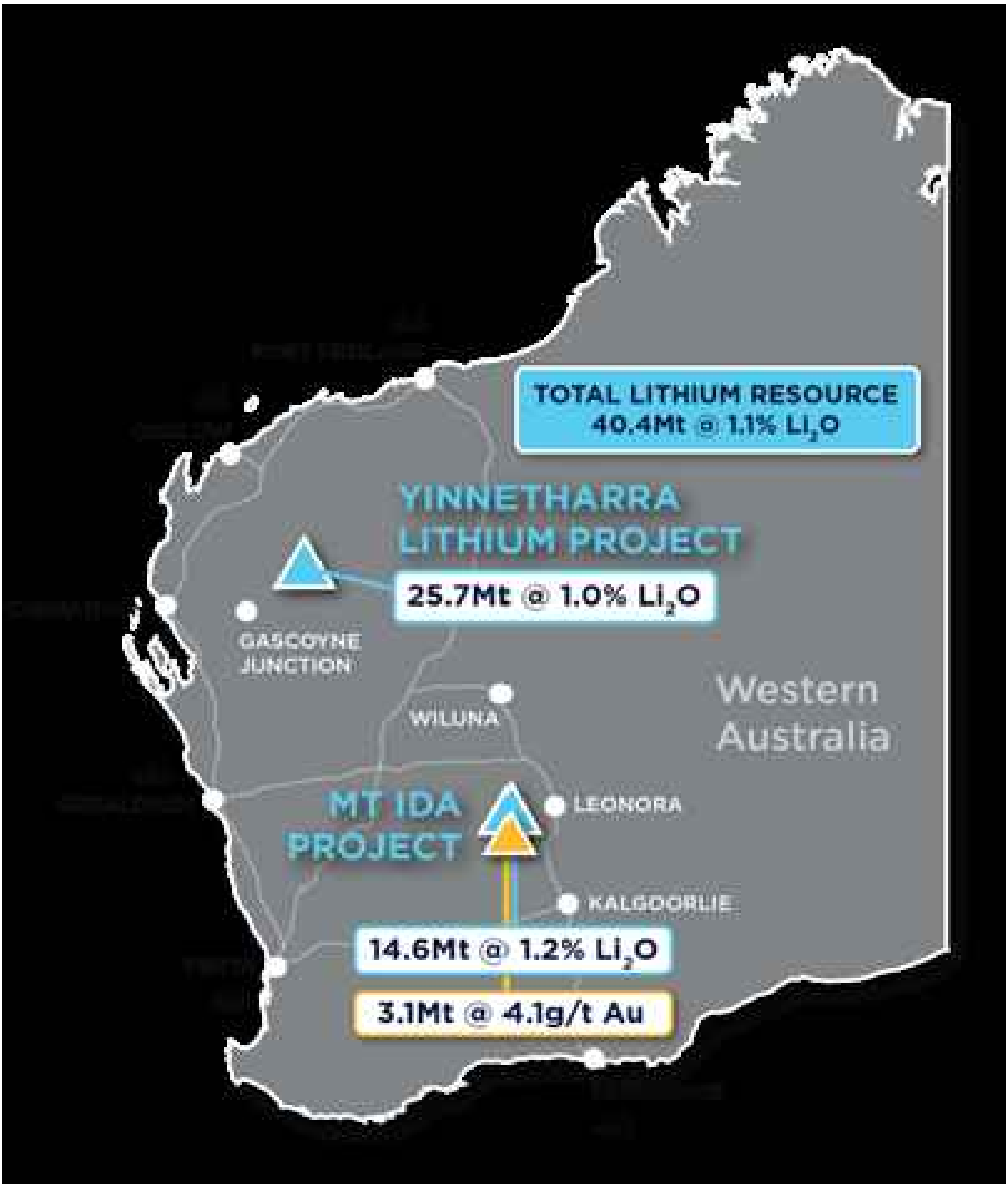
A Geotechnical Engineer, who is fully familiar with the site and the background information, can assess whether the report's recommendations remain valid and whether changes should be considered as the project develops. An unfamiliar party using this report increases the risk that the report will be misinterpreted.

Environmental Matters Are Not Covered

Unless specifically discussed in your report environmental matters are not covered by a CMW Geotechnical Report. Environmental matters might include the level of contaminants present of the site covered by this report, potential uses or treatment of contaminated materials or the disposal of contaminated materials. These matters can be complex and are often governed by specific legislation.

The personnel, equipment, and techniques used to perform an environmental study can differ significantly from those used in this report. For that reason, our report does not provide environmental recommendations. Unanticipated subsurface environmental problems can have large consequences for your site. If you have not obtained your own environmental information about the project site, ask your CMW contact about how to find environmental risk-management guidance.

Appendix A:
Site Location Plan



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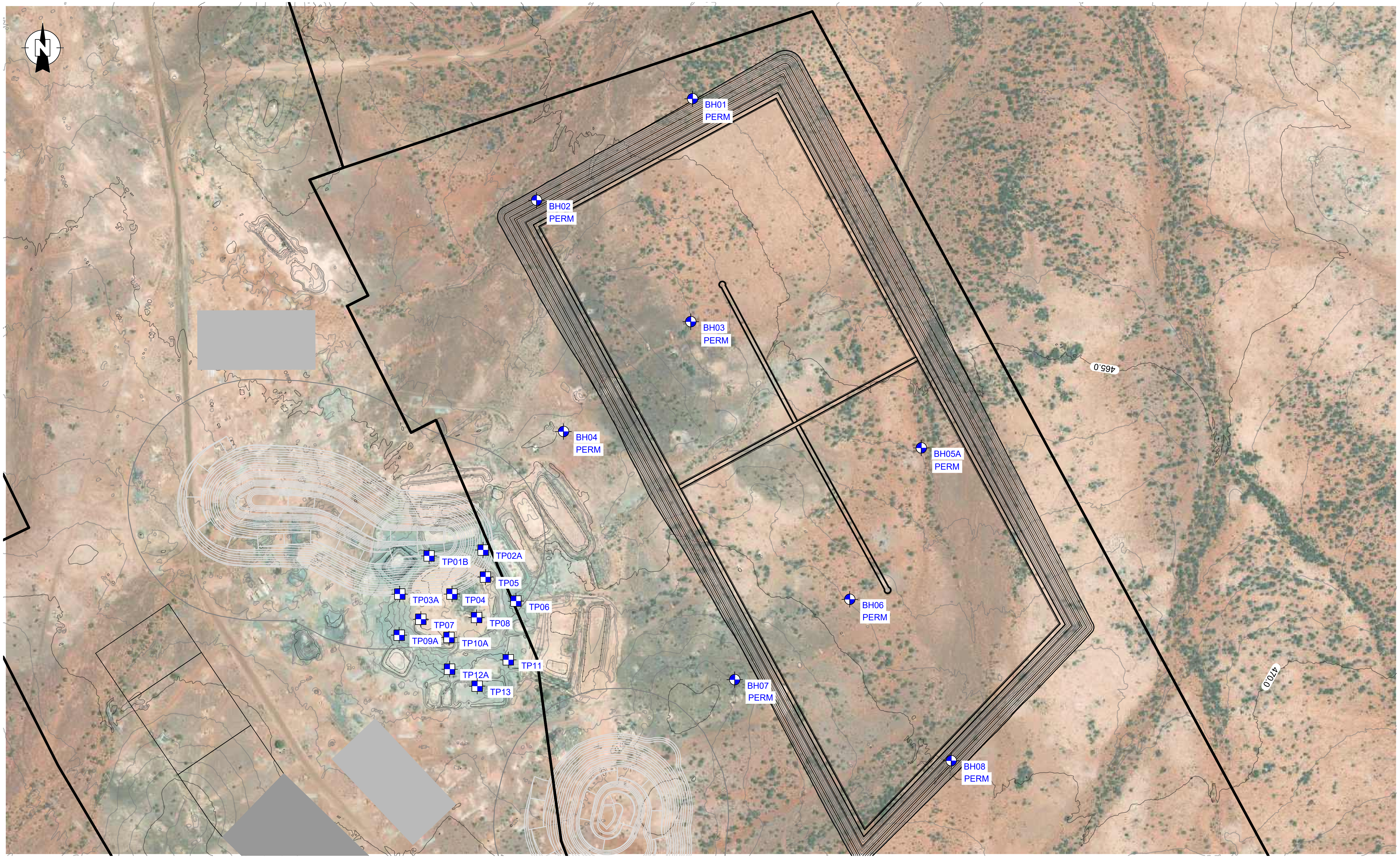
CLIENT: **DELTA LITHIUM**	DRAWN: DE	PROJECT: PER2023-0213AB
PROJECT: **TSF DESIGN** **MT IDA LITHIUM PROJECT**	CHECKED: PA	FIGURE: 01
	REVISION: A	SCALE: NTS
TITLE: **SITE LOCATION PLAN**	DATE: 13.05.24	SHEET: A4 P

Appendix B:
Geotechnical Investigation Plan



LEGEND:

BH01 PERM	BOREHOLE AND PERMEABILITY TESTING
TP01	TEST PIT LOCATION

NOTES:

1. AERIAL FROM BING MAPS
2. COORDINATE SYSTEM: MGA ZONE 51, GDA94

1:6000 0 60 120 180 240 300 m

CMW Geosciences Great People | Practical Solutions	CLIENT:	**DELTA LITHIUM**	DRAWN: DE	PROJECT: PER2023-0213AB
	PROJECT:	**TSF DESIGN MT IDA LITHIUM PROJECT**	CHECKED: PA	FIGURE: 02
			REVISION: A	SCALE: 1:6000
	TITLE:	**SITE INVESTIGATION PLAN**	DATE: 13.05.24	SHEET: A3 L

Appendix C:
Borehole Logs

Explanatory Notes – Soil Description

GRAVEL
SILTY GRAVEL
CLAYEY GRAVEL
Sandy GRAVEL
SAND

Gravelly SAND
SILTY SAND
CLAYEY SAND
CLAY
Gravelly CLAY

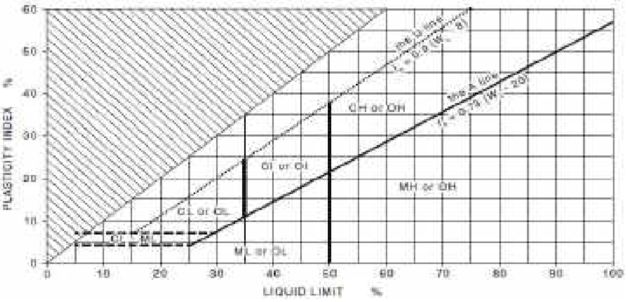
Sandy CLAY
SILT
Gravelly SILT
Sandy SILT
PEAT

FILL
TOPSOIL
COBBLES & BOULDERS
CONCRETE
NO CORE

GP	Poorly Graded Gravel	ML	Low Plasticity Silt
GW	Well Graded Gravel	MH	High Plasticity Silt
GM	Silty Gravel	CL	Low Plasticity Clay
GC	Clayey Gravel	CI	Medium Plasticity Clay
SP	Poorly Graded Sand	CH	High Plasticity Clay
SW	Well Graded Sand	OL	Organic Soils (LP)
SM	Silty Sand	OH	Organic Soils (HP)
SC	Clayey Sand	PT	Peat
	Fill		Cobbles & Boulders

Soil colours based on BGS Internal report IR/05/123 "A Revised scheme for coding unlithified deposits", 2006.

WATER	
▼ Groundwater (Strike)	▽ Groundwater (rise)



CLASSIFICATION AND INFERRED STRATIGRAPHY

Particle Size		
Major Division	Sub Division	Particle Size
Boulders		> 200 mm
Cobbles		63 to 200 mm
Gravel	Coarse	19 to 63 mm
	Medium	6.7 to 19 mm
	Fine	2.36 to 6.7 mm
Sand	Coarse	0.6 to 2.36 mm
	Medium	0.21 to 0.6 mm
	Fine	0.075 to 0.21 mm
Silt		0.002 to 0.075 mm
Clay		< 0.002 mm

SECONDARY/MINOR COMPONENTS	
TERMS FOR SANDS/GRAVELS (Less than 35% Particles < 0.075mm)	**TERMS FOR CLAYS/SILTS** (More than 35% Particles < 0.075mm)
trace… sand/gravel = <15% clay/silt = <5%	**trace…** sand/gravel = <15%
with… sand/gravel = >15%, <30% clay/silt = >5%, <12%	**with…** sand/gravel = >15%, <30%
Sandy… / Gravelly… >30%	**Sandy… / Gravelly…** >30%
Clayey… / Silty … >12%	

MOISTURE CONDITION (Cohesionless Soils)

Symbol	Term	Description
D	**Dry**	Looks and feels dry. Cohesionless and free-running.
M	**Moist**	No free water on remoulding. Soil feels cool, darkened in colour. Soil tends to cohere.
W	**Wet**	Free water on remoulding. Soil feels cool, darkened in colour. Soil tends to cohere.

MOISTURE CONDITION (Cohesive Soils)

Symbol	Term	Description
<PL	**Dry**	Looks and feels dry. Hard and friable or powdery, well dry of the plastic limit
≈PL	**Moist**	Soil feels cool, darkened in colour. Soil can be moulded. Near plastic limit.
>PL	**Wet**	Soils feels cool, darkened in colour. Usually weakened and free water forms when remoulding. Wet of plastic limit.

DENSITY (Cohesionless Soils)

Sym.	Term	Density Index (%)	SPT 'N'
VL	Very Loose	Less than 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Dense	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

STIFFNESS (Cohesive Soils)

Sym.	Term	Undrained Shear Strength
VS	Very Soft	0 to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa

SAMPLING AND LABORATORY / INSITU TESTING RESULTS

B	Bulk Disturbed Sample	**U**	Undisturbed Push-in Sample	**CBR**	California Bearing Ratio
BLK	Block Sample	**W**	Water Sample	**UCS**	Unconfined Compressive Strength
C	Core Sample	**LL**	Liquid Limit	**PLI**	Point Load Index
ES	Environmental Soil Sample	**PI**	Plasticity Index	**N**	SPT-N Value
P	Piston Sample	**LS**	Linear Shrinkage		

DRILLING/EXCAVATION METHOD

AC	Air Core	**HA**	Hand Auger	**RC**	Rotary Cored
ADH	Hollow Auger Drilling	**HQ**	Rotary Core 63.5mm	**RO**	Rotary Open Hole
AD/V	Auger with V-Bit	**HQ3**	Rotary Core 61.1mm	**SPT**	Standard Penetration Test
AD/T	Auger with TC-Bit	**PQ3**	Rotary Drill 83mm	**TP**	Test Pit
DPP	Direct Push Probe	**PT**	Push Tube	**W**	Wash Bore

Explanatory Notes – Rock Description

▤ **MUDSTONE**
▨ **SILTSTONE**
▦ **SANDSTONE**

▦ **LIMESTONE**
▦ **CHALK**
▲ **BRECCIA**

○ **CONGLOMERATE**
✚ **IGNEOUS**
〰 **METAMORPHIC**

◇ **GYPSUM**
▤ **SHALE**
▩ **PYROCLASTIC**

ROCK MATERIAL STRENGTH

Symbol	Term	Uniaxial Compressive Strength - UCS (MPa)	Point Load Index - $I_{s(50)}$ (MPa) - GUIDE ONLY	Field Guide
EL	Extremely Low	Less than 0.6	Less than 0.03	Easily remoulded by hand to a material with soil properties (logged as soil).
VL	Very Low	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 3 cm thick can be broken by finger pressure.
L	Low	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150 mm long 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	6 to 20	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	20 to 60	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
VH	Very High	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	More than 200	More than 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

WEATHERING CLASSIFICATION

Symbol	Term	Definition
RS	Residual Soil	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
XW	Extremely weathered rock	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
HW (or DW)	Highly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured. Porosity may be increased by leaching, or may be decreased due to deposition of weathering
MW (or DW)	Moderately Weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.
SW	Slightly weathered rock	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
FR	Fresh rock	Rock shows no sign of decomposition or staining.

CEMENTATION CLASSIFICATION

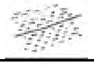
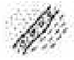
Symbol	Term	Definition
Uc	Uncemented	Clean grains, exhibiting soil properties.
VWc	Very weakly cemented	Marginal soil-rock strengths, collapsing feel under light finger pressure, cement seen on some washed grains.
Wc	Weakly Cemented	Collapsing feel under light soil pressure, breaks down to individual grains or with some grains cemented together, cement seen on many washed grains.
MWk	Moderately Weakly Cemented	Cement on nearly all grains, breaks down to lumps and some individual grains under finger pressure, can crush to individual grains under knife blade.
Mo	Moderately Cemented	Cement on most grains, can break fragments off by hand and crush to small lumps under knife blade.
We	Well Cemented	Practically all grains cemented together, cannot break fragments off by hand, dull sound under hammer.
VWe	Very Well Cemented	Most Primary Pores filled with cement, requires firm blow with hammer to break off fragments, rings when struck

ROCK CORE RECOVERY

Symbol	Term	Definition
TCR	Total Core Recovery (%)	The ratio of total length of core recovered to length of core run drilled, expressed as a percentage.
SCR	Solid Core Recovery (%)	The ratio of the total length of solid cylindrical pieces of core recovered to length of core run drilled, expressed as a percentage.
RQD	Rock Quality Designation (%)	The ratio of the total length of solid cylindrical pieces of core over 100mm in length recovered to length of core run drilled, expressed as a percentage.

Explanatory Notes – Defect Description

Defect Type

ABBREVIATION	TERM	DEFINITION	DIAGRAM
PT	**Parting**	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
JT	**Joint**	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed.	
SS	**Sheared Surface**	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.	
SZ	**Sheared Zone**	Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.	
CS	**Crushed Zone / Seam**	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.	
SM	**Seam**	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1 mm thick may be described as a veneer or coating on a joint surface.	

Surface Roughness

ABBREVIATION	TERM	Description
VR	**Very Rough**	Many large irregularities generally > 1 mm
RO	**Rough**	Many small irregularities generally > 1 mm
SM	**Smooth**	Few or no surface irregularities
PO	**Polished**	Shiny smooth surface
Sl	**Slickensided/Striated**	Grooved/striated surface, usually polished

Orientation

ABBREVIATION	TERM
SH	**Sub Vertical**
SV	**Sub Horizontal**
10°	**Angle from horizontal**

Surface Shape

ABBREVIATION	TERM	Description
PL	**Planar**	Does not vary in orientation
CU	**Curved**	gradual change in orientation
UN	**Undulating**	wavy surface
ST	**Stepped**	one or more well defined steps
IR	**Irregular**	many sharp changes in orientation

Aperture

ABBREVIATION	TERM
DIS	**Discontinuous**
CL	**Closed**
5mm	**Measured width between joint surfaces**

Coatings

ABBREVIATION	TERM	Description
CN	**Clean**	No visible coating
SN	**Stained**	No coating but surface discoloured
VN	**Veneer**	visible coating too thin to measure
CT	**Coating**	visible coating up to 1mm thick
IF	**Infilled**	Over 1mm thick of soil present

Block Shape

Term	Description
Blocky	Roughly equidimensional blocks.
Tabular	thickness of blocks much less than length or width.
Columnar	lengths much greater than other dimensions
Irregular	Irregular discontinuities without arrangement into distinct sets,

BOREHOLE LOG - BH01

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Sheet 1 of 2

Logged by: OP
Checked by: PA

Position: E.253729m N.6779355m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	1 2 3 4 5 6 7 8 9 10		CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to sub-rounded. 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

BOREHOLE LOG - BH01

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Sheet 2 of 2

Logged by: OP
Checked by: PA

Position: E.253729m N.6779355m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components		Moisture Condition	Consistency/ Relative Density	Structure & other observations
			CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to sub-rounded.				
				10.5			
	11			11.0			
				11.5			
	12			12.0			
				12.5			
	13			13.0			
				13.5			
	14		*... at 14.00m, becomes yellow brown*	14.0			
				14.5			
456.00	15		Borehole terminated at 15.00 m	15.0			
				15.5			
	16			16.0			
				16.5			
	17			17.0			
				17.5			
	18			18.0			
				18.5			
	19			19.0			
				19.5			
	20			20.0			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH01

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH01 0.00 - 15.00m

BOREHOLE LOG - BH02

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Sheet 1 of 1

Logged by: OP
Checked by: PA

Position: E.253463m N.6779182m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
			CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to sub-rounded.			
			0.5			
	1		1.0			
			1.5			
	2		2.0			
			2.5			
	3		3.0			
			3.5			
	4		4.0			
			4.5			
	5		5.0			
			5.5			
	6		6.0			
			6.5			
	7		7.0			
			7.5			
	8		8.0			
			8.5			
	9		9.0			
			9.5			
	10		Borehole terminated at 10.00 m 10.0			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH02

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH02 0.00 - 10.00m

BOREHOLE LOG - BH03

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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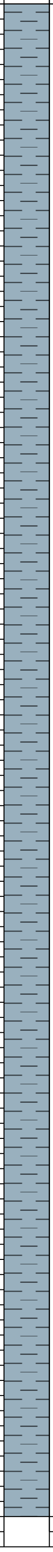
Sheet 1 of 1

Logged by: OP
Checked by: PA

Position: E.253726m N.6778975m (MGA 51)
Elevation: 471 m (AHD)



RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
			CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to sub-rounded.			
	1					
	2					
	3					
	4					
	5		*... from 5.00m to 7.00m, becomes red brown*			
	6					
	7					
	8					
	9		*... from 9.00m to 14.00m, becomes pale grey*			
	10		Borehole terminated at 10.00 m			

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH03

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH03 0.00 - 15.00m

BOREHOLE LOG - BH04

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Sheet 1 of 1

Logged by: OP
Checked by: PA
Position: E.253509m N.6778788m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
			CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to sub-rounded.			
			0.5			
	1		1.0			
			1.5			
	2		2.0			
			2.5			
	3		3.0			
			3.5			
	4		4.0			
			4.5			
	5		5.0			
			5.5			
	6		6.0			
			6.5			
	7		7.0			
			7.5			
	8		*... at 8.00m, becomes red brown* 8.0			
			8.5			
	9		9.0			
			9.5			
	10		10.0 Borehole terminated at 10.00 m			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH04

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH04 0.00 - 10.00m

BOREHOLE LOG - BH05A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Sheet 1 of 1

Logged by: OP
Checked by: PA

Position: E.254119m N.6778760m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	1 2 3 4 5 6 7 8 9		CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to subrounded. 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5			
	10		10.0 Borehole terminated at 10.00 m			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH05A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH05A 0.00 - 10.00m

BOREHOLE LOG - BH06

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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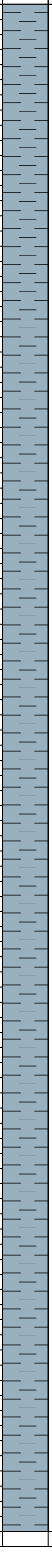
Sheet 1 of 2

Logged by: OP
Checked by: PA
Position: E.253997m N.6778502m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	0 – 10		CL: Saprolite recovered as CLAY: low plasticity; pale grey; with sand, fine grained, subangular to sub-rounded. *... from 6.00m to 8.00m, becomes orange brown*			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

BOREHOLE LOG - BH06

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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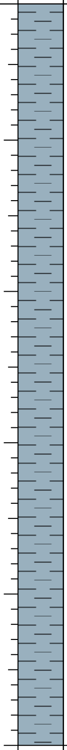
Sheet 2 of 2

Logged by: OP   Position: E.253997m N.6778502m (MGA 51)
Checked by: PA   Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components		Moisture Condition	Consistency/ Relative Density	Structure & other observations
			CL: : Saprolite recovered as CLAY: low plasticity; pale grey; with sand, fine grained, subangular to sub-rounded.				
				10.5			
	11			11.0			
				11.5			
	12			12.0			
				12.5			
	13			13.0			
				13.5			
	14			14.0			
				14.5			
456.00	15		Borehole terminated at 15.00 m	15.0			
				15.5			
	16			16.0			
				16.5			
	17			17.0			
				17.5			
	18			18.0			
				18.5			
	19			19.0			
				19.5			
	20			20.0			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH06

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH06 0.00 - 15.00m

BOREHOLE LOG - BH07

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Logged by: OP
Checked by: PA

Position: E.253801m N.6778365m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components		Moisture Condition	Consistency/ Relative Density	Structure & other observations
			CL: Saprolite recovered as CLAY: low plasticity; red brown; with sand, fine grained, subangular to sub-rounded.				
				0.5			
	1			1.0			
				1.5			
	2			2.0			
				2.5			
	3			3.0			
				3.5			
	4			4.0			
				4.5			
	5			5.0			
				5.5			
	6			6.0			
				6.5			
	7		*... at 7.00m, becomes orange brown*	7.0			
				7.5			
	8			8.0			
				8.5			
	9			9.0			
				9.5			
	10		Borehole terminated at 10.00 m	10.0			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH07

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH07 0.00 - 15.00m

BOREHOLE LOG - BH08

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

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Sheet 1 of 1

Logged by: OP
Checked by: PA
Position: E.254170m N.6778227m (MGA 51)
Elevation: 471 m (AHD)

RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		▤	CL: Saprolite recovered as CLAY: low plasticity; orange brown; with sand, fine grained, subangular to sub-rounded.			
	3	▤	*... from 3.00m to 6.00m, becomes red brown*			
	10		Borehole terminated at 10.00 m			

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered. Permeability testing completed within borehole.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - BH08

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 02/12/2023

BH08 0.00 - 10.00m

Appendix D:
Test Pit Logs

TEST PIT LOG - TP01B

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP
Position: E.253280m N.6778576m (MGA 51)
Plant: 30T Excavator
Checked By: PA
Elevation:
Contractor:
Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FIll: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1	▨				
				2	▨				
	3.0 - 4.0	B		3	▨				
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP01B

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP	Position: E.253280m N.6778576m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FIll: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP01B

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP01 Test Pit

TP01B Spoil

TEST PIT LOG - TP02A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP
Checked By: PA
Position: E.253372m N.6778586m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	SP: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1	▨				
				2	▨				
	3.0 - 4.0	B		3	▨				
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP02A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP	Position: E.253372m N.6778586m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	SP: GRAVELLY SAND: Saprolite recovered as gravelly SAND: fine to coarse grained, sub-angular; orange brown; with gravel, fine to coarse grained, angular to subrounded; with clay, low plasticity.			
						Test pit terminated at 4.10 m			
				5					
				6					
				7					
				8					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP02A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP02A Test Pit

TP02A Spoil

TEST PIT LOG - TP03A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

Sheet 1 of 2

Logged by: OP
Checked By: PA
Position: E.253230m N.6778511m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
	0.5 - 1.5	B			▨				
				1	▨				
				2	▨				
	3.0 - 4.0	B		3	▨				
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP03A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP
Checked By: PA
Position: E.253230m N.6778511m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP03A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP03A Test Pit

TEST PIT LOG - TP04

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP
Checked By: PA
Position: E.253319m N.6778511m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
				1 2	▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
				3	▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				4					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP04

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

Sheet 2 of 2

Logged by: OP	Position: E.253319m N.6778511m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP04

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP04 Spoil

TEST PIT LOG - TP05

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP	Position: E.253376m N.6778540m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
						FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1					
				2					
						FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
	3.0 - 4.0	B		3					
				4					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP05

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP
Checked By: PA
Position: E.253376m N.6778540m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP05

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP05 Spoil

TEST PIT LOG - TP06

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 1

Logged by: OP
Checked By: PA
Position: E.253428m N.6778499m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
				1 2	▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
					▒	SP: GRAVELLY SAND: Saprolite recovered as gravelly SAND: fine to coarse grained, sub-angular; orange brown; with gravel, fine to coarse grained, angular to subrounded; with clay, low plasticity.			
				3 4		Test pit terminated at 2.90 m			

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP06

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP06 Test Pit

TP06 Spoil

TEST PIT LOG - TP07

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP
Position: E.253266m N.6778468m (MGA 51)
Plant: 30T Excavator
Checked By: PA
Elevation:
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
				1	▨				
				2	▨				
				3	▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP07

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP
Checked By: PA
Position: E.253266m N.6778468m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▩	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP07

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP07 Test Pit

TP07 Spoil

TEST PIT LOG - TP08

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP
Position: E.253361m N.6778471m (MGA 51)
Plant: 30T Excavator
Checked By: PA
Elevation:
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
						FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
				1					
	1.5 - 2.5	B							
				2					
						FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				3					
	3.5 - 4.5	B							
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP08

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

Sheet 2 of 2

Logged by: OP
Checked By: PA
Position: E.253361m N.6778471m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 3.00m x 1.20m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP08

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP08 Test Pit

TP08 Spoil

TEST PIT LOG - TP09A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP	Position: E.253229m N.6778441m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1	▨				
				2	▨				
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				3	▨				
	4.0 - 5.0	B		4					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP09A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP
Checked By: PA
Position: E.253229m N.6778441m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP09A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP09A Test Pit

TP09A Spoil

TEST PIT LOG - TP10A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 2

Logged by: OP
Checked By: PA
Position: E.253314m N.6778437m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1	▨				
				2	▨				
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
	3.0 - 4.0	B		3	▨				
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP10A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 2 of 2

Logged by: OP
Checked By: PA
Position: E.253314m N.6778437m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▩	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
				5		Test pit terminated at 5.00 m			
				6					
				7					
				8					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP10A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP10A Test Pit

TP10A Spoil

TEST PIT LOG - TP11

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 1

Logged by: OP	Position: E.253415m N.6778399m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1	▨				
				2	▨				
						SP: GRAVELLY SAND: Saprolite recovered as gravelly SAND: fine to coarse grained, sub-angular; orange brown; with gravel, fine to coarse grained, angular to subrounded; with clay, low plasticity.			
						Test pit terminated at 2.60 m			
				3					
				4					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

TEST PIT LOG - TP12A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 1

Logged by: OP	Position: E.253315m N.6778383m (MGA 51)	Plant: 30T Excavator	
Checked By: PA	Elevation:	Contractor:	Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; dark grey; with silt; dry. (Tailings) (Fill)			
	1.0 - 2.0	B		1	▨				
	2.0 - 3.0	B		2	▨				
				3	░	SP: GRAVELLY SAND: Saprolite recovered as gravelly SAND: fine to coarse grained, sub-angular; orange brown; with gravel, fine to coarse grained, angular to sub-rounded; with clay, low plasticity.			
						Test pit terminated at 3.10 m			
				4					

DCP/PSP Equipment Ref.:	In Situ Vane Equipment Ref.:	Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached

Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP12A

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP12A Test Pit

TP12A Spoil

TEST PIT LOG - TP13

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

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Sheet 1 of 1

Logged by: OP
Checked By: PA
Position: E.253362m N.6778354m (MGA 51)
Elevation:
Plant: 30T Excavator
Contractor:
Dimensions : 1.20m x 3.00m

Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
	Depth	Type & Results							
					▨	FILL: SILTY SAND: fine to medium grained, sub-rounded; brown; with silt; dry. (Tailings) (Fill)			
					░	SP: GRAVELLY SAND: Saprolite recovered as gravelly SAND: fine to coarse grained, sub-angular; orange brown; with gravel, fine to coarse grained, angular to sub-rounded; with clay, low plasticity.			
						Test pit terminated at 0.40 m			
				1					
				2					
				3					
				4					

DCP/PSP Equipment Ref.:
In Situ Vane Equipment Ref.:
Pocket Penetrometer Equipment Ref.:

Termination Reason: Target Depth Reached
Remarks: Groundwater not encountered.

This report must be read in conjunction with accompanying notes and abbreviations.

PHOTOGRAPH SHEET - TP13

Client: Delta Lithium
Project: TSF Design + Hydrogeology, Mt Ida Lithium Project
Location: Mount Ida
Project ID: PER2023-0213
Date: 1 December 2023

TP13 Test Pit

TP13 Spoil

Appendix E:
Laboratory Test Certificates

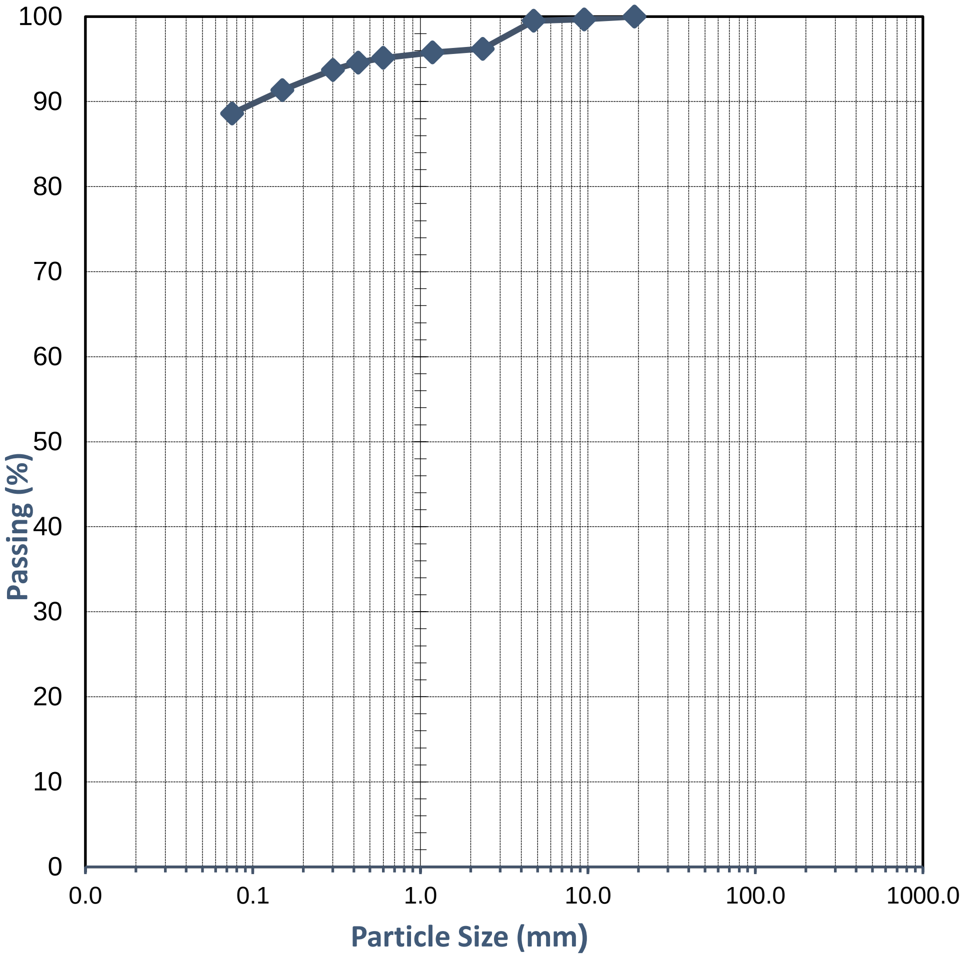
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19787_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19787
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW01 (0.3-0.5)m	*Date Tested:*	2/1 - 3/1/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	100
4.75	100
2.36	96
1.18	96
0.600	95
0.425	95
0.300	94
0.150	91
0.075	89



Comments:

[redacted]

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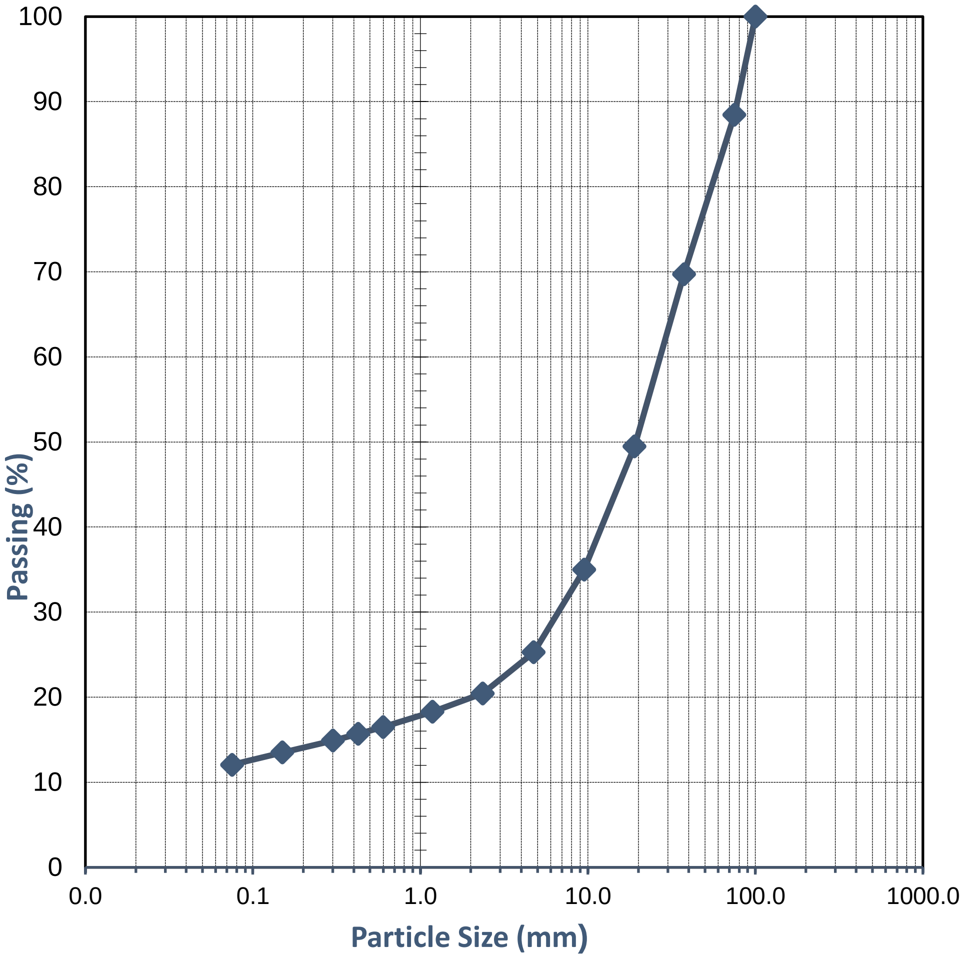
TEST REPORT - AS 1289.3.6.1, *AS 1289.1.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19788_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19788
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW02 (0-0.5)m	*Date Tested:*	29/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	100
75.0	88
37.5	70
19.0	49
9.5	35
4.75	25
2.36	20
1.18	18
0.600	17
0.425	16
0.300	15
0.150	14
0.075	12



*Comments: *AS 1289.1.1- Deviation from standard: Insufficient sample according to test method requirements. NATA accreditation does not cover the performance of this service.*

[redacted]

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SOIL | AGGREGATE | CONCRETE | CRUSHING

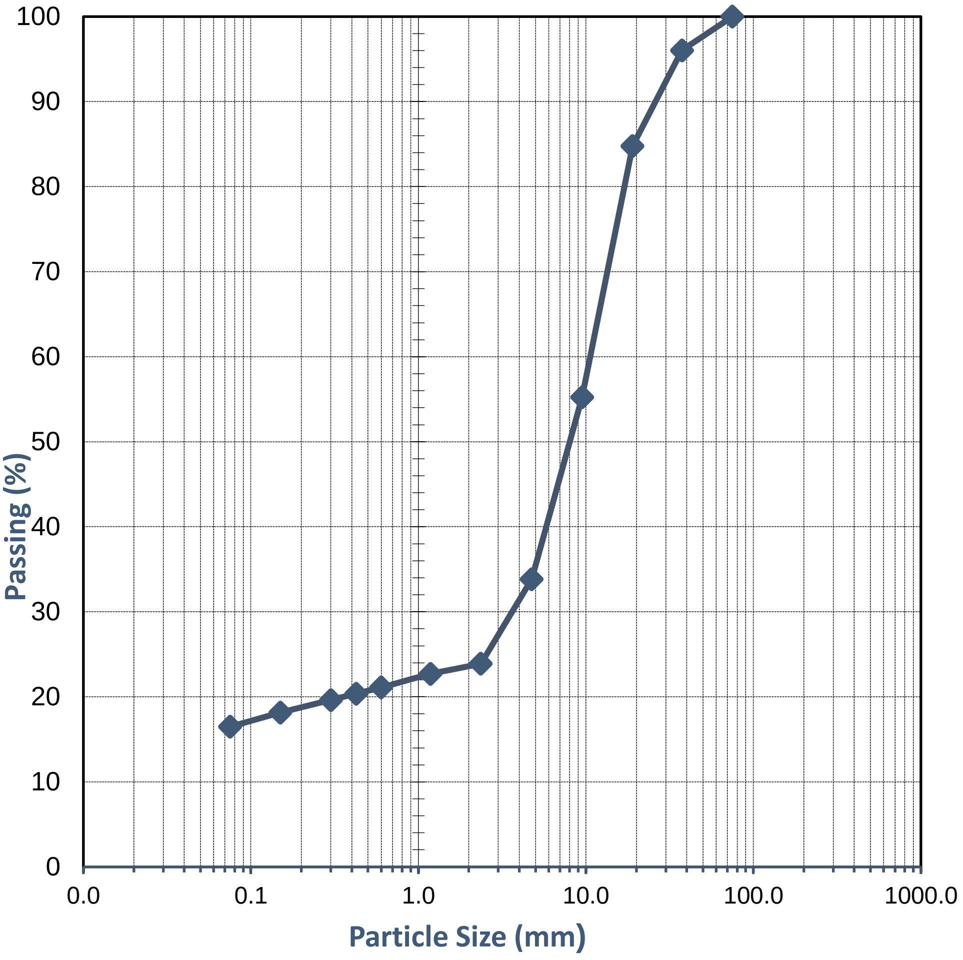
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19789_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19789
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW03 (0-0.5)m	*Date Tested:*	28/12 - 29/12/2023

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	100
37.5	96
19.0	85
9.5	55
4.75	34
2.36	24
1.18	23
0.600	21
0.425	20
0.300	20
0.150	18
0.075	16



Comments:

[redacted]

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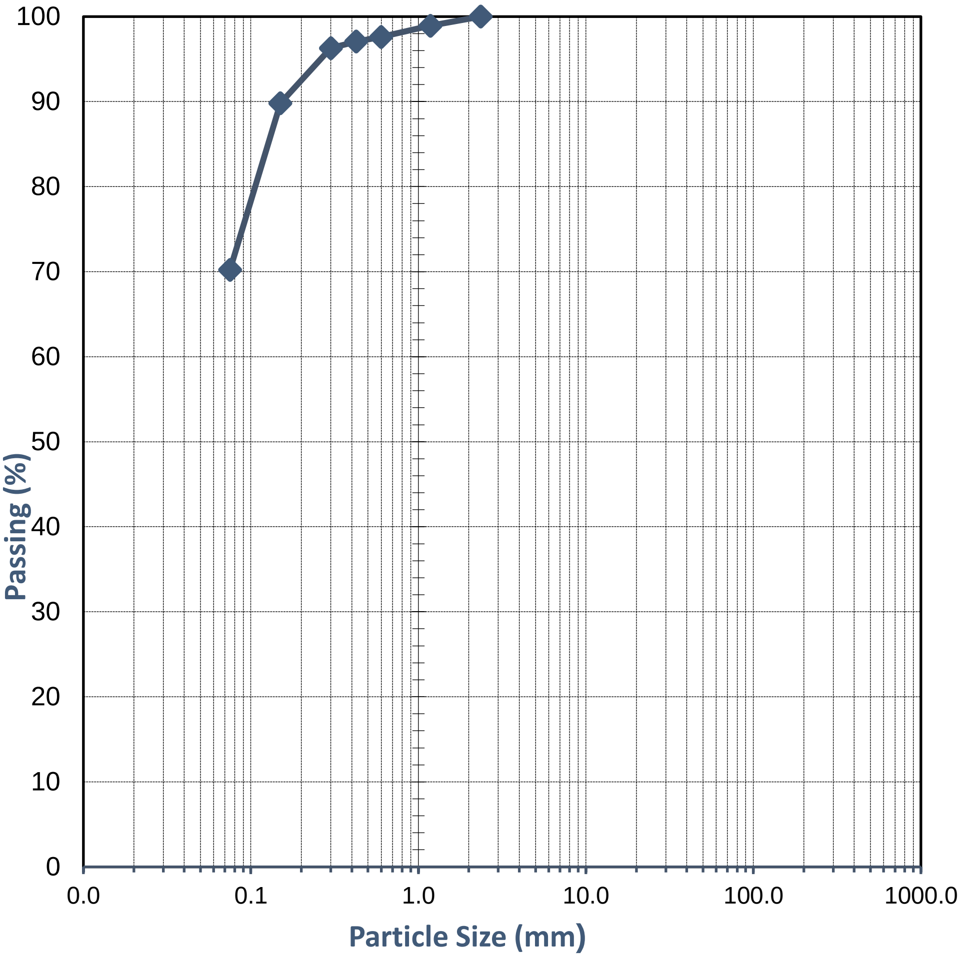
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19790_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19790
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP01b (1-2 and 3-4)m	*Date Tested:*	29/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	99
0.600	98
0.425	97
0.300	96
0.150	90
0.075	70



Comments:

[redacted]

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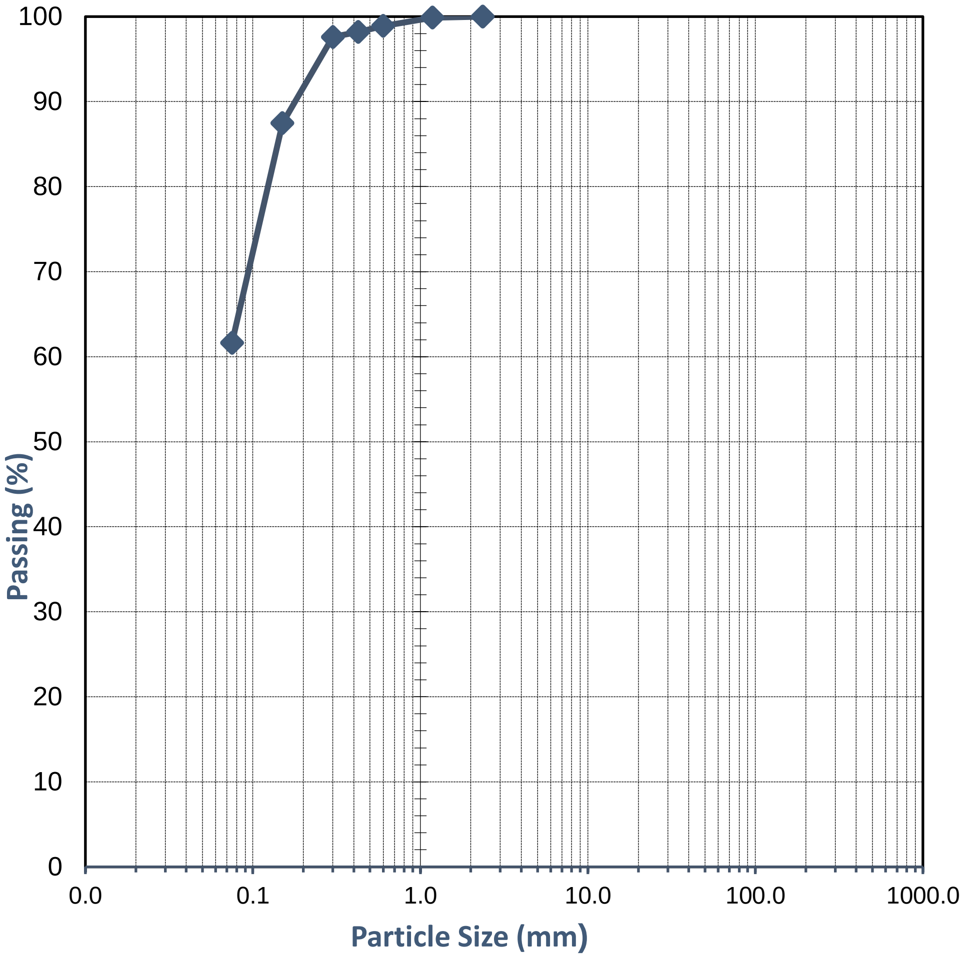
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19791_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19791
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP02a (1-2)m and TP03a (0.6-1.5)m	*Date Tested:*	28/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	98
0.300	98
0.150	87
0.075	62



Comments:

[redacted]

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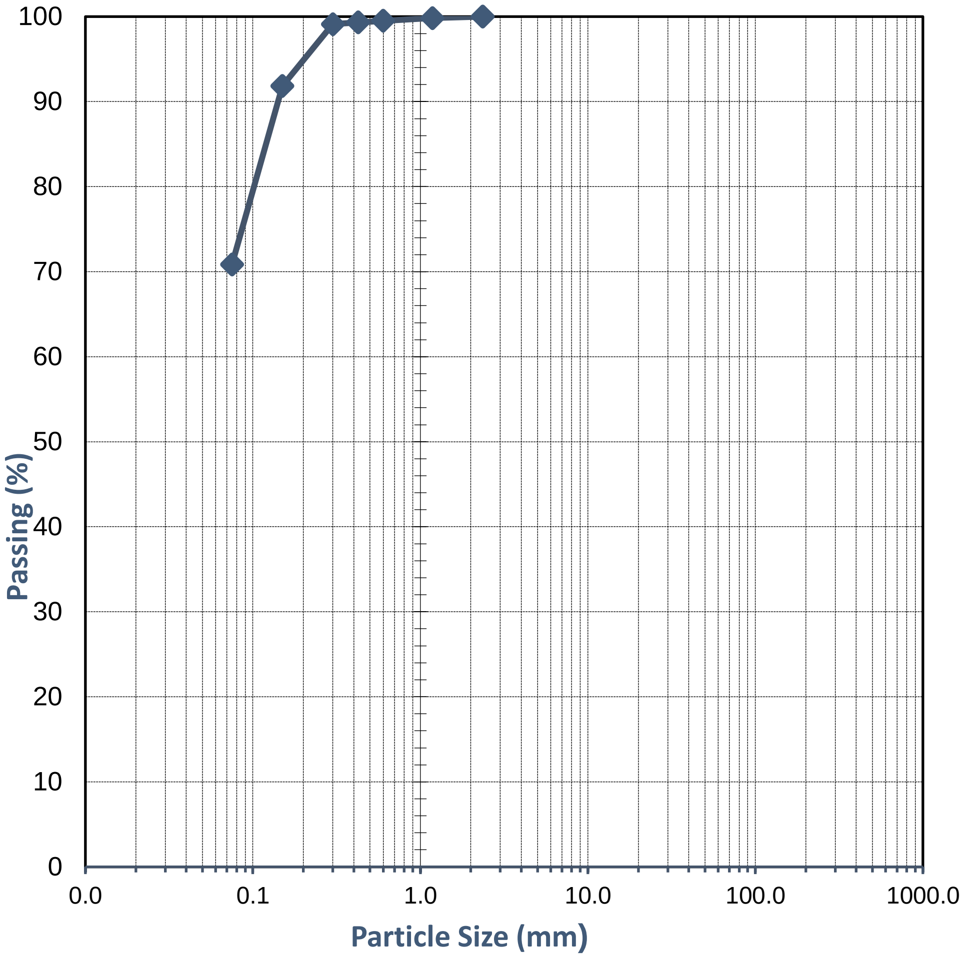
TEST REPORT - AS 1289.3.6.1

Client:	**CMW Geosciences**	***Ticket No.***	**S11902**
Client Address:	**Suite 1, Level 3/29 Flynn Street, Wembley WA 6014**	***Report No.***	**WG23.19792_1_PSD**
Project:	**TSF Design**	***Sample No.***	**WG23.19792**
Location:	**Mount Ida**	***Date Sampled:***	**Not Specified**
Sample Identification:	**TP02a and TP03a (3-4)m**	***Date Tested:***	**29/12/2023 - 02/01/2024**

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	100
0.425	99
0.300	99
0.150	92
0.075	71



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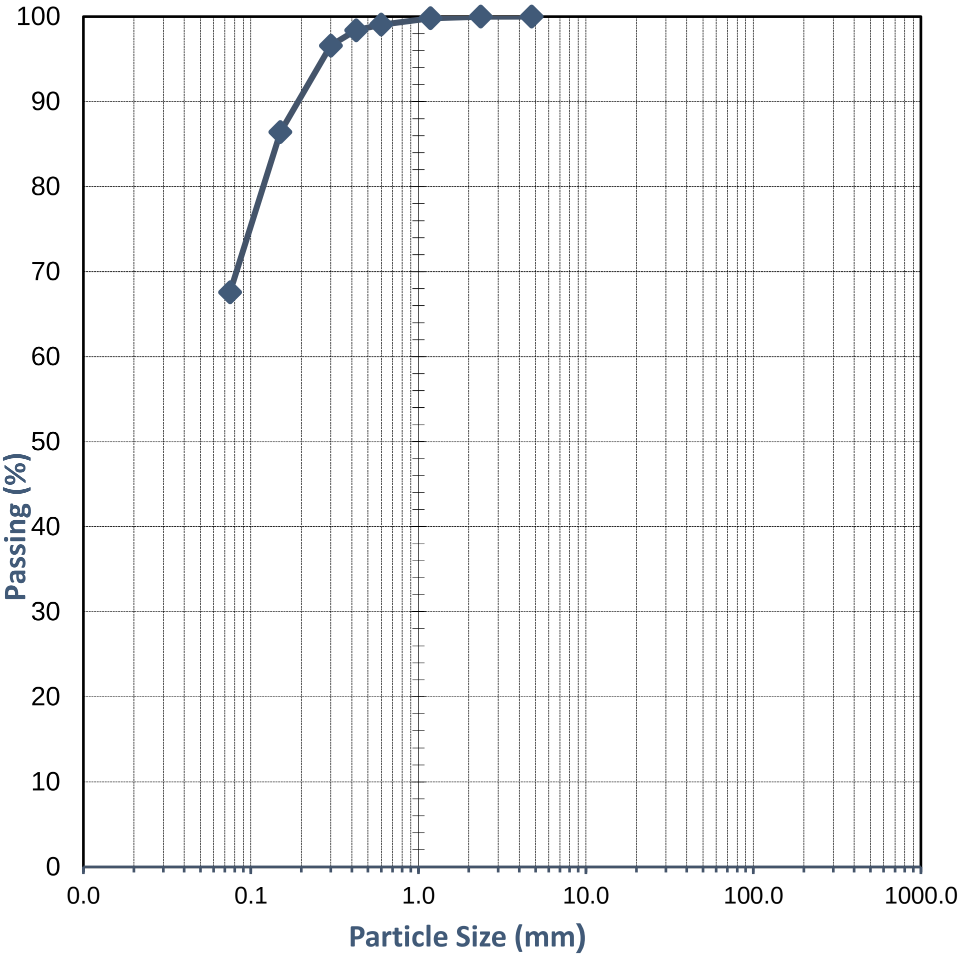
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19793_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19793
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (1-2)m	*Date Tested:*	29/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	99
0.425	98
0.300	97
0.150	86
0.075	68



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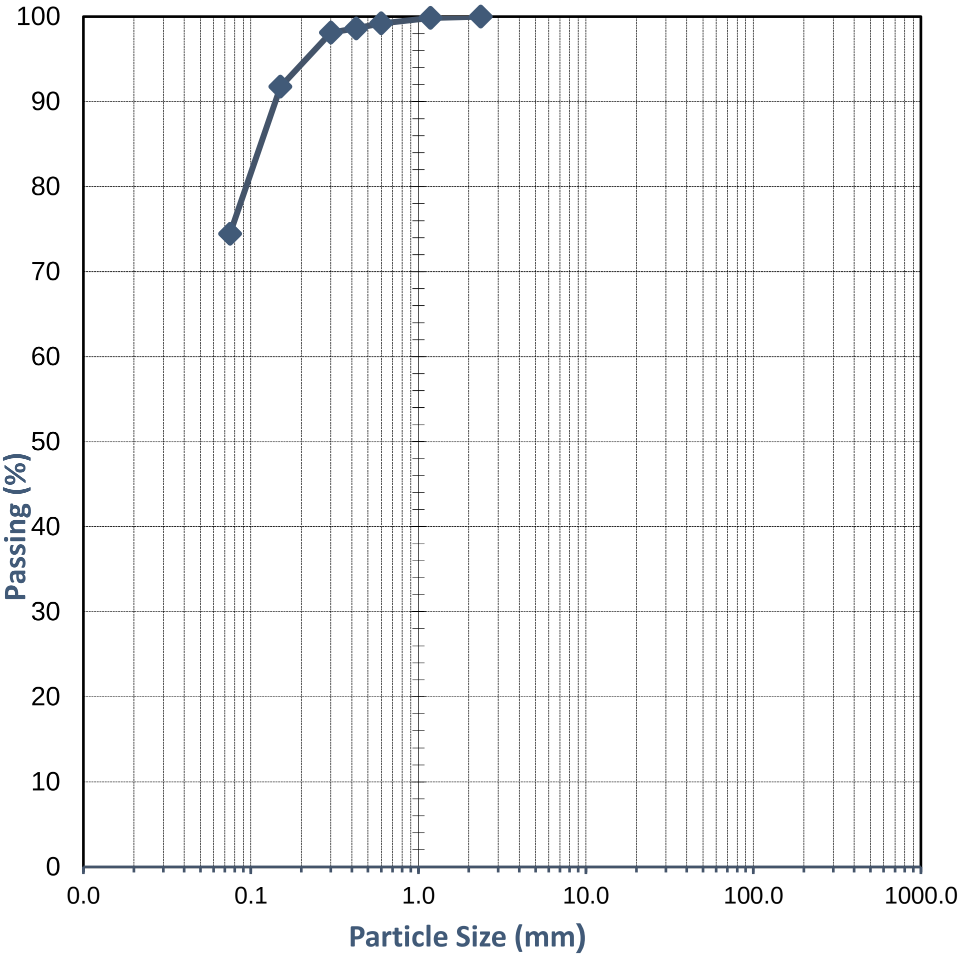
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19794_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19794
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (3-4)m	*Date Tested:*	2/1 - 3/1/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	99
0.300	98
0.150	92
0.075	74



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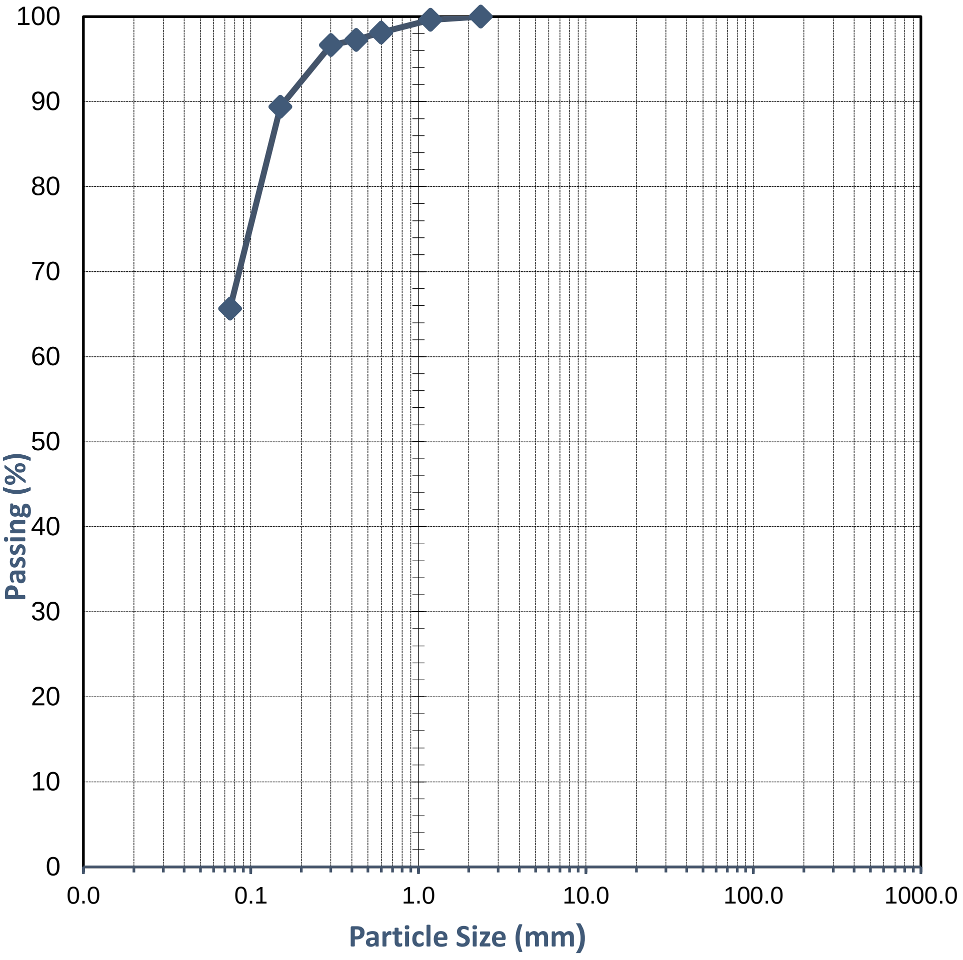
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	***Ticket No.***	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	***Report No.***	WG23.19795_1_PSD
Project:	TSF Design	***Sample No.***	WG23.19795
Location:	Mount Ida	***Date Sampled:***	Not Specified
Sample Identification:	TP06 (1-2)m	***Date Tested:***	2/1 - 3/1/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	98
0.425	97
0.300	97
0.150	89
0.075	66



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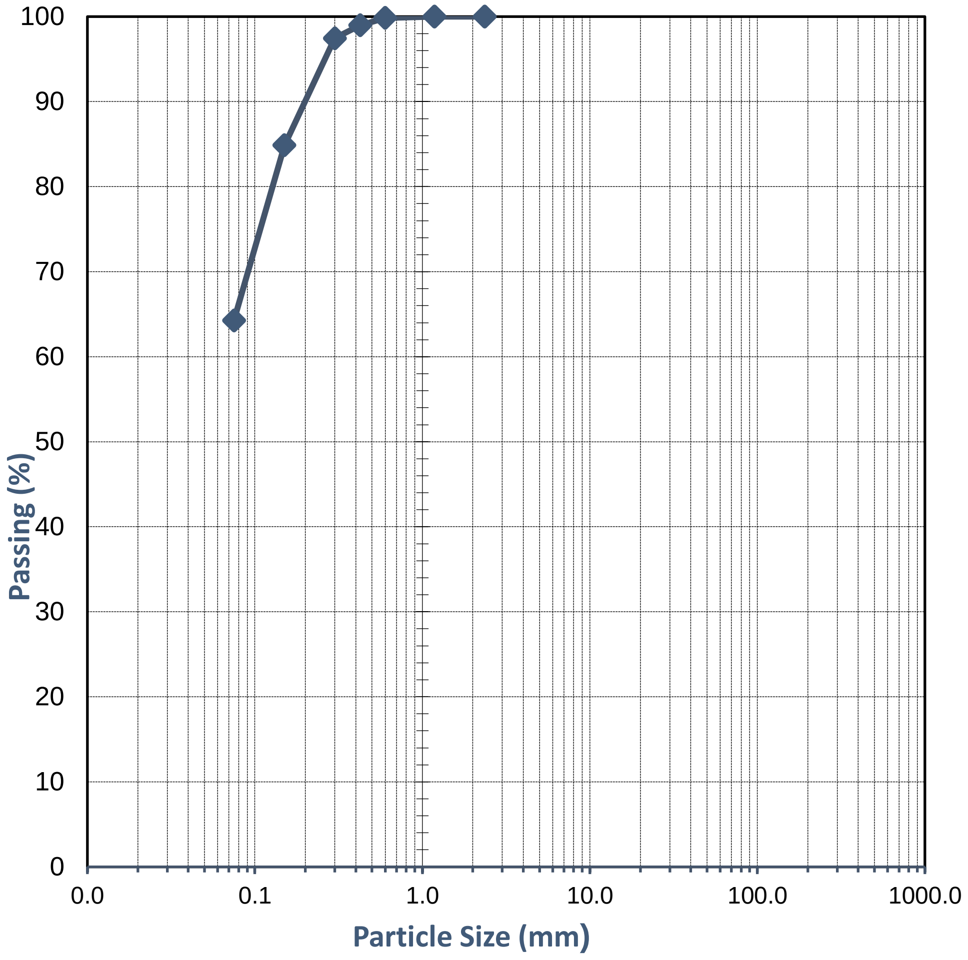
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19796_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19796
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (0.5-1.5)m and TP08 (1.5-2.5)m	*Date Tested:*	2/1 - 3/1/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	100
0.425	99
0.300	97
0.150	85
0.075	64



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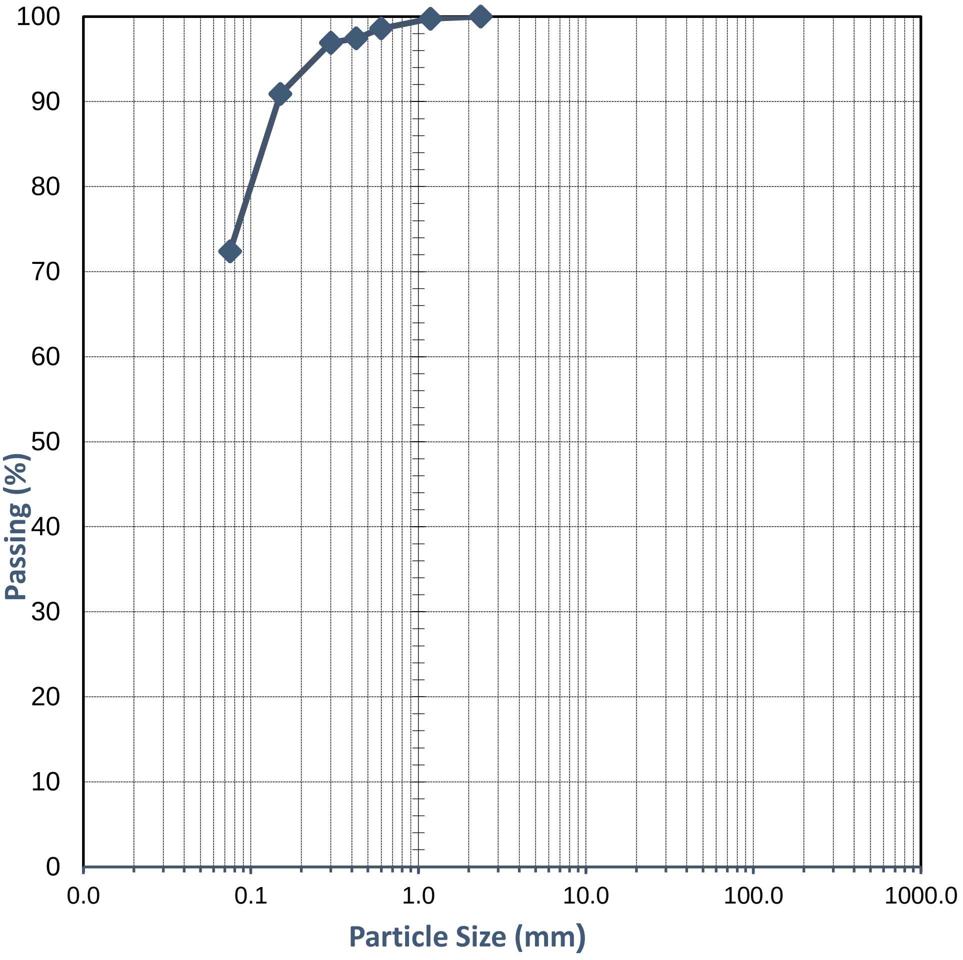
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19797_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19797
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (3-4)m and TP08 (3.5-4.5)m	*Date Tested:*	2/1 - 3/1/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	97
0.300	97
0.150	91
0.075	72



Comments:

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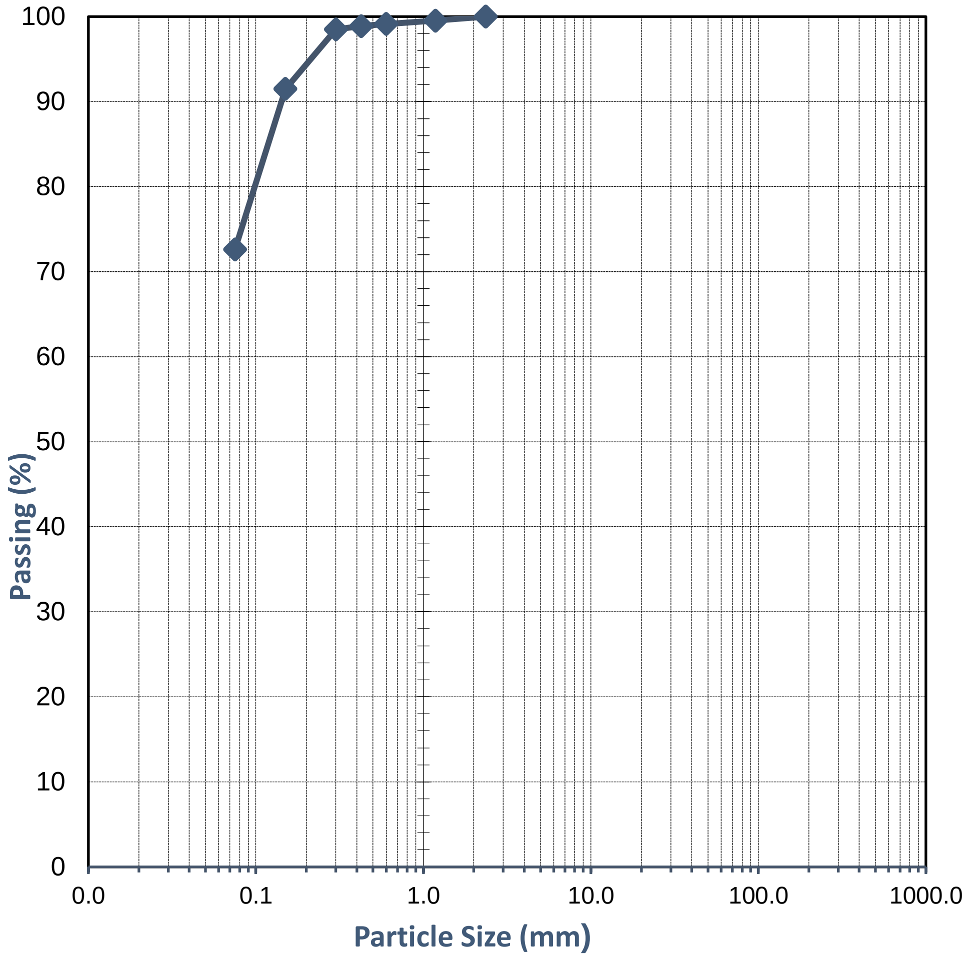
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19798_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19798
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP09a and TP12a (1-2)m	*Date Tested:*	28/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	99
0.300	98
0.150	92
0.075	73



Comments:

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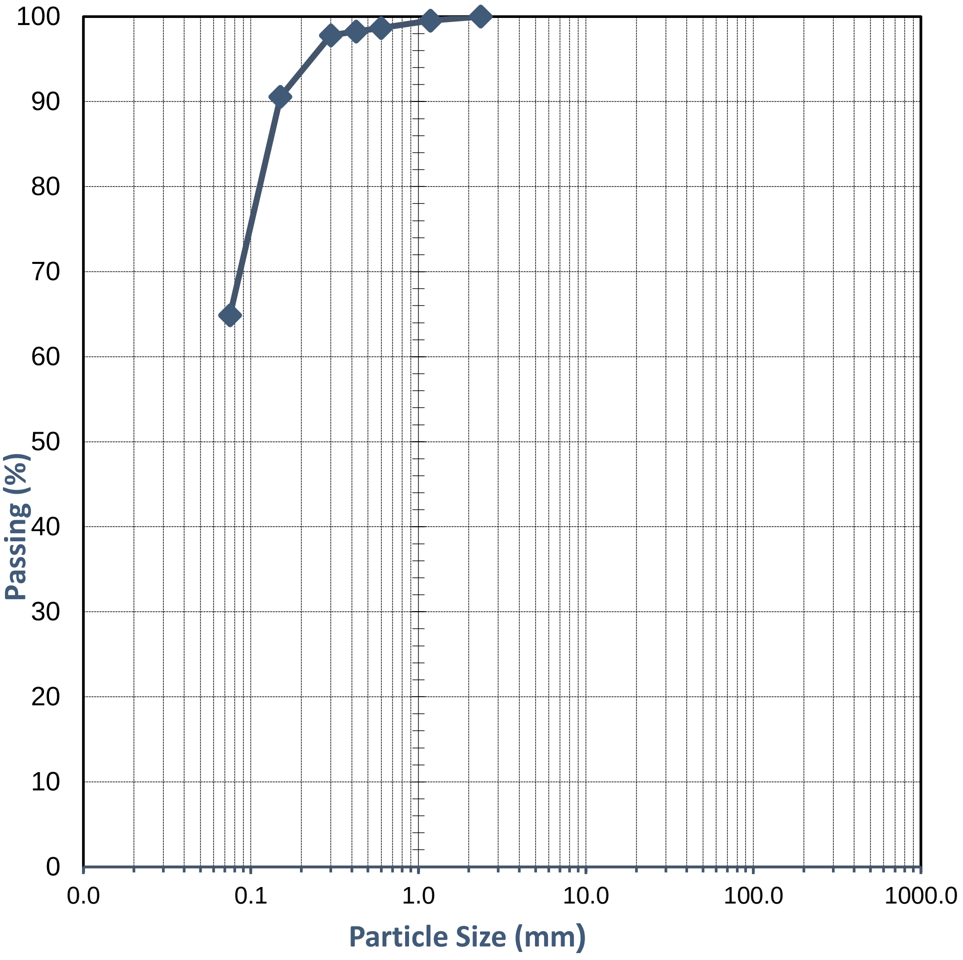
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	***Ticket No.***	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	***Report No.***	WG23.19799_1_PSD
Project:	TSF Design	***Sample No.***	WG23.19799
Location:	Mount Ida	***Date Sampled:***	Not Specified
Sample Identification:	TP09a (4-5)m and TP012a (2-3)m	***Date Tested:***	28/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	98
0.300	98
0.150	91
0.075	65



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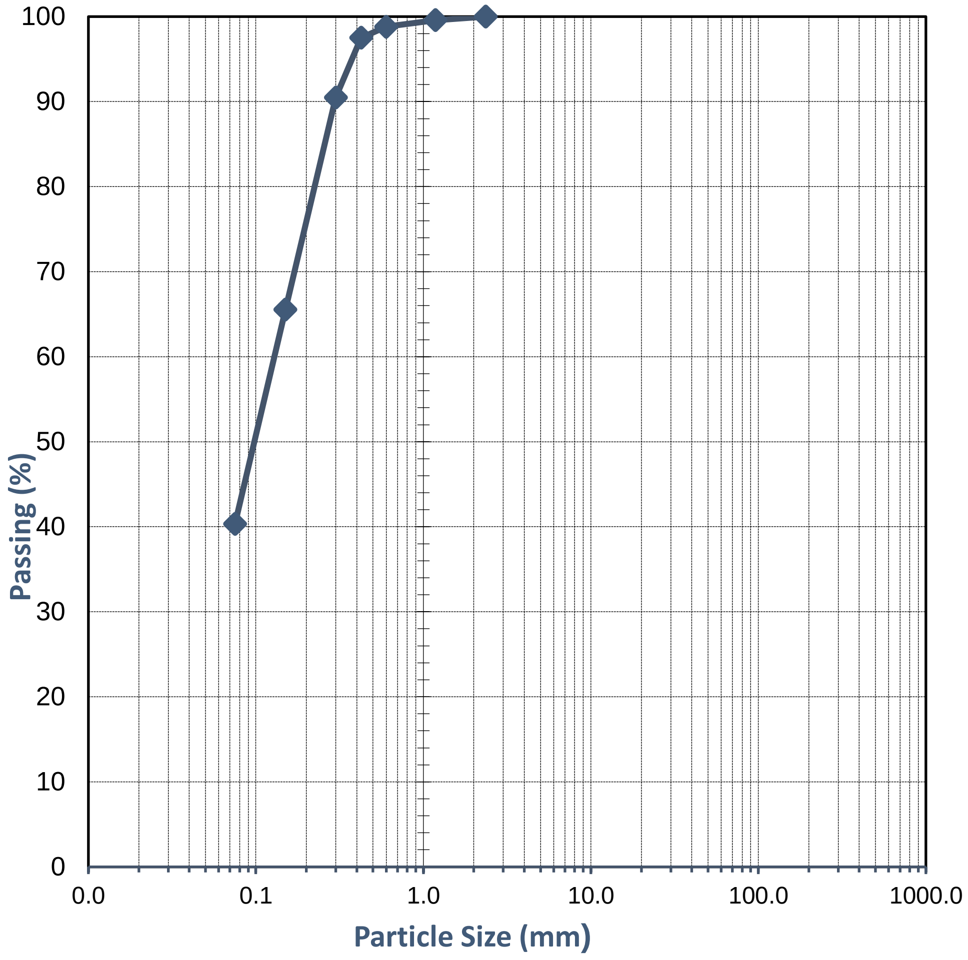
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	***Ticket No.***	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	***Report No.***	WG23.19800_1_PSD
Project:	TSF Design	***Sample No.***	WG23.19800
Location:	Mount Ida	***Date Sampled:***	Not Specified
Sample Identification:	TP10a (1-2)m	***Date Tested:***	29/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	98
0.300	91
0.150	66
0.075	40



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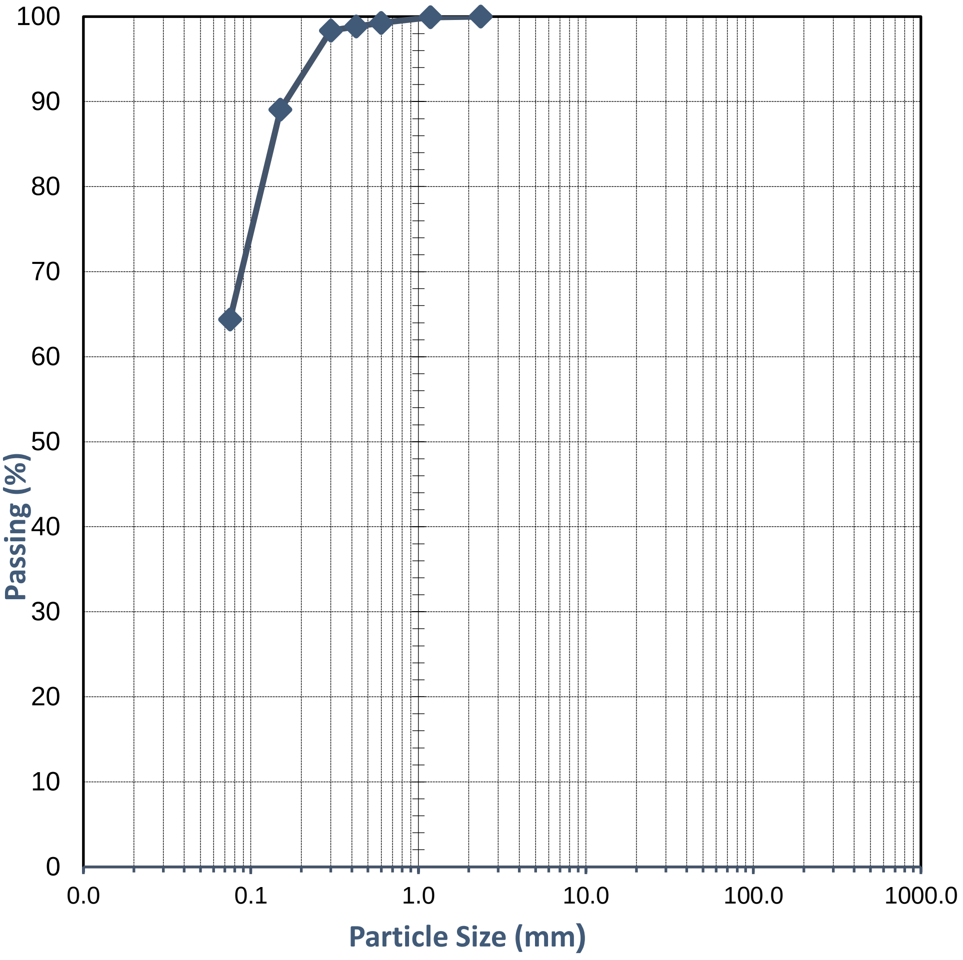
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19801_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19801
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP10a (3-4)m	*Date Tested:*	29/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	99
0.300	98
0.150	89
0.075	64



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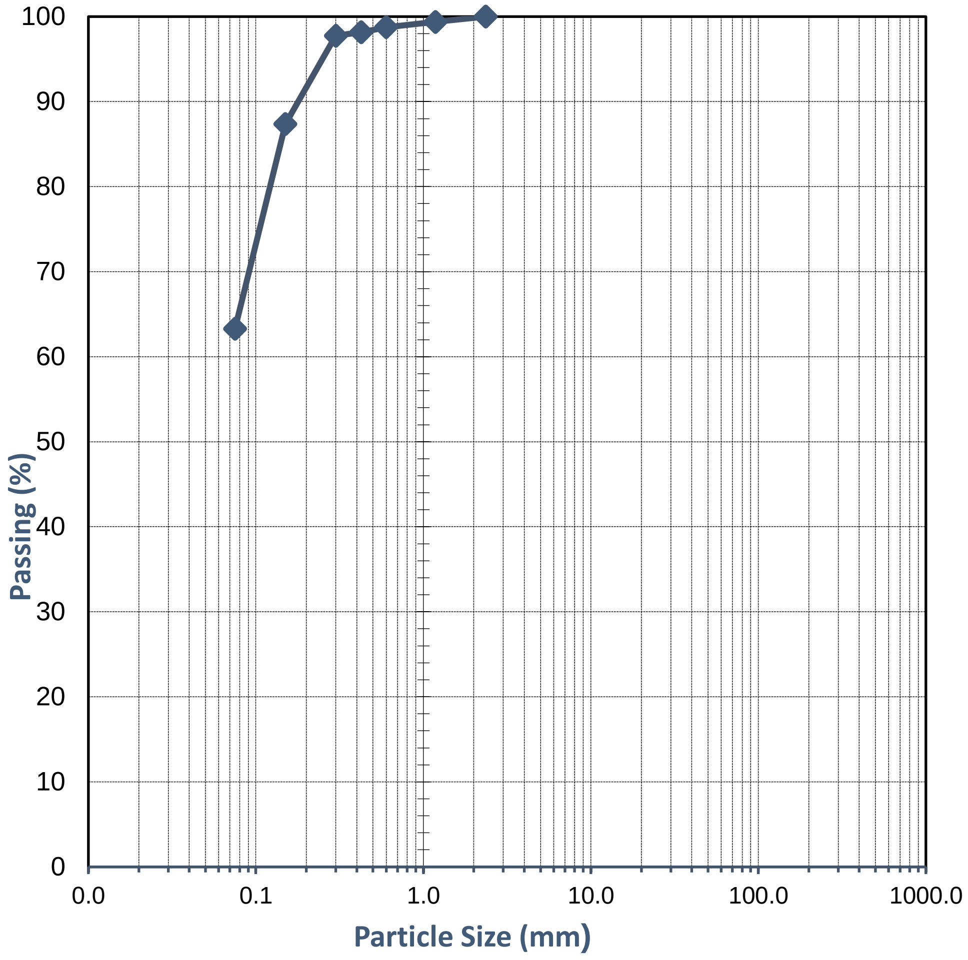
TEST REPORT - AS 1289.3.6.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19802_1_PSD
Project:	TSF Design	*Sample No.*	WG23.19802
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (1-2)m	*Date Tested:*	29/12/2023 - 02/01/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	99
0.600	99
0.425	98
0.300	98
0.150	87
0.075	63



Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19787_1_PI
Project:	TSF Design	*Sample No.*	WG23.19787
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW01 (0.3-0.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50^{o}C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**61**
AS 1289.3.2.1	**Plastic Limit (%)**	**23**
AS 1289.3.3.1	**Plasticity Index (%)**	**38**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**14.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**Curled**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19788_1_PI
Project:	TSF Design	*Sample No.*	WG23.19788
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW02 (0-0.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**46**
AS 1289.3.2.1	**Plastic Limit (%)**	**23**
AS 1289.3.3.1	**Plasticity Index (%)**	**23**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**9.0**

AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**Curled**

Comments:

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19790_1_PI
Project:	TSF Design	*Sample No.*	WG23.19790
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP01b (1-2 and 3-4)m	*Date Tested:*	3/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**Cracked**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19791_1_PI
Project:	TSF Design	*Sample No.*	WG23.19791
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP02a (1-2)m and TP03a (0.6-1.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19792_1_PI
Project:	TSF Design	*Sample No.*	WG23.19792
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP02a and TP03a (3-4)m	*Date Tested:*	3/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**0.0**

Comments:

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19793_1_PI
Project:	TSF Design	*Sample No.*	WG23.19793
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (1-2)m	*Date Tested:*	3/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50^{o}C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19794_1_PI
Project:	TSF Design	*Sample No.*	WG23.19794
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (3-4)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50^{o}C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19795_1_PI
Project:	TSF Design	*Sample No.*	WG23.19795
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (1-2)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19797_1_PI
Project:	TSF Design	*Sample No.*	WG23.19797
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (3-4)m and TP08 (3.5-4.5)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50^{o}C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19796_1_PI
Project:	TSF Design	*Sample No.*	WG23.19796
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (0.5-1.5)m and TP08 (1.5-2.5)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19798_1_PI
Project:	TSF Design	*Sample No.*	WG23.19798
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP09a and TP12a (1-2)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19799_1_PI
Project:	TSF Design	*Sample No.*	WG23.19799
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP09a (4-5)m and TP012a (2-3)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50^{o}C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19800_1_PI
Project:	TSF Design	*Sample No.*	WG23.19800
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP10a (1-2)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19801_1_PI
Project:	TSF Design	*Sample No.*	WG23.19801
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP10a (3-4)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**

AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19802_1_PI
Project:	TSF Design	*Sample No.*	WG23.19802
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (1-2)m	*Date Tested:*	4/01/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

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TEST REPORT - AS 1289.3.5.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19787_1_PD
Project:	TSF Design	*Sample No.*	WG23.19787
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW01 (0.3-0.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - SOIL PARTICLE DENSITY

Sampling Method: **Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
Temperature at test (°C)	**25.0**
Passing 2.36mm **Soil apparent particle density (g/cm^3)**	**2.75**

Particle Density - Fraction Retained 2.36mm	
Retained 2.36mm **Soil apparent particle density (g/cm^3)**	**N/A**

Particle Density - Total Soil Sample	
Total Sample **Soil particle density (g/cm^3)**	**N/A**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.5.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19788_1_PD
Project:	TSF Design	*Sample No.*	WG23.19788
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW02 (0-0.5)m	*Date Tested:*	2/01/2024

TEST RESULTS - SOIL PARTICLE DENSITY

Sampling Method: **Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
Temperature at test (°C)	24.0
Passing 2.36mm Soil apparent particle density (g/cm^3)	2.88

Particle Density - Fraction Retained 2.36mm	
Retained 2.36mm Soil apparent particle density (g/cm^3)	N/A

Particle Density - Total Soil Sample	
Total Sample Soil particle density (g/cm^3)	N/A

Comments:

[redacted]

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TEST REPORT - AS 1289.3.5.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19793_1_PD
Project:	TSF Design	*Sample No.*	WG23.19793
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (1-2)m	*Date Tested:*	2/01/2024

TEST RESULTS - SOIL PARTICLE DENSITY

Sampling Method: **Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
Temperature at test (°C)	24.0
Passing 2.36mm Soil apparent particle density (g/cm^3)	2.85

Particle Density - Fraction Retained 2.36mm	
Retained 2.36mm Soil apparent particle density (g/cm^3)	N/A

Particle Density - Total Soil Sample	
Total Sample Soil particle density (g/cm^3)	N/A

Comments:

[redacted]

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TEST REPORT - AS 1289.3.5.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19797_1_PD
Project:	TSF Design	*Sample No.*	WG23.19797
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (3-4)m and TP08 (3.5-4.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - SOIL PARTICLE DENSITY

Sampling Method: **Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
Temperature at test (°C)	26.0
Passing 2.36mm Soil apparent particle density (g/cm^3)	2.73

Particle Density - Fraction Retained 2.36mm	
Retained 2.36mm Soil apparent particle density (g/cm^3)	N/A

Particle Density - Total Soil Sample	
Total Sample Soil particle density (g/cm^3)	N/A

Comments:

[redacted]

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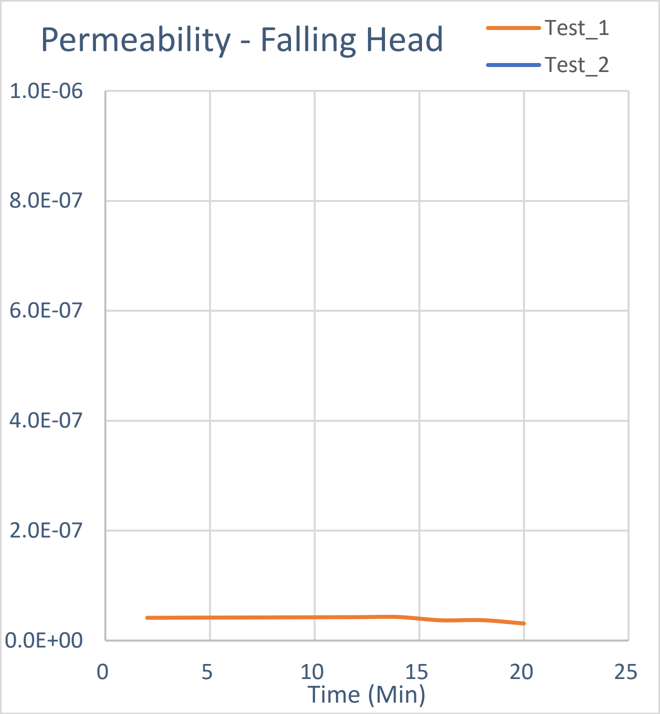
TEST REPORT AS 1289.6.7.2

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19790_1_FHPERM
Project:	TSF Design	*Sample No.*	WG23.19790
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification	TP01b (1-2 and 3-4)m	*Date Tested:*	02/01 - 08/01/2024

TEST RESULTS - FALLING HEAD PERMEABILITY

Sampling Method: **Sampled by Client, Tested as Received**



Compaction Details	
Compaction Method	AS 1289.5.2.1
Hammer Type	Modifed
CuringTime (Hours)	48
% Retained on 19.0mm	0
Maximum Dry Density (t/m^3)	1.84
Optimum Moisture (%)	13.5
Target Dry Density Ratio	95
Target Moisture Ratio	100

Specimen Conditions at Compaction	
Laboratory Density Ratio (%)	95.2
Laboratory Moisture Ratio (%)	100.4
Surcharge (kPa)	3

Coefficient of Permeability K_{20} (m/s) **4.00E-08**

Comments:

[redacted]

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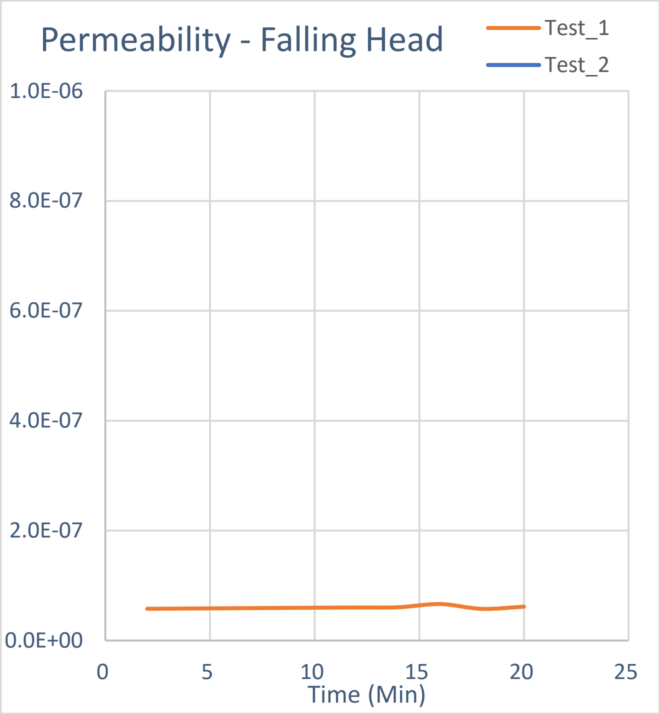
TEST REPORT AS 1289.6.7.2

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19792_1_FHPERM
Project:	TSF Design	*Sample No.*	WG23.19792
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification	TP02a and TP03a (3-4)m	*Date Tested:*	02/01 - 08/01/2024

TEST RESULTS - FALLING HEAD PERMEABILITY

Sampling Method: Sampled by Client, Tested as Received



Compaction Details	
Compaction Method	AS 1289.5.2.1
Hammer Type	Modifed
CuringTime (Hours)	48
% Retained on 19.0mm	0
Maximum Dry Density (t/m^3)	1.94
Optimum Moisture (%)	13.0
Target Dry Density Ratio	95
Target Moisture Ratio	100

Specimen Conditions at Compaction	
Laboratory Density Ratio (%)	95.2
Laboratory Moisture Ratio (%)	100.5
Surcharge (kPa)	3

Coefficient of Permeability K_{20} (m/s) **6.01E-08**

Comments:

[redacted]

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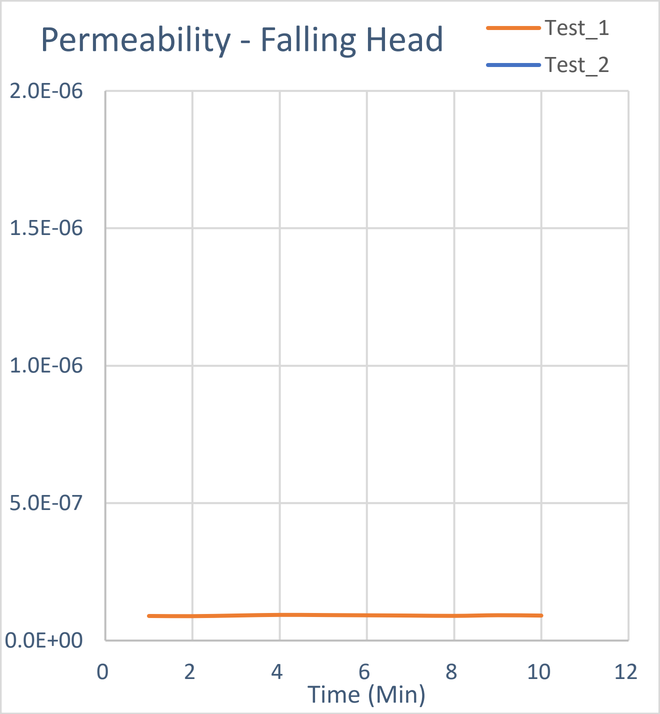
TEST REPORT AS 1289.6.7.2

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19793_1_FHPERM
Project:	TSF Design	*Sample No.*	WG23.19793
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification	TP04 and TP05 (1-2)m	*Date Tested:*	02/01 - 08/01/2024

TEST RESULTS - FALLING HEAD PERMEABILITY

Sampling Method: Sampled by Client, Tested as Received



Compaction Details	
Compaction Method	AS 1289.5.2.1
Hammer Type	Modifed
CuringTime (Hours)	48
% Retained on 19.0mm	0
Maximum Dry Density (t/m^3)	1.80
Optimum Moisture (%)	14.5
Target Dry Density Ratio	95
Target Moisture Ratio	100

Specimen Conditions at Compaction	
Laboratory Density Ratio (%)	95.2
Laboratory Moisture Ratio (%)	98.4
Surcharge (kPa)	3

Coefficient of Permeability K_{20} (m/s) **9.12E-08**

Comments:

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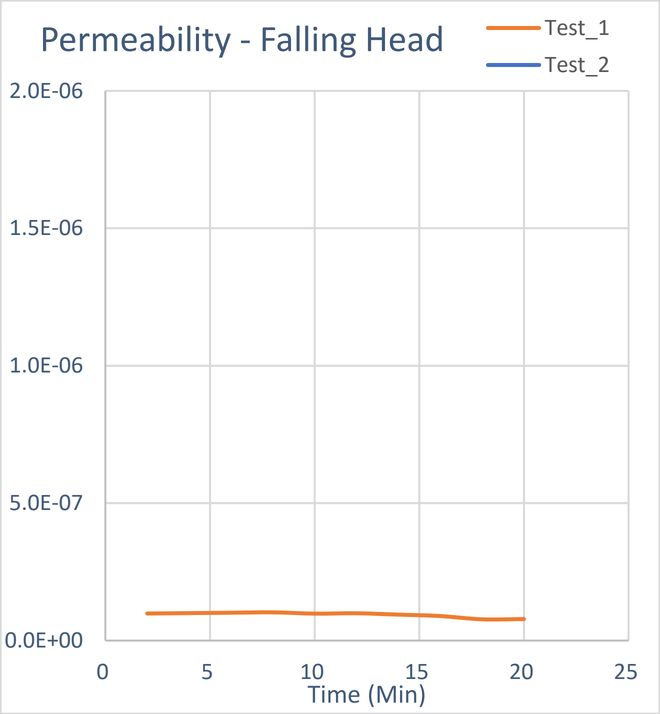
TEST REPORT AS 1289.6.7.2

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19794_1_FHPERM
Project:	TSF Design	*Sample No.*	WG23.19794
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification	TP04 and TP05 (3-4)m	*Date Tested:*	02/01 - 08/01/2024

TEST RESULTS - FALLING HEAD PERMEABILITY

Sampling Method: Sampled by Client, Tested as Received



Compaction Details	
Compaction Method	AS 1289.5.2.1
Hammer Type	Modifed
CuringTime (Hours)	48
% Retained on 19.0mm	0
Maximum Dry Density (t/m^3)	1.92
Optimum Moisture (%)	14.0
Target Dry Density Ratio	95
Target Moisture Ratio	100

Specimen Conditions at Compaction	
Laboratory Density Ratio (%)	95.2
Laboratory Moisture Ratio (%)	95.5
Surcharge (kPa)	3

Coefficient of Permeability K_{20} (m/s) 9.39E-08

Comments:

[redacted]

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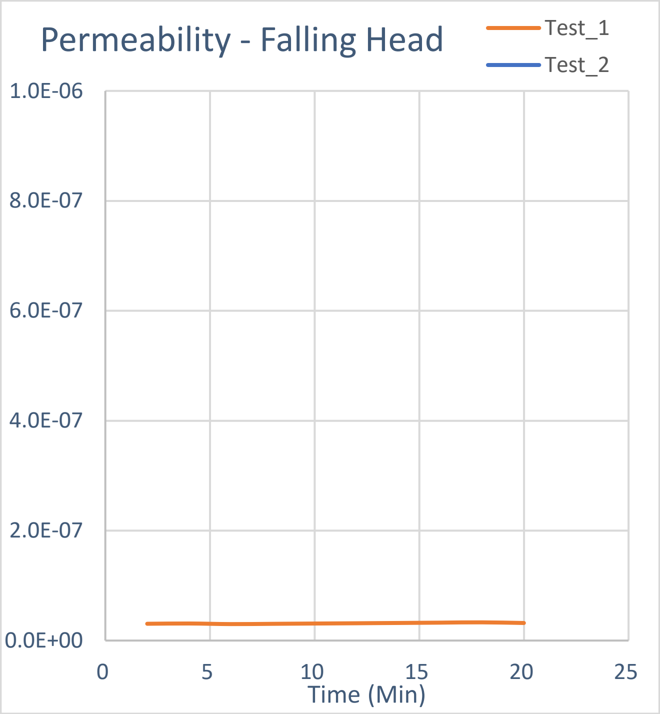
TEST REPORT AS 1289.6.7.2

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19797_1_FHPERM
Project:	TSF Design	*Sample No.*	WG23.19797
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification	TP07 (3-4)m and TP08 (3.5-4.5)m	*Date Tested:*	02/01 - 09/01/2024

TEST RESULTS - FALLING HEAD PERMEABILITY

Sampling Method: **Sampled by Client, Tested as Received**



Compaction Details	
Compaction Method	AS 1289.5.2.1
Hammer Type	Modifed
CuringTime (Hours)	2
% Retained on 19.0mm	0
Maximum Dry Density (t/m^3)	1.87
Optimum Moisture (%)	13.0
Target Dry Density Ratio	95
Target Moisture Ratio	100

Specimen Conditions at Compaction	
Laboratory Density Ratio (%)	95.3
Laboratory Moisture Ratio (%)	98.9
Surcharge (kPa)	3

Coefficient of Permeability K_{20} (m/s) **3.15E-08**

Comments:

[redacted]

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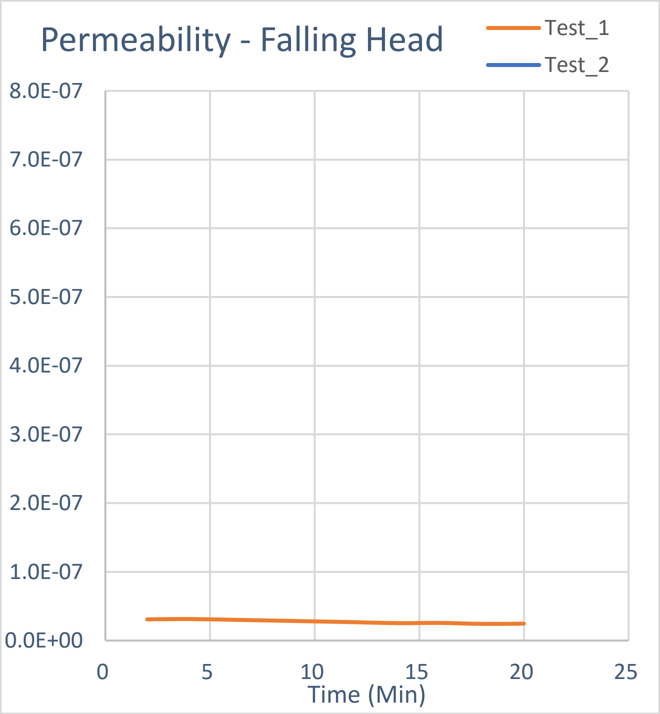
TEST REPORT AS 1289.6.7.2

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19796_1_FHPERM
Project:	TSF Design	*Sample No.*	WG23.19796
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification	TP07 (0.5-1.5)m and TP08 (1.5-2.5)m	*Date Tested:*	02/01 - 09/01/2024

TEST RESULTS - FALLING HEAD PERMEABILITY

Sampling Method: **Sampled by Client, Tested as Received**



Compaction Details	
Compaction Method	AS 1289.5.2.1
Hammer Type	Modifed
CuringTime (Hours)	2
% Retained on 19.0mm	0
Maximum Dry Density (t/m^3)	1.72
Optimum Moisture (%)	16.0
Target Dry Density Ratio	95
Target Moisture Ratio	100

Specimen Conditions at Compaction	
Laboratory Density Ratio (%)	95.4
Laboratory Moisture Ratio (%)	97.7
Surcharge (kPa)	3

Coefficient of Permeability K_{20} (m/s) **2.76E-08**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.8.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19787_1_ECN
Project:	TSF Design	*Sample No.*	WG23.19787
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW01 (0.3-0.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - Emerson Class Number

Sampling Method:	**Sampled by Client, Tested as Received**
Source of Material:	**Not Specified**
Soil Description:	**Clay**
Water Used:	**Distilled**

EMERSON CLASS NUMBER	**5**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.8.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19788_1_ECN
Project:	TSF Design	*Sample No.*	WG23.19788
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	MW02 (0-0.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - Emerson Class Number

Sampling Method:	**Sampled by Client, Tested as Received**
Source of Material:	**Not Specified**
Soil Description:	**Clayey Gravel**
Water Used:	**Distilled**

EMERSON CLASS NUMBER	**4**

Comments: Calcite present in sample.

[redacted]

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TEST REPORT - AS 1289.3.8.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19793_1_ECN
Project:	TSF Design	*Sample No.*	WG23.19793
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (1-2)m	*Date Tested:*	3/01/2024

TEST RESULTS - Emerson Class Number

Sampling Method:	**Sampled by Client, Tested as Received**
Source of Material:	**Not Specified**
Soil Description:	**Silty Sand**
Water Used:	**Distilled**

EMERSON CLASS NUMBER	**5**

Comments:

[redacted]

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WESTERN GEOTECHNICAL
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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.8.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19797_1_ECN
Project:	TSF Design	*Sample No.*	WG23.19797
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (3-4)m and TP08 (3.5-4.5)m	*Date Tested:*	3/01/2024

TEST RESULTS - Emerson Class Number

Sampling Method:	**Sampled by Client, Tested as Received**
Source of Material:	**Not Specified**
Soil Description:	**Silty Sand**
Water Used:	**Distilled**

EMERSON CLASS NUMBER	**5**

Comments:

[redacted]

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TEST REPORT - AS 1289.5.2.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA	*Report No.*	WG23.19790_1_MMDD
Project:	TSF Design	*Sample No.*	WG23.19790
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP01b (1-2 and 3-4)m	*Date Tested:*	2/01/2024

TEST RESULTS - Modified Maximum Dry Density

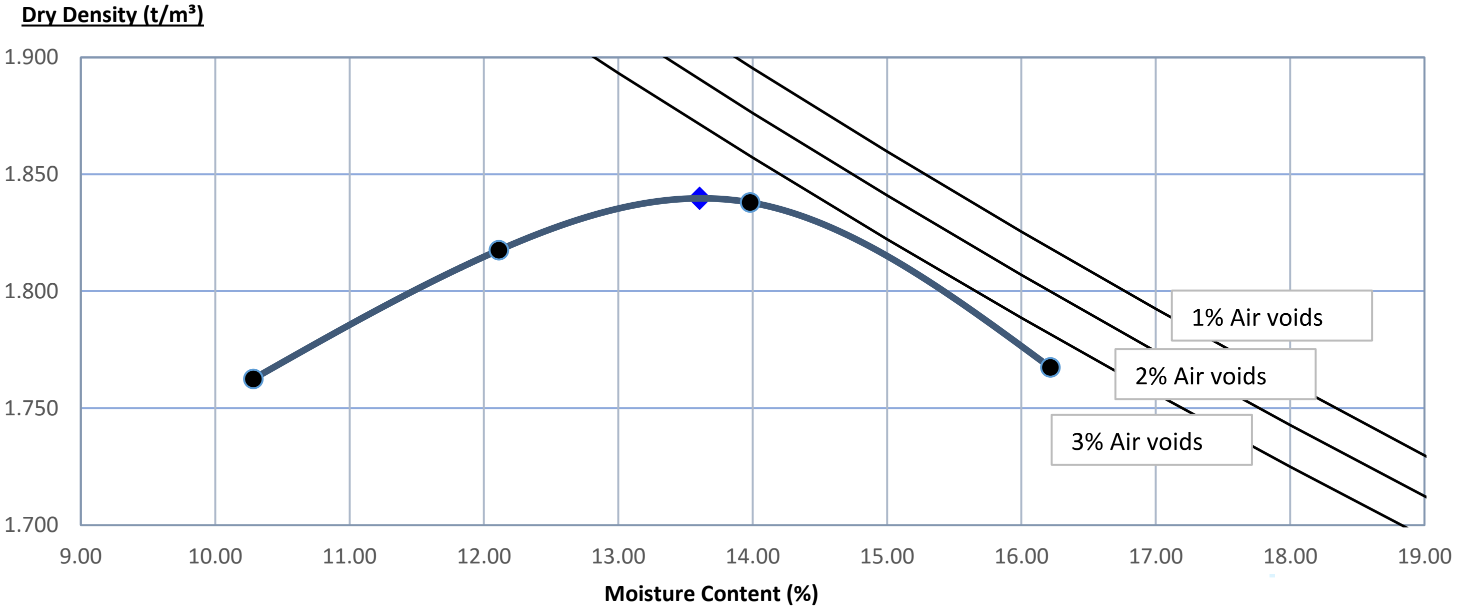
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**10.3**	**12.1**	**14.0**	**16.2**	
Dry Density (t/m^3)	**1.763**	**1.818**	**1.838**	**1.767**	



Modified Maximum Dry Density (t/m^3) **1.84**

Optimum Moisture Content (%) **13.5**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.616 t/m³*

[redacted]

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TEST REPORT - AS 1289.5.2.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA	*Report No.*	WG23.19792_1_MMDD
Project:	TSF Design	*Sample No.*	WG23.19792
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP02a and TP03a (3-4)m	*Date Tested:*	2/01/2024

TEST RESULTS - Modified Maximum Dry Density

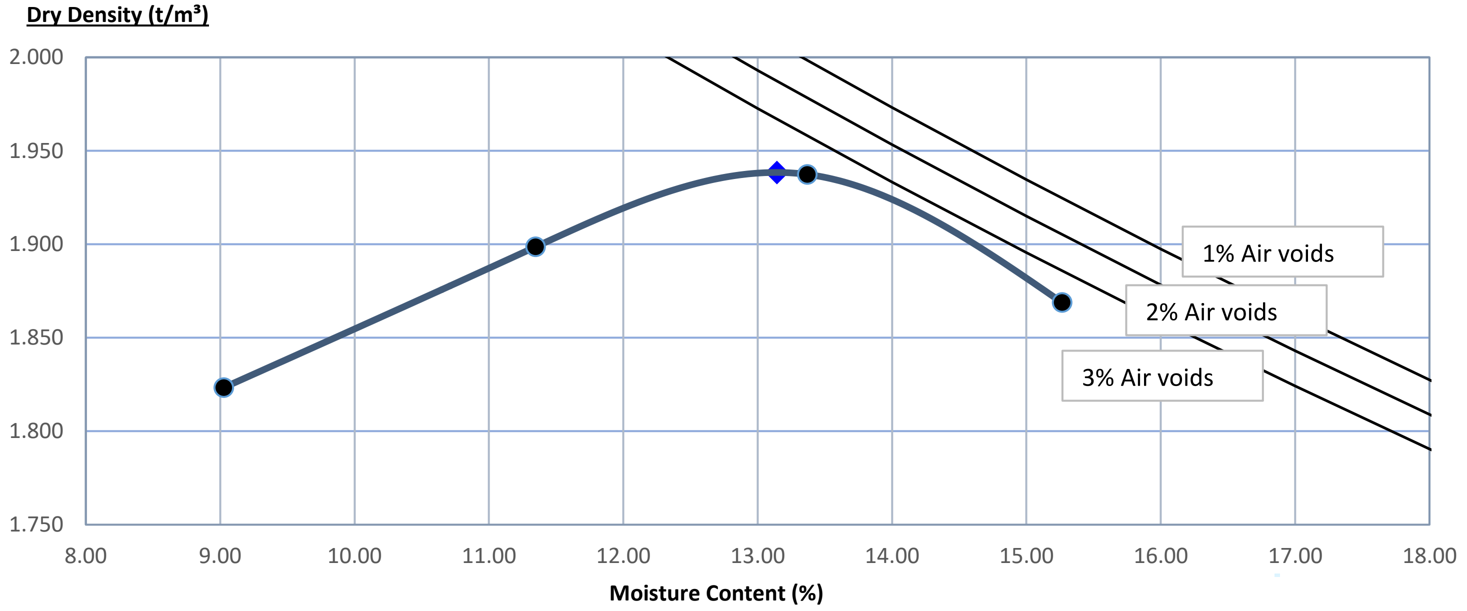
Sampling Method: **Sampled by Client, Tested as Received**

Sample Curing Time (Hours): **2**

Method used to Determine Liquid Limit: **Visual / Tactile Assessment by Competent Technician**

Material + 19.0mm (%): **0** **Material + 37.5mm (%)** **-**

Moisture Content (%)	**9.0**	**11.3**	**13.4**	**15.3**	
Dry Density (t/m³)	**1.823**	**1.899**	**1.937**	**1.869**	



Modified Maximum Dry Density (t/m³) **1.94**

Optimum Moisture Content (%) **13.0**

Comments: ***The above air void lines are derived from a calculated apparent particle density of 2.764 t/m³***

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WESTERN GEOTECHNICAL
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TEST REPORT - AS 1289.5.2.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19793_1_MMDD
Project:	TSF Design	*Sample No.*	WG23.19793
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (1-2)m	*Date Tested:*	2/01/2024

TEST RESULTS - Modified Maximum Dry Density

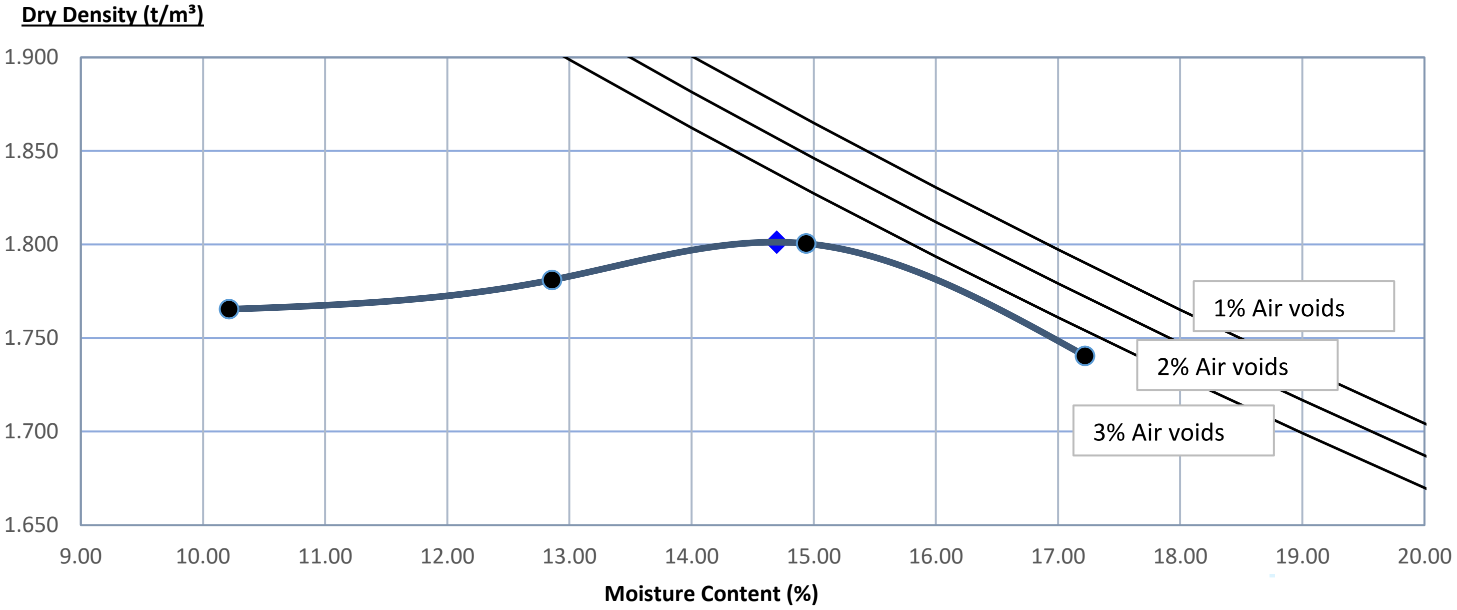
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**10.2**	**12.9**	**14.9**	**17.2**	
Dry Density (t/m³)	**1.765**	**1.781**	**1.800**	**1.741**	



Modified Maximum Dry Density (t/m³) **1.80**

Optimum Moisture Content (%) **14.5**

Comments: ***The above air void lines are derived from a calculated apparent particle density of 2.626 t/m³***

[redacted]

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TEST REPORT - AS 1289.5.2.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA	*Report No.*	WG23.19794_1_MMDD
Project:	TSF Design	*Sample No.*	WG23.19794
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP04 and TP05 (3-4)m	*Date Tested:*	2/01/2024

TEST RESULTS - Modified Maximum Dry Density

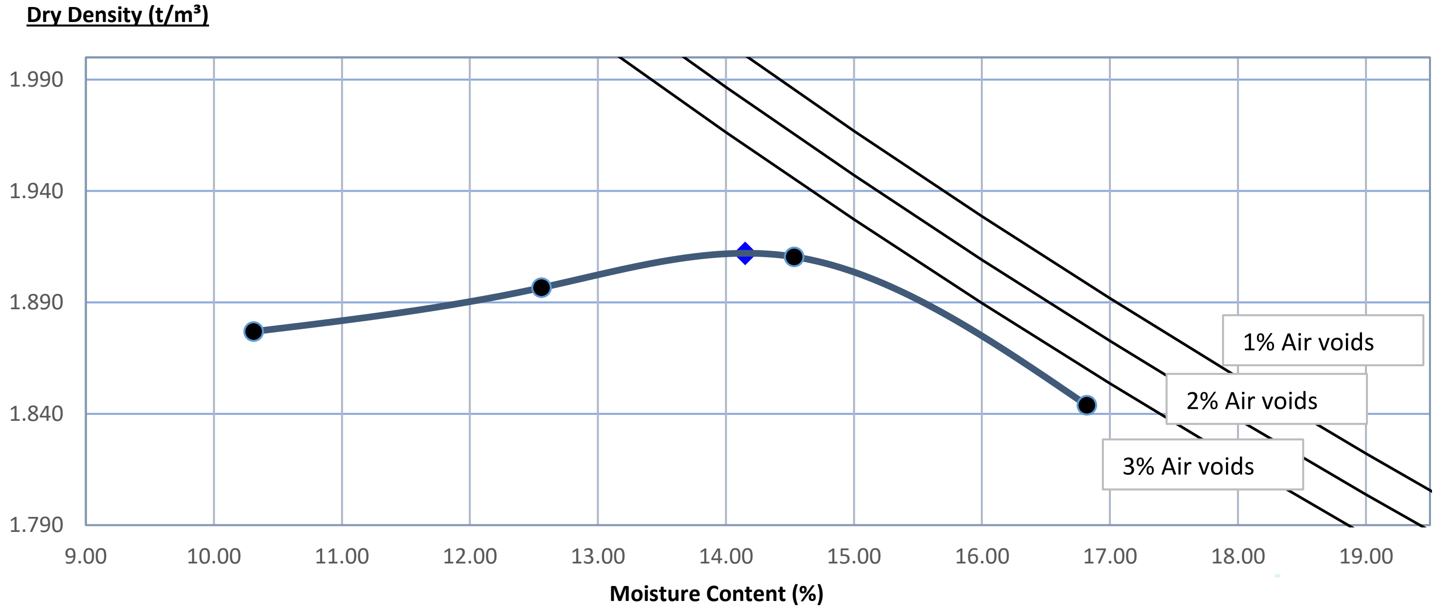
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**10.3**	**12.6**	**14.5**	**16.8**	
Dry Density (t/m³)	**1.877**	**1.897**	**1.910**	**1.844**	



Modified Maximum Dry Density (t/m³) **1.91**

Optimum Moisture Content (%) **14.0**

Comments: ***The above air void lines are derived from a calculated apparent particle density of 2.83 t/m³***

[redacted]

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TEST REPORT - AS 1289.5.2.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA	*Report No.*	WG23.19796_1_MMDD
Project:	TSF Design	*Sample No.*	WG23.19796
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (0.5-1.5)m and TP08 (1.5-2.5)m	*Date Tested:*	2/01/2024

TEST RESULTS - Modified Maximum Dry Density

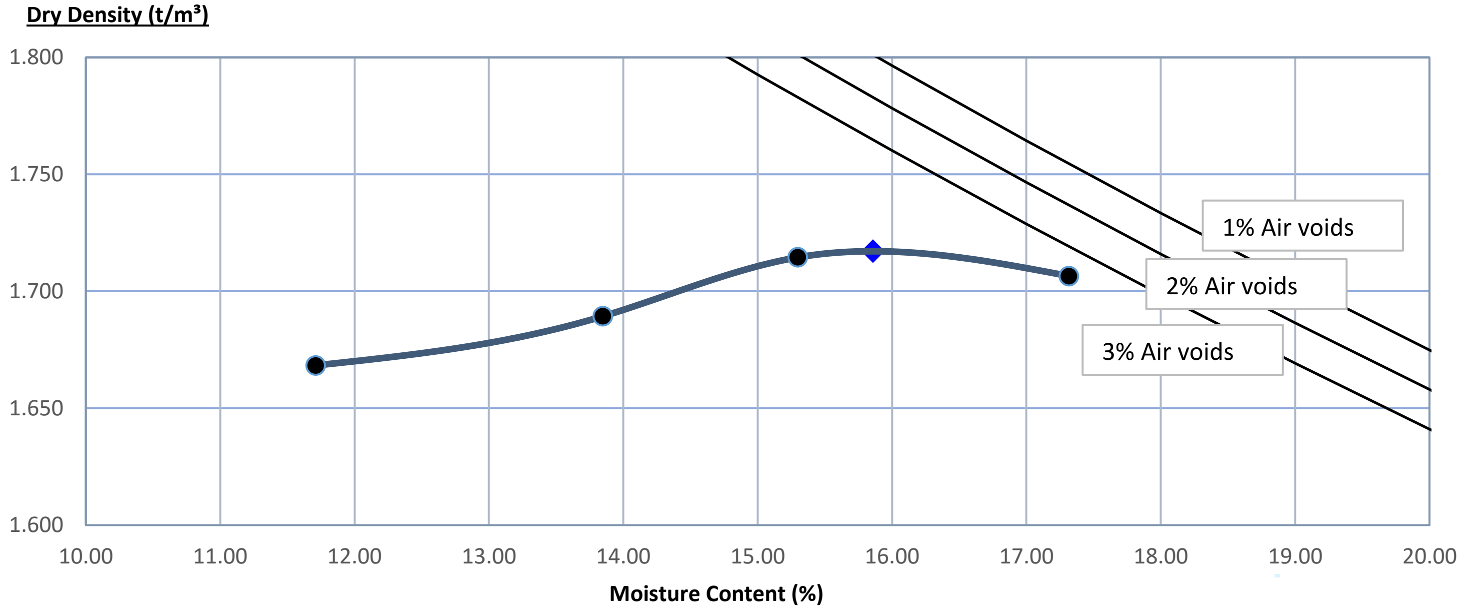
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**11.7**	**13.8**	**15.3**	**17.3**	
Dry Density (t/m^3)	**1.668**	**1.689**	**1.714**	**1.707**	



Modified Maximum Dry Density (t/m³) **1.72**

Optimum Moisture Content (%) **16.0**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.557 t/m³*

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	CMW Geosciences	*Ticket No.*	S11902
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.19797_1_MMDD
Project:	TSF Design	*Sample No.*	WG23.19797
Location:	Mount Ida	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (3-4)m and TP08 (3.5-4.5)m	*Date Tested:*	2/01/2024

TEST RESULTS - Modified Maximum Dry Density

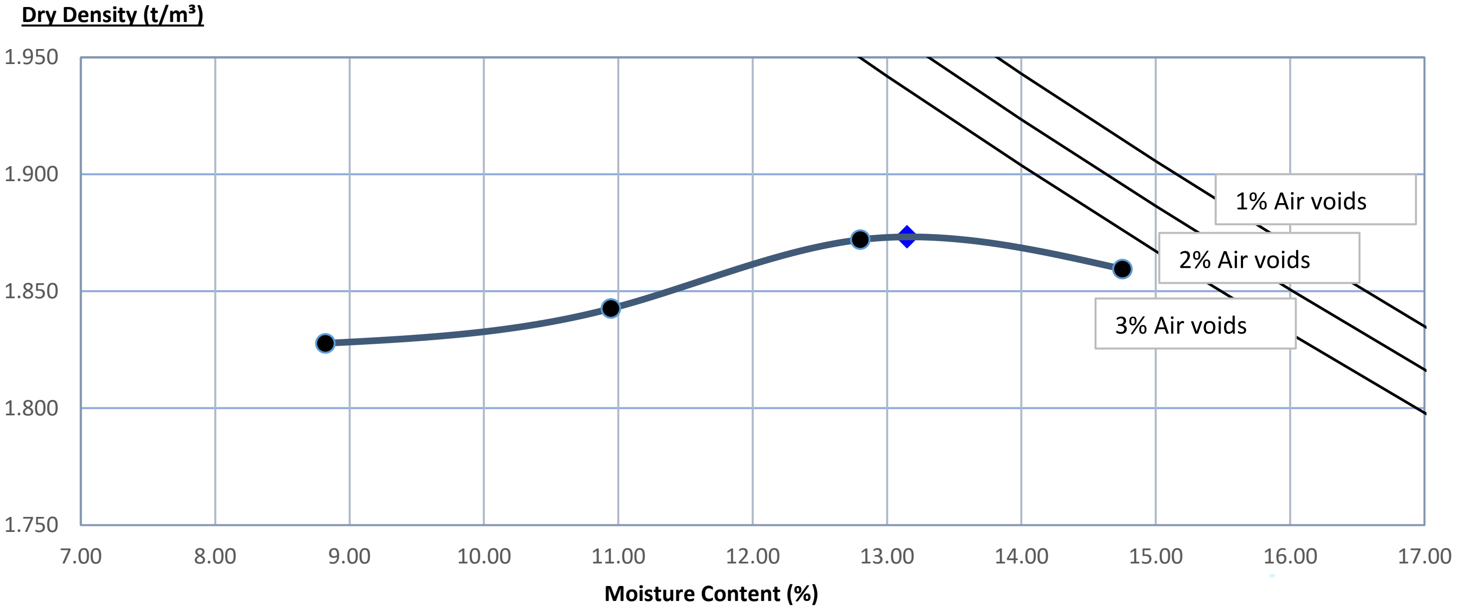
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	8.8	10.9	12.8	14.8	
Dry Density (t/m^3)	1.828	1.843	1.872	1.860	



Modified Maximum Dry Density (t/m^3) **1.87**

Optimum Moisture Content (%) **13.0**

Comments: ***The above air void lines are derived from a calculated apparent particle density of 2.706 t/m³***

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E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

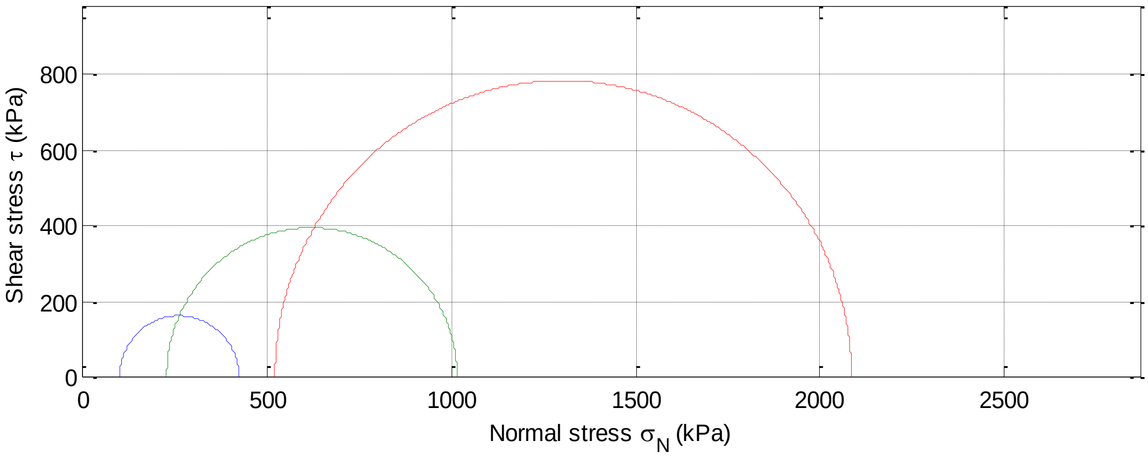
Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP04 and TP05	Lab:	EPLab
Sample ID:	WG23_19793_DST3	Report Date:	06/02/2024
Depth (m):	1.00 - 2.00	Room Temperature at Test:	~ 18°c

Tested by:	Phil Li	Initial Moisture (%):	14.63	Strain Rate (mm/min):	0.01
Height (mm):	120.29	Final Moisture (%):	21.35	Skempton's (B):	1
Diameter (mm):	62.43	Bulk Density (t/m^3):	1.96	Geology:	-
L/D Ratio:	1.93	Dry Density (t/m^3):	1.71	Particle Density (t/m^3):	-

Failure Criteria used: Peak Principle Stress Ratio

Mohr Circle Diagram



Interpretations conducted using Matlab

Interpretation from Mohr Circle:	**Stage 1 & 2**	**Stage 1 & 3**	**Stage 2 & 3**
Cohesion C' (kPa):	2.21	8.03	50.22
Angle of Shear Resistance Φ' (Degrees) :	38.31	36.50	34.61

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NATA: 19078 **Authorised Signatory (Geotechnical En** [redacted]

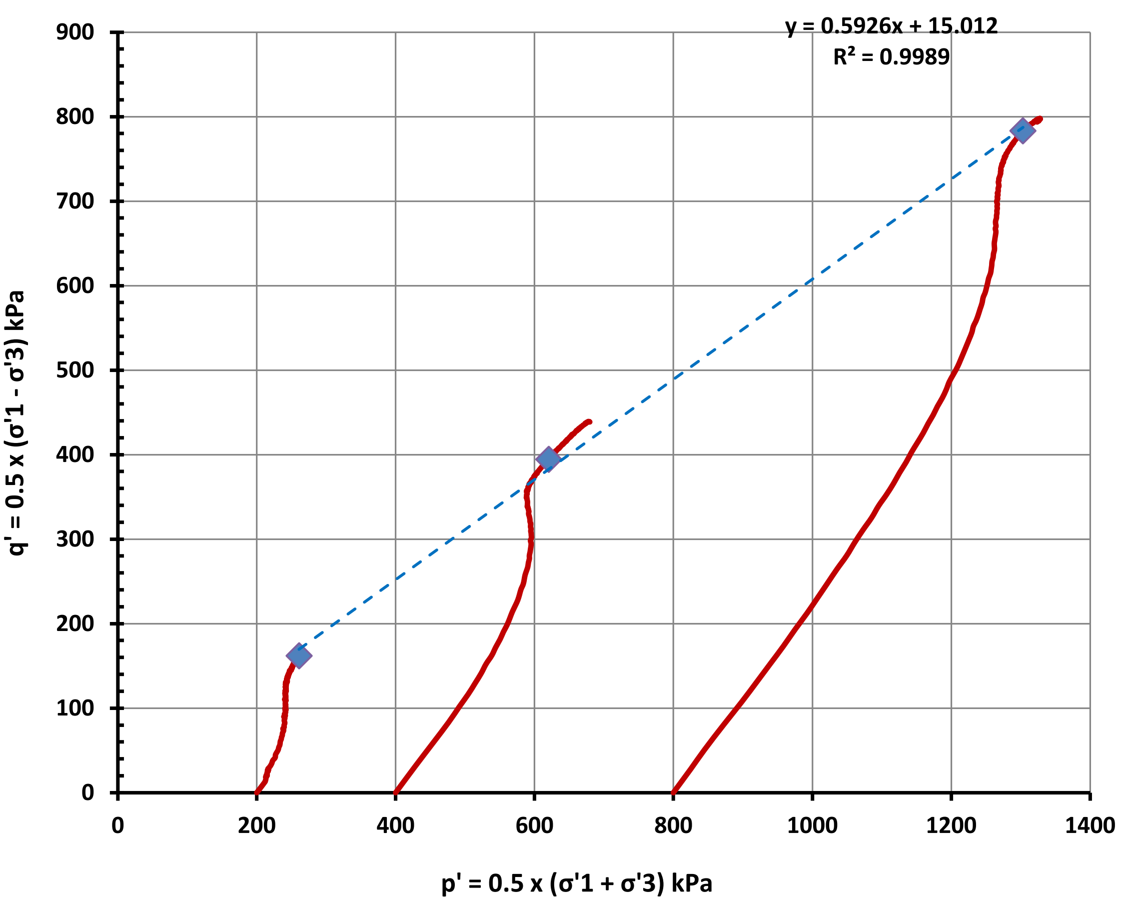
NATA ACCREDITATION NO: 19078

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP04 and TP05	Lab:	EPLab
Sample ID:	WG23_19793_DST3		
Depth (m):	1.00 - 2.00	Room Temperature at Test:	~ 18°C

MIT Effective Stress Path (q' vs p' diagram)



MIT Stress Path - Using Stress Path Tangency Method

Cohesion C' (kPa) :	**18.59**
Angle of Shear Resistance Φ' (Deg) :	**36.16**

[redacted]

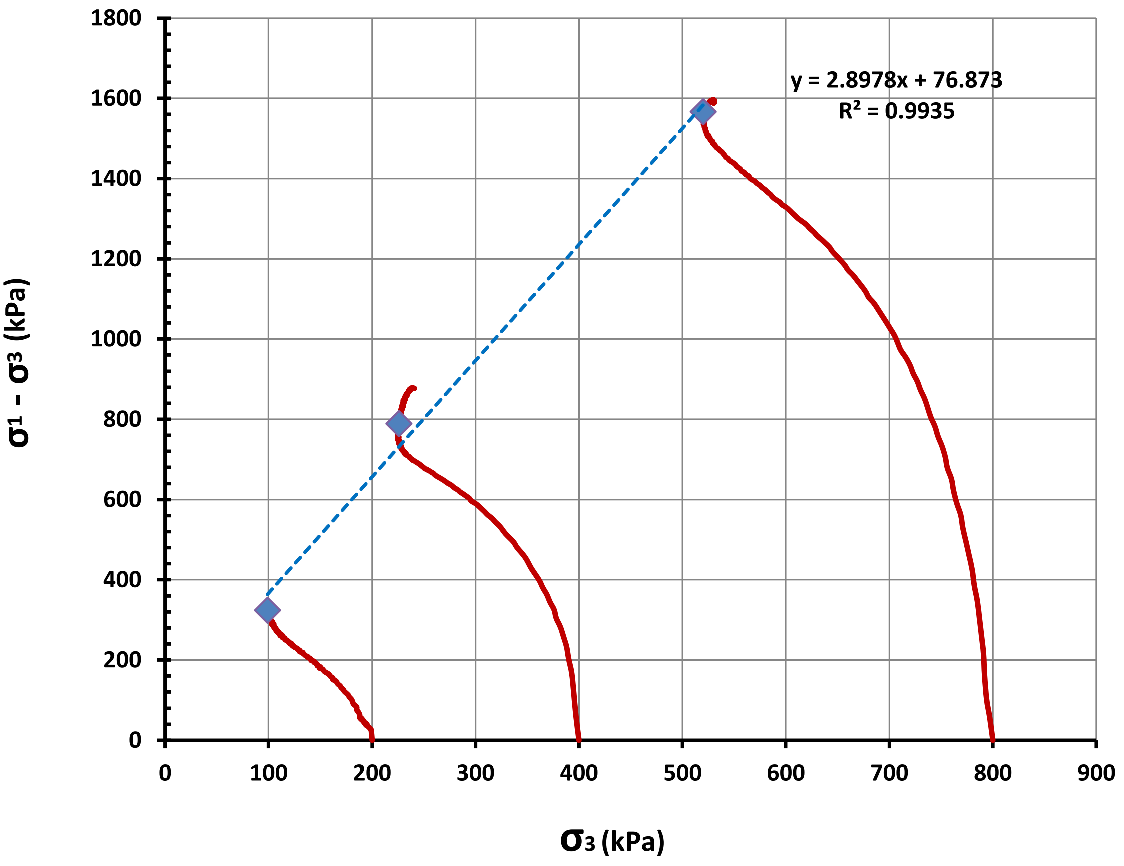
E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP04 and TP05	Lab:	EPLab
Sample ID:	WG23_19793_DST3		
Depth (m):	1.00 - 2.00	Room Temperature at Test:	~ 18°C

Modified Mohr Coulomb Stress Path



Modified Mohr Coulomb Path - Using Stress Path Tangency Method

Cohesion C' (kPa) :	**19.46**
Angle of Shear Resistance Φ' (Deg) :	**36.29**

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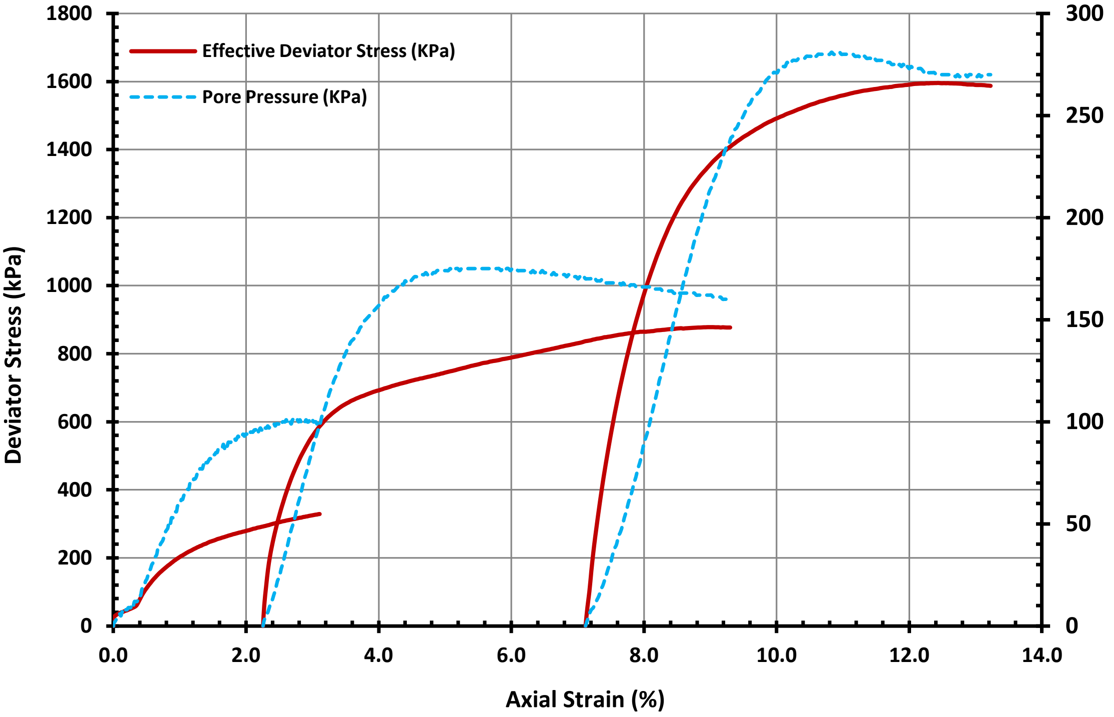
E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP04 and TP05	Lab:	EPLab
Sample ID:	WG23_19793_DST3		
Depth (m):	1.00 - 2.00	Room Temperature at Test:	~ 18°C

Deviator Stress Vs Strain Diagram



SHEAR STAGE DATA AND STRESS MEASUREMENTS (kPa)

Shear Stage	Confining Pressure	U'$_0$	U'$_f$	Principal Effective Stresses			σ'$_1$ - σ'$_3$	Strain (%)
				σ'1	σ'3	σ'1 / σ'3		
1	200	0	101	423	99	4.27	324	2.96
2	400	0	174	1015	226	4.49	789	6.01
3	800	0	280	2086	520	4.01	1566	11.15

[redacted]

E-Precision Laboratory

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP04 and TP05	Lab:	EPLab
Sample ID:	WG23_19793_DST3		
Depth (m):	1.00 - 2.00	Room Temperature at Test:	~ 18°C

Photo After Test

Sample ID:	TP04 and TP05	**Depth (m):**	1.00 - 2.00
Lab ID:	WG23_19793_DST3	**Date Tested:**	01/02/2024

Failure Mode: Bulging Failure

[redacted]

Notes: **Remolded to 95% SMDD @ OMC**

Stored and Tested the Sample as received

Samples supplied by the Client

NATA: 19078 **Authorised Signatory (Geotechnical Engineer):**

NATA
ACCREDITATION NO: 19078

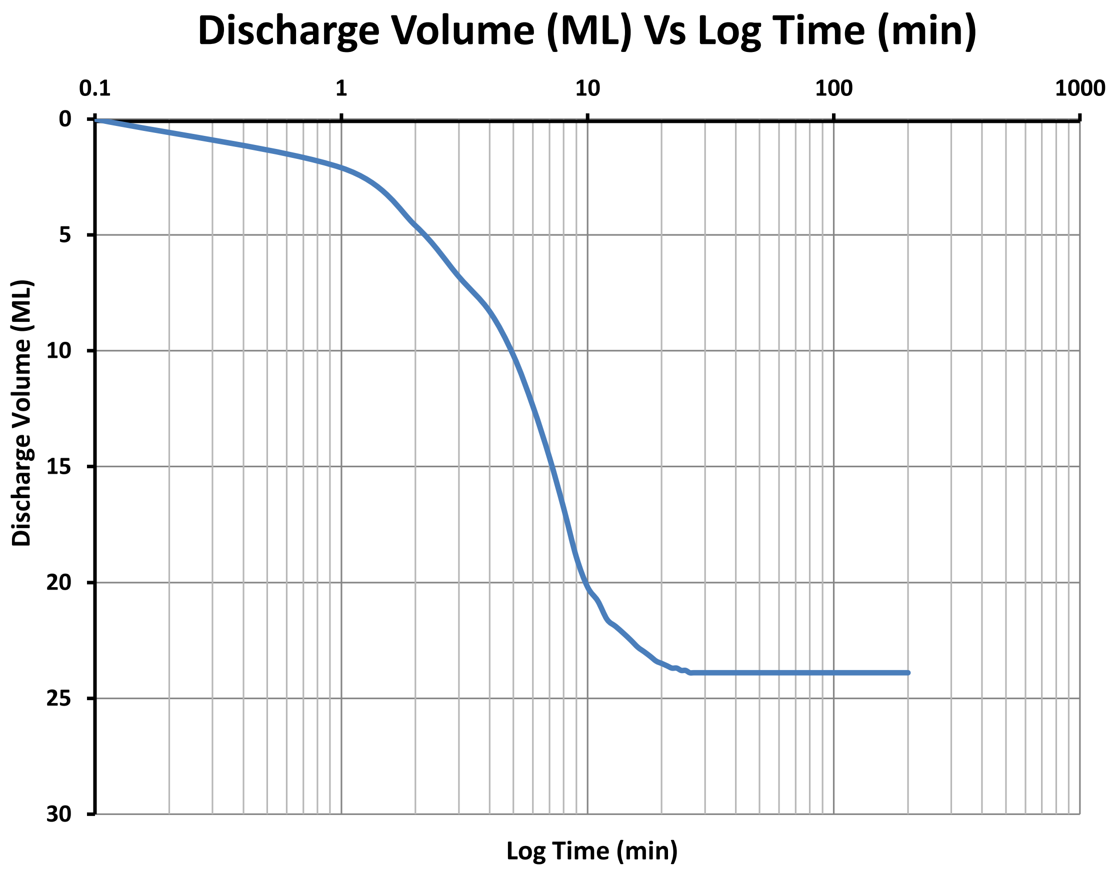
[redacted]

E-Precision Laboratory

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP04 and TP05	Lab:	EPLab
Sample ID:	WG23_19793_DST3		
Depth (m):	1.00 - 2.00	Room Temperature at Test:	~ 18°C



Cv (cm²/s):	0.225	based on **t_{90}**
K (m/s):	3.58E-08	
Mv (m²/kN):	1.62E-04	

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E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

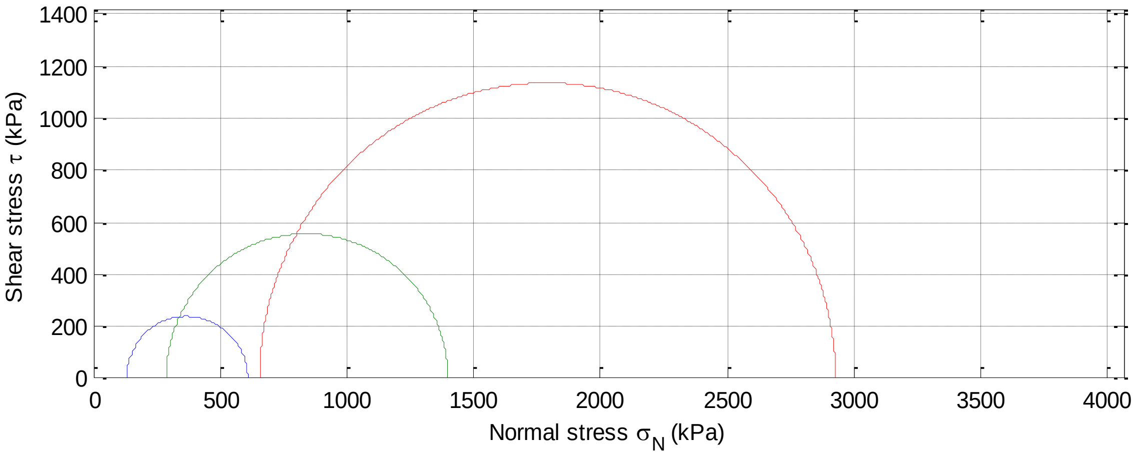
Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP07 and TP08	Lab:	EPLab
Sample ID:	WG23_19797_DST3	Report Date:	06/02/2024
Depth (m):	-	Room Temperature at Test:	~ 18°c

Tested by:	Phil Li	Initial Moisture (%):	13.08	Strain Rate (mm/min):	0.01
Height (mm):	126.19	Final Moisture (%):	21.76	Skempton's (B):	1
Diameter (mm):	62.35	Bulk Density (t/m³):	2.01	Geology:	-
L/D Ratio:	2.02	Dry Density (t/m³):	1.78	Particle Density (t/m³):	-

Failure Criteria used: Peak Principle Stress Ratio

Mohr Circle Diagram



Interpretations conducted using Matlab

Interpretation from Mohr Circle:	**Stage 1 & 2**	**Stage 1 & 3**	**Stage 2 & 3**
Cohesion C' (kPa):	0.65	7.22	51.53
Angle of Shear Resistance Φ' (Degrees) :	41.02	39.01	37.60

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NATA: 19078 **Authorised Signatory (Geotechnical Eng** [redacted]

NATA ACCREDITATION NO: 19078

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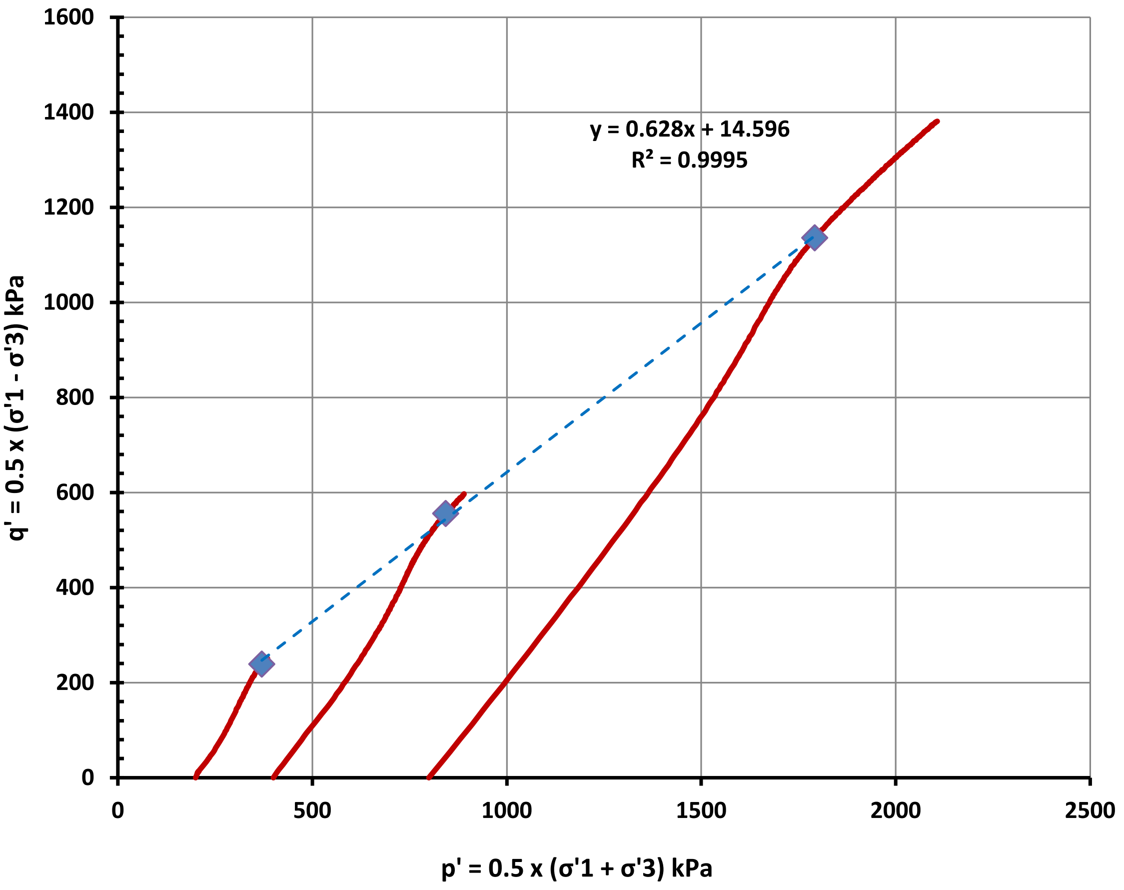
E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP07 and TP08	Lab:	EPLab
Sample ID:	WG23_19797_DST3		
Depth (m):	-	Room Temperature at Test:	~ 18°C

MIT Effective Stress Path (q' vs p' diagram)



MIT Stress Path - Using Stress Path Tangency Method

Cohesion C' (kPa) : **18.79**

Angle of Shear Resistance Φ' (Deg) : **39.05**

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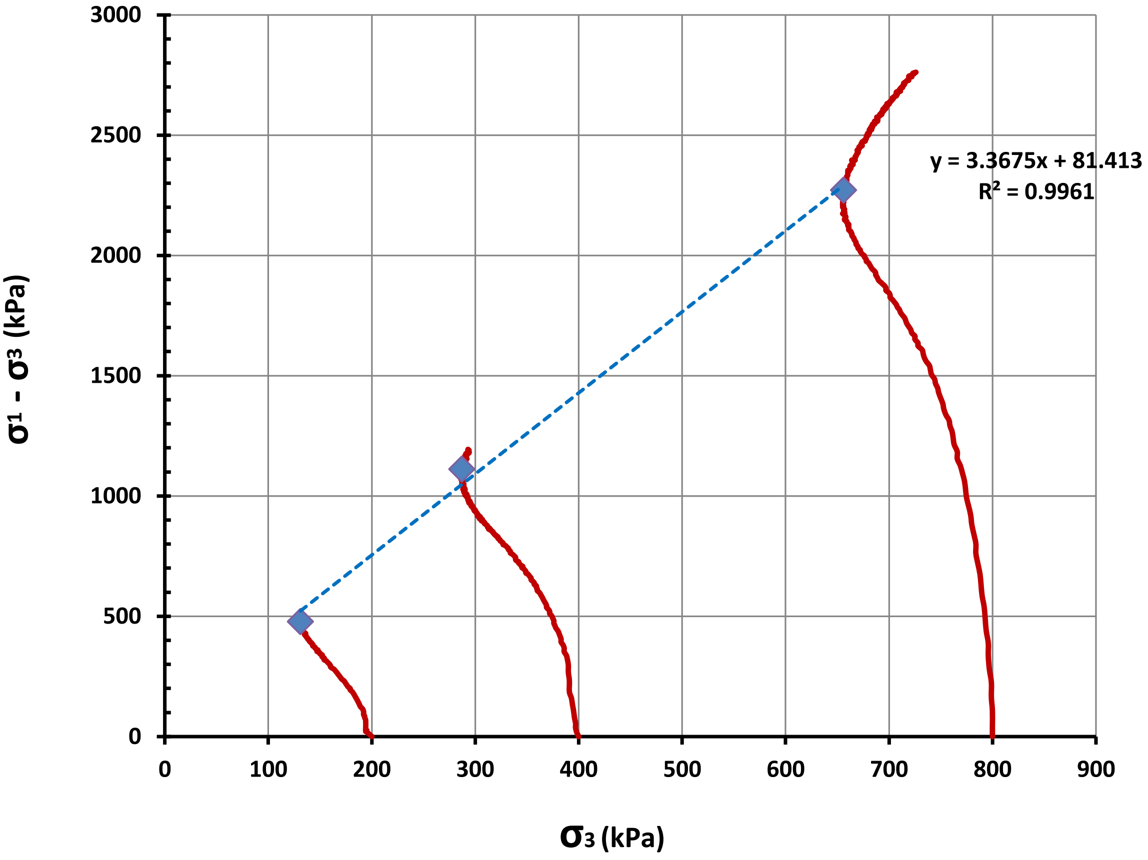
E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP07 and TP08	Lab:	EPLab
Sample ID:	WG23_19797_DST3		
Depth (m):	-	Room Temperature at Test:	~ 18°C

Modified Mohr Coulomb Stress Path



Modified Mohr Coulomb Path - Using Stress Path Tangency Method

Cohesion C' (kPa) : **19.47**

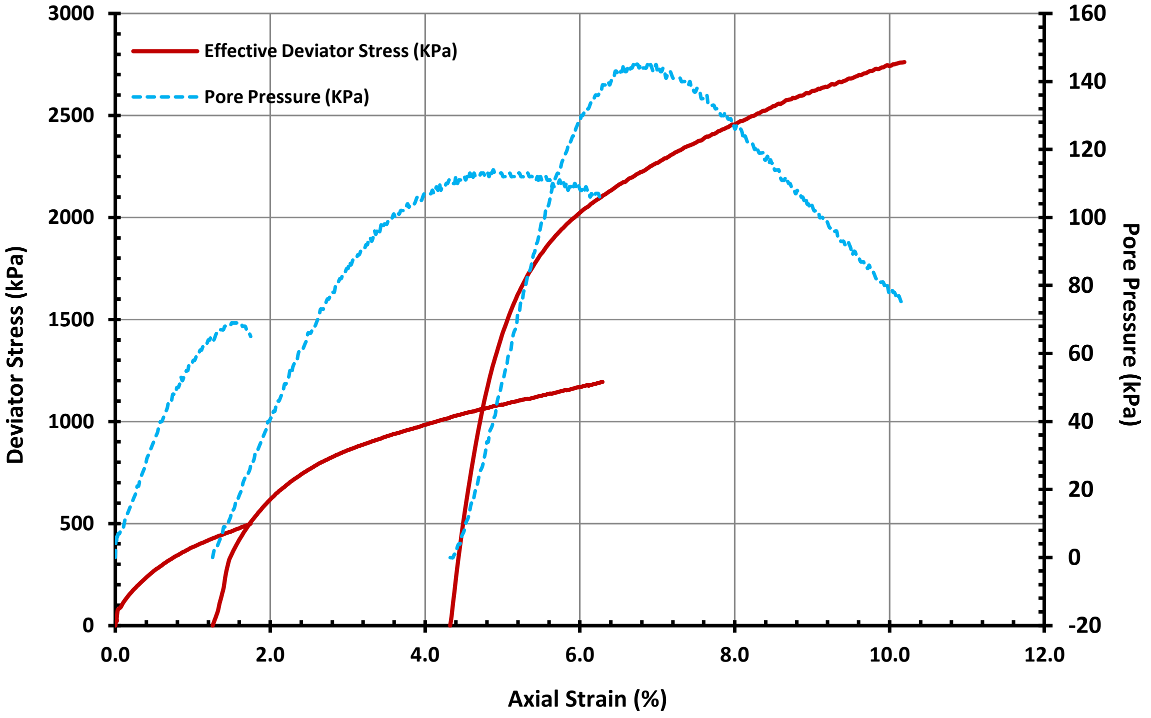
Angle of Shear Resistance Φ' (Deg) : **38.87**

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP07 and TP08	Lab:	EPLab
Sample ID:	WG23_19797_DST3		
Depth (m):	-	Room Temperature at Test:	~ 18°C

Deviator Stress Vs Strain Diagram



SHEAR STAGE DATA AND STRESS MEASUREMENTS (kPa)

Shear Stage	Confining Pressure	U'$_0$	U'$_f$	Principal Effective Stresses			σ'$_1$ - σ'$_3$	Strain (%)
				σ'$_1$	σ'$_3$	σ'$_1$ / σ'$_3$		
1	200	0	69	609	131	4.65	478	1.61
2	400	0	113	1399	287	4.87	1112	5.33
3	800	0	144	2928	656	4.46	2272	7.02

[redacted]

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP07 and TP08	Lab:	EPLab
Sample ID:	WG23_19797_DST3		
Depth (m):	-	Room Temperature at Test:	~ 18°C

Photo After Test

Sample ID:	TP07 and TP08	**Depth (m):**	-
Lab ID:	WG23_19797_DST3	**Date Tested:**	01/02/2024

Failure Mode: Bulging Failure

Notes: **Remolded to 95% SMDD @ OMC**

Stored and Tested the Sample as received

Samples supplied by the Client

NATA: 19078 **Authorised Signatory (Geotechnical Eng**

[redacted]

NATA
ACCREDITATION NO: 19078

Perth
16 Gympie Way, Willetton
WA 6155
Ph: (08) 9418 8742
[redacted]

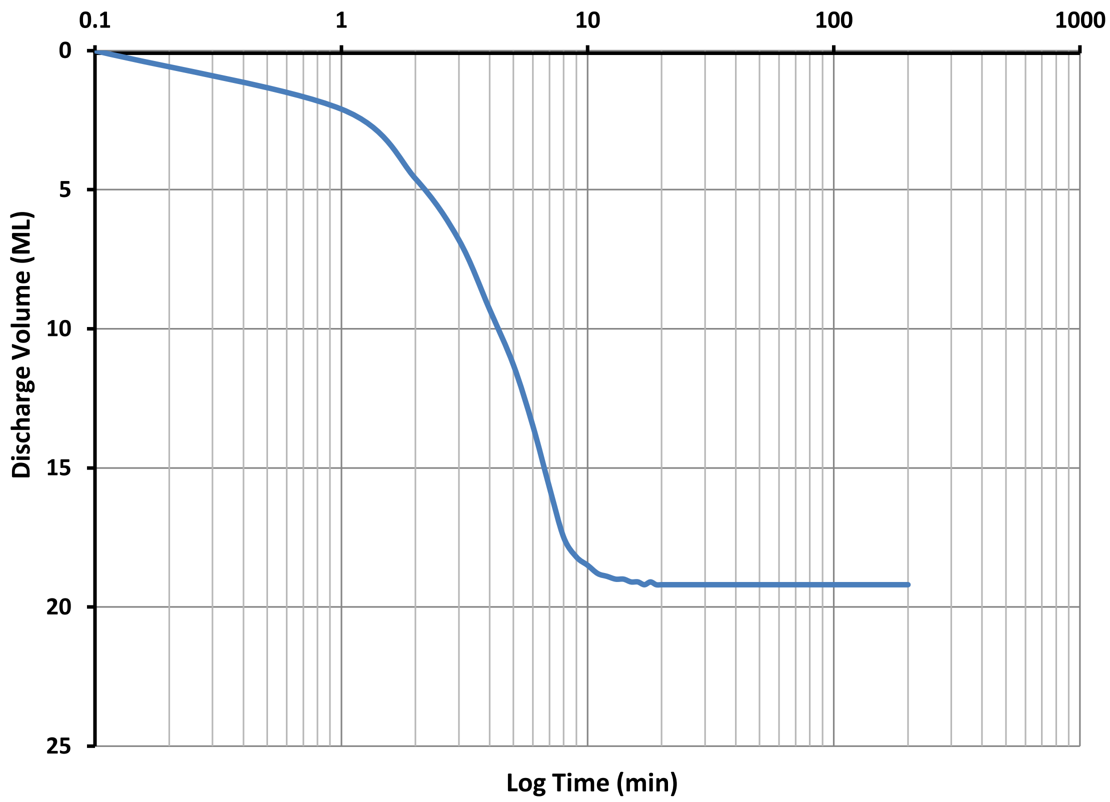
E-PRECISION LABORATORY

MULTI-STAGE CONSOLIDATED UNDRAINED TRIAXIAL TEST

Method: AS1289.6.4.2 2.1.1

Client:	Western Geotechnical Lab Services	Date Tested:	01/02/2024
Project:	TSF Design, Mt Ida	EP Lab Job Number:	WGEO
Sample No:	TP07 and TP08	Lab:	EPLab
Sample ID:	WG23_19797_DST3		
Depth (m):	-	Room Temperature at Test:	~ 18°C

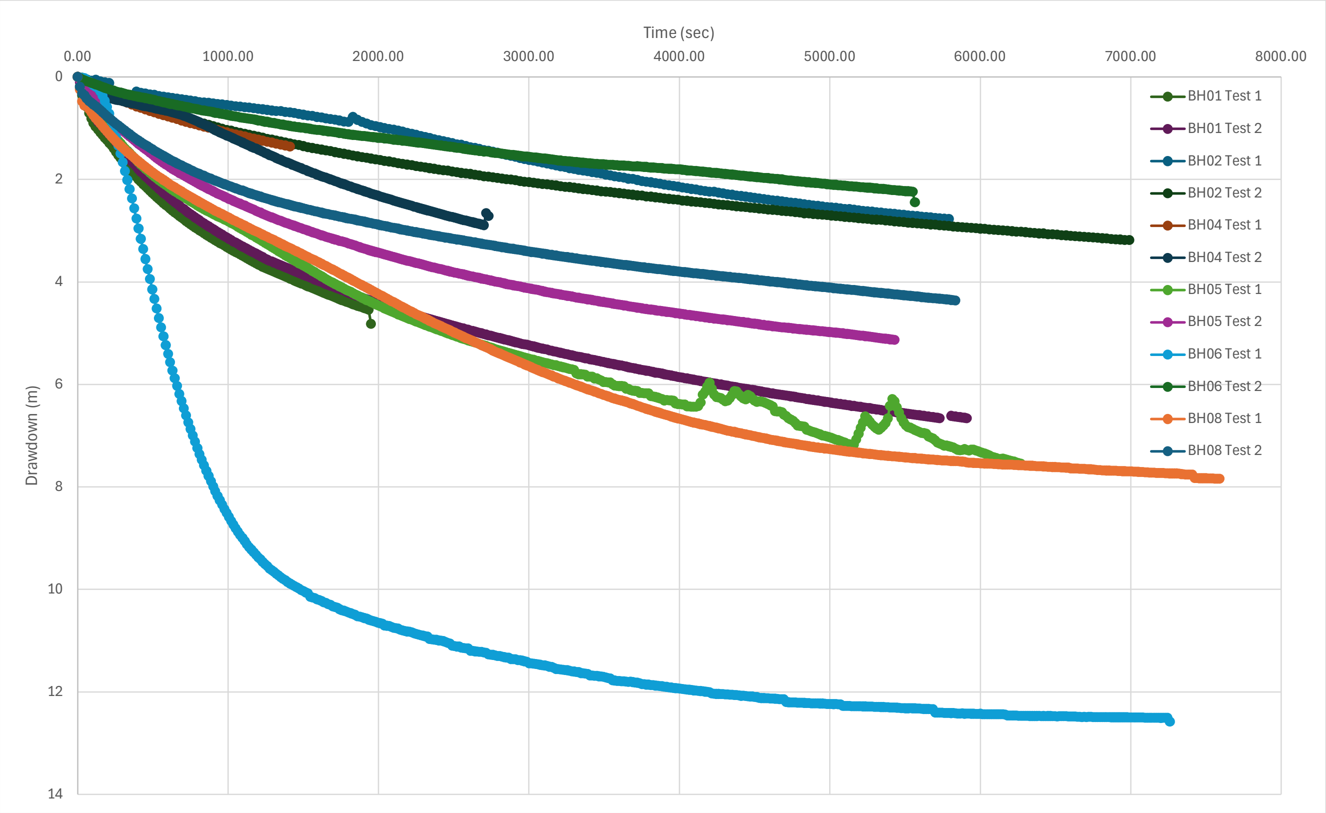
Discharge Volume (ML) Vs Log Time (min)



Cv (cm²/s):	0.437	based on **t_{90}**
K (m/s):	6.63E-08	
Mv (m²/kN):	1.55E-04	

Appendix F:
Analyses of Infiltration Testing

TestID	**tan(α)**	**k(m/s) -ve**	**k(m/s)**	**k(m/day)**		
BH01-1	-8.80371E-05	-5.06213E-06	5.06213E-06	0.437368	r (m)	0.05
BH01-2	-5.40491E-05	-3.10782E-06	3.10782E-06	0.268516		
BH02-1	-4.84516E-05	-2.78597E-06	2.78597E-06	0.240708		
BH02-2	-3.63361E-05	-2.08932E-06	2.08932E-06	0.180518		
BH04-1	-7.87719E-05	-4.52938E-06	4.52938E-06	0.391339		
BH04-2	-9.06472E-05	-5.21221E-06	5.21221E-06	0.450335		
BH05-1	-0.000112144	-6.44826E-06	6.44826E-06	0.55713		
BH05-2	-8.68565E-05	-4.99425E-06	4.99425E-06	0.431503		
BH06-1	-0.000181398	-1.04304E-05	1.04304E-05	0.901185		
BH06-2	-3.03413E-05	-1.74463E-06	1.74463E-06	0.150736		
BH07-1	hole collapse					
BH07-2						
BH08-1	-0.000119464	-6.86916E-06	6.86916E-06	0.593495		
BH08-2	-6.56222E-05	-3.77328E-06	3.77328E-06	0.326011		
		-4.7539E-06	4.7539E-06			
		-0.410736898	0.410736898			
		Unsaturated Average			Saturated Average	
		0.52020408			0.30127	


Time (sec)
0.00
1000.00
2000.00
3000.00
4000.00
5000.00
6000.00
7000.00
8000.00
Drawdown (m)
0
2
4
6
8
10
12
14
BH01 Test 1
BH01 Test 2
BH02 Test 1
BH02 Test 2
BH04 Test 1
BH04 Test 2
BH05 Test 1
BH05 Test 2
BH06 Test 1
BH06 Test 2
BH08 Test 1
BH08 Test 2

Appendix G:
Tailings Testwork

WESTERN GEOTECHNICAL
& Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

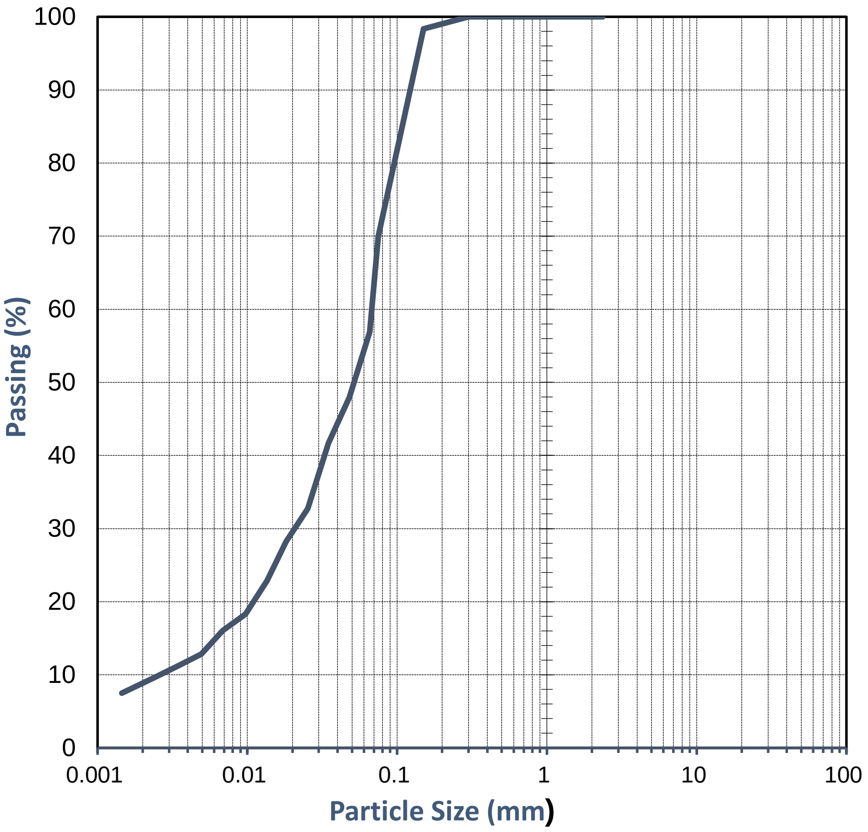
TEST REPORT - AS 1289.3.6.1, 3.6.3, 3.5.1

Client:	CMW Geosciences	*Ticket No.*	S11717
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.18758_1_PSDHY
Project:	TSF Design	*Sample No.*	WG23.18758
Location:	Not Specified	*Date Sampled:*	Not Specified
Sample Identification:	Tailings Slurry Sample	*Date Tested:*	24/11 - 29/11/2023

TEST RESULTS - Particle Size Distribution of Soil & Hydrometer Analysis

Sampling method:	**Sampled by Client, Tested as Received**
Sample description:	**Tailings**
Sample preparation:	**Oven Dried <50°C**
Loss in pre-treatment (%):	**N/A**
Type of hydrometer:	**g/L**
Method of dispersion:	**Mechanical Device**

Sieve Size (mm)	Passing (%)
75	
37.5	
19	
9.5	
4.75	
2.36	100
1.18	100
0.6	100
0.425	100
0.3	100
0.15	98
0.075	70
0.066	57
0.048	48
0.035	42
0.025	33
0.018	28
0.014	23
0.010	18
0.007	16
0.005	13
0.004	11
0.002	10
0.001	7



AS 1289.3.5.1 -2.36mm Particle Density (g/cm^3)
2.63

Comments:

[redacted]

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	CMW Geosciences	*Ticket No.*	S11717
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.18758_1_PI
Project:	TSF Design	*Sample No.*	WG23.18758
Location:	Not Specified	*Date Sampled:*	Not Specified
Sample Identification:	Tailings Slurry Sample	*Date Tested:*	27-11-2023

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

[redacted]

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TEST REPORT - AS 1289.3.5.1

Client:	CMW Geosciences	*Ticket No.*	S11717
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG23.18758_1_PD
Project:	TSF Design	*Sample No.*	WG23.18758
Location:	Not Specified	*Date Sampled:*	Not Specified
Sample Identification:	Tailings Slurry Sample	*Date Tested:*	27/11 - 28/11/2023

TEST RESULTS - SOIL PARTICLE DENSITY

Sampling Method: **Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
Temperature at test (°C)	**21.0**
Passing 2.36mm **Soil apparent particle density (g/cm^3)**	**2.63**

Particle Density - Fraction Retained 2.36mm	
Retained 2.36mm **Soil apparent particle density (g/cm^3)**	**N/A**

Particle Density - Total Soil Sample	
Total Sample **Soil particle density (g/cm^3)**	**N/A**

Comments:

[redacted]

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E-PRECISION LABORATORY

FALLING HEAD PERMEABILITY TEST REPORT

Test Method: AS1289 6.7.2

Client:	Western Geotechnical Lab Services	Date Tested:	10/12/2023
Project:	TSF Design 2023	Date Reported:	12/12/2023
Lab:	WG23_18758_FH	EP Lab Job Number:	WGEO

Tested by: Phil
Checked by: Phil

Lab ID:	WG23_18758_FH			
Client ID:	Slurry			
Depth (m):	-			
Sample Conditions:	Drained Settled Density			
Surcharge Pressure (kPa):	12.5			
Initial Bulk Density (t/m³):	1.88			
Initial Moisture Content (%):	34.31			
Dry Density (t/m³):	1.40			
Saturation (Skempton's B):	1.00			
K_{20} (m/s):	**4.56×10^{-6}**			

Notes:

Stored and Tested the Sample as received
Samples supplied by the Client

Authorised Signatory (Geotechnica [redacted]

The results of tests performed apply only to the specific sample at time of test unless otherwise clearly stated. Reference should be made to E-Precision Laboratory's "Standard Terms and Conditions" E-Precision Laboratory ABN 431 559 578 87

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WA 6155
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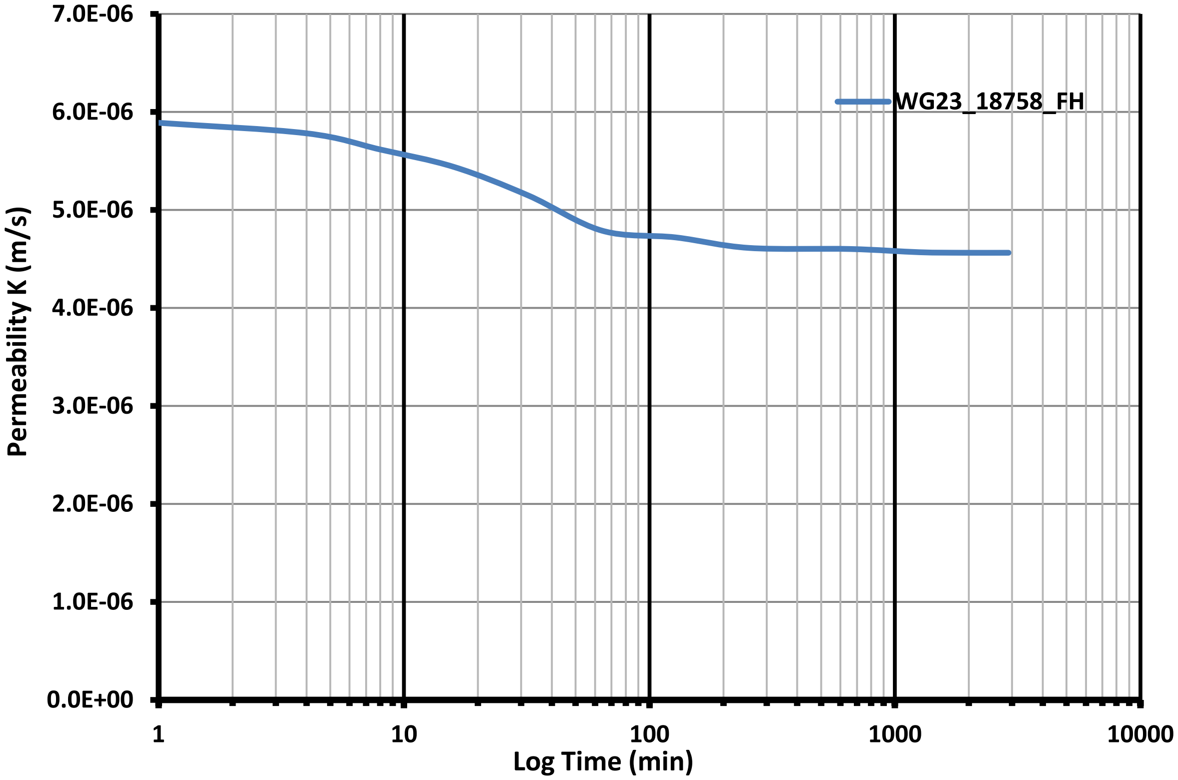
E-PRECISION LABORATORY

FALLING HEAD PERMEABILITY TEST REPORT

Test Method: AS1289 6.7.2

Client:	Western Geotechnical Lab Services	Date Tested:	10/12/2023
Project:	TSF Design 2023	Date Reported:	12/12/2023
Lab:	WG23_18758_FH	EP Lab Job Number:	WGEO



Notes:

Stored and Tested the Sample as received

Samples supplied by the Client

Authorised Signatory (Geotechnical Engineer): [redacted]

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E-Precision Laboratory

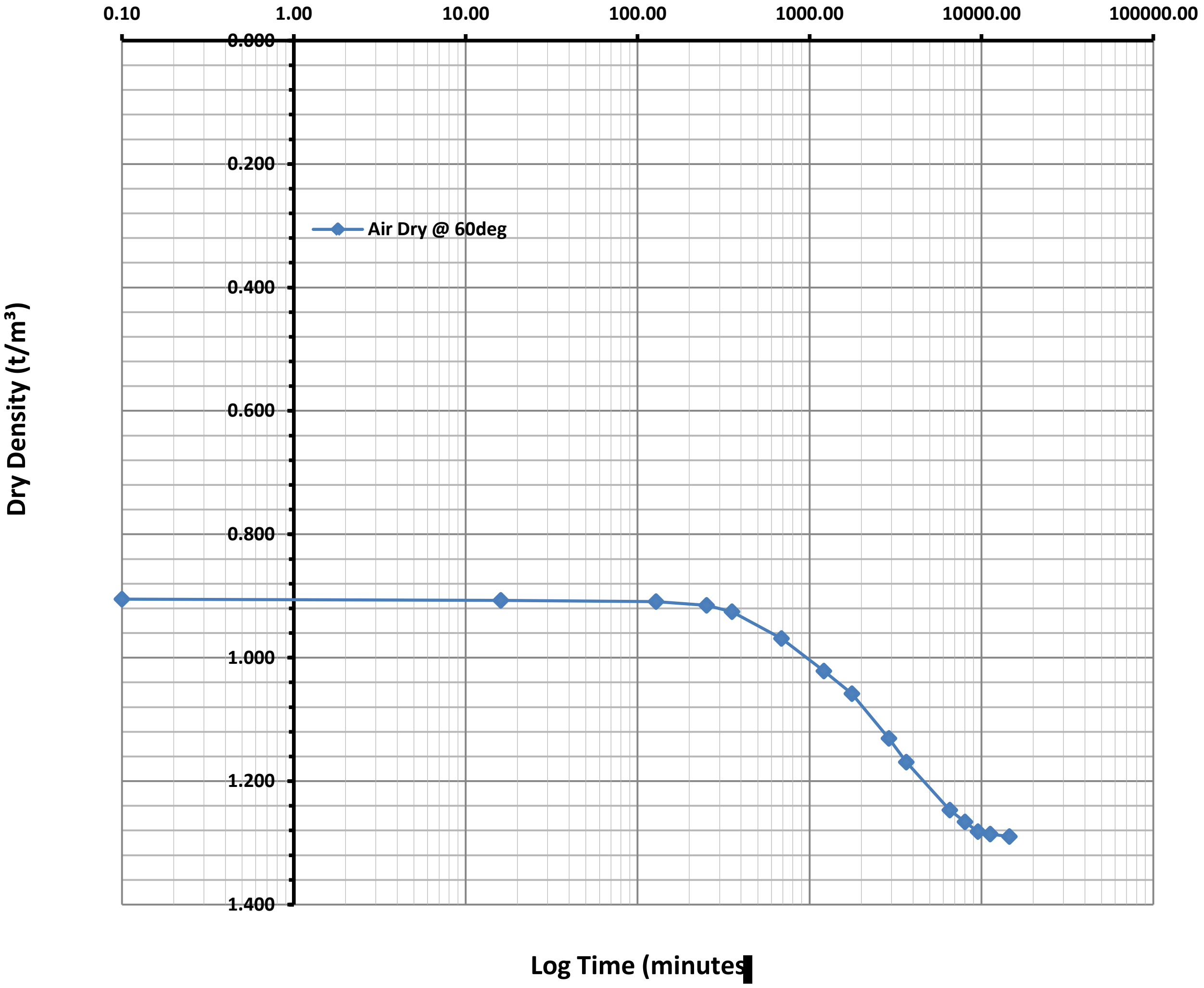
AIR DRYING SETTLING TEST

METHOD: Supplied by Client SRC-WF-100 / SRC-RF-100

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample No:	Slurry		
Lab ID:	WG23_18758_AIR_DRY	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Bulk Density (t/m³):**	1.561
Type of Test:	Air Dry Testing	**Particle Density (t/m³):**	2.629
Sample Preparation:	54% Solids	**Moisture Content Initial (%):**	72.483

Dry Density (t/m³) Vs Time (minutes)



[redacted]

Comments:

Authorised Signature (Geotechnical Engineer): [redacted]

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E-Precision Laboratory

AIR DRYING SETTLING TEST

METHOD: Supplied by Client SRC-WF-100 / SRC-RF-100

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample No:	Slurry		
Lab ID:	WG23_18758_AIR_DRY	Room Temperature at Test:	19°

Photo of Samples after Testing

Oven dried @ 60deg

Comments:

Authorised Signature (Geotechnical Engineer):

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E-Precision Laboratory

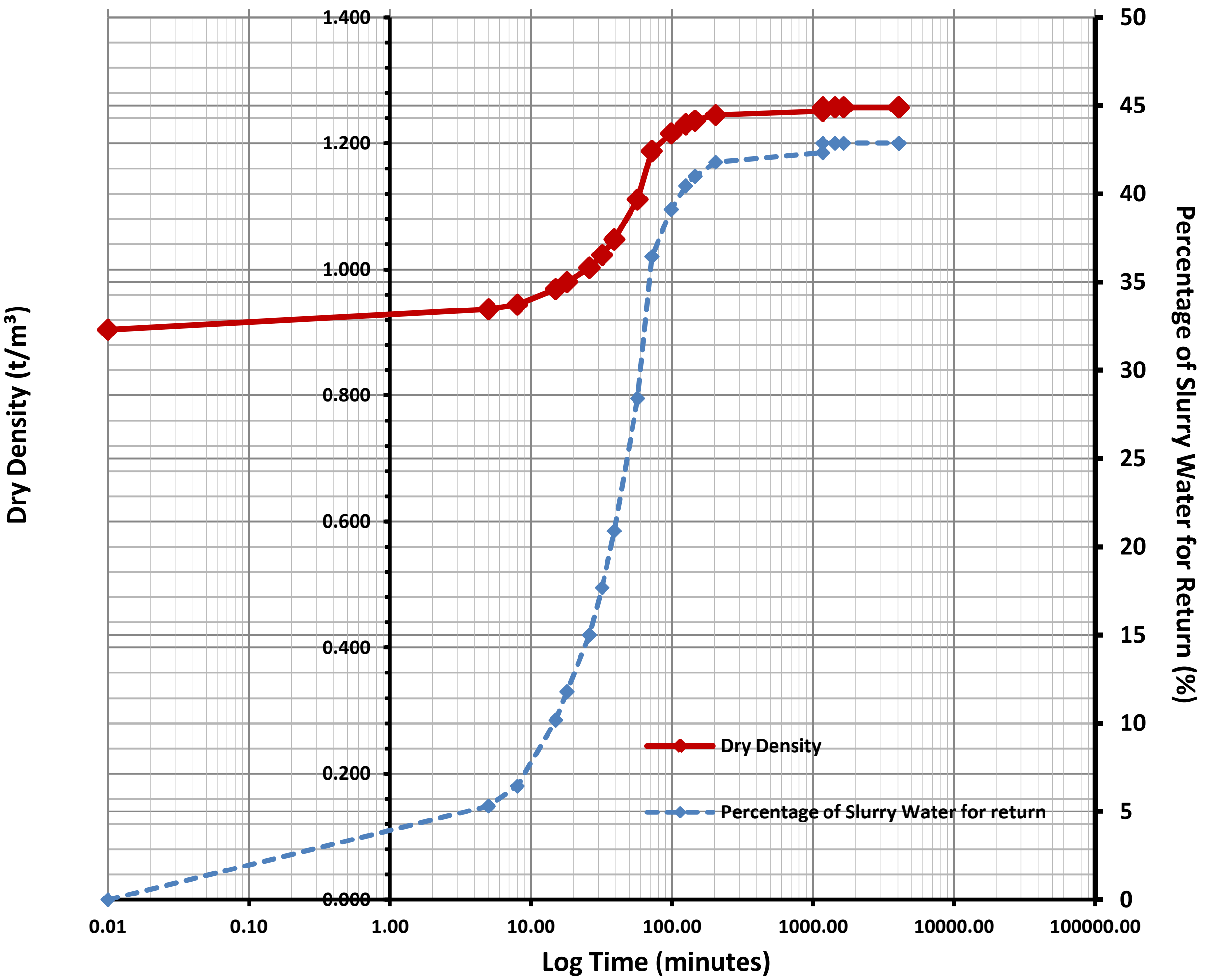
SETTLEMENT TESTING TAILINGS

METHOD: IN-HOUSE METHOD

Client: Western Geotechnical Lab Services
Date Tested: 07/12/2023
Project: TSF Design 2023
EP Lab Job Number: WGEO
Sample No: Slurry
Lab ID: WG23_18758_SETTLEMENT
Room Temperature at Test: 19°

Tested by: Phil
Type of Test: Settlement Testing
Sample Preparation: 54% Solids
Initial Dry Density (t/m³): 0.904
Particle Density (t/m³): 2.629
Initial Bulk Density (t/m³): 1.559

Undrained Dry Density (t/m³) Vs Log Time (minutes)



Comments:

Authorised Signature (Geotechnical Engineer):

[redacted]

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WA 6155
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E-Precision Laboratory

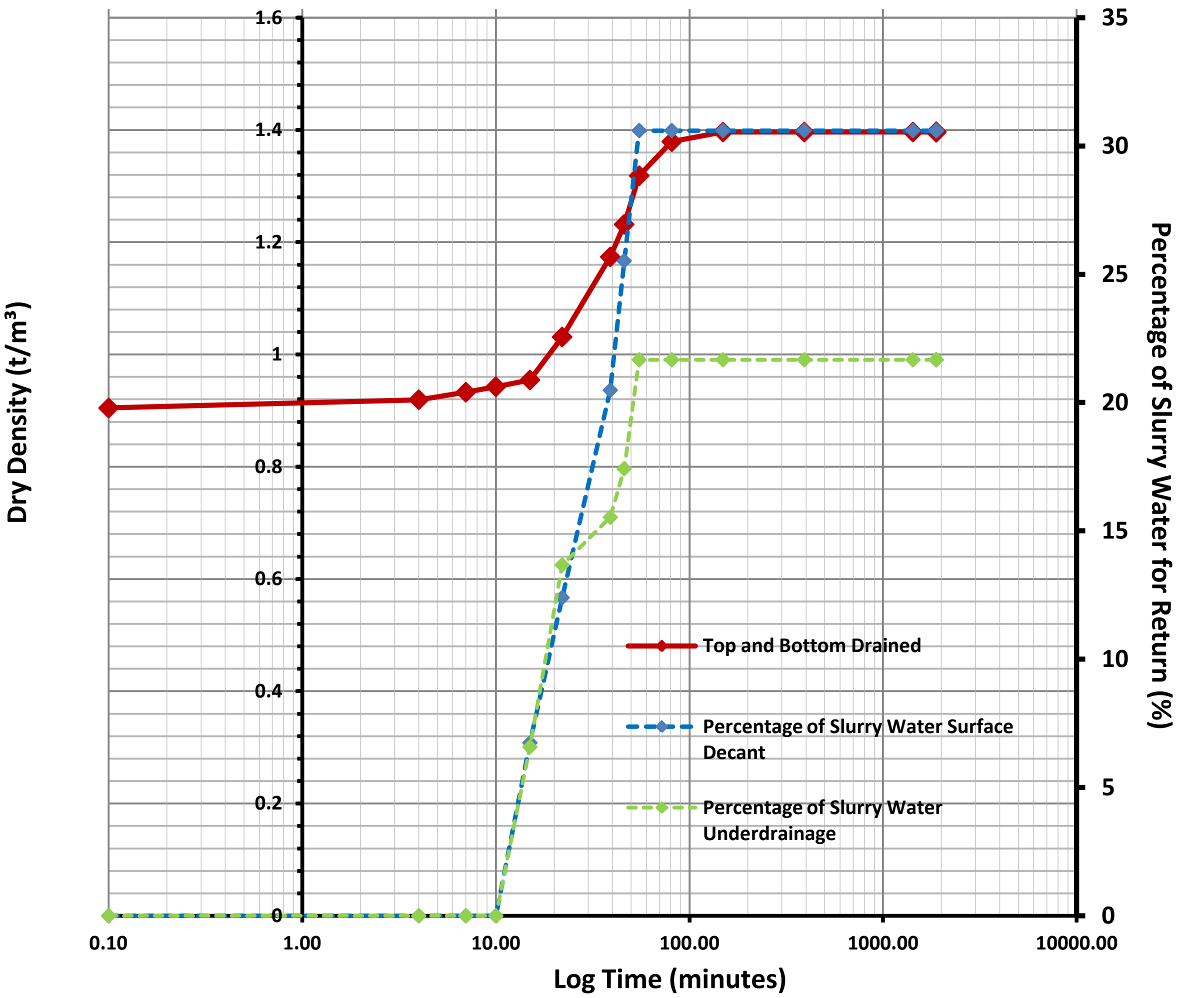
SETTLEMENT TESTING TAILINGS

METHOD: IN-HOUSE METHOD

Client:	Western Geotechnical Lab Services	Date Tested:	07/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample No:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Dry Density (t/m³):**	0.905
Type of Test:	Settlement Testing	**Particle Density (t/m³):**	2.629
Sample Preparation:	54% Solids	**Initial Bulk Density (t/m³):**	1.560

Top and Bottom Drained Dry Density (t/m³) Vs Log Time (minutes)



Comments:

Authorised Signature (Geotechnical Engineer): [redacted]

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WA 6155
Ph: (08) 9418 8742
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E-PRECISION LABORATORY

SETTLEMENT TESTING TAILINGS

METHOD: IN-HOUSE METHOD

Client:	Western Geotechnical Lab Services	Date Tested:	07/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample No:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Dry Density (t/m³):**	-
Type of Test:	Settlement Testing	**Particle Density (t/m³):**	-
Sample Preparation:	54% Solids	**Initial Bulk Density (t/m3):**	-

Photo of Test Setup

Undrained

Drained

Comments:

Authorised Signature (Geotechnical Engineer): [redacted]

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E-Precision Laboratory

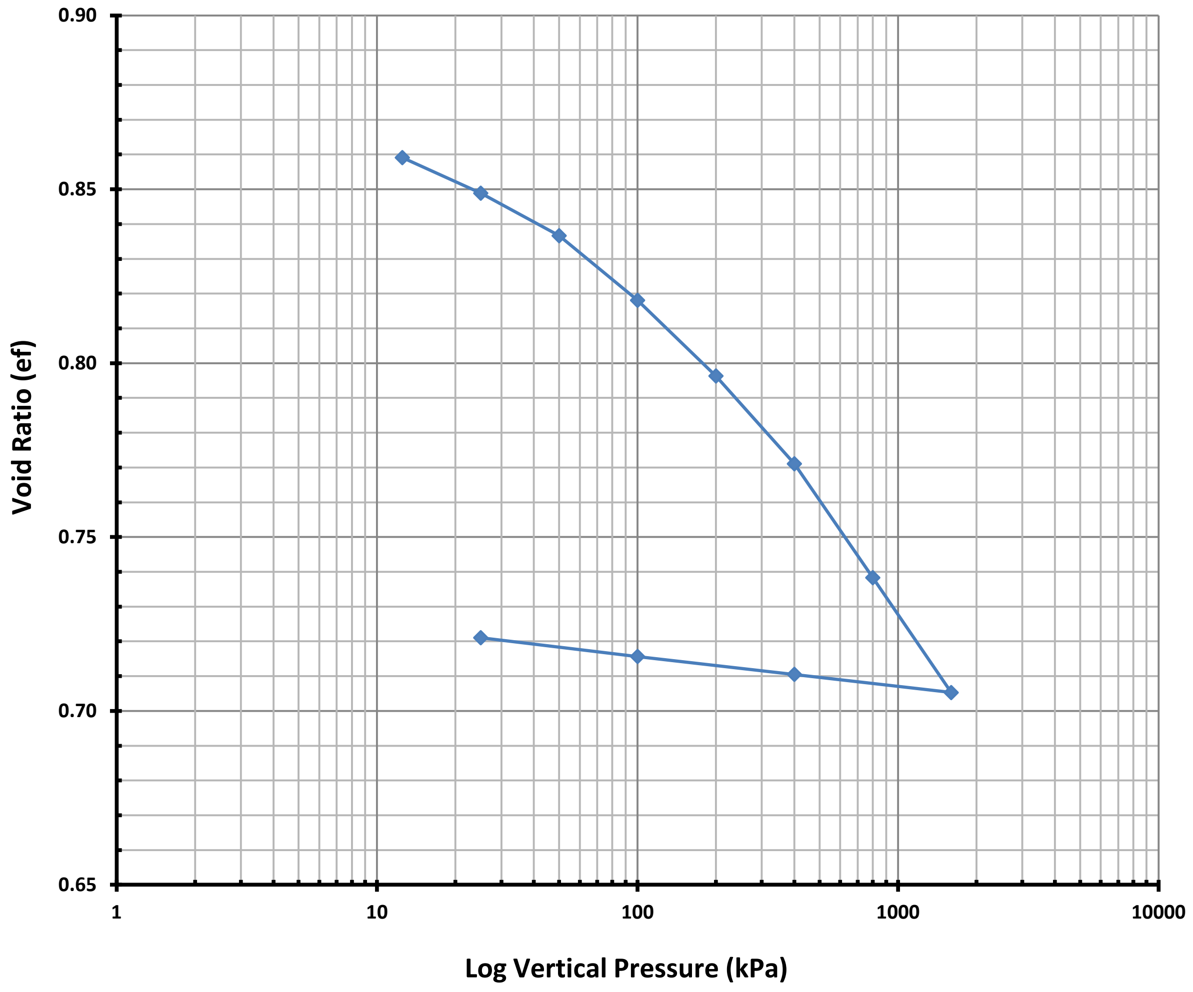
CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Tested by:	Phil	Initial Moisture (%):	34.25	Test Condition:	Undrained
Height (mm):	38.71	Final Moisture Content (%):	33.54	Sample Condition:	Saturated
Diameter (mm):	61.80	Bulk Density (t/m³):	1.88	Particle Density (t/m³):	2.629
Direction:	Vertical	Dry Density (t/m³):	1.40	Initial Void Ratio (e_i):	0.880

Void Ratio (e_f) Vs Log of Vertical Pressure (kPa)



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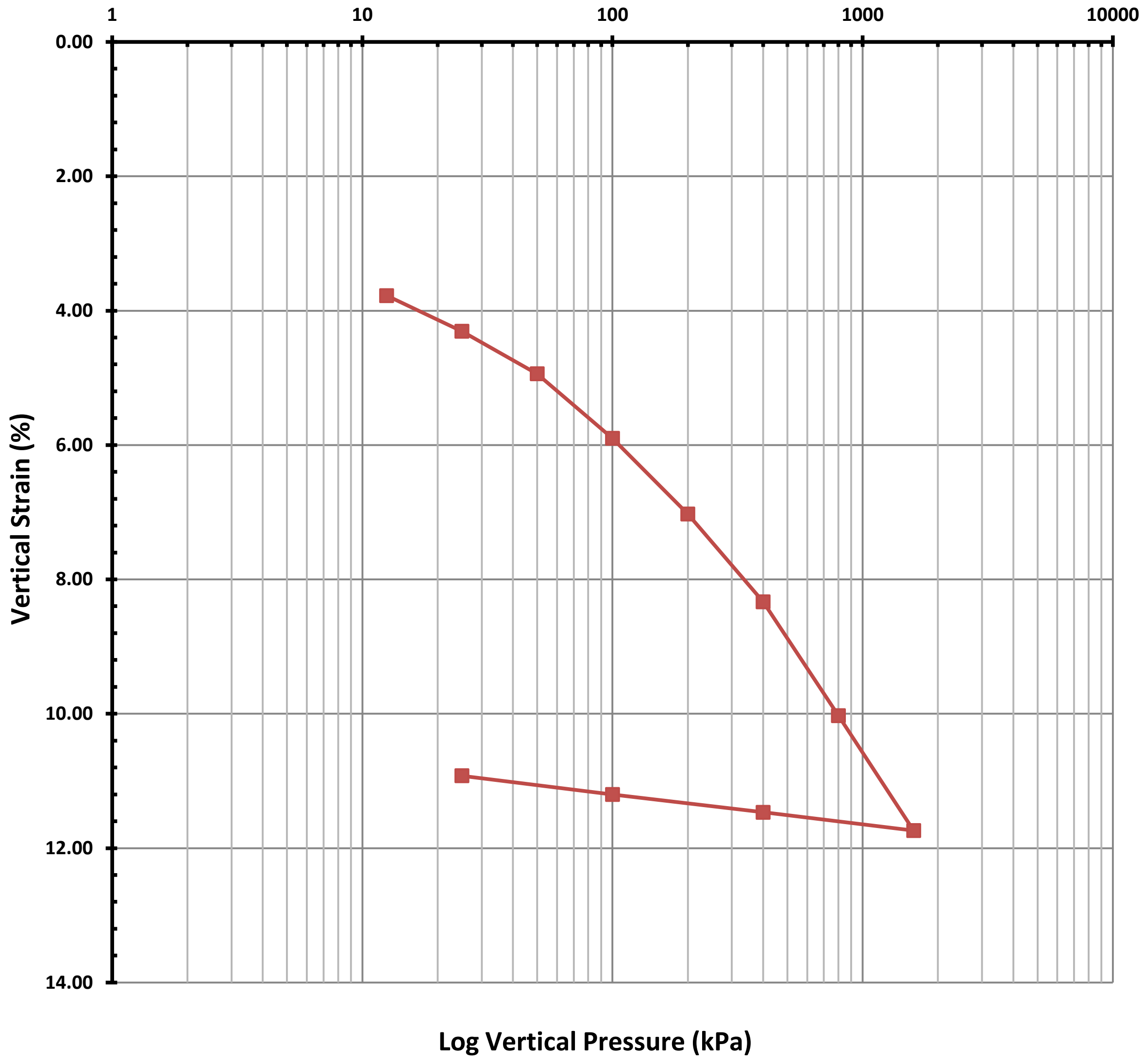
CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°c

Vertical Strain (%) Vs Log of Vertical Pressure (kPa)



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CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Test Results

*

Stages	Vert Disp (mm)	Cv (m^2/yr)		Compressibility Mv (m^2/kN)	K (m/s)		Void Ratio (e_f)	Vertical Strain (%)
		*t_{50}	t_{90}					
Stage 1 @ 12.5kPa	1.462	18.098	-	3.02E-03	1.7E-08		0.859	3.78
Stage 2 @ 25kPa	1.667	17.868	-	4.40E-04	2.4E-09		0.849	4.31
Stage 3 @ 50kPa	1.912	17.634	-	2.65E-04	1.5E-09		0.837	4.94
Stage 4 @ 100kPa	2.284	17.275	-	2.02E-04	1.1E-09		0.818	5.90
Stage 5 @ 200kPa	2.720	16.868	-	1.20E-04	6.3E-10		0.796	7.03
Stage 6 @ 400kPa	3.226	16.426	-	7.03E-05	3.6E-10		0.771	8.33
Stage 7 @ 800kPa	3.882	15.825	-	4.62E-05	2.3E-10		0.738	10.03
Stage 8 @ 1600kPa	4.544	15.226	-	2.38E-05	1.1E-10		0.705	11.74
Unload @ 400kPa	4.439							
Unload @ 100kPa	4.336							
Unload @ 25kPa	4.228							

** Values interpreted via lab only*

Comments: **Samples collected from Drained Settlement Testing**
Cv values to be interpreted via Engineer

Samples supplied by the Client

Authorised Signatory (Geotechnical Engineer): [redacted]

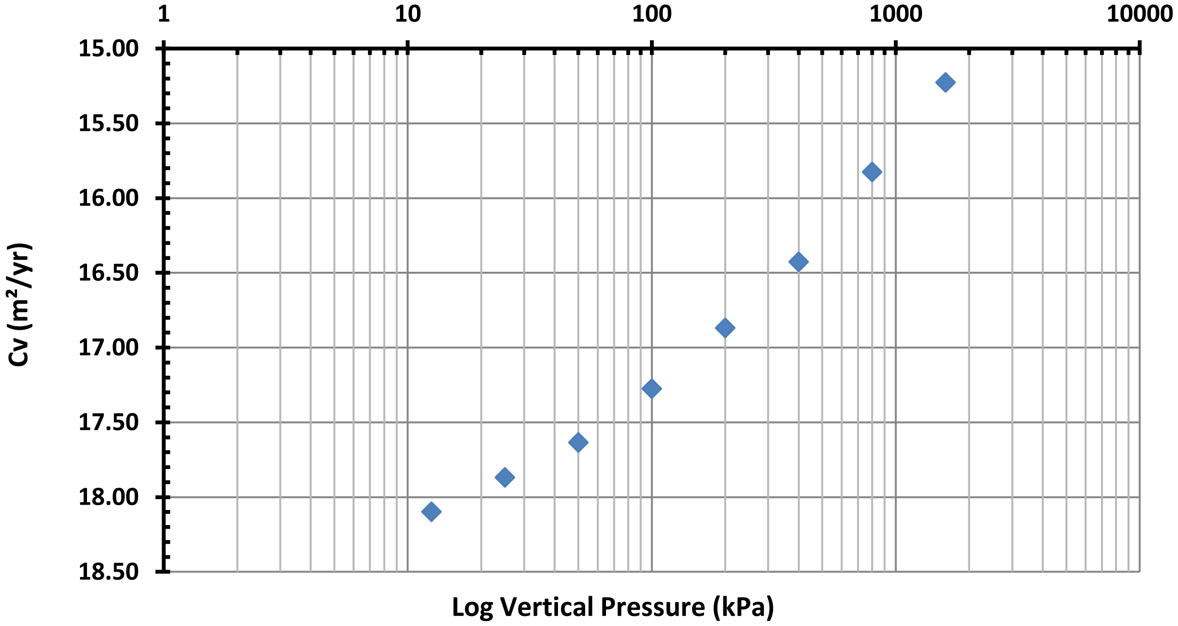
[redacted]

CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

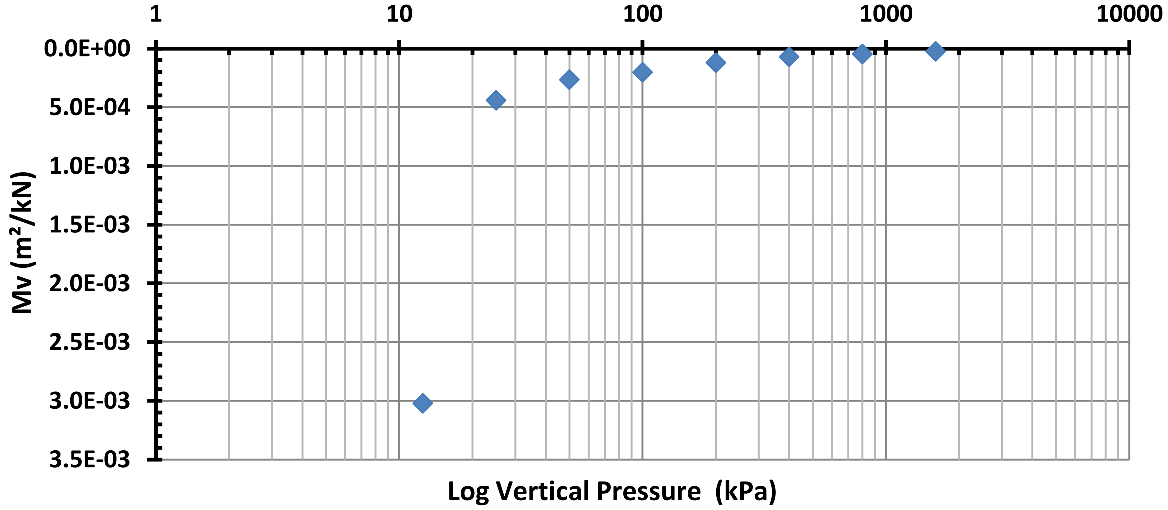
Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Cv (m²/yr) Vs Log of Vertical Pressure (kPa)



* Plot based on Log (time) data

Mv (m²/kN) Vs Log of Vertical Pressure (kPa)



[redacted]

CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

TEST RESULTS PLEASE SEE PAGES BELOW

[redacted]

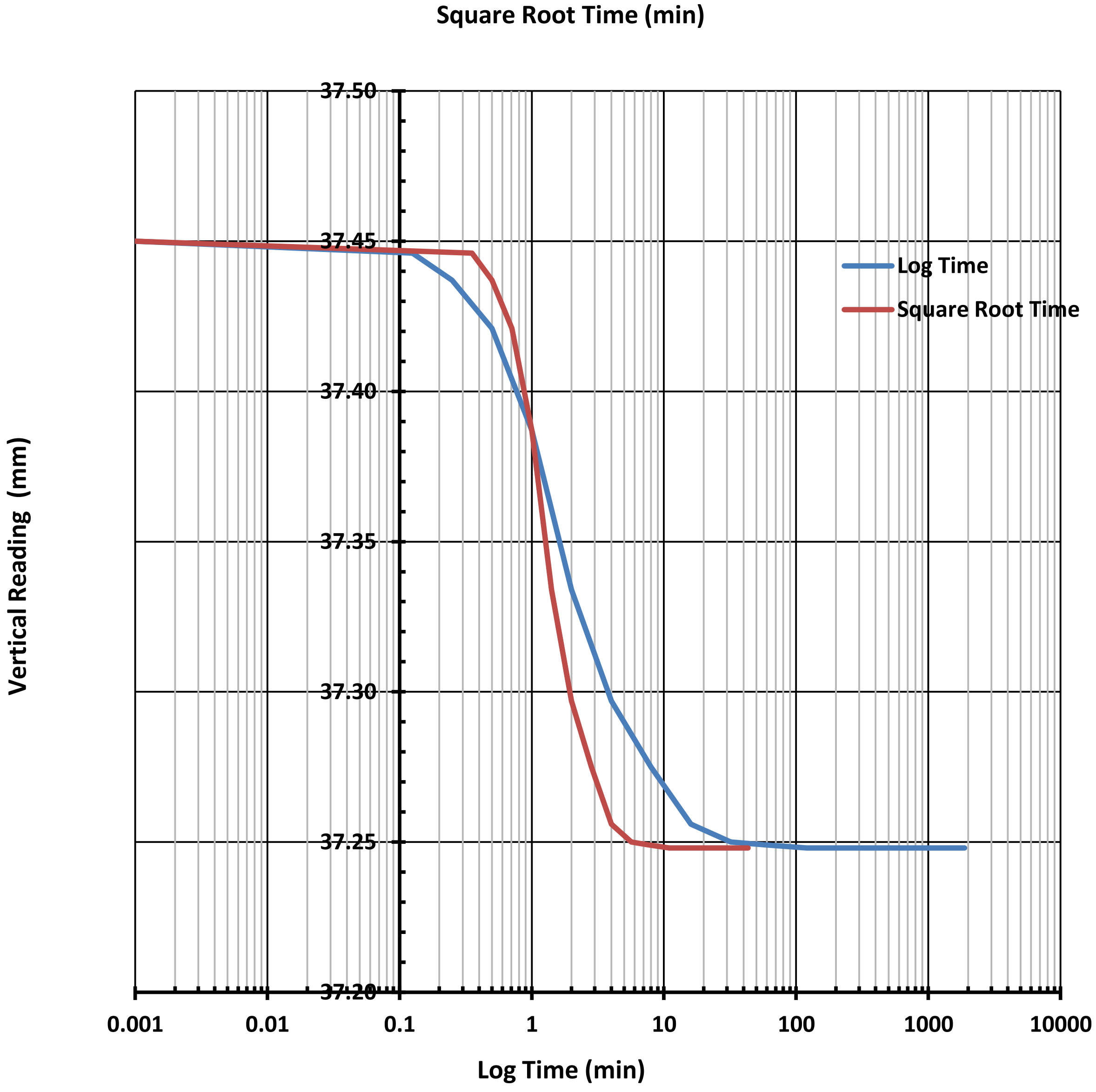
E-Precision Laboratory

CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 1 @ 12.5kPa



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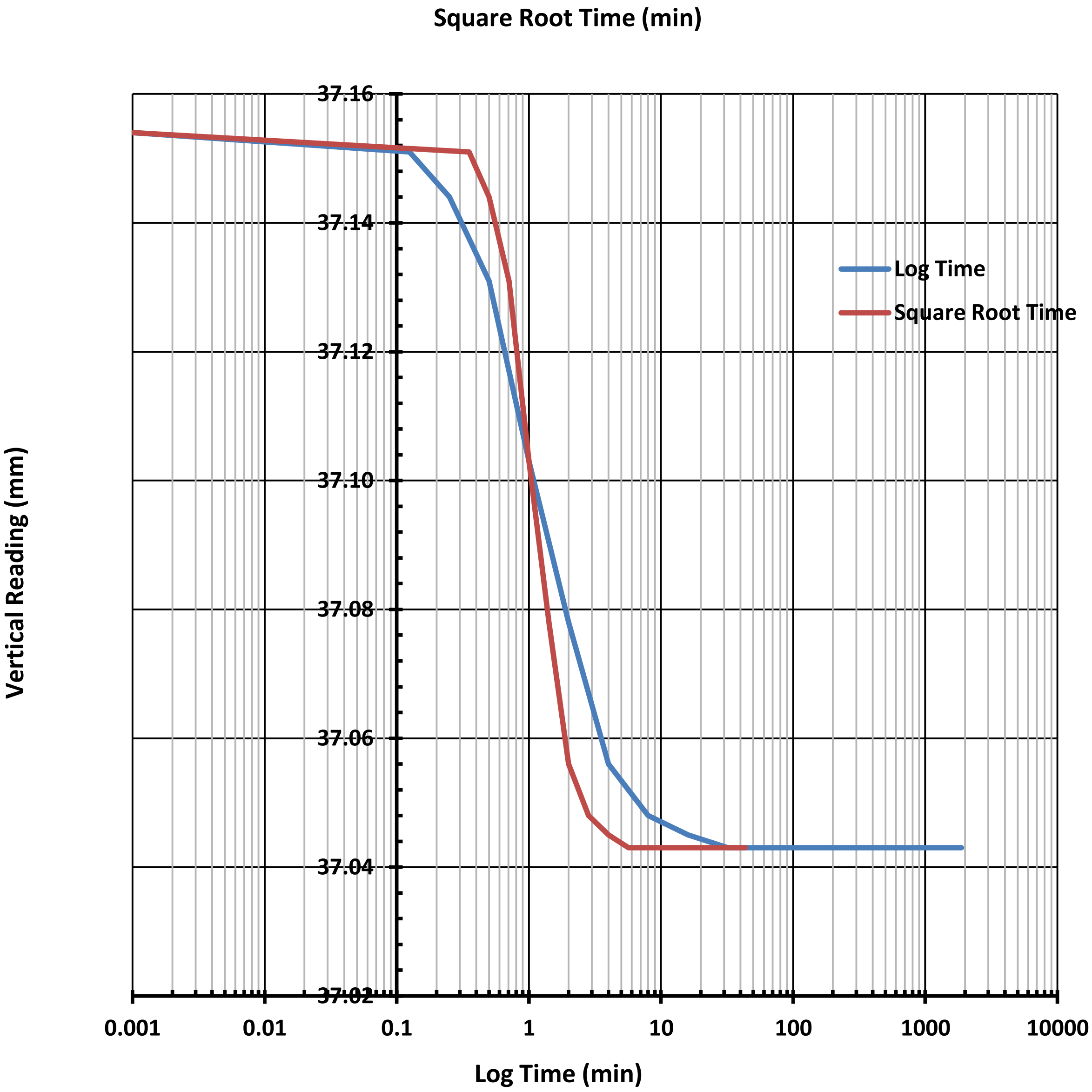
E-Precision Laboratory

CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 2 @ 25kPa



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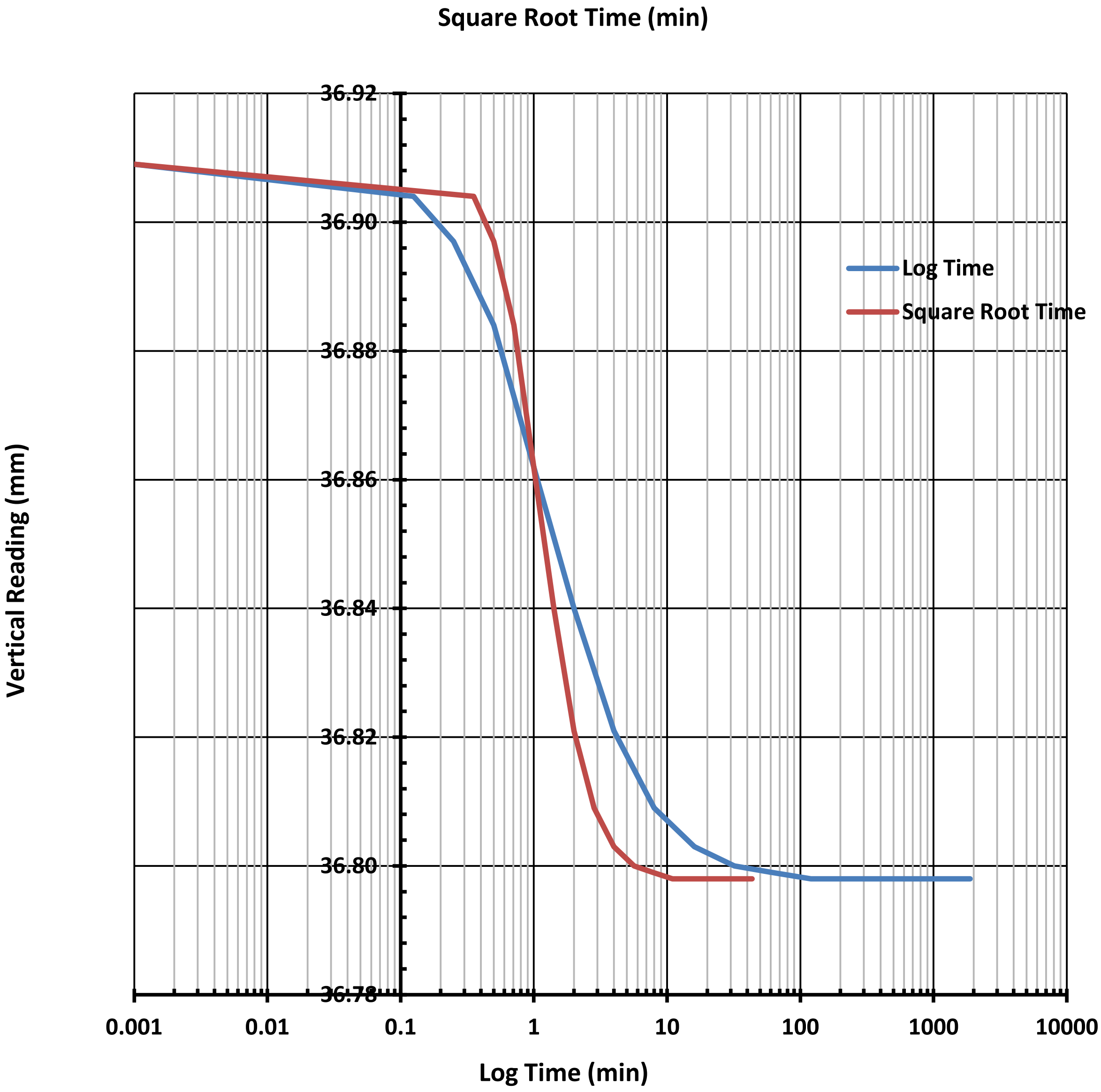
CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 3 @ 50kPa

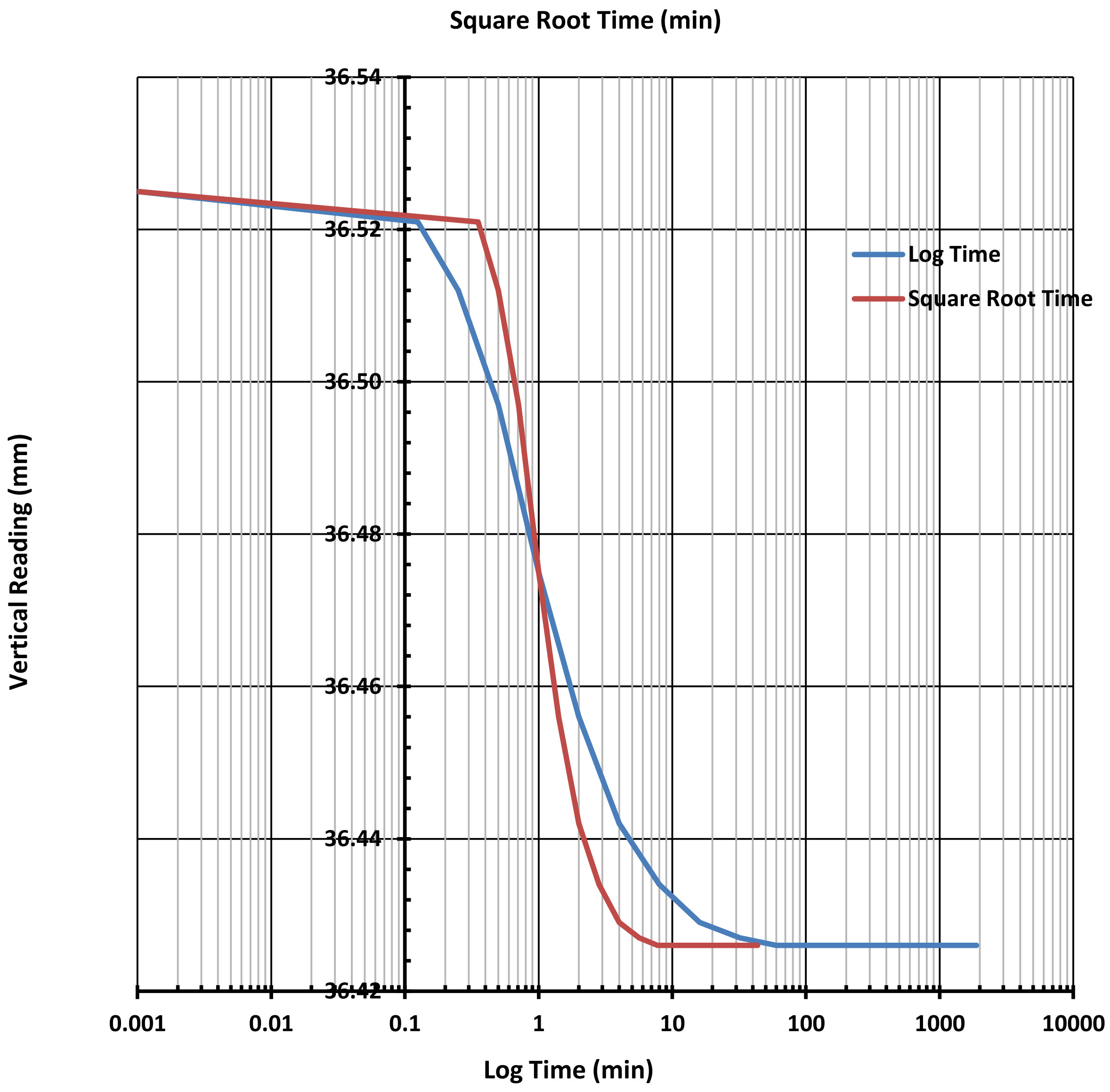


CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 4 @ 100kPa



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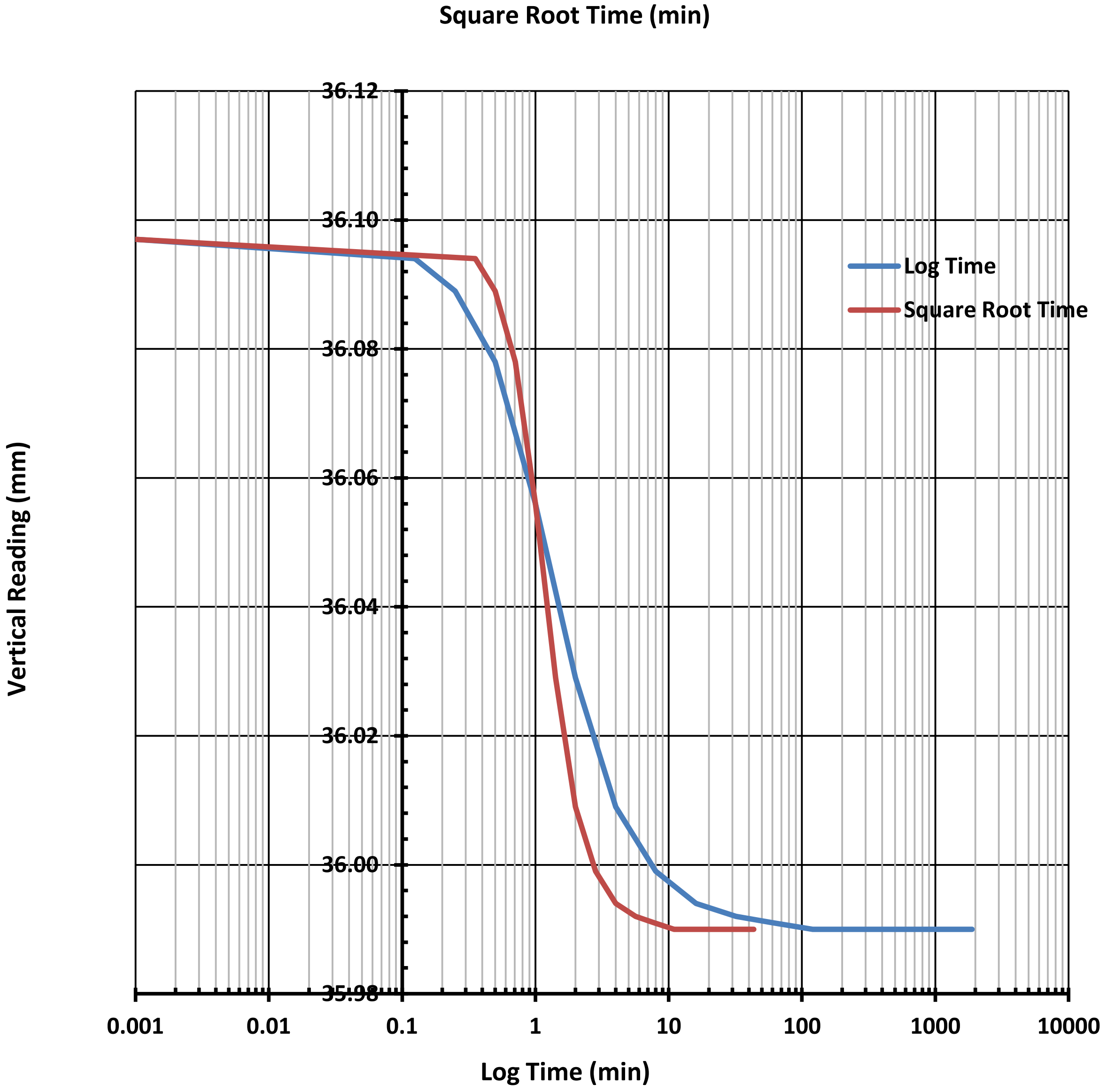
CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 5 @ 200kPa



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WA 6155
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[redacted]

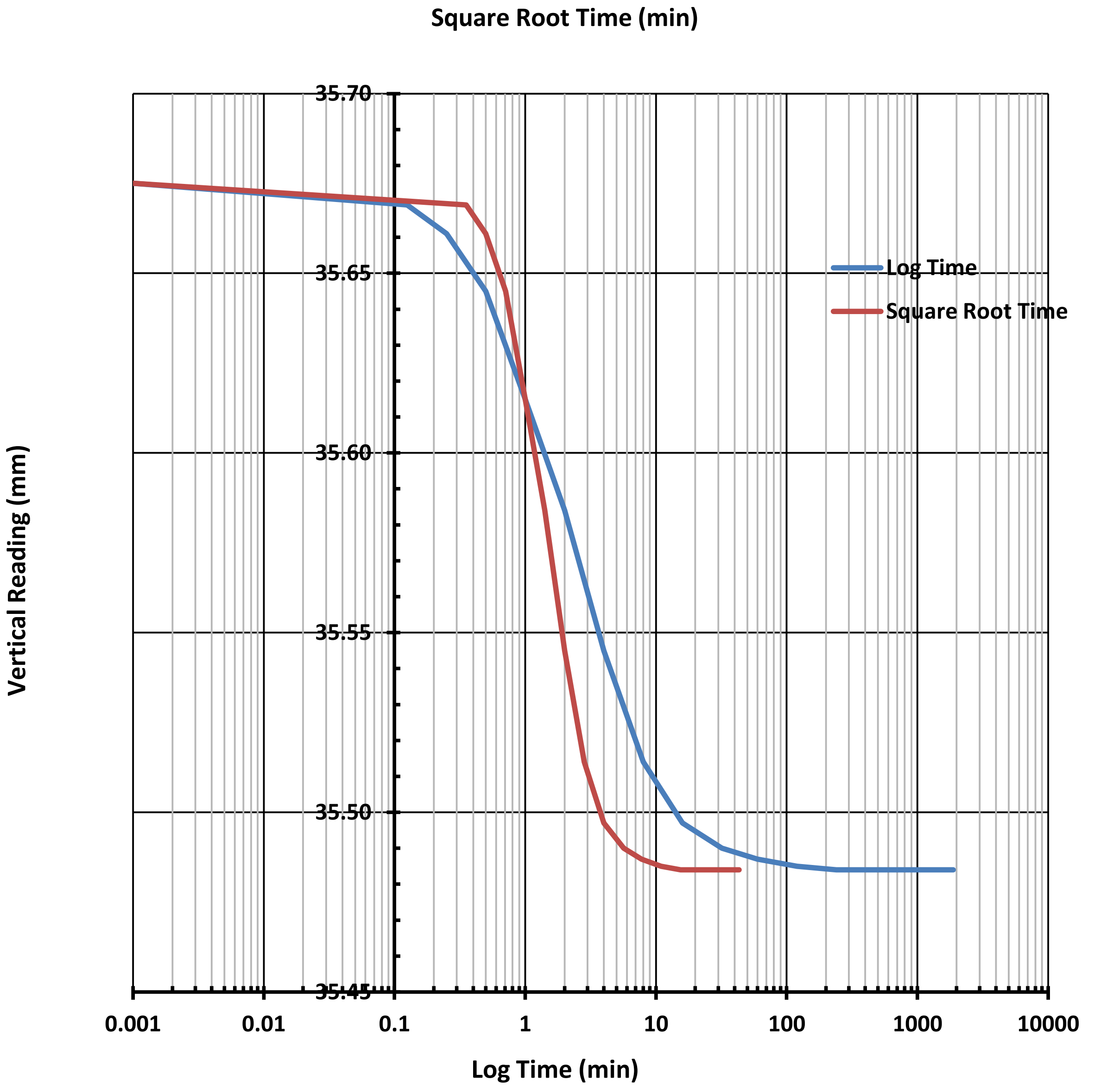
E-PRECISION LABORATORY

CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 6 @ 400kPa

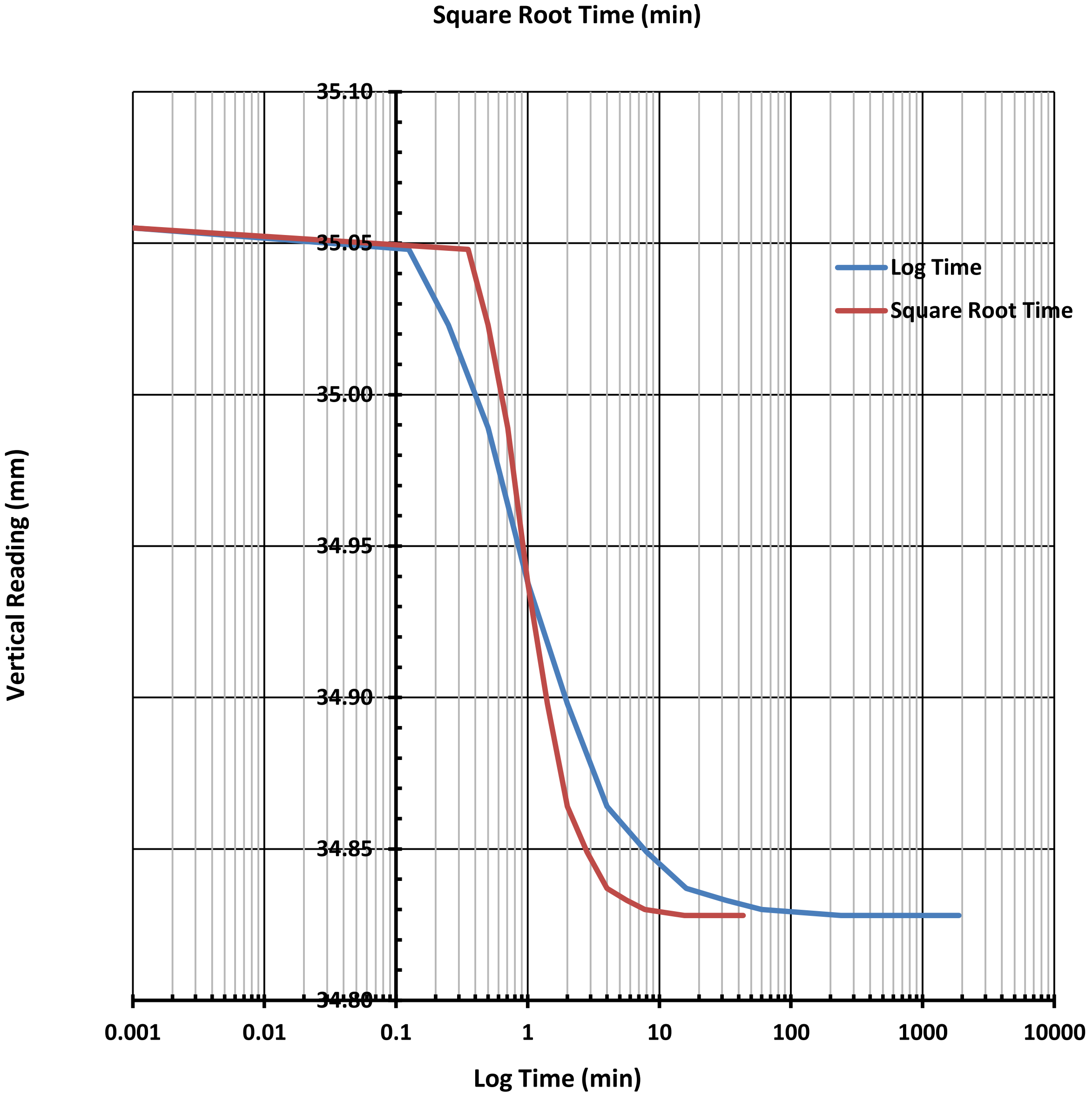


CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 7 @ 800kPa



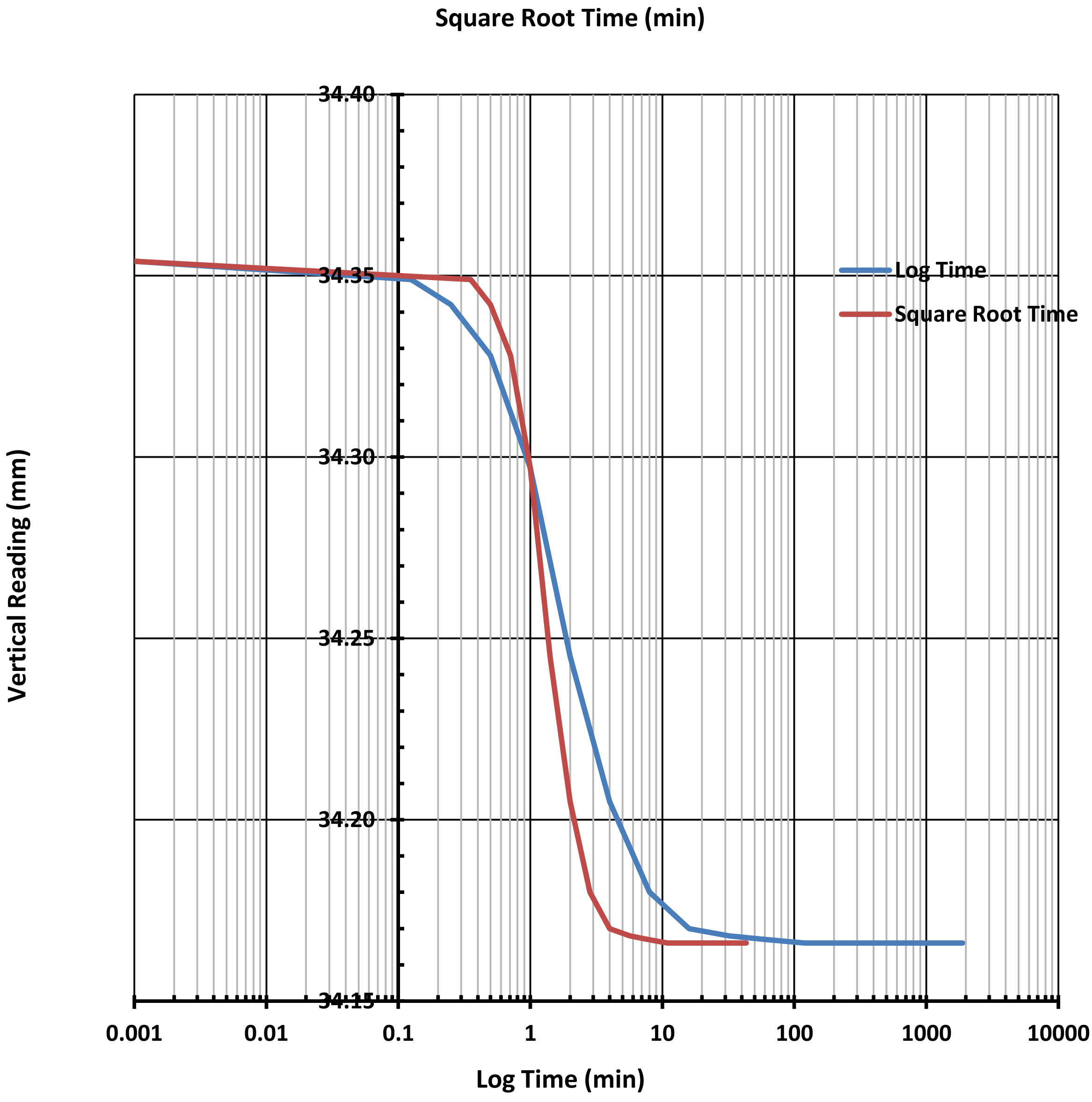
Integrity Precision Innovation

CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	05/12/2023
Project:	TSF Design 2023	EP Lab Job Number:	WGEO
Sample ID:	Slurry		
Lab ID:	WG23_18758_SETTLEMENT	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

Stage 8 @ 1600kPa



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Appendix G:
Tailings Testwork

SOIL | AGGREGATE | CONCRETE | CRUSHING

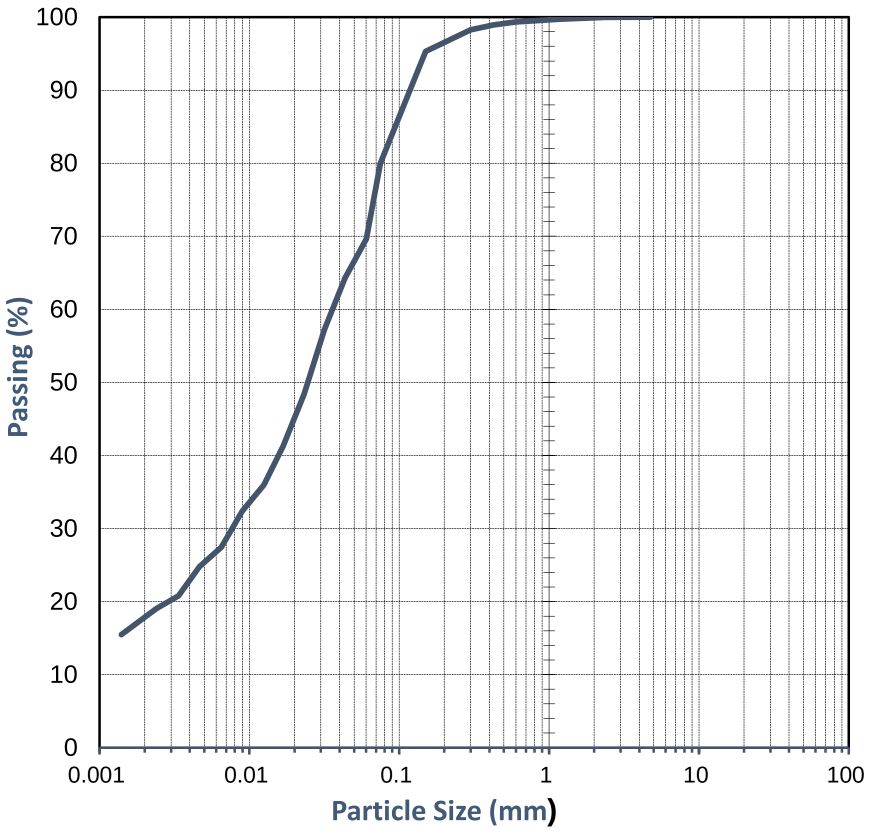
TEST REPORT - AS 1289.3.6.1, 3.6.3, 3.5.1

Client:	CMW Geosciences	*Ticket No.*	S14880
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG24.16165_1_PSDHY
Project:	TSF Redesign, Mt Ida Lithium-Gold Project	*Sample No.*	WG24.16165
Location:	Not Specified	*Date Sampled:*	Not Specified
Sample Identification:	Representative Tailings into TSF	*Date Tested:*	07/11 - 11/11/2024

TEST RESULTS - Particle Size Distribution of Soil & Hydrometer Analysis

Sampling method:	**Sampled by Client, Tested as Received**
Sample description:	**Tailings**
Sample preparation:	**Oven Dried <50°C**
Loss in pre-treatment (%):	**N/A**
Type of hydrometer:	**g/L**
Method of dispersion:	**Mechanical Device**

Sieve Size (mm)	Passing (%)
75	
37.5	
19	
9.5	
4.75	100
2.36	100
1.18	100
0.6	99
0.425	99
0.3	98
0.15	95
0.075	80
0.060	70
0.044	64
0.032	57
0.023	48
0.017	41
0.013	36
0.009	32
0.007	27
0.005	25
0.003	21
0.002	19
0.001	15



AS 1289.3.5.1 -2.36mm Particle Density (g/cm^3)
2.76

Comments:

[redacted]

Accreditation No. 20599
Accredited for compliance
with ISO/IEC 17025 - Testing
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TEST REPORT - AS 1289.3.5.1

Client:	CMW Geosciences	*Ticket No.*	S14880
Client Address:	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	*Report No.*	WG24.16165_1_PD
Project:	TSF Redesign, Mt Ida Lithium-Gold Project	*Sample No.*	WG24.16165
Location:	Not Specified	*Date Sampled:*	Not Specified
Sample Identification:	Representative Tailings into TSF	*Date Tested:*	8/11/2024

TEST RESULTS - SOIL PARTICLE DENSITY

Sampling Method: **Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
Temperature at test (°C)	21.0
Passing 2.36mm Soil apparent particle density (g/cm^3)	2.76

Particle Density - Fraction Retained 2.36mm	
Retained 2.36mm Soil apparent particle density (g/cm^3)	N/A

Particle Density - Total Soil Sample	
Total Sample Soil particle density (g/cm^3)	N/A

Comments:

[redacted]

NATA
Accreditation No. 20599
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WA 6155
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[redacted]

E-PRECISION LABORATORY

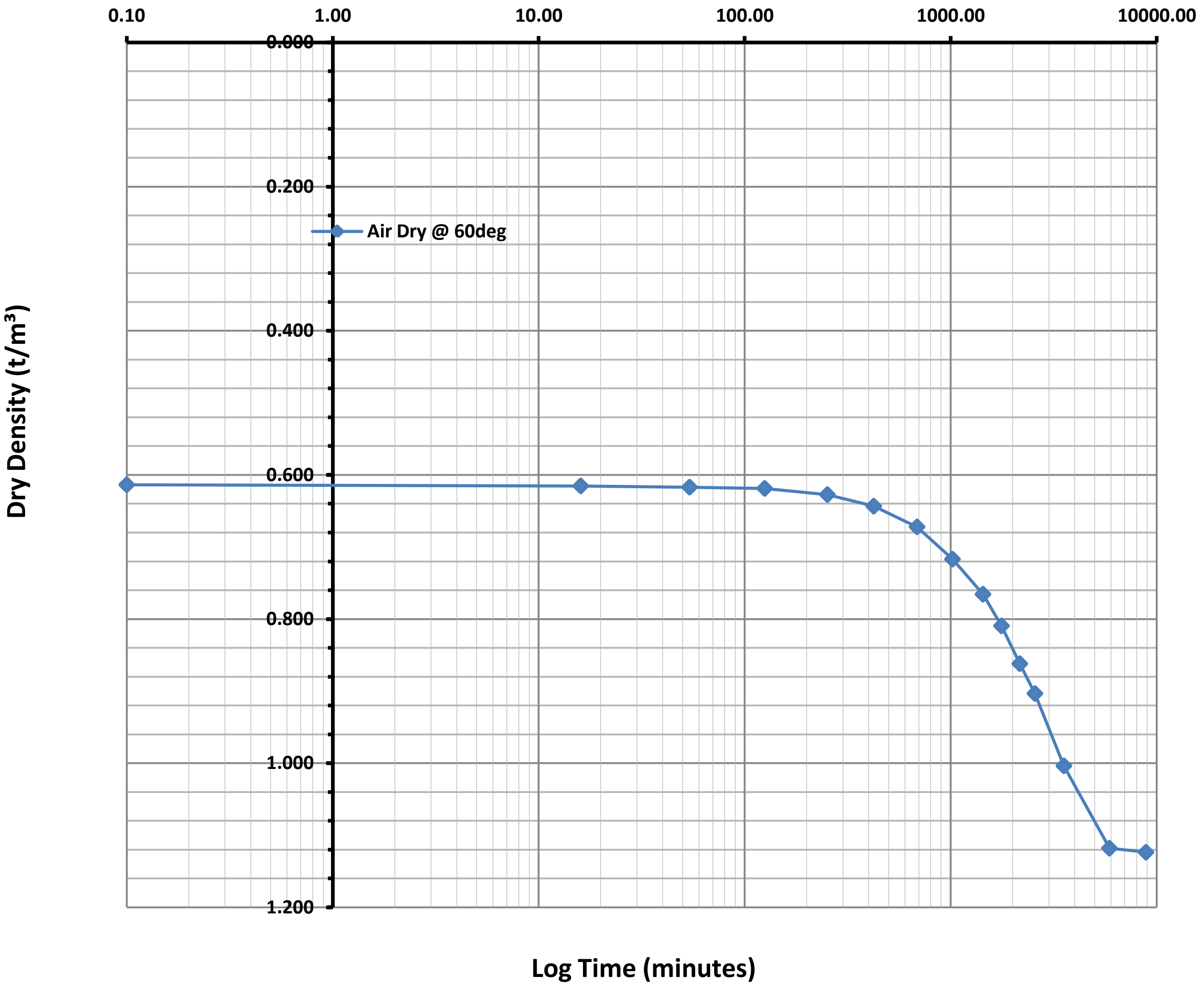
AIR DRYING SETTLING TEST

METHOD: Supplied by Client SRC-WF-100 / SRC-RF-100

Client:	Western Geotechnical Lab Services	Date Tested:	08/11/2024
Project:	TSF Redesign, Mt Ida Lithium-Gold	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16165_44.5%_AIR_DRY	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Bulk Density (t/m³):**	1.388
Type of Test:	Air Dry Testing	**Particle Density (t/m³):**	2.76
Sample Preparation:	44.5% Solids	**Moisture Content Initial (%):**	126.204

Dry Density (t/m³) Vs Time (minutes)



Comments:

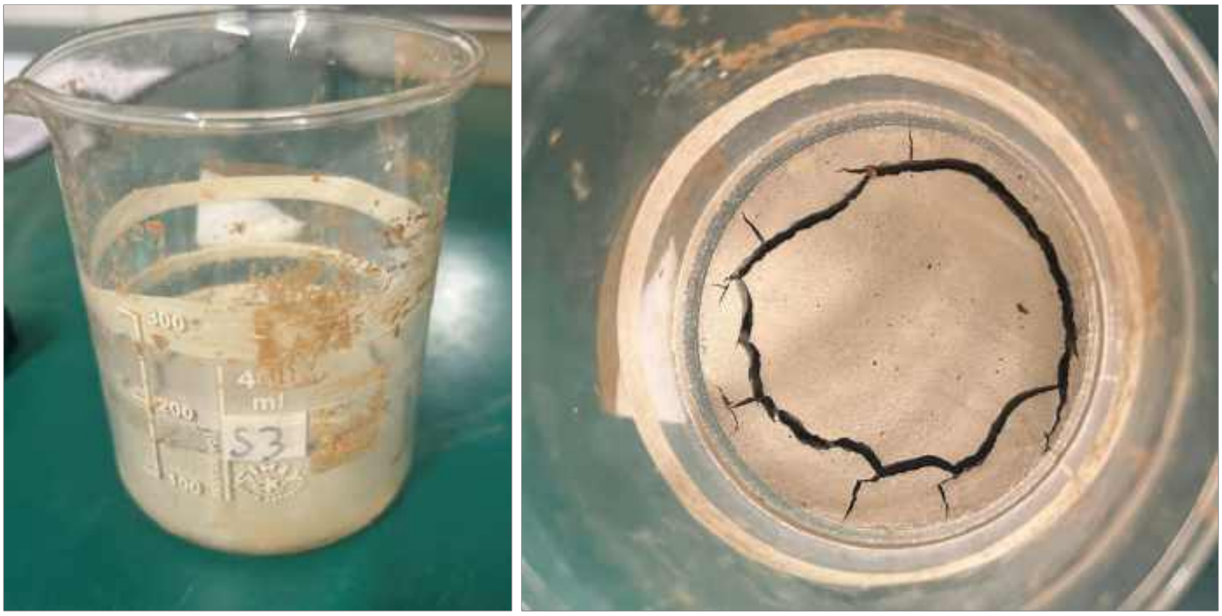
Authorised Signature (Geotechnical Engineer): [redacted]

AIR DRYING SETTLING TEST

METHOD: Supplied by Client SRC-WF-100 / SRC-RF-100

Client:	Western Geotechnical Lab Services	Date Tested:	08/11/2024
Project:	TSF Redesign, Mt Ida Lithium-Gold	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16165_44.5%_AIR_DRY	Room Temperature at Test:	19°

Photo of Samples after Testing



Oven dried @ 60deg

Comments:

Authorised Signature (Geotechnical Engineer): [redacted]

Perth
16 Gympie Way, Willetton
WA 6155
Ph: (08) 9418 8742

[redacted]

E-Precision Laboratory

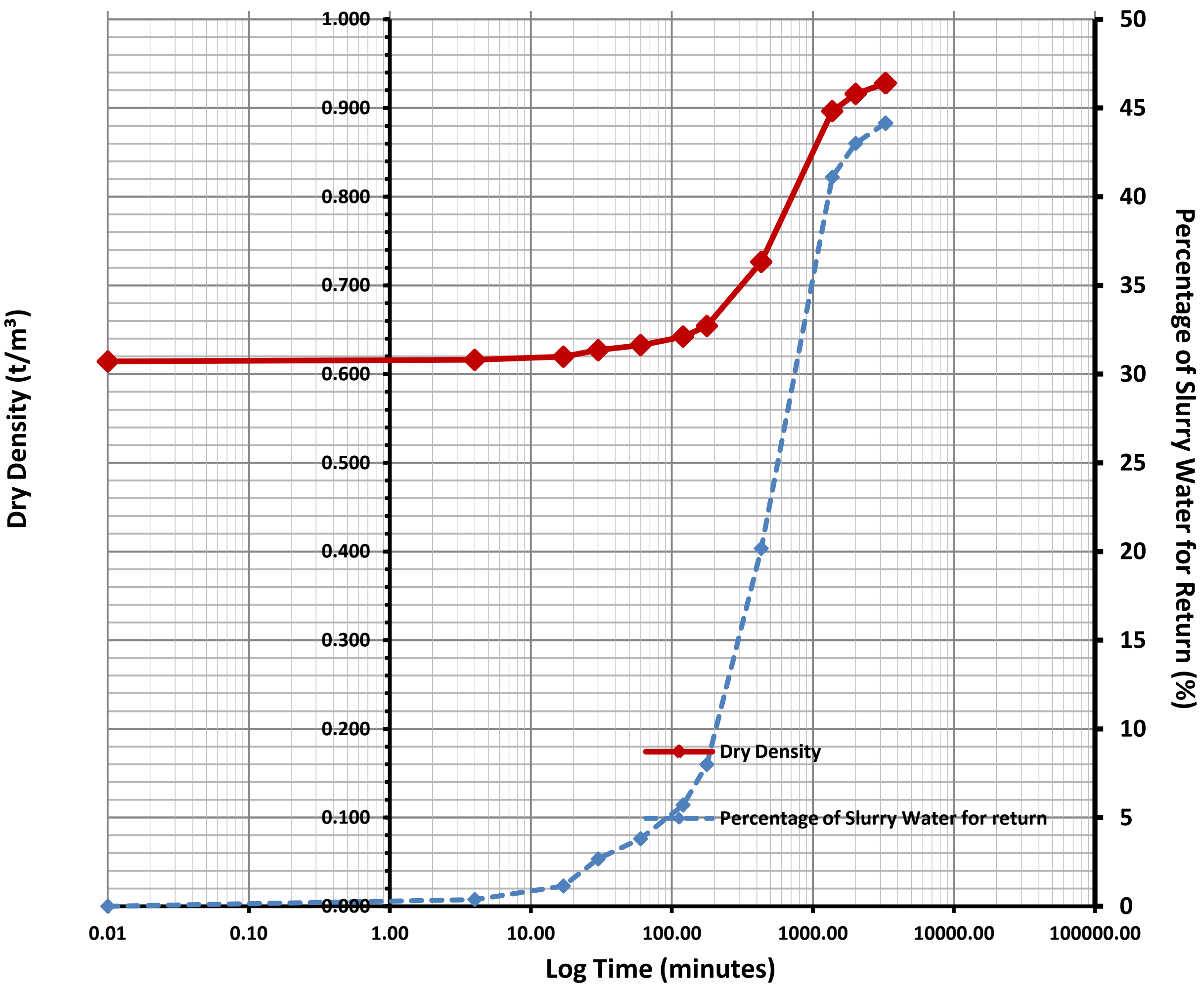
SETTLEMENT TESTING TAILINGS

METHOD: IN-HOUSE METHOD

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	TSF Redesign, Mt Ida Lithium-Gold	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16165_44.5%_SETTLEMENT	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Dry Density (t/m³):**	0.614
Type of Test:	Settlement Testing	**Particle Density (t/m³):**	2.76
Sample Preparation:	44.5% Solids	**Initial Bulk Density (t/m^3):**	1.380

Undrained Dry Density (t/m³) Vs Log Time (minutes)



Comments:

Authorised Signature (Geotechnical Engineer):

[redacted]

Perth
16 Gympie Way, Willetton
WA 6155
Ph: (08) 9418 8742
[redacted]

E-PRECISION LABORATORY

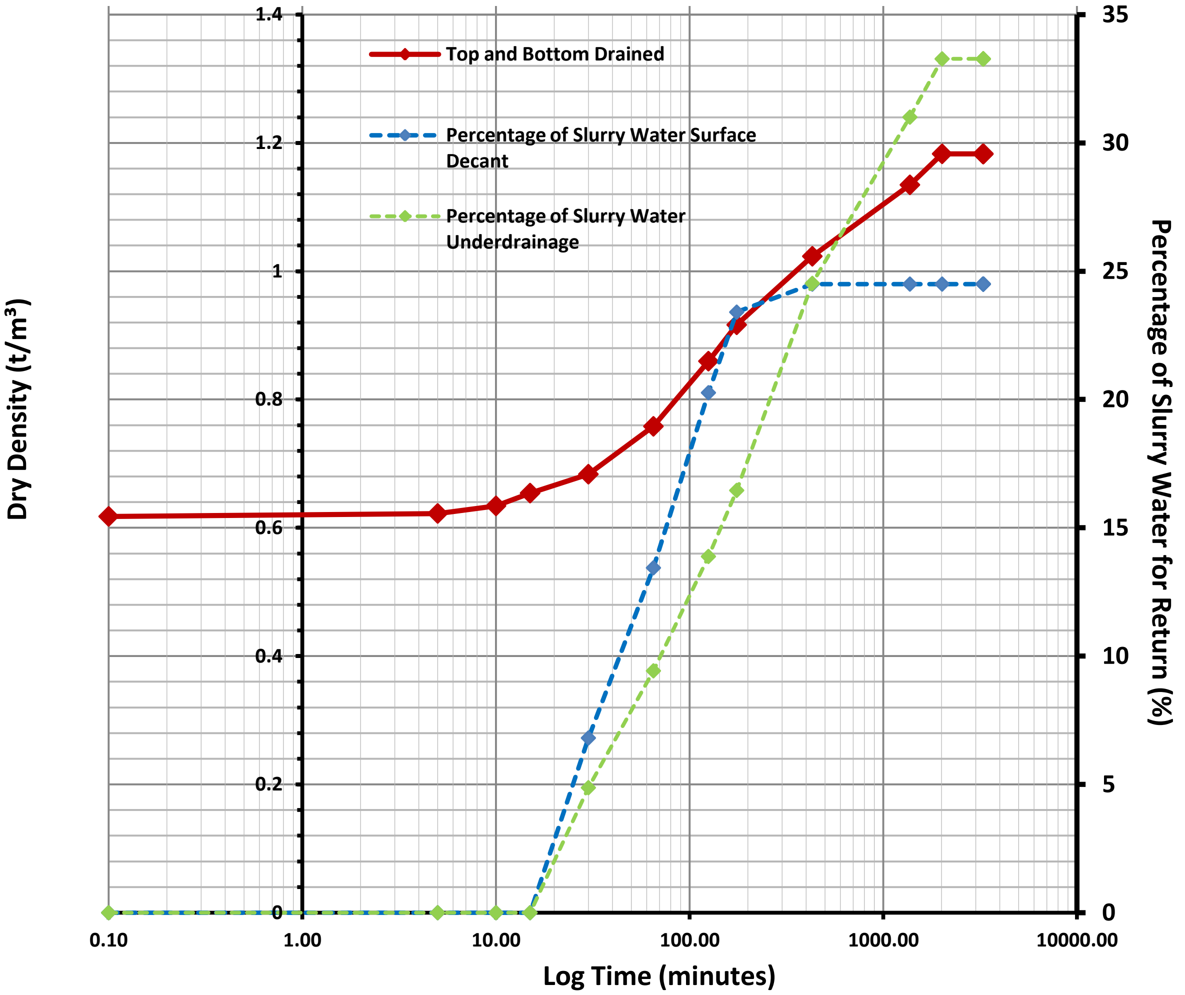
SETTLEMENT TESTING TAILINGS

METHOD: IN-HOUSE METHOD

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	TSF Redesign, Mt Ida Lithium-Gold	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16165_44.5%_SETTLEMENT	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Dry Density (t/m³):**	0.618
Type of Test:	Settlement Testing	**Particle Density (t/m³):**	2.76
Sample Preparation:	44.5% Solids	**Initial Bulk Density (t/m³):**	1.388

Top and Bottom Drained Dry Density (t/m³) Vs Log Time (minutes)



Comments:

Authorised Signature (Geotechnical Engineer): [redacted]

The results of tests performed apply only to the specific sample at time of test unless oth [redacted] ade to E-Precision Laboratory's "Standard Terms and Conditions" E-Precision Laboratory ABN 431 559 578 87

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[redacted]

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SETTLEMENT TESTING TAILINGS

METHOD: IN-HOUSE METHOD

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	TSF Redesign, Mt Ida Lithium-Gold	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16165_44.5%_SETTLEMENT	Room Temperature at Test:	19°

Tested by:	Phil	**Initial Dry Density (t/m³):**	-
Type of Test:	Settlement Testing	**Particle Density (t/m³):**	-
Sample Preparation:	44.5% Solids	**Initial Bulk Density (t/m3):**	-

Photo of Test Setup

Undrained

Drained

Comments:

Authorised Signature (Geotechnical Engineer):

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Appendix H:
Hydrogeological Assessment Report

2 May 2024

Mt Ida Lithium Project

Western Australia

MT IDA TSF HYDROGEOLOGICAL ASSESSMENT REPORT

Delta Lithium Ltd

Job No. PER2023-0213 AC Rev0

CMW Geosciences
28 Flynn St
Wembley
Perth WA 6014
Australia

www.cmwgeosciences.com

[redacted]

Review and update history

Version	Date	Comments
0	2/05/2024	Initial draft for Client review

CONTENTS

Appendices

1.0 INTRODUCTION

CMW Geosciences (CMW) has been commissioned by Delta Lithium Ltd (Delta) to undertake a design for the proposed Tailings Storage Facility (TSF) design for the Mt Ida Lithium Project (the Project), including the hydrogeological assessment.

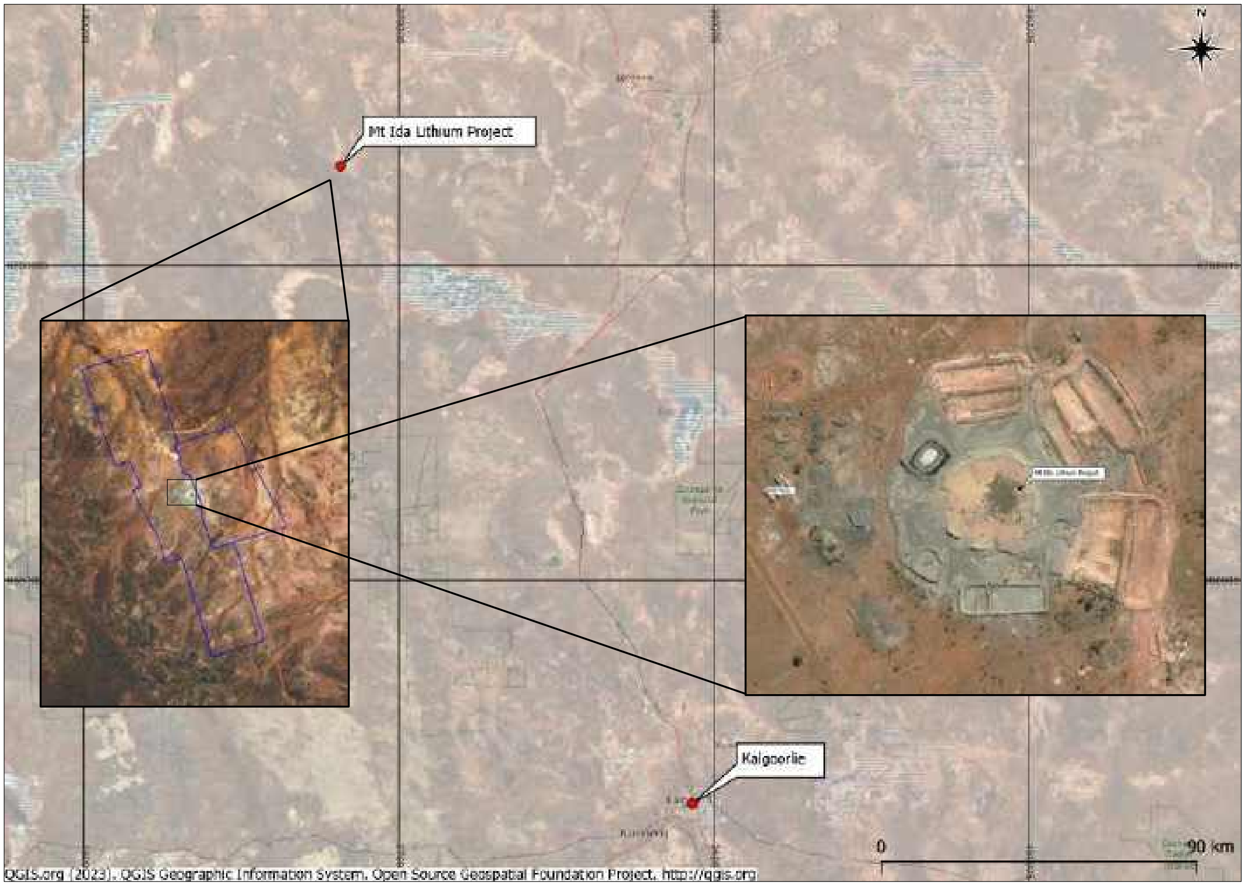
This report collates and reviews existing information regarding the hydrogeological setting of the Project, presents a conceptual hydrogeological model (CHM) and appraises local groundwater conditions in the vicinity of the proposed TSF.

2.0 PROJECT BACKGROUND

The Project is located at the former Mt Ida Gold Mine and comprises 30 tenements in the historical ‘Mt Ida Gold’ mining district, located approximately 100 km northwest of Menzies and 230 km northeast of Kalgoorlie, in Western Australia.

The Project represents a brownfield development with pre-existing legacy mining infrastructure (shaft and underground workings), evaporative pans and dry stack tailings present at surface.

The spatial location of the Project including site aerial views depicting the post mining waste is presented in Figure 2.1.



QGIS.org (2023). QGIS Geographic Information System. Open Source Geospatial Foundation Project. http://qgis.org

Figure 2.1 Project location

The Project tenements cover an area of 167 km^2 and include the historic Timoni Gold Mine and others, which have produced over 300,000 oz gold to date, at 17.2 g/t grade. The Mt Ida license area (depicted in blue in Figure 2.1) covers approximately 5.4 km^2 of land. The gold mineralisation of the deposit is typically shallow with lithium high-grade mineralisation occurring at greater depths.

2.1 Preliminary Mine and TSF Design

The mine development is proposed to comprise two open pits, namely 'Timoni' and 'Sister Sam' producing a Direct Shipping Ore (DSO).

Under a preliminary design concept, the mine waste was proposed to be disposed into an Integrated Waste Landform Tailings Storage Facility (IWLTSF) with HDPE liner to facilitate water recovery. To enhance the retainment of wet tailings, the underdrainage system surrounded by the engineered mine waste material and containment embankment from compacted earthworks was implemented into the design.

Following an optimisation process undertaken by Delta, Project design was amended to include a transition from open pit to underground operation. The Project will commence with open pit mining of the 'Sister Sam' deposit containing gold bearing ore at surface and lithium rich pegmatite at the bottom of the pit. Subsequently, the pit will be used as the portal entrance to access into underground operation.

Based on our understanding, an increase in Life of Mine and improved production rates will result in larger tailings quantities requiring storage disposal and potentially insufficient waste rock volume required for construction of the IWLTSF. As a consequence, a new TSF design was developed by CMW (2024) that incorporated re-utilisation of existing tailings into a construction phase.

The general layout of the mine facilities will be similar to that shown in Figure 2.2.

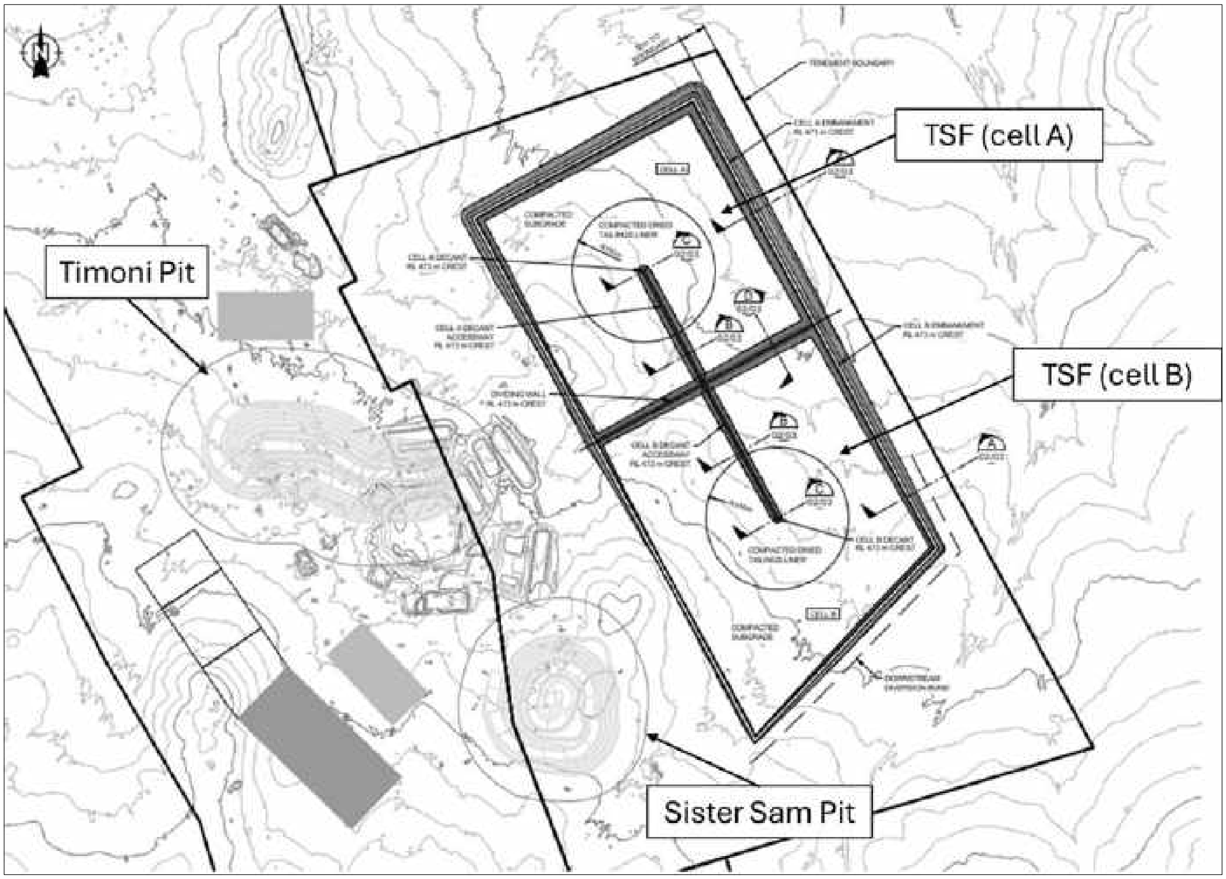


Figure 2.2 Proposed Project layout (CMW, 2024)

2.1.1 Open Pit Dewatering Assessment

The analytical assessment of open pit dewatering was undertaken by Rockwater (2023) using a numerical method approach (AQTESOLV) adopting a radial flow towards a well as a proxy for in-pit dump pumping to estimate operational open pit inflows. The 'Sister Sam' and 'Timini' pit dewatering base was assumed at 385 mAHD and 390 mAHD respectively. In the absence of site-specific data, Rockwater's model simulation assumed a base-case hydraulic conductivity of 0.25 m/day and specific yield of 2% and indicated the extraction rates required to dewater the open pits would vary between 6.5 - 12.5 L/sec (561 - 1,080 m^3/day) and 5.5 - 11 L/sec (475 - 950 m^3/day) for the 'Sister Sam' and 'Timoni' respectively, depending on the sensitivity scenario.

Radius of influence calculations indicated that under the most conservative scenario, there would be approximately 0.03 m of drawdown at the Water Reserve 12922 located approximately 2 km north from the Project site (Rockwater, 2023).

2.1.2 TSF Design Concept

The TSF design is described in CMW (2024). At the proposed tailings freeboard level of RL 483 m (upstream rise - Stage 4), the storage area and volume would be approximately 26 ha (Cell 1) and 31 ha (Cell 2), and 0.8 Mm^3

and 1.0 Mm^3 respectively. From the hydrogeological and water balance standpoints, the key design aspects include:

- Maximising tailings storage capacity by optimising tailings storage;
- Optimising removal of supernatant water from the facility and return it to the processing plant for re-use and recycle;
- Reducing environmental risk by maximising water recovery and minimising potential for seepage losses; and
- Implementing seepage management measures for TSF including the installation of piezometers/monitoring wells.

Maximising in-situ dry density of the deposited tailings will minimise water make-up requirements, and on eventual decommissioning, the facility will remain as a permanent feature of the landscape with the contained tailings drained to an increasingly stable mass.

2.1.3 Water Balance Analysis

A high-level steady-state water balance for the processing plant was developed as part of the design assessment by Delta (2023). It assumes that for the tailings slurry, deposited at 78.6 m^3/hr rate (including 50% TSF recycling rate), the Project would require approximately 62 m^3/hr of make-up water. This demand volume is proposed to be met from existing water supply wells.

2.2 Environmental Settings

2.2.1 Climate

The Project is located within the area characterised by a semi-arid climate with hot dry summers and mild winters. Climate data extracted from the Menzies Bureau of Meteorology station 12052, located approximately 85 km southeast from the Project site, shows the mean annual rainfall between 1896 to 2019 is calculated to be 254 mm/year. The historical data indicates the mean monthly rainfall is distributed through the year, with little seasonality, and ranged from 10.4 mm (September) to 32.5 mm (February).

Mean daily maximum temperature ranged from 17.0°C (July) to 35.1°C (January) with the annual mean of 26.3°C.

Historical rainfall and temperature statistic records from Menzies BOM station are plotted in Chart 2.1 and shown in tabular form Table 2.1.

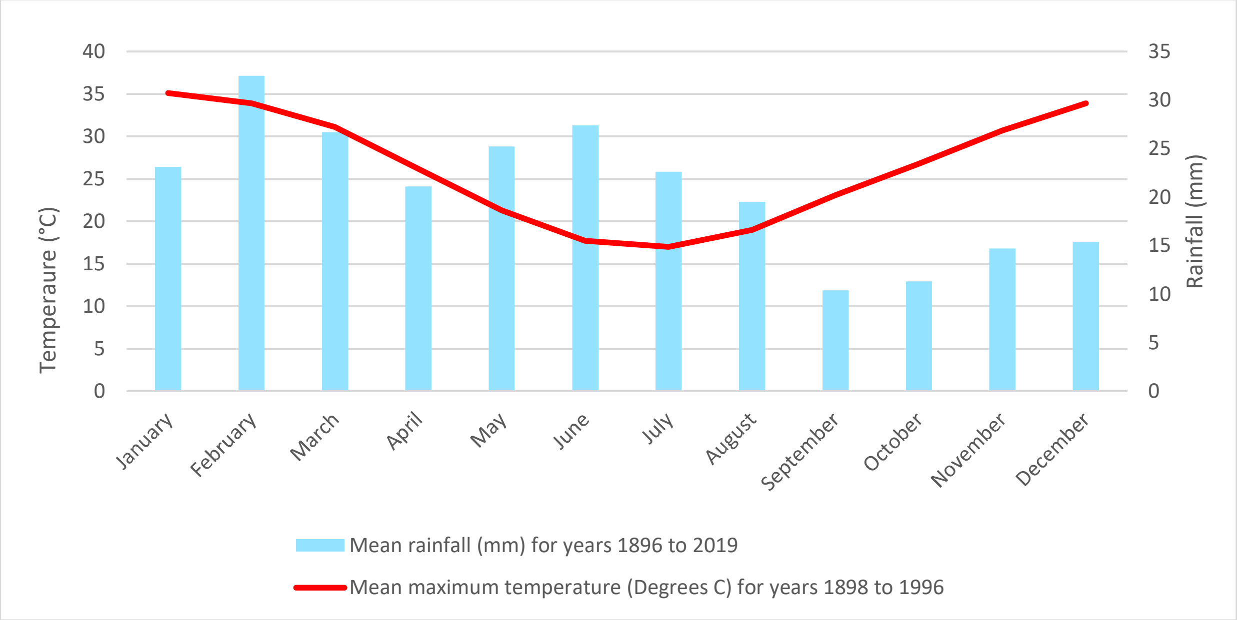


Chart 2.1: Monthly distribution of rainfall and temperature records for Menzies (AWS No.: 12052)

Table 2.1: Rainfall and Temperature Records for Menzies.

Parameter:	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual average**
Temperature (°C)	35.1	33.9	31.1	26.2	21.3	17.7	17	19	23.1	26.8	30.7	33.9	*26.3*
Rainfall (mm)	23.1	32.5	26.7	21.1	25.2	27.4	22.6	19.5	10.4	11.3	14.7	15.4	*254.0*

BOM mapping of shows that average pan evaporation in the region is approximately 2,600 mm/year, far in excess of the mean annual rainfall of 254 mm/year. Evaporation rate peaks during the summer months of January and February and lowest during the winter months of June and July.

2.2.2 Topography

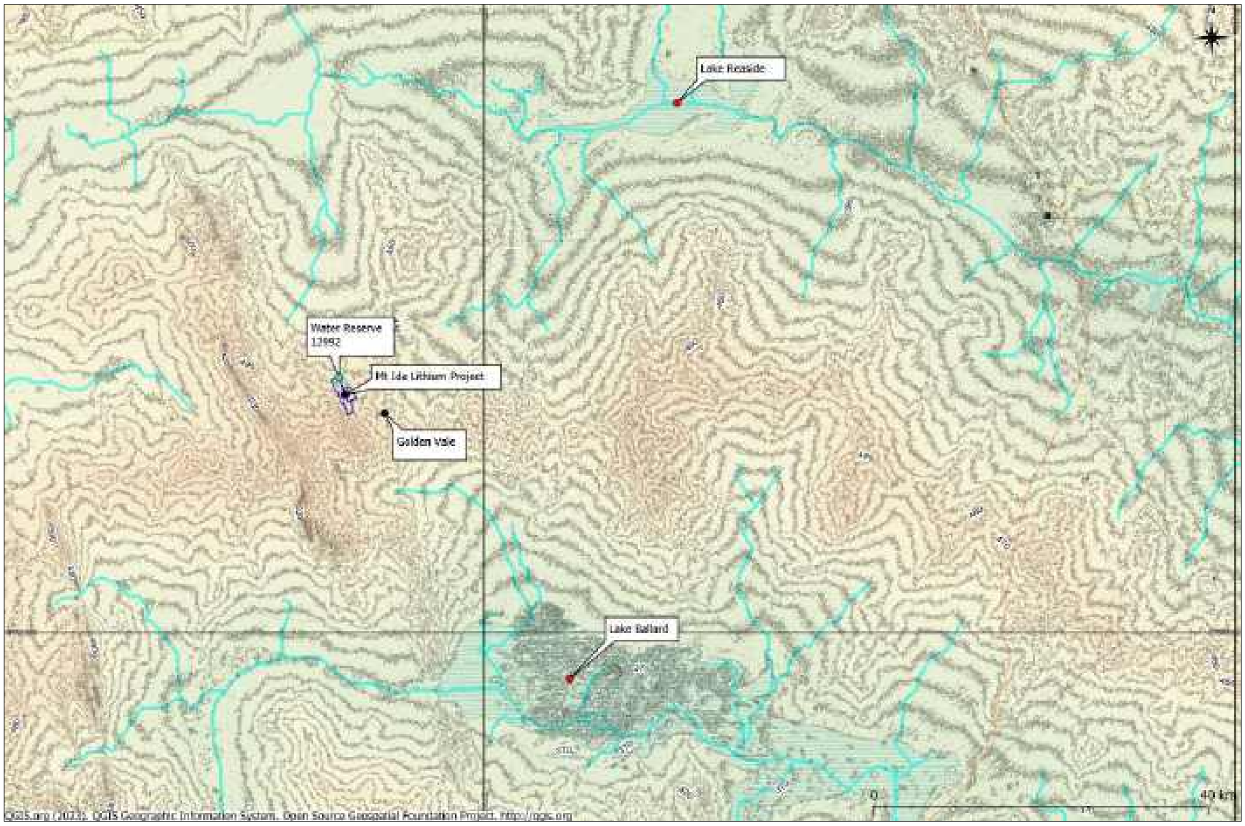
The general topography of the Project area comprises scattered bushland with occasional undulating hills and pit voids from historical mining activities. Elevation ranges from around 450 m above Australian Height Datum (mAHD) in the southwest to 530 mAHD in the middle of the Project area, with low to moderate relief ridges present to the west from the Project site with elevations rising up to 560 mAHD. The topographical depressions are associated with the presence of paleochannels occupying relatively expansive and shallow valleys gently undulating from approximately 440 mAHD to 370 mAHD towards the local drainage basins north and east from the Project site. The topography of the Project area is shown in Figure 3.4.

2.2.3 Surface Water

There are no permanent surface water bodies in the vicinity of the Project site, and due to the semi-arid environment, stream flow in local gullies and watercourses is ephemeral. The Mt Ida Project is understood to be situated near the catchment divide running east-west and splitting a regional run-off carried out via local drainage lines which tend to have a shallow, braided, and indistinct main channel, and a wide diffuse floodplain and overland flow area, ultimately reporting to a drainage base of Lake Raeside to the north (368 mAHD) and Lake Ballard to the south (370 mAHD).

It is inferred from the local topography, that local run-off flows generated after short duration rainfall events will have a short time of concentration due to proximity to the ridge line (approximately 1.5 km) and will drain to Lake Reaside located approximately 40 km from the Project site.

The regional hydrological setting is presented in Figure 2.3.



QGIS.org (2023). QGIS Geographic Information System. Open Source Geospatial Foundation Project. http://qgis.org

Figure 2.3 Project regional topography and surface water drainage

2.2.4 Geology

The regional topography is understood to be closely related to underlying geology, with resistant greenstone belts with granite intrusions forming the northerly trending ridges, surrounded by undulating sandplains with unconsolidated superficial deposits, and ephemeral playa lakes in low lying areas.

Unconsolidated superficial deposits

The Mt Ida mining area typically has a thin layer of colluvium and topsoil overlying weathered ultramafic rock which grades into fresh ultramafic rock. The colluvium is typically clayey sand to sandy clay as evidenced from the TSF geotechnical site investigation (CMW, 2024a).

Tertiary paleochannel sediments usually contain a large thickness of alluvial or lacustrine clay that overlays a basal fluvial sand. More recent alluvial colluvial sediments top the Tertiary sequence and can be sometimes calcretised. The basal sand can be up to 40 m thick and 100 to 1,000 m in width, which can vary along the axis of the paleochannel. The paleochannel sand is understood to be continuous along the main drainage trunks but may be missing or minor in upper reaches of secondary tributaries or at intersections with greenstones.

Calcrete occurs at the margins of playa lakes and in some tributaries of the main paleo-drainages. An example of the latter is situated approximately 20 km to the north of the Mt Ida Project, on the margin of the Raeside paleochannel. It covers an area of over 2,800 hectares however, its thickness is unknown although it typically is less than 10 m (Advisian, 2022).

Bedrock geology

The general bedrock geology of the area is recorded as being metamorphosed mafic and ultramafic volcanics (gabbro, dolerite and diorite with ultramafic schist) of the Archaean Yilgarn Craton. The project area geology comprises the Archean-aged Copperfield Monzogranite and Kalgoorlie Group mafic volcanics. The Copperfield Monzogranite is a large granitoid structure intruded into the centre of a regionally significant anticlinal structure of the Mount Ida greenstone belt.

At the proposed mines the Kalgoorlie Group is weathered near to the surface with saprolite extending to about 40 m depth, grading into transition zone rocks which are oxidised along joints and fractures.

The stratigraphic sequence dips to the west and the anticlinal structure plunges to the south.

2.2.5 Hydrogeology

Regional hydrogeological settings

The groundwater system is reported (Advisian, 2022) to comprise the following water bearing zones:

- Alluvial (unconfined aquifer of limited spatial extent characterised by typically low recharge from precipitation and low/moderate permeability. Shallow occurrence results in high evaporative losses and subsequently brackish water quality as well as relatively small aquifer yields);
- Calcrete (a localised system of moderate to high hydraulic conductivity);
- Paleochannels (a multilayer aquifer system containing a mix of alluvial and lacustrine sequences which receives enhanced rainfall recharge in low lying areas that often form regional drainage lines. The groundwater table is often confined and abstraction from this might induce both the lateral leakage from surrounding bedrock aquifer and vertical leakage from overlying saturated sand/gravel lenses. The water quality is typically hypersaline.

  The geological sequence of the Raeside paleochannel drainage base is shown in Figure 2.4.

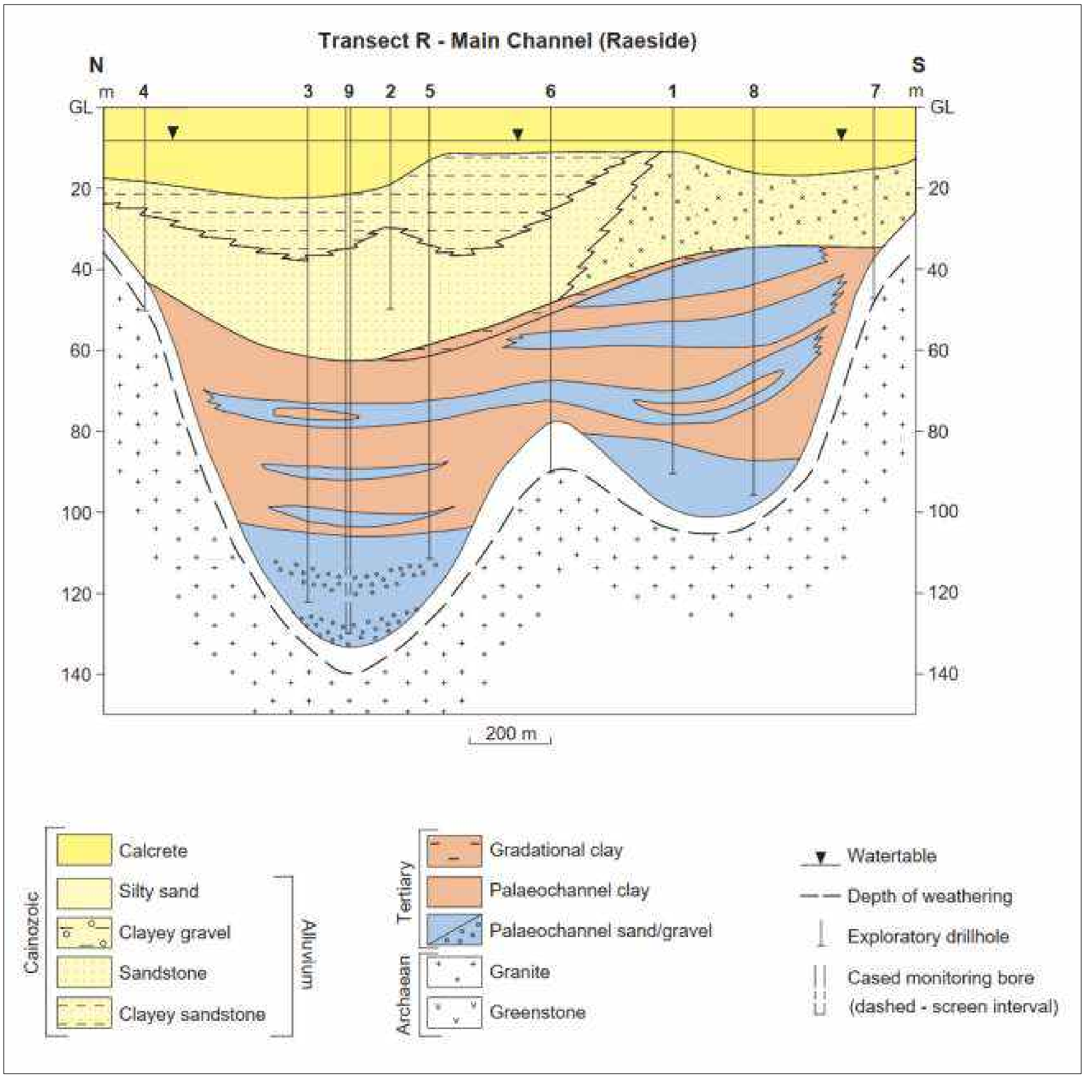


Figure 2.4 Hydrogeological cross-section through main Raeside paleochannel (Advisian, 2022)

- Fractured bedrock aquifer - this unit could be further subdivided into higher permeability weathered bedrock (approximately 40 m) and underlying competent bedrock. The permeability of the top of the bedrock profile can be enhanced by the presence of an oxidised zone (typically up to 20 m thick). The salinity ranges between 1,000 to 10,000 mg/L and is typically less than that reported for paleochannels.

Local hydrogeological settings

At the Project site, the weathered profile appears to be largely unsaturated. Groundwater flow is constrained primarily to fracture flow in the fresh mafic volcanics. This fractured rock aquifer is recharged by direct infiltration from rainfall precipitation, or by infiltration of surface water during periodic stream-flows.

Aquifer yield and productivity

Fractured-rock aquifers occupy the greater part of the Eastern Goldfields area but are reported to generally contain only minor groundwater supplies, with paleochannels being the most prospective aquifers (Kern, 1995). Groundwater resources associated with Cainozoic surficial deposits are reported as small, and saline to hypersaline. Limited areas of brackish groundwater are reported to exist in the upper reaches of some catchments (Kern, 1995).

3.0 SITE HYDROGEOLOGICAL CONCEPTUAL MODEL (CHM)

The groundwater conditions across the Project site have been predominantly derived from historical studies and review of a monitoring database provided by Delta and containing groundwater elevations, water quality, and aquifer yield.

The CHM has been primarily based on hydrogeological principles to assess the expected groundwater recharge, flow, and discharge mechanisms operating within the Project area. CMW has collated and synthesised available hydrogeological information for the Project (i.e. dewatering assessment and water supply options) including findings from geotechnical site investigations.

This conceptual model is intended to provide a basis for understanding the subsurface hydrologic processes, including the expected interaction between the TSF phreatic levels and the underlying aquifer, and to identify data or monitoring gaps.

3.1 Groundwater Occurrence

The groundwater table elevations were collected from six hydrogeological boreholes including three water supply wells (MIPPB01, MIPPB02, MIPPB03) drilled to between 150 and 193 mbgl.

The groundwater elevation at boreholes MIPPB01 and MIPPB03, located 2.8 km northwest from the Mt Ida Project site, are calculated to be approximately 413 mAHD. The groundwater levels records within the Golden Vale site 5.2 km southeast from Mt Ida indicate higher hydraulic heads, approximately 438 mAHD.

The spatial distribution of both hydrogeological boreholes (in red) and interpolated groundwater contours are shown in Figure 3.1.

QGIS.org (2024). QGIS Geographic Information System. Open Source Geospatial Foundation Project. http://qgis.org

Figure 3.1 Interpolated regional groundwater contours

The groundwater level recorded at MIPPB02 in the vicinity of proposed 'Timoni' pit at the Project site was historically reported as 76 mbgl (407 mAHD) and to have been lower than pre-mining level (Rockwater, 2023). A recent groundwater monitoring event undertaken in December 2023 (CMW, 2024a) did not establish the groundwater table up to 100 m deep at MIPPB02, potentially indicating that an ongoing underdrainage could be associated with a nearby shaft connecting to legacy underground workings. Notwithstanding the potential cone of depression around a disused mining shaft, the regional groundwater contours indicate the northerly groundwater flow under a relatively small hydraulic gradient calculated to be 0.08. Under natural conditions, and without a possible effect on groundwater level reduction from previous mining, the groundwater flow direction is understood to follow topographical relief and align with catchment geometry (refer Figure 2.3).

Drillhole data from the explorational database was processed (locations shown in pink in Figure 3.1) to collate groundwater strike data, indicative of the groundwater table. A histogram of the data is presented in Figure 3.2.

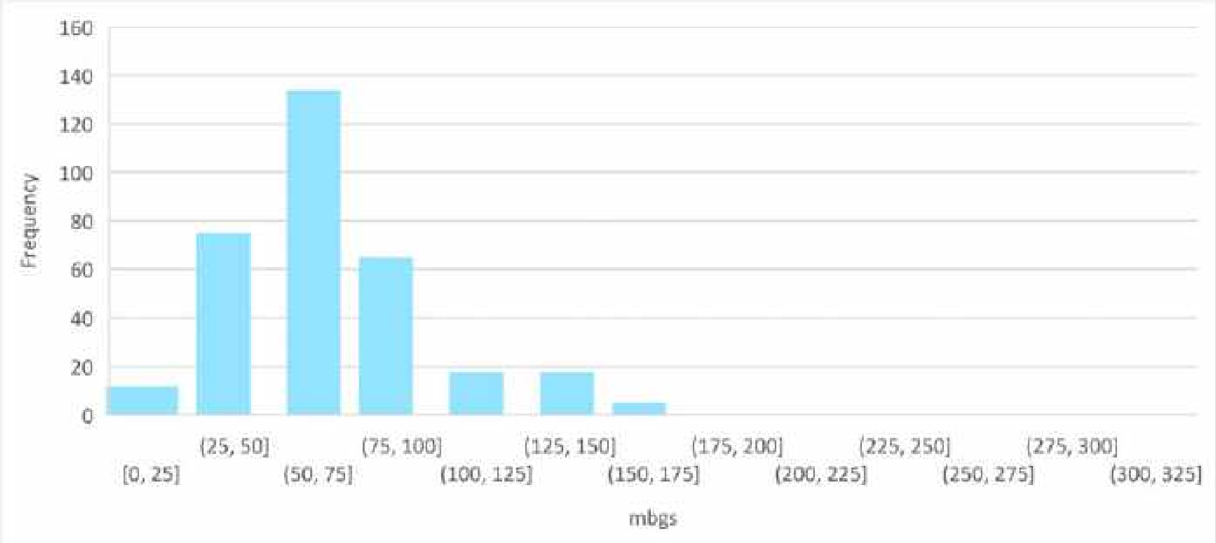


Figure 3.2 Groundwater strike histogram in explorational drillholes

The database indicated that groundwater table was intercepted by a total of 338 drillholes, of which approximately 82% recorded groundwater strike between 25 mbgl to 100 mbgl. The highest groundwater strike frequency range was between 50-75 mbgl, which correlates with the groundwater contours on Figure 3.1.

In Figure 3.3 the indicative location of the groundwater table is shown beneath the proposed TSF (in orange) along the line perpendicular to groundwater flow (in red). The unsaturated zone beneath the TSF is inferred to be approximately 40 m.

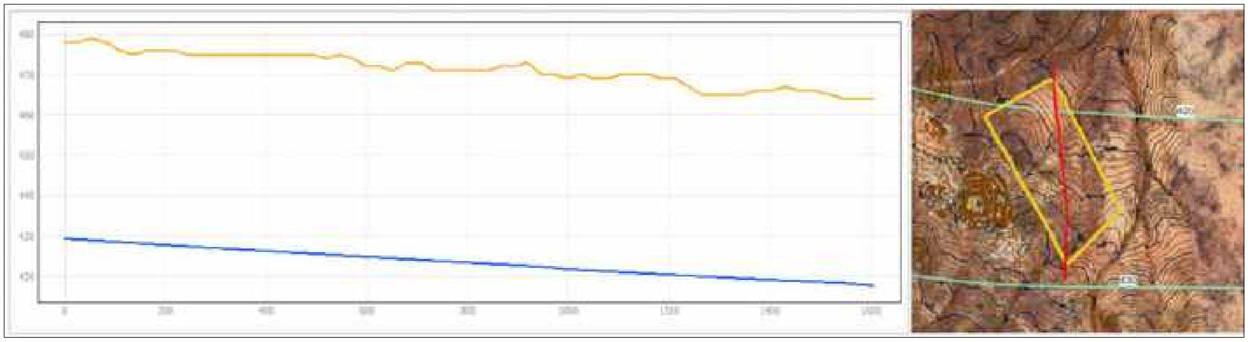


Figure 3.3 The indicative groundwater table position beneath proposed TSF location

3.2 Groundwater Recharge, Discharge and Flow

It is assumed, in the absence of confining beds in the geological profile, that the aquifer is unconfined. The regional groundwater potentiometric surface in unconfined aquifers is a function of recharge and discharge processes. Higher rates of recharge occur at topographic highs, with downgradient flow and groundwater discharge occurring in low lying areas, either through direct discharge, through evapotranspiration, or as baseflow to streams.

Based on topographic considerations, the regional groundwater flow in the site vicinity is indicated to be northerly with recharge occurring in the high ground and ridges located west and south adjacent to the Mt Ida Project site. The position of the Project near a recharge zone infers that downward vertical hydraulic gradients may be present.

Groundwater in the site vicinity is inferred to ultimately discharge as baseflow to Lake Reaside, approximately 40 km northeast of the site. Groundwater will also discharge through evapotranspiration in these down-gradient areas (due to capillary rise) at locations where the water table approaches the surface.

The very high salinity typical of the region indicates that, at least in the local vicinity, rates of groundwater recharge are very low. This is because low recharge rates lead to low hydraulic gradients, and therefore long groundwater residence times, in low-permeability aquifers. Long residence times in turn result in high levels of mineral dissolution, and hence high salinity.

The low rates of recharge in the region are a function of regional pan evaporation (2,800 mm/year) far exceeding the very low (254 mm/year) annual rainfall. In such environments groundwater recharge may only occur during infrequent episodic events where significant rain occurs during a relatively short period.

The basic components of the CHM are shown graphically in Figure 3.4.

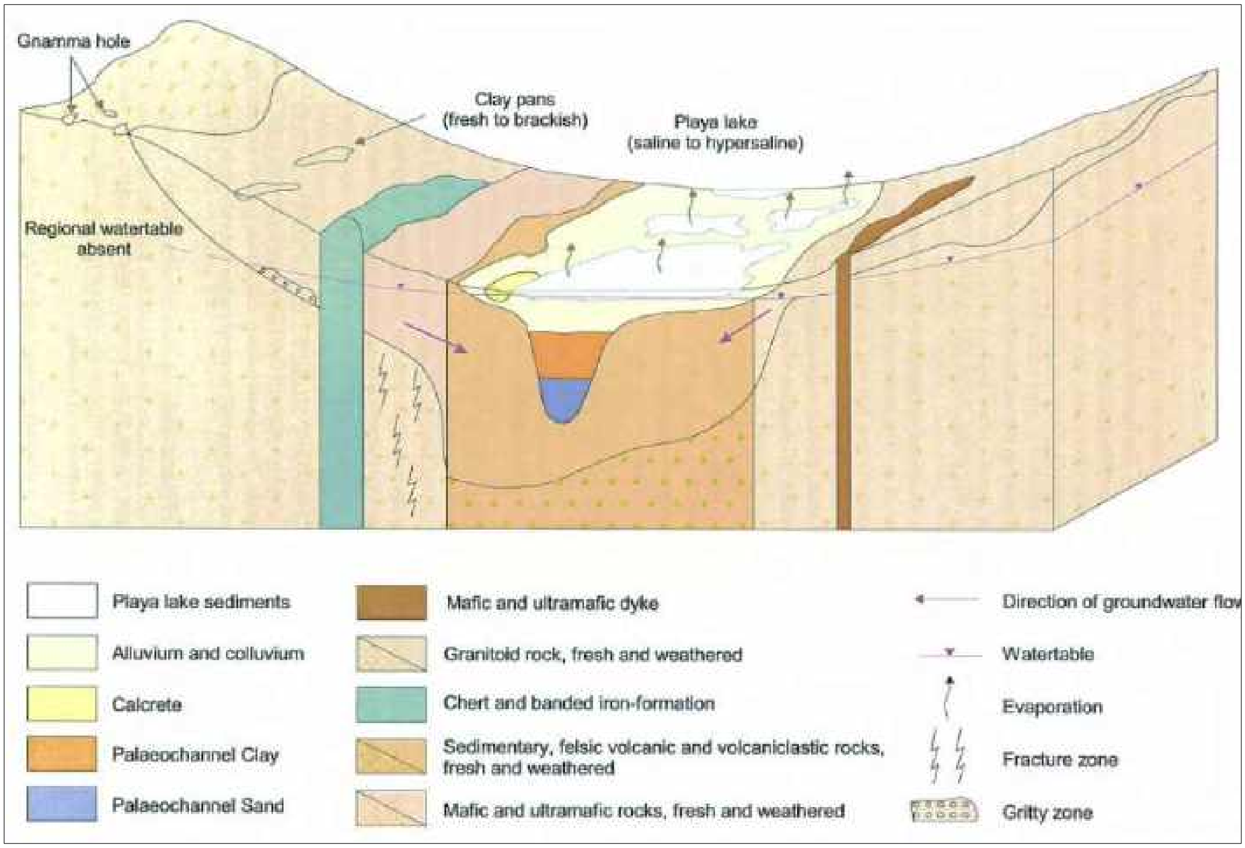


Figure 3.4 Graphical representation of Mt Ida Project region CHM (Advisian, 2022)

3.3 Groundwater Chemistry

The groundwater of the bedrock aquifer is characterised by high salinity and neutral pH (~7.2). The samples collected as a part of field investigation for potential water supply wells showed high electrical conductivity values and therefore salinity levels calculated to be ranging between 21,000 mg/L (MIPB03) to 22,000 mg/L (MIPB01).

Because of high salinity, desalination may be required before being useable for many industrial and utility purposes.

3.4 Data Gaps

The regulatory and industry guidelines stipulate that TSF design should integrate an understanding of potential interactions between the structure (foundation) and groundwater system to address potential failure modes. Key aspects to consider in TSF design and operational management include pore pressure distribution and seepage collection system (Fortuna et al., 2021).

At present, limitations in the understanding of site hydrogeology include:

- Groundwater quality and groundwater level information for the Project is limited to three water supply wells within the wider Project area;
- No confirmation of groundwater level data in the vicinity of the TSF;
- A systematic groundwater monitoring network has not been established;
- Groundwater flow direction and hydraulic gradient inferred based on topography and regional indications;
- Limited groundwater quality data;
- No aquifer hydraulic parameter data; and
- The presence and geometry of any preferential seepage pathways to downgradient receptors is unknown.

Despite data gaps and limitations, the indicated 40 m of unsaturated zone beneath the proposed TSF area is considered advantageous due to the potential for pore pressure dissipation along the vertical path and subsequently limited potential for lateral migration of seepage directly beneath the TSF.

In consideration of the limitations and data gaps, it is recommended to establish a suitable groundwater monitoring system for the TSF. Sections 3.5 and 3.6 provide details of a proposed monitoring network and groundwater monitoring.

3.5 Monitoring Network

A monitoring network is recommended to establish basic groundwater data and to enable monitoring of groundwater conditions in the vicinity of the TSF, including groundwater levels, groundwater flow direction, groundwater quality, and to enable assessment of changes to these parameters over time and to evaluate performance of TSF seepage collection system.

Figure 3.5 and Table 3.1 provide indicative locations for a proposed initial network of four monitoring wells. Minor adjustment of the locations in the field can be made to accommodate site and access constraints.

The selected locations assume that groundwater flow is indicated to be northerly, allowing for one upgradient monitoring well (TSF-MW01), two cross-gradient locations (TSF-MW02, TSF-MW03), and one downgradient monitoring well (TSF-MW04).

Figure 3.5 Proposed groundwater monitoring well locations (TSF outline in yellow)

3.5.1 Well Construction

The monitoring wells are to be constructed with standard 50 mm uPVC casings and screens, with graded sand filter packs, bentonite seals, grouted to the surface, and lockable protective headworks cemented in at the surface. Assuming the radius of influence from the pit dewatering propagates to the TSF location, and allowing for subsequent drawdown of approximately 0.5 m (as estimated by Rockwater, 2023), then monitoring wells with 6 m to 9 m screens with top of screens from ~40 mbgl should be considered. The proposed monitoring well locations and screen positions are detailed in Table 3.1.

Locks should be installed to preclude tampering or non-authorised access to the monitoring wells. A typical construction detail is provided in Appendix A. The monitoring wells should be constructed and developed consistent with:

- The Minimum Construction Requirements for Water Bores in Australia (National Uniform Drillers Licensing Committee, 2020); and
- Water Quality Protection Guideline No 4 - Installation of Mine Site Groundwater Monitoring Bores (Department of Minerals and Energy, 2000).

The wells should be gauged and sampled approximately one week after installation to enable a snapshot of groundwater conditions to be established. Groundwater level monitoring and water quality sampling should be conducted in accordance with the requirements set out in Section 3.6.

Table 3.1 Proposed Monitoring Well Details.

Monitoring Well	Longitude*	Latitude*	Surface Elevation (mAHD)	Top of Screen (mAHD)
TSF-MW01	254108.86	6778093.00	471.5	428.0
TSF-MW02	253738.69	6778480.00	472.0	425.5
TSF-MW03	254138.77	6779087.61	463.5	420.0
TSF-MW04	253540.52	6779287.65	465.0	419.5

*GDA94 / MGA zone 51

3.6 Proposed Monitoring

Recommendations are made for interim groundwater level monitoring and water quality sampling for the proposed TSF. Future groundwater monitoring will also be undertaken in accordance with any DWER Licence requirements that are specified.

A groundwater monitoring and plan should be developed, that incorporates the elements below, and that includes triggers, actions, and mitigations.

Groundwater level monitoring

All groundwater monitoring wells for the TSF monitoring network will be monitored for groundwater level on a monthly frequency, and at least 15 days apart.

For any monitoring locations where shallow groundwater levels are present (less than 5 mbgl) fortnightly monitoring should be undertaken to ensure effective and timely management of shallow groundwater occurrences if such were to occur.

A documented and quality-controlled record of groundwater levels will be maintained.

Groundwater quality sampling

Groundwater quality is to be monitored quarterly by sampling and analysis, in accordance with AS/NZS 5667.11, and consistent with any DWER Licence requirements that may be applied.

Groundwater samples will be collected and preserved in accordance with AS/NZS 5667.1, and transported under chain-of-custody in accordance with industry best practice and applicable regulations, to a NATA accredited laboratory for analysis for the following parameters:

- pH
- Total dissolved solids (TDS)
- Total cyanide (TCN)
- Free cyanide (FCN)
- WAD cyanide
- Total Alkalinity ($CaCO_3$)
- Chloride (Cl)
- Total metals suite comprising:
    - Aluminium (Al)

- Arsenic (As)
- Cadmium (Cd)
- Calcium (Ca)
- Chromium (Cr)
- Copper (Cu)
- Iron (Fe)
- Lead (Pb)
- Magnesium (Mg)
- Manganese (Mn)
- Mercury (Hg)
- Nickel (Ni)
- Potassium (K)
- Selenium (Se)
- Sodium (Na)
- Zinc (Zn)

A documented record of water quality analyses will be maintained by the operator.

Review

The groundwater monitoring plan should be reviewed annually, to enable Delta to improve the performance of groundwater management associated with the TSF, and to ensure that the groundwater monitoring network, and the management and mitigation measures, are effective in monitoring and managing groundwater levels in the site vicinity.

Records and Reporting

Monitoring results for groundwater quality and groundwater level are to be recorded on spreadsheets, quality controlled, and plotted and graphed as soon as possible. The information is required to be reviewed after being entered and plotted, to allow any changes in condition to be identified and acted upon.

The plotting of recorded information allows trends to be determined. Where newly recorded information deviates (generally significantly) from a previously established trend, actions and processes may be triggered.

Delta would comply with any specified reporting requirements in any applicable DWER Licence, and monitoring results would be reported to DWER in Delta's Annual Environmental Report (AER) and annual TSF audit.

4.0 SUMMARY

The Mt Ida Lithium Project is proposed to be initially developed from two open pits namely, 'Timoni' and 'Sister Sam', transitioning into underground operation with the tailings deposited into a newly constructed Tailings Storage Facility (TSF) located approximately 100 m north-east from the designed pit perimeters.

The Conceptual Hydrogeological Model (CHM) assumes the Project location is near the groundwater recharge zone with downward vertical gradients and northerly groundwater flow. The interpretation of groundwater heads from the water supply well (MIPB02) located adjacent to eastern boundary of Tomoni pit indicates that localised cone of depression might have formed due to interactions with the legacy mining facilities. The inferred groundwater levels within the Project site are between 430 to 420 mAHD and occurring within the bedrock strata.

Although the approximately 40 m of unsaturated zone beneath the proposed TSF is considered advantageous due to providing a capacity to dissipate potential pore pressure conditions within TSF embankments, some lateral TSF seepage along potential preferential pathways is deemed possible. CMW has incorporated control measures in TSF design to reduce this seepage, including embankment cut-offs, underdrainage systems and compaction of the TSF basin and partial lining and Instrumentation. The TSF will also be operated in order to maximise water return and hence control the seepage.

A groundwater monitoring network is proposed to comprise four monitoring wells to identify any seepage mounding cross-gradient and downgradient from the TSF. An upgradient location is included to provide a background groundwater quality reference point.

A monitoring program should be developed and include regular assessment of groundwater levels and quality over time, including quarterly groundwater sampling to analyse groundwater quality parameters such as pH, electrical conductivity, major ions, and metals. An annual review of the monitoring program is proposed to optimise its effectiveness based on observed data and any evolving project conditions.

5.0 REFERENCES

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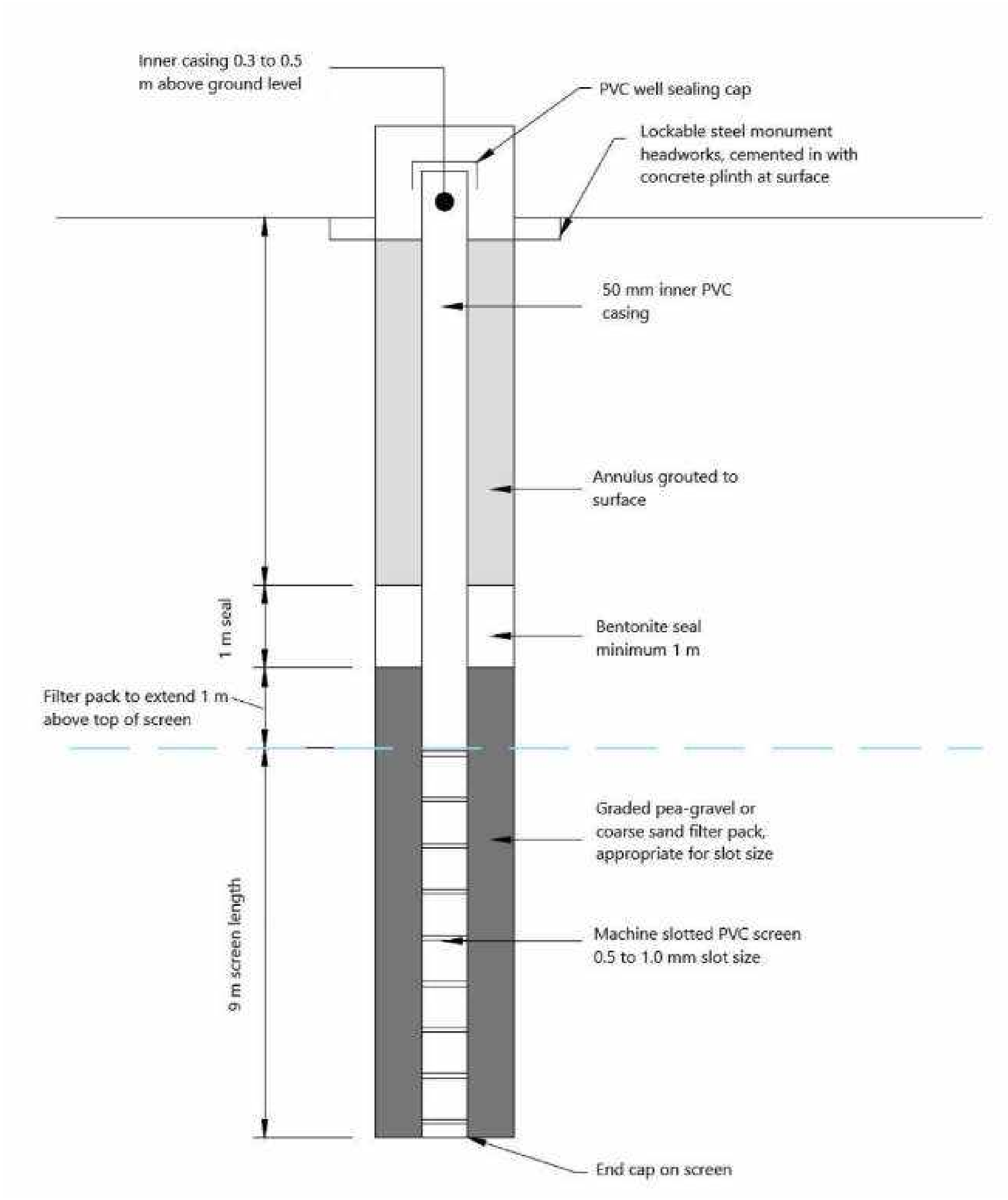
APPENDIX A

Typical Groundwater Monitoring Well Installation

Plan A.1: Typical groundwater monitoring well construction details



CMW Geosciences

28 Flynn St
Wembley
Perth WA 6014
Australia

Ph: (08) 6555 4920

www.cmwgeosciences.com

Appendix I:
Scope of Works and Technical Specification Document

18 December 2024

INTEGRATED WASTE LANDFORM TAILINGS STORAGE FACILITY (IWLTSF)

MT IDA PROJECT - GOLD

WESTERN AUSTRALIA

CONSTRUCTION SPECIFICATION, SCOPE OF WORKS & TECHNICAL SPECIFICATION

Delta Lithium Limited (DLI)

PER2024-0325AC Rev 1

TABLE OF CONTENTS

APPENDIX

TABLES

TERMINOLOGY AND ABBREVIATIONS

The following terminology and abbreviations are defined as stated, unless otherwise indicated:

AS	Australian Standard
ASTM	American Society for Testing and Materials
Contractor	Appropriate individual, partnership, company or corporation contractually obligated to perform the work prescribed in this document and becomes contractually obligated to the Owner/Principal
Design Drawings	Detailed Design Drawings issued by the Owner/Principal to the Contractor
DEMIRS	Department of Energy, Mines, Industry, Regulation and Safety
DLI	Delta Lithium Limited
DWER	Department of Water and Environmental Regulation
Engineer	The Engineer (or designated Representative) appointed by the Owner/Principal who is responsible for evaluating the suitability of the materials involved in the work and for verifying the compliance of the work to the requirements of this SoW
Independent Testing and Inspection Firm	The company, partnership, or corporation retained to perform the inspections and tests, required to determine and verify compliance of the work with the requirements of this SoW
IWLTSF	Integrated Waste Landform Tailings Storage Facility
mbgl	Metres below ground level
MIT	Mt Ida Project - Gold
NAF	Non-acid Forming
NATA	National Association of Testing Authorities
OMC	Optimum Moisture Content at which the SMDD is achieved
Owner/Principal	DLI
Project Superintendent	The designated Representative of the Owner/Principal appointed by the Owner/Principal who is responsible for the work on the project
QA/QC	Quality Assurance and Quality Control
RL	Reduced Level
SMDD	Standard Maximum Dry Density as per AS 1289.5.1.1 (2017) for testing of a representative material sample of that to be compacted in the field
SoW	Construction Specification, Scope of Work and Technical Specification Document
t/m^3	Tonnes per cubic metre
TSF	Tailings Storage Facility
The Project	MIT
USCS	Unified Soil Classification System
VWP	Vibrating Wire Piezometer
WRD	Waste Rock Dump
Work / Works	The activities specified within this document as the responsibility for the Contractor

1 INTRODUCTION

This SoW prescribes the requirements for the embankment construction works to achieve the site finished grades indicated on the Design Drawings for IWLTSF construction at the Mt Ida Lithium-Gold Project (MIT, The Project) in Western Australia (WA).

The works mainly involve bulk earthworks to construct the engineered containment perimeter embankment, decant accessway and structure for the IWLTSF. All details presented herein are to be read in conjunction with the Design Drawings presented in the CMW report referenced PER2024-0325AB Rev 1 dated 18 December 2024 (Design Report).

The SoW shall comprise the provision of all materials, construction plant, equipment, labour, supervision, tools, services, warehousing if required, testing equipment, and each and every item of expense necessary for the construction, acceptance testing and preparing of "as-built" drawings and documents for work shown in the drawings, materials schedules and specifications forming part of the construction of the IWLTSF.

Also prescribed are the requirements for clearing and grubbing, the removal, replacement, and disposal of unsuitable materials, the disposal of surplus materials and the furnishing, placement and compaction of embankment fill material.

All works must be constructed complete and operational except as specifically excluded and must include all necessary auxiliary works, accessories and the incorporation of all miscellaneous material, minor parts and other such items, whether or not the items are specified, where it is clearly the intent of the design that they should be supplied or where they are obviously required and necessary to complete and commission the work.

The milling and processing teams should fully cooperate with each other and at all times coordinate activities to ensure the IWLTSF are constructed in accordance with the intent of the design in a timely manner and are ready to accept the tailings. The protection of all active and non-active pipework and instrumentation which is in place is paramount. The Mine Superintendent must be immediately notified of any damage to pipework or instrumentation no matter how minor.

The Contractor must liaise with the milling team, other contractors and the Owner/Principal to agree on a sequence for the works. The Contractor and other contractors must endeavour to complete the embankment in the sequence agreed. The Contractor must coordinate work prescribed by this document with other related works to be performed, such as relocation of tailings pipework.

1.1 Design Drawings

This SoW must be read in conjunction with the latest revisions of the following Design Drawings:

Title	Project and Drawing Number
IWLTSF Plan	PER2024-0325-01
IWLTSF Sections and Details – Sheet 1	PER2024-0325-02
IWLTSF Sections and Details – Sheet 2	PER2024-0325-03
IWLTSF Sections and Details – Sheet 3	PER2024-0325-04

1.2 Applicable Codes / Standards

The works must be carried out to comply with the latest revision of the Design Drawings, Codes and Standards specified or to the appropriate Australian Standards or to other recognised International Standards approved by the Owner/Principal or the Engineer where there is no comparable Australian Standard.

The applicable Australian Standards for earthworks are as follows:

- AS 1289 - Methods of testing soils for engineering purposes;
- AS 1726 - Geotechnical site investigations; and
- AS 3798 - Guidelines on earthworks for commercial and residential developments.

Before making any change in any work under the Contract to comply with any revisions to the relevant codes and standards, the Contractor shall give to the Owner/Principal written notice specifying the reason therefore and requesting his direction thereon. The Owner/Principal shall decide whether a change is necessary and issue an order accordingly under the provisions of the General Conditions of Contract.

1.3 Safety

The Contractor must:

- Carry out the works in a safe manner and comply with all of Owner/Principal's procedures and guidelines.
- Conform to all relevant Acts or Statutes of Parliament, Regulations, By-Laws or Orders relating to the safety of persons and property on or about the site.

1.4 Submittals

All submittals must be delivered to the Owner/Principal. The following information must be submitted by the Contractor one month prior to the start of the work:

- A description of construction procedures/sequences together with;
- Proposed methods and construction details for any excavation where groundwater is expected to be encountered, to ensure that all excavations are kept dry during construction. Discharge/disposal of the dewatering system effluent must be coordinated with the temporary installations for stormwater management and dust control.

The following information must be submitted at the completion of the work:

- All field and laboratory test results and comments, which must be compiled in date order, for permanent project records.

1.5 Site Location

MIT is located about 85 km northwest of Menzies and 200 km northwest of Kalgoorlie in the Goldfields region of WA. It covers approximately 170 km^2 of the Mt Ida – Ularring Greenstone Belt with multiple granted prospecting, exploration, and mining licences. The proposed IWLTSF is to be located in mining tenement M29/165, which licence is valid until 20 December 2036.

The IWLTSF has an approximate centre located at (MGA, Zone 51J) coordinates 6,778,897 m North and 253,792 m East. Future mine pit, process plant and site office areas will likely be located at the higher elevations to the west of the IWLTSF.

1.6 Design Summary

The IWLTSF has been designed to store a minimum of 4 Mt of tailings. At an estimated slurry dry density of 1.3 t/m^3, a storage volume of 3.48 Mm^3 the facility will have a storage capacities of 4.52 Mt which is sufficient to store the gold resource of 4 Mt.

The IWLTSF will comprise a tailings storage facility surrounded by the mine waste dump. It will be formed by the construction of two (2) zones within the waste dump. From the inside, the materials will comprise two zones nominated as 1 and 2. Zone 1 would typically consist of oxide mine waste, moisture conditioned and compacted 'clayey' material placed in discrete layers, nominally 300 mm thick, which will form the inner liner.

This zone will be nominally 6 m wide with some possible variation in width dependent on the type of construction equipment that is used and any controlling safety criteria. The internal batter slope will be formed at 1:2.5 (V:H). The internal finished surface of Zone 1 has to be suitable to accept the placement of the 1 mm HDPE liner, which will be installed as part of the Stage 1 and Stage 2 constructions.

The next zone (Zone 2), nominally 30 m wide, supports Zone 1 and will comprise run of mine waste placed in 1 m lifts with a rock limit of 750 mm with sufficient fines to fill any voids. Zone 2 and general run of mine waste provide support for the overall structure.

The general run of mine waste will be constructed based on the adopted mining plan and waste dump configuration, with no particular controls provided by the IWLTSF , with the external batter slopes at a maximum of 1:3.0 (V:H).

The natural subgrade over the base of the facility, after topsoil and any unsuitable materials are removed, will be shaped to form a crossfall across the base to facilitate flows within the underdrainage system. A compacted layer of low permeability clayey material (Zone 1) will then be placed over the base of the IWLTSF prior to placement of the HDPE base liner.

Water will be removed from the facility and pumped back to the processing plant via a decant structure comprised of slotted concrete well liners with select filter rock surround. The recommended average water recovery should not be less than 83 tph.

1.7 Site Conditions

Materials assessment to determine site conditions has been conducted and the test results associated with the assessment are, by this reference, made a part of this SoW. The materials assessment report has been summarised in the CMW Design Report.

The information contained in the document must not be construed as a guarantee of the depth, extent or character of materials, groundwater level and quality actually present.

The physical properties of the upstream clayey mine waste (Zone 1) should be confirmed by laboratory testing as part of the construction. The existing IWLTSF design will be updated, if required, based on the results of this verification testing.

1.8 Site Inspection

The Contractor must inspect the site and must allow for the following factors in the price:

- The nature and requirements of the work to be done.
- All conditions on and adjacent to the site.
- Access to the site.
- The types of soil and vegetation present on the site.
- The expected or known water table.
- The nearest sources of suitable construction material which comply with this SoW.
- The source of water for construction purposes.
- The Contractor is to manage saline water usage, hydrocarbon storage and dust suppression to the Owner/Principal’s requirements.
- Prevailing climatic conditions for the site.

2 DESCRIPTION OF WORKS - SPECIFIC

The SoW includes, but is not necessarily limited to the following:

2.1 General

The work shall include:

- Attend a Site Induction of approximately five (5) hours duration before the commencement of works if they have not already attended one in the last six (6) months.
- Carry out all works indicated or implied in the Design Drawings or in the SoW.
- Supply all labour, plant and materials (except those indicated as being supplied by the Owner/Principal) necessary for the completion of the works.
- Maintain all works as required by the Contract documents and for the period stated therein.
- All construction shall be to the minimum lines and grades shown on the Drawings or as required by the Owner/Principal's Representative as work progresses.
- During the progress of the works, the Owner/Principal's Representative may find it necessary to revise the lines, levels and grades of any part of the works because of the conditions revealed by the works.

2.2 Survey

The Contractor must:

- Perform all ground surveys using conventional and agreed surveying techniques.
- Survey and set out the works based on the datum points provided.
- Be responsible for the protection of all permanent and temporary beacons/benchmarks.
- Be wholly responsible for the setting out of his works in accordance with the terms of the SoW. Although the Owner/Principal's Representative will cause such setting out to be checked from time to time, such checking will not relieve the Contractor of full responsibility for the accuracy of such setting out.
- Carry out surveys prior to the commencement of the item of work and at the completion of the item of work.
- Carry out a post-construction survey by a licensed surveyor of the works to verify that the works were constructed within the specified tolerances and submit to the Owner/Principal's Representative.
- Submit his survey data and calculations to the Owner/Principal's Representative.
- Ensure initial and/or final surveys are undertaken and approved by the Owner's Representative prior to the removal or placement of any material, especially where such action will destroy or cover the surface just surveyed. All survey checks or quantity measurements must be supplied to the Owner/Principal's Representative and suitable time must be given to the Owner/Principal's Representative to allow such calculations to be checked and approved prior to the works being covered or removed.

The Owner/Principal's Representative may undertake their own survey of any item, either in conjunction with the Contractor or separately.

The Contractor and Owner/Principal's Representative must agree on the results of measurement surveys that are carried out prior to any works being covered up or within seven (7) days of a survey being undertaken. Should an agreement not be reached, the difference must be documented such that the matter can be later decided without disruption to the construction programme.

2.3 Construction Tolerances

The embankment shall be constructed to the lines, grades, dimensions and details shown on the Design Drawings.

The embankment foundation footprint shall be surveyed following stripping, prior to the placement of any fill materials. Finished work shall comply with the tolerances set out in Table 1.

The maximum permissible horizontal deviation from the finished lines or zone boundaries shall be −0 m to +0.5 m. Vertical deviation shall be −0 m to +0.2 m, provided no abrupt changes in slope or level are present on any finished surface. Payment shall, however, be to the design lines, minimum requirements, excluding tolerances.

TABLE 1: CONSTRUCTION TOLERANCES

Construction Item	Tolerance Item		Tolerance (1)
Perimeter Embankment	Crest Level		+200 mm, -0 mm
	Crest Width		+500 mm, -0 mm
	Slopes (2)	Upstream	+ or -10% of specified
		Downstream	+ or -2% of specified
Decant Accessway	Crest Level		+200 mm, -0 mm
	Crest Width		+500 mm, -0 mm
	Side Slopes (2)		+ or -5% of specified

Notes:

1. These shall mean that if a dimension is checked at a particular location, the work is acceptable provided that the dimension departs from that shown on the Drawings by no more than the amount shown above. They shall not be read to imply any basis for payment other than the design dimensions or levels are shown on the Design Drawings, upon which all quantities for payment purposes shall be calculated. The average dimension shall be not less than that shown on the Design Drawings.
2. Tolerances on slopes assume that slopes are specified in the format 1 vertical: X horizontal. The tolerance shall apply to X.

Measurement for payment of all embankment fill materials shall be made for the compacted material, measured in place and only to the lines and grades required (excluding tolerances), measured in either metres (m), square metres (m^2) or cubic metres (m^3) as defined in the Schedule of Quantities. Measurement for payment shall be undertaken to AS1181 (1982). The Owner/Principal may inspect or check any setting out or measurements at any time and the Contractor shall allow for delays while any works are checked.

At the completion of the works, the Contractor shall provide detailed as-built details including an electronic copy of the plan layout and survey information in electronic format as well as a concise summary of item volumes.

3 MATERIALS

3.1 General

Satisfactory materials must be free from large lumps or clods, refuse or other material that might prevent proper compaction. All materials must be approved for use by the Engineer prior to placement.

The material zones, as indicated on the Design Drawings, are as follows:

- Zone 1, Clayey Mine Waste – this material must be used to construct the upstream (inner) zone of the IWLTSF as indicted on the Design Drawings.
- Zone 2, Waste Dump – this material shall be used to construct the bulk section or downstream zone of the embankment to support the compacted Zone 1 as indicated on the Design Drawings.
- Zone 3, Decant Filter – this material shall be used to construct the decant structure.
- Wearing Course – this material forms the upper 0.1 m of the perimeter embankment and decant accessway.

3.2 Clayey Mine Waste

Clayey Mine Waste for the IWLTSF embankments must be sourced from the designated pit areas near the IWL and must meet the requirements listed in Table 2.

TABLE 2: PROPERTIES OF ZONE 1, CLAYEY MINE WASTE

Item	Test Method	Requirement
Soil Classification (USCS)	AS 1726	GC, SC, CL / CI / CH
Particle Size Distribution	AS 1289	100% passing 100 mm, ≥70% passing 19 mm, ≥30% passing 0.075 mm
Plasticity Index	AS 1289	>8%
Liquid Limit	AS 1289	>20%

Testing frequencies as per Section 7.5.

3.3 Waste Dump

Waste Dump for the IWLTSF embankments must be materials sourced from the designated pit areas and meet the requirements listed in Table 3.

TABLE 3: PROPERTIES OF ZONE 2, WASTE DUMP

Item	Test Method	Requirement
Soil Classification (USCS)	AS 1726	GW / GP / GM / GC, Cobbles, and trace Boulders
Particle Size Distribution	AS 1289	100% passing 300 mm, 65% to 95% passing 60 mm, between 10% and 15% passing 0.075 mm

No testing is required for Zone 2, Waste Dump upon placement as this material is to be traffic compacted during placement.

3.4 Decant Filter

Decant Filter should be geochemically inert, hard durable competent rock having the properties as outlined in Table 4.

TABLE 4: PROPERTIES OF ZONE 3, DECANT FILTER

Item	Test Method	Requirement
Soil Classification (USCS)	AS 1726	GW including Cobbles, and Boulders max. 500 mm.
Particle Size Distribution	AS 1289	≤500 mm, 70% passing 200 mm, 20% passing 75 mm, <3% passing 0.075 mm, geochemically inert, hard durable competent rock.
Particle Density	AS 1289	>2.5 t/m^3.

No testing is required for Decant Filter as this material is to be placed by excavator and tamped with its bucket.

3.5 Wearing Course

Wearing Course should be well graded laterite gravel with properties as recommended in Table 5.

TABLE 5: PROPERTIES OF WEARING COURSE

Item	Test Method	Requirement
Soil Classification (USCS)	AS 1726	GW / GP / GM
Particle Size Distribution	AS 1289	100% passing 37.5 mm, ≥60% retained on 4.75 mm, >4% to <20% fines (0.075 mm), low plasticity or non-plastic

No testing is required for Wearing Course.

3.6 Unsuitable Materials

Materials that do not meet the requirements listed in Table 2 to Table 5, and soil having insufficient strength or stability to carry the loads that will be superimposed on the completed embankment or decant without excessive settlement or loss of stability, must not be used in the constructed works. Materials containing vegetable matter, muck refuse, large rocks, debris, or other materials that could cause the embankment not to compact, and organic soils with USCS of Pt, OH, or OL, are considered to be unsuitable material and shall be removed from the site.

4 EXECUTION OF THE WORK

This SoW must include, but is not necessarily limited to the following:

4.1 Site Preparation

4.1.1 Construction Layout

The earthworks must be set out in accordance with the Design Drawings. The Contractor must examine the site and verify all existing levels and survey control points and the set-out points shown on the Design Drawings, before commencing the earthworks. The Contractor must be responsible for checking and agreeing with the correctness of all values of monuments, datum or benchmarks, prior to the commencement of work. The

Engineer may find it necessary to revise the lines, levels and grades of any part of the works during progress, because of conditions revealed during construction.

The Contractor must confirm that there are no existing services in the area. If any services are noted, the Contractor must bring them to the notice of the Owner/Principal.

4.1.2 Borehole Sealing

The Contractor must seal all investigation boreholes, groundwater and sterilisation holes within the storage area of the proposed IWLTSF facility and keep an accurate record of all holes filled.

4.1.3 Clearing and Grubbing

The Contractor must remove trees, stumps, roots, rubbish and any debris and vegetation resting on or protruding through the ground surface from the designated areas as shown on the Design Drawings. Trees, stumps, roots and other vegetation must be removed to the bottom of their root zone. The cut materials from the clearing works may, with the permission of the Engineer, be placed on the outer, downstream batter slope of the IWLTSF.

The area to be cleared must extend approximately 5 m past the downstream toe of the IWLTSF embankment. All stripped vegetation should be pushed into heaps in locations as indicated by the Owner's Representative.

4.1.4 Topsoil Stripping

Strip topsoil from the IWLTSF footprint to a minimum depth below the natural ground surface of 0.1 m. The depth of stripping may be increased as directed by the Owner/Principal's Representative.

The Contractor must avoid mixing topsoil with subsoil or other undesirable materials. The Contractor must place the removed topsoil in stockpiles to a maximum height of 2.0 m with side slopes of 1 (vertical) to 1.5 (horizontal) in areas nominated by the Owner/Principal.

4.1.5 Stockpiling

The Contractor must deposit material resulting from the clearing and grubbing operations in the disposal areas. The Contractor must cover with soil or burn if permitted by applicable regulations.

4.1.6 Haul Roads and Access

The Contractor must clear all vegetation, standing and fallen, from the agreed routes of all haul roads. The Contractor must push this vegetation into heaps in the locations as indicated by the Owner/Principal's Representative.

The Contractor must form up and lay the base course as necessary and do all things necessary to form and maintain the haul roads linking the mine waste dumps/borrow areas to the site and other haul roads necessary for the works and which are approved by the Owner/Principal's Representative.

The Contractor must keep all haul roads sprayed and wetted to totally prevent the generation of airborne dust during the course of road construction and usage.

4.2 Foundation Preparation

4.2.1 Stage 1 Construction

The Contractor shall, as appropriate:

- Removal of unsuitable material as directed by the Engineer.
- Strip topsoil from the IWLTSF footprint to the specified minimum depth of 0.1 m below the natural ground surface levels, and stockpile in nominated areas. The Contractor must remove soil only to such depth that

the soil meets the definition of topsoil. Under no circumstance is the Contractor to rip or excavate rock unless directed by the Engineer.

- Tyne, moisture condition (to within –2% / +2% of OMC) and compact the IWLTSF footprint (refer to Design Drawings) to a depth of 0.3 m (following topsoil stripping). The prepared surface of the embankment footprint should be compacted using a minimum of 6 passes of a 12 t vibratory roller.
- Tyne, moisture condition and roller compact the foundation material within the IWLTSF storage area (basin) with a minimum of 4 passes of the 12 t vibratory roller.
- Prepare the foundation for the cut-off trench under the Stage 1 embankment as shown on the Design Drawings by excavating to ‘refusal’ on a cemented layer, a depth of nominally 1.5 mbgl or as directed by the Owner/Principal’s Representative. The depth shall be increased if loose sands or gravels are present in the excavation, so the base of the excavation is in competent low permeability material or cemented layer. Side batters shall have a minimum slope of 1 (vertical) to 1 (horizontal).
- Ripping may be necessary to construct the cut-off excavation. Blasting in the IWLTSF area is not anticipated. No blasting or excavation into or through any competent layer shall be undertaken unless approval has been received from the Owner/Principal’s Representative.
- All areas to receive fill shall be left in a clean and suitable condition to allow an uninterrupted placement of fill. No fill shall be placed in the cut-off trench until the base of all excavations has been inspected and approved by the Owner/Principal’s Representative.
- Allow for keeping water from excavations by pumping, dewatering, or other suitable means, and adequately dispose of it clear of the works.
- The cut-off trench backfill shall comply with the following:
  - Moisture content at the time of placement is within -2% / +2% of the OMC as determined from laboratory test in accordance with AS1289.5.1.1 with moisture curing of materials as required during construction;
  - Each layer is compacted to achieve a density ratio greater than 95% of SMDD as determined from laboratory test AS 1289.5.1.1; and
  - Materials specifications as detailed in Section 3.2.
- On the basin including at the decant area, a minimum of 0.5 m thick ‘liner’ constructed of clayey mine waste, of the same specifications as detailed in Section 3.2, must be constructed on top of the prepared subgrade. The material shall be moisture conditioned to within the range of -2% / +2% of the OMC as determined in accordance with AS1289.5.1.1, and placed in homogenous layers not exceeding 0.3 m loose lift thickness. This shall then be compacted by a minimum of 6 passes of a 12 t vibratory roller or approved equivalent, to achieve a minimum of 95% dry density ratio in accordance with AS1289.5.1.1. Placement should be continuous and if a break in fill placement allows the exposed surface to dry, it should be lightly tyned, watered and compacted prior to fill placement recommencing.

4.2.2 Stage 2 and Stage 3 Constructions

The Contractor shall, as appropriate:

- Inspect the existing embankment crests to determine the extent of the requirements for preparatory works;
- As required, remove any gravel wearing course materials from the existing embankment crests (perimeter, internal and decant access) and stockpile for re-use if practical, otherwise doze (remove) to waste following approval from the Owner/Principal’s Representative;
- No material shall be disposed of onto the tailings beach that is within the intended embankment footprint area. Material can be placed outside this surveyed area;

- Survey and clearly peg the embankment footprint area;
- Tyne, moisture condition and compact any areas of loose material on the prepared and surveyed surface of the embankment or tailings beach footprint areas identified by the Owner/Principal's Representative;
- Leave all areas to receive fill in a clean and suitable condition to allow an uninterrupted placement of fill;
- Do not place any fill until the prepared surface has been inspected and approved by the Owner/Principal's Representative (especially prior to the placement of the first layer);
- Allow for keeping water from excavations by pumping, dewatering, or other suitable means, and appropriately dispose of it clear of the works; and
- If instructed place competent waste rock over the tailings beach extending 1.0 m horizontally past the toe of the proposed decant and decant accessway raises to provide a stable platform for construction only if required and as instructed by the Owner/Principal's Representative.

4.3 Perimeter Embankment

4.3.1 Downstream Zone

Following completion of the foundation preparation, the IWLTSF embankment construction can commence. The downstream waste dump section of the embankment (Zone 2) can be constructed using traditional waste dump techniques, including tipping from minor faces and paddock dumping (i.e. not dumping off a high face). The following points should however be noted:

- The mine waste within 20 m of the upstream zone shall be placed in ≤0.5 m nominal thick layers and trafficked by construction equipment across the full width of the layer. The maximum particle size in this zone should be a maximum of ≤1/3 the layer thickness.
- The upstream face of Zone 2 shall be 'smooth', free of projections i.e. large cobbles and boulders greater than 0.15 m in size and voided rock, in order to allow for placement of the upstream zone. Trimming of the waste dump face may be required.
- Preference should be made to placing large boulders and cobbles towards the downstream of Zone 2.

4.3.2 Upstream Zone

Construct the IWLTSF embankment at the upstream zone using selected approved Zone 1 – Clayey Mine Waste material sourced from within MIT. Prior to construction, areas within MIT must be identified that have potential for use in construction.

Suitable Zone 1 material will typically comprise of materials that will be described as CLAY with low, medium to high plasticity (CL / CI / CH), Clayey SAND (SC), or Clayey GRAVEL (GC) in accordance with AS1289. The upstream zone material must be free of organic matter and other deleterious material. It shall comply with the limits set in Sections 3.2.

All materials to be utilised in construction must be approved by the Engineer/Owner's Representative.

The Contractor shall:

- Adjust the moisture content of Zone 1 materials, which have been approved for use in the perimeter embankment construction. Moisture condition the borrow to within the range of -2% / +2% of the OMC as determined in accordance with AS1289.5.1.1. The borrow materials shall be cured to ensure the moisture is thoroughly mixed and evenly spread through all materials proposed for embankment construction.
- Place Zone 1 material in homogeneous horizontal layers not exceeding 0.3 m loose lift thickness. Each lift shall be compacted by a minimum of 6 passes of a 12 t vibratory roller or approved equivalent. Placement should be continuous. If a break in fill placement allows the exposed surface to dry, it should be lightly

tyned, watered and compacted prior to fill placement recommencing. No oversize rock is to be placed into the embankment. Largest size should be 100 mm.

- Each of Zone 1 layer shall be compacted to achieve a density ratio greater than 95% of the SMDD as determined from laboratory test carried out in accordance with AS1289.5.1.1. The actual number of passes of a 12 t vibratory roller or an approved equivalent to achieve a density greater than 95% SMDD shall be determined on site using roller trials.

4.4 Decant and Decant Accessway Fill

The Contractor must, as appropriate place a cushion layer over the underdrainage above the HDPE liner within the rock filter decant and decant accessway footprint. The cushion layer must be placed on the Bidim A64 geotextile or approved equivalent placed over the flownet and must comprise an initial minimum 0.3 m layer of 10 to 14 mm sized aggregate followed by a minimum 0.5 m layer of rock fill, with minimum particle size of 100 mm and a maximum particle size not exceeding 250 mm.

The cushion layer extends 5.0 m beyond the design slope of the decant accessway and rock filter decant and be left with a 1 m high windrow as shown on the drawings. Carefully construct the internal decant accessway over the cushion layer using selected mine waste material sourced from the waste rock storage located adjacent to the IWLTSF. Internal trafficking within the IWLTSF should be avoided and care must be taken to avoid damage to the liner during placement of materials. Any damage to the HDPE liner and underdrainage pipes must be reported to the Owner/Principal and repaired and replaced by the contractor at their cost.

4.5 Decant Structure

The Contractor must:

- Survey the position of the decant structure.
- Carefully place the cushion layer over the footprint of the decant structure. The cushion layer must be placed on the Bidim A64 geotextile or approved equivalent placed over the flownet and must comprises an initial minimum 0.3 m layer of 10 to 14 mm sized aggregate followed by a minimum 0.5 m layer of rock fill with minimum particle size of 100 mm and a maximum particle size not exceeding 250 mm. The cushion layer extends 5.0 m beyond the design slope of the decant accessway and rock filter decant and be left with a 1 m high windrow as shown on the drawings.
- Carefully construct the rock filter decant over the cushion layer using Zone 3, which will comprise hard durable competent rock with a maximum particle size not exceeding 500 mm, preferably 70% passing 200 mm, 20% passing 75 mm and non-plastic fines (silt and clay finer than 0.075 mm) < 3% and a particle density greater than 2.5 t/m3 sourced from the waste rock storage located adjacent to the IWLTSF.

4.6 HDPE Liner

4.6.1 General

The work involving HDPE Liner must include:

- The upstream batter and cut-off trench of the IWLTSF embankments shall be lined, as shown by the drawings, to the crest RL 538.3 m of the perimeter embankment. The liner shall be installed onto a ‘smooth’ surface, free of projections that could damage the liner (i.e. sharp irregularities or abrupt elevation changes).
- Prior to the installation of the liner, a layer of geotextile (Bidim A34 or similar approved) shall be placed on the batters of the embankment as additional protection for the liner. The placement and installation of the geotextile layer shall be in accordance with the manufacturer’s specification. Recommended maximum exposure prior to the HDPE liner installation is 14 days.

- The liner material shall comprise 1.5 mm thick Class 16 smooth/smooth HDPE liner. The liner shall have ultraviolet protection. The liner shall be free of holes, blisters, undispersed raw materials or any sign of contamination by foreign matter. The manufacturing process shall provide a smooth surface with a regular thickness of material. The liner shall be ‘defect free’ and contain no more than one repairable damage per 450 m^2 upon unrolling at site. The Contractor shall submit the manufacturer’s test certificates for the liner prior to delivery to site for approval by the Owner’s Representative.

The Contractor will:

- Store and handle, install, join, site weld and anchor the liner in accordance with the manufacturer’s recommendations. Details shall be provided for approval by the Owner’s Representative.
- QA/QC testing should be performed in accordance with the manufacturer’s recommendations. Testing should be performed to the latest ASTM and GRI standards.
- No HDPE welding should be performed when the sheet temperature is above 60^o C.
- Ensure that the liner is quality control tested (both destructive and non-destructive) in accordance with the manufacturer’s recommendations. On a daily basis, a weld specimen destructive (peel) test shall be performed at a frequency of 2 trial welds per shift per welding machine. All liner welds shall be tested for integrity using the vacuum box method, air pressure test or similar approved. Details of test procedures, all test reports and all quality assurance reports are to be submitted to the Owner’s Representative.
- Ensure that all liner joins are generally constructed at 90^o to the embankment crests. The liner shall not be joined parallel to the embankment crest.
- Very light small equipment with low ground pressures must be used for the areas where the liner has to be trafficked. Sequencing construction to minimise this is essential.
- Advise at the time of tender the installer of the HDPE liner, for approval by the Owner. In addition, a description of processes to be adopted, equipment to be utilised and all necessary documentation in regard to QA/QC shall be provided.
- The HDPE liner shall be inspected for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The liner surface shall be clean at the time of examination. Each suspect location shall be repaired and non-destructively tested.

The contractor will supply materials from the nominated supplier. The Contractor will supply the following information with their tender:

- Liner specification.
- Inspection, supervision and installation methodology.
- Proposed supervision and installation personnel proving experience on a similar size project.
- Quality Assurance plan including checking for defects prior to installation, weld testing, etc.
- Panel layout drawing showing sheet numbers.
- Manufacturer’s sampling and testing.
- Installation methodology.
- Layout drawing showing sheet numbers.

The following will be supplied by the Owner:

- 1.5 mm thick smooth/smooth HDPE liner.

Any defective or damaged liner will be rejected and replaced at the Contractor’s cost.

4.6.2 HDPE Flownet

An HDPE Flownet must be installed in accordance with the manufacturer's specification.

4.6.3 HDPE Liner Testing Plans

The Contractor installing the liner must provide not later than seven (7) days after Award of Contract, a certified Testing Program.

The Testing Program must include details of Procedures, Standards and acceptance levels and conform to the requirements of Specifications forming part of the Contract documentation and must include details of testing of the HDPE liner installation.

The details of testing of the HDPE liner installation must comprise the following, as appropriate:

- Raw material testing.
- Geomembrane production testing.
- Geomembrane roll report.
- Daily operating control report.
- Pre weld test certificate.
- Daily weld test report (vacuum box method or similar approved).
- Daily weld specimen destructive test report.
- Weld layout drawings.

The Contractor must advise the qualifications of the personnel involved with liner testing.

4.7 Underdrainage

4.7.1 General

The base of the IWLTSF will be double HDPE lined with flownet (Trinet T5 triaxial drainage geonet or approved equivalent) installed in between the liners in areas where ponding may occur, and a single HDPE liner elsewhere. Subsequently, the geotextile and flownet (Trinet T5 triaxial drainage) underdrainage system will be installed.

4.7.2 Underdrainage Pipework

The Contractor must, as appropriate:

- Transport all pipe, underdrainage pipe and associated items to site.
- Install, test and commission all pipework to the grades and levels shown on the drawings and noted in this scope of work.
- Excavate a trench through the embankment to take the outfall pipework.
- Excavate for the Bentonite: Cement cut-off within the embankment as noted on the drawings.
- Supply and place materials for the Bentonite :Cement cut-off.
- Backfill, fill and bed items as noted with approved earthfill as shown on the drawings and noted in this scope of work.
- Cover and stake sealed pipes which are to be tested, i.e., decant and underdrainage outfall pipework, to prevent floating and/or movement during testing.

- Ensure that areas to receive pipework/underdrainage are smooth and free of any rock, cobbles and other deleterious materials that could damage the pipework, and that there is an even fall towards the outlet point.
- Install the flownet to the grades and levels shown on the drawings and noted in this scope of work. Care must be taken to avoid damaging the underlying liner. Installation is to be sequential following the placement of each strip of liner to minimise the areas where the liner has to be trafficked.
- Carefully place the geotextile cover over the flownet with the protection layer applied around the perimeter of the IWLTSF to the extent as shown on the drawings. The protection layer must comprise an initial minimum 0.3 m layer of 10 to 14 mm aggregates, placed over the Bidim A64 geotextile or approved equivalent, followed by a minimum thickness of 0.3 m of select rock fill with a minimum particle size of 100 mm and a maximum particle size not exceeding 250 mm.
- Allow for keeping water from excavations by pumping, dewatering, or other suitable means, and adequately dispose of it clear of the works.

4.7.3 Underdrainage Final Cover

The Contractor must place the geotextile over the flownet and cover with not more than 20 mm of sand or other approved cover materials as shown on the Drawings.

4.7.4 Underdrainage Outfall Pipework

All underdrainage outflow pipework must be installed on a prepared surface free from projections with an even fall towards the outlet point. The pipe grade must not deviate greater than 1/3 the diameter of the pipework from the design grade.

The pipework in the vicinity of the embankment and as marked on the drawings must be thoroughly protected. Similarly, rock in the vicinity of the underdrainage pipe must be placed with care to prevent damage.

The main trench through the mine waste embankment for the decant and underdrainage outfall pipes must have an approximate width of 5.5 m and must be excavated prior to the placement of the HDPE liners. Material excavated from the trench must be stockpiled for reuse in other parts of the construction where the materials meet the specified requirements for that part of the construction.

Once excavated, select backfill free of cobbles, boulders or rocks must be placed in compacted layers of 100 mm and shaped to provide full support for the barrel of the pipe.

Prior to trench backfilling, a cut-off comprising a Bentonite: Cement: Water mix of 1: 10: 20 is to be installed to reduce the potential for any seepage flow along the outfall pipe trench. The cut-off is to be formed against and into either natural ground or well-compacted fill; no formwork is to be used except across the trench excavation. A cut-off comprising Bentonite: Sand of 2: 1 dry mix can also be considered.

Once the pipes have been pressure tested and the cut off installed backfilling with overburden waste must be undertaken, with 100 mm thick layers being hand tamped from the pipe invert level and around the pipe to 100 mm above the top of the pipe. Small plate compactors are to be used in the area between the pipes and trench sides as appropriate.

The remainder of the trench must be carefully backfilled with overburden waste to the surrounding ground level. Extreme care must be taken to avoid any damage to the installed pipework when backfilling and compacting around and above the pipes. Normal embankment construction can recommence once the trench has been backfilled to the surrounding construction level. Any pipes which are not laid to line, level or grade, or are damaged or displaced during backfilling or other operations by the Contractor in the course of the works, must be removed and replaced at the Contractor's expense. The Contractor must be responsible for any excavation of backfilling necessary for the removal and replacement of any pipe.

The Contractor must ensure that all other pipework is placed in accordance with the appropriate recommendations of the manufacturer. Any damage to the HDPE liner and pipes must be reported to the Owner/Principal and repaired and replaced by the contractor at their cost.

On completion of pipe laying and testing, the underdrainage lines must be covered as shown on the drawings to prevent floating during the initial stages of tailings deposition. The valves near the return water storage should be closed and the underdrainage outfall pipes filled with water to prevent floating during initial tailings deposition.

4.8 Return Water Storage

4.8.1 General

The Contractor must construct the return water storage (underdrainage sump) in the location and to the details shown on the drawings. The shape of the storage may vary on site, as directed by theOwner's Representative, to suit excavation conditions. All surplus excavated material must be removed to spoil.

The Contractor must:

- Excavate the pond and place material to form the surrounding bunds.
- Spoil any excess material from within the pond as directed.
- Supply and place sand bedding under the artificial liner.
- Install, join, anchor, test and commission the artificial liner as shown on the drawings and to the manufacturer's requirements.
- Install all pipework and penetrations.

4.8.2 Preparatory Earthworks

The Contractor must prepare the subgrade surface to accept the liner. The subgrade must be compacted to 95% of the standard maximum dry density for a depth of 200 mm. The finished subgrade surface must be smooth and free of projections (e.g. cobbles, roots etc) that could damage the HDPE liner.

4.8.3 HDPE Liner Specification

Refer to Section 4.6.

4.9 Surface and Drainage

The Contractor must conduct fill operations in such a manner and sequence that proper drainage is maintained at all times in and around the work area. Promptly remove surface waters that become impounded. Remove and replace with satisfactory fill materials, or stabilise (by drying or approved mechanical or chemical amendment methods) materials that become loosened due to exposure to the elements.

4.10 Maintenance

The Contractor must maintain the final surfaces in a well-drained, dewatered and sufficiently moist condition to prevent shrinkage cracking and minimise dusting. The compacted surface must be smooth and generally free from roller marks, ruts, holes, depressions or protrusions.

4.11 Completion

The Contractor shall meet the requirements listed here:

- Clean up all rubbish, remove all plant and supply materials, trim all banks neatly, spread all excavated material not specified to be removed from the site and leave the site in a clean and tidy condition;

- Batter down the sides of the borrow pits, as appropriate, for stability on completion of the work. Materials not considered suitable for use in the works shall be stockpiled as directed by the Owner/Principal; and
- Provide as-built drawings and quantities to the Owner/Principal within two weeks of the completion of the earthworks in hard copy and electronically (3D AutoCAD DXF).

4.12 Construction Sequence

The Contractor shall liaise with the Owner/Principal to agree a sequence for the works. The Contractor shall endeavour to complete the works in the sequence agreed.

The Contractor shall cooperate with and provide full opportunity to the Owner/Principal's Representative to monitor regularly the progress of the Works of the Contractor and their subcontractors to the extent necessary to confirm satisfactory progress relative to the Construction Program.

All pertinent information to enable the Owner/Principal's Representative to determine the adequacy of advance planning for material procurement, machine and manpower resources to meet the Construction Program shall be made freely available to the Owner/Principal's Representative.

These requirements shall be incorporated in orders placed with Subcontractors.

5 EXCLUSIONS

The following works will be performed by others:

- Removal of pipework, electrical services and other infrastructure as deemed necessary by the Owner/Principal;
- At the completion of the construction of the embankment, the Owner/Principal will install the tailings distribution pipework (pipes, spigots, droppers, etc.) on the embankment crest;
- Supply and placement of pumps for return water networks; and
- Placement of all associated electrical equipment at the decant structure.

The Contractor shall:

- Fully cooperate with the pipe handling and operating crew and shall work in with their activities at all times; and
- Avoid damaging the tailings distribution pipework and any electrical installations which is either operational or has been removed from the crest of the storage by the Owner/Principal. Any pipework or electrical equipment damaged by the Contractor through carelessness shall be replaced at no additional cost to the Owner/Principal.

6 OWNER/PRINCIPAL SUPPLIED ITEMS

Any services or materials not specifically identified as being provided by the Owner/Principal shall be provided by the Contractor.

6.1 Survey

The Owner/Principal will provide coordinates and levels of survey marks within the vicinity of the storage. The Contractor shall set out all lines and levels using the survey marks provided.

6.2 Materials

The Owner/Principal will supply the following from designated sources:

- 'Dry' tailings and mine waste materials for construction (the Contractor will allow for winning, loading, hauling and placement of fill);
- Wearing course material for sheeting of crests;
- Clean rock for use as decant select filter rock, noting crushing and screening may be required subject to sources available at the time of construction;
- Fuel (free issue via Contractor's service truck), noting adequate records of vehicle consumption will be required for reporting purposes.

Water will be made available to the Contractor at no charge. Supply will be from a standpipe/pond nominated by the Owner/Principal. Access to the water source will not be exclusive to the Contractor. The Contractor shall determine the type and suitability of the water supplies for use in this Contract, noting site water is saline and cannot be fresh. The Contractor shall make their own arrangements for loading and hauling.

The Contractor shall advise the expected daily and total water requirements to allow the Owner/Principal to plan water consumption requirements and advise the Contractor accordingly.

It is to be noted that water supplies are sometimes limited, and the Owner/Principal may, from time to time, direct the Contractor to use alternative sources.

During construction, the existing mine infrastructure will be used (haul roads, washdown bay, refuelling facilities, standpipe/pond, and hydrocarbon management).

The Owner/Principal will supply accommodation and messing for the Contractor.

7 TESTING AND INSPECTION

7.1 Testing Firm/Facilities

An Independent Testing and Inspection Firm will be retained by the Owner/Principal to perform field and laboratory testing and soil evaluations for control of construction activities and/or to verify compliance of the work with the requirements of this SoW. The performance or lack of performance of Quality Control tests and inspections must not be construed as granting relief from the requirements of this SoW or the other contract documents.

The Independent Testing and Inspection Firm must meet the technical criteria of NATA for agencies involved in soil and rock inspection and testing.

Any work failing to meet the criteria of the SoW must be rectified at the Contractor's expense.

7.2 Finishing Tolerances

Refer to Table 1 in Section 2.3.

7.3 Material Suitability

Prior to the placement of clayey/silty mine waste materials, field and laboratory testing must be performed by the Independent Testing and Inspection Firm to assess the suitability of the materials for construction. Materials must meet the requirements outlined in Section 3 of this document.

The Contractor must make provision for physical testing of the mine waste materials upon selection of their sources by the Owner/Principal. Test results must be made available to the Engineer for further comment.

Compaction criteria for the IWLTSF constructions must be established by performing compaction testing on representative samples in accordance with AS 1289.1.1 as appropriate to the materials.

7.4 Compaction Testing

Field density testing must be performed by the Independent Testing and Inspection Firm on the compacted embankment material to ensure the compaction criteria meet the requirements of this document. The preferred field density testing method is the Nuclear Density test method in accordance with AS 1289.5.8.1. The calibration curves must be checked and adjusted using either the sand cone method as described in AS 1289.5.3.1, or by an approved method by the Engineer.

The calibration checks of both the density and moisture of each gauge must be made at the beginning of the project, on each different type of material encountered, and at intervals as directed by the Engineer. The number of tests must be increased if visual inspection indicates non-uniform moisture content or variable compaction effort considered inadequate to achieve the specified dry density.

The Contractor must provide the survey data for the locations and RLs of the test sites.

7.5 Testing Program

The testing for the foundation and Zone 1 of the embankment must follow the requirements of Table 6 as a minimum. For the QA/QC requirements of the HDPE liner, refer to Section 4.3.5.

TABLE 6: QUALITY CONTROL TESTS

Property	Test Method	Minimum Testing Frequency
Particle Size Distribution (PSD)	AS 1289.3.6.1	1 per 5,000 m^3
Atterberg Limits incl. USCS classification	AS 1289.3.1.1, 3.2.1, 3.3.1 and 3.4.1	1 per 5,000 m^3
Field Dry Density	AS 1289.5.8.1	1 per layer per 750 m^3 or 2,500 m^2
Density Moisture Relation (Standard Compaction)	AS 1289.5.3.1	1 per 3 Field Dry Densities (min.)

The embankment foundation preparation will be checked for compaction, using a testing frequency of 1 field density test per 2,500 m^2 per layer.

Each test location shall be identified by the Contractor or the Owner/Principal. The test location and result will be deemed to be representative of the section or volume of work being tested.

The Contractor shall, at their own expense, rework or replace materials which do not meet the moisture content requirements.

7.6 Additional Inspection

The Contractor must perform a random survey of the top surface of every layer to monitor fill progress.

8 PERMITS, LICENCES AND APPROVAL

Further to the General Conditions of Contract, the Owner/Principal will obtain all government approvals relevant to the works. All other necessary permits, licenses and approvals shall be obtained by the Contractor.

9 SHIPMENT (GENERAL)

The Contractor shall be responsible for transporting plant and equipment to the site and shall maintain full responsibility for loading, unloading, handling, site storage and insurance of the plant and equipment during transportation and while on the worksite.

Notice of dispatch shall be sent by the Contractor to the Owner/Principal at the time of dispatch of all consignments of the plant. Such notice shall contain the method, date of dispatch and date of arrival on site.

10 DATA REQUIREMENTS

The Contractor shall supply to the Owner/Principal as-built drawings within 14 days of the issue of a Certificate of Practical Completion, in addition to the data requirements detailed elsewhere in this Scope of Work as part of the Work. The Contractor shall show the reference contract number and identifying item numbers, if applicable, on all data submitted.

The Contractor shall supply to the Owner/Principal within 14 days of the completion of testing a copy (digital and hard) of laboratory test certificates and a summary of all test results in a spreadsheet. The Contractor shall show the reference contract number and identifying item numbers, if applicable, on all data submitted.

11 CONSTRUCTION PROGRAM

- The Contractor shall provide a construction program and indicate the following milestone dates:
- Contract award;
- Notice to proceed with the fieldwork;
- Owner/Principal completion date; and
- Final completion date.

12 SCHEDULE OF QUANTITIES

A preliminary Schedule of Quantities (Appendix A) has been provided to allow material requirements to be gauged for the IWLTSF constructions. The Schedule of Quantities have not been calculated by a quantity surveyor and is provided for convenience only. The Contractor shall be responsible for independently determining quantities for the purpose of bidding the works.

Appendix A:
Schedule of Quantities

PROJECT : INTEGRATED WASTE LANDFORM, MT IDA PROJECT - GOLD

CLIENT : DELTA LITHIUM LIMITED (DLI)

LOCATION : MT IDA, via MENZIES WA

Date	18/12/2024
Job No	
File	
Subject	costing
Revision	0

SUBJECT : COSTING OF TAILINGS STORAGE CONSTRUCTION - STAGE 1 Internal Embankments and liner to RL 470.0 **mAHD)**

Item	Description	Unit	Quantity	Rate	Amount
1.00	**EARTHWORKS**				
1.01	Clearing tailings storage floor area	m^2	925,000		\$ -
1.02	Strip top soil from beneath waste dump area adjacent to TSF Stage 1	m^3	361,000		\$ -
1.03	Strip top soil from beneath underdrainage sump and pipework corridors	m^3	2,000		\$ -
1.04	Excavate for underdrains at internal embankent toe and to underdrainage sump	m^3	6,000		\$ -
1.05	Mine Waste to IWLTSF (estimated by Red Dirt Metals)	m^3	7,410,000		\$ -
1.06	Borrow, moisture condition, transport, place and compact Zone 1 (oxide mine waste/clay) over internal base of TSF (0.5 m thick)	m^3	78,000		\$ -
1.07	Excavate seepage cutoff	m^3	13,500		\$ -
1.08	Supply and install 1.5mm HDPE liner to underdrainage sump and upstream batters, including welds, anchoring, etc.	m^2	700		\$ -
1.09	Supply and install underdrainage collection pipes within TSF and outfall pipes (to return underdrainage water storage)	m	1,100		
1.10	Borrow, moisture condition, transport, place and compact Zone 1 fill to seepage cutoff	m^3	13,500		\$ -
1.11	Form and place cutoff to outfall pipes	no	2		\$ -
1.12	Backfill to underdrains	m^3	6,000		
1.13	Borrow, transport, and place waste rock (Zone 1) to internal perimeter embankment crest width 6 m for 12.5 m height	m^3	168,500		\$ -
1.14	Borrow, transport, and place cushion layer to decant and accessway (300 mm of 10 to 14 mm aggreate followed by 500 mm waste 100 to 250 mm)	m^3	4,800		\$ -
1.15	Borrow, transport, and place rockfill to decant accessway to 7.5 m above ground level	m^3	10,200		\$ -
1.16	Transport and place decant rockfill to 7.5 m above ground level	m^3	20,000		\$ -
1.17	Place gravel sheeting to internal perimeter embankment	m^2	13,200		\$ -
1.20	Excavate runoff collection drains around waste dump (by client)	lm	2,000		\$ -
1.21	Borehole Sealing (by client)	item	1		\$ -
1.22	Supply and install bottom 1.5mm HDPE liner over entire TSF footprint and upstream batters, including welds, anchoring, etc., up to 12.5 m above ground level.	m^2	700		\$ -
1.23	Supply and install 'Flownet' over HDPE lined TSF footprint	m^2	700		\$ -
1.24	Supply and install top geotextile (Bidim A64) over designated area of TSF footprint	m^2	700		\$ -
1.25	Supply and install ballast over geotextile (Bidim A64) over designated area of TSF footpri	m^2	700		\$ -
	STAGE 1 TOTAL				\$ -

PROJECT : INTEGRATED WASTE LANDFORM, MT IDA LITHIUM PROJECT

CLIENT : RED DIRT METALS

LOCATION : MT IDA, via MENZIES WA

SUBJECT : COSTING OF TAILINGS STORAGE CONSTRUCTION - STAGE 1 Internal Embankments and liner to RL 476.0 **mAHD)**

Date	9/12/2024
Job No	
File	
Subject	costing
Revision	A

Item	Description	Unit	Quantity	Rate	Amount
1.00	**EARTHWORKS**				
1.01	Clearing tailings storage floor area	m^2	300,000		$ -
1.02	Strip top soil from beneath waste dump area adjacent to TSF Stage 1	m^3	30,000		$ -
1.03	Strip top soil from beneath underdrainage sump and pipework corridors	m^3	2,000		$ -
1.04	Excavate for underdrains at internal embankent toe and to underdrainage sump	m^3	6,000		$ -
1.05	Mine Waste for downstream zone	m^3	805,200		$ -
1.06	Borrow, moisture condition, transport, place and compact Zone 1 (oxide mine waste/clay) over internal base of TSF (0.5 m thick)	m^3	77,500		$ -
1.07	Excavate seepage cutoff	m^3	13,500		$ -
1.08	Supply and install 1.5mm HDPE liner to underdrainage sump and upstream batters, including welds, anchoring, etc.	m^2	700		$ -
1.09	Supply and install underdrainage collection pipes within TSF and outfall pipes (to return underdrainage water storage)	m	1,100		
1.10	Borrow, moisture condition, transport, place and compact Zone 1 fill to seepage cutoff	m^3	13,500		$ -
1.11	Form and place cutoff to outfall pipes	no	2		$ -
1.12	Backfill to underdrains	m^3	6,000		
1.13	Borrow, transport, and place waste rock (Zone 1) to internal perimeter embankment crest width 6 m for 12.5 m height	m^3	168,500		$ -
1.14	Borrow, transport, and place cushion layer to decant and accessway (300 mm of 10 to 14 mm aggreate followed by 500 mm waste 100 to 250 mm)	m^3	2,184		$ -
1.15	Borrow, transport, and place rockfill to decant accessway	m^3	28,500		$ -
1.16	Transport and place decant rockfill	m^3	20,000		$ -
1.17	Place gravel sheeting to internal perimeter embankment	m^2	13,680		$ -
1.20	Excavate runoff collection drains around waste dump (by client)	lm	2,000		$ -
1.21	Borehole Sealing (by client)	item	1		$ -
1.22	Supply and install bottom 1.5mm HDPE liner over entire TSF footprint and upstream batters, including welds, anchoring, etc., up to 12.5 m above ground level.	m^2	224,000		$ -
1.23	Supply and install 'Flownet' over HDPE lined TSF footprint	m^2	224,000		$ -
1.24	Supply and install top geotextile (Bidim A64) over designated area of TSF footprint	m^2	224,000		$ -
1.25	Supply and install ballast over geotextile (Bidim A64) over designated area of TSF footpri	m^2	224,000		$ -
	STAGE 1 TOTAL				$ -

Appendix J:
Operations Manual – Process Plant Staff

18 December 2024

INTEGRATED WASTE LANDFORM TAILINGS STORAGE FACILITY (IWLTSF)

MT IDA PROJECT - GOLD

WESTERN AUSTRALIA

OPERATIONS MANUAL

PROCESS PLANT STAFF

Delta Lithium Limited

PER2023-0213AF Rev 1

TERMINOLOGY AND ABBREVIATIONS

The following terminology and abbreviations are defined as stated, unless otherwise indicated:

AEP	Annual Exceedance Probability
ANCOLD	Australian National Committee on Large Dams
BOM	Bureau of Meteorology
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety, previously referred to as DMP
DLI	Delta Lithium Limited
DMP	Department of Minerals and Petroleum
DSEP	Dam Safety Emergency Plan
IFD	Intensity Frequency Duration
IWLTSF	Integrated Waste Landform Tailings Storage Facility
LOM	Life of Mine
m/a	Metres per annum
m^3/d	Cubic meters per day
MIT	Mt Ida Project - Gold
Mm^3	Million cubic meters
Mt	Million tonnes
Mtpa	Million tons per annum
NAF	Non-Acid Forming
OD	Outside Diameter
Owner	DLI
RL	Relative Level
SG	Specific Gravity
t/m^3	Tonnes per cubic metre
TARP	Trigger Action Response Plan
TMMP	Tailings Management Master Plan
tpa	Tonnes per annum
tpd	Tonnes per day
TSF	Tailings Storage Facility
TSM	Tailings Storage Management

TABLE OF CONTENTS

TABLE

APPENDICES

1 INTRODUCTION

1.1 Summary

This document presents the details of the operating procedures for the Integrated Waste Landform Tailings Storage Facility (IWLTSF) at the Mt Ida Project - Gold (MIT) owned by Delta Lithium Limited (DLI). The project is located about 85 km northwest of Menzies and 200 km northwest of Kalgoorlie in the Goldfields region of WA.

The Operating Manuals for the IWLTSF describe the operating procedures recommended for the safe management and control of the IWLTSF. The provisions of the Operating Manuals must be strictly adhered to by DLI (Owner) and the storages must be constructed and operated strictly in accordance with the provisions of the Operations Manuals and in accordance with the design. The consultant involved in the design (CMW Geosciences Pty Limited – CMW) shall not be liable in any respect whatsoever for any damage to or failure in the operations of the tailings and water storages resulting from failure of the Owner, its servants or agents to comply with the provisions of the design and Operating Manuals for these facilities.

The Appendices referred to in this document comprise the following and are to be attached to this document by the Owner:

i) Appendix 1 Emergency Assembly Points

ii) Appendix 2 Regulatory Licence and Lease Conditions

iii) Appendix 3 Operations Manual Forms Process Plant Staff

1.2 IWLTSF Design

The IWLTSF has been designed to store a minimum of 4 Mt of tailings. At an estimated slurry dry density of 1.3 t/m^3, a storage volume of 3.48 Mm^3 the facility will have a storage capacities of 4.52 Mt which is sufficient to store the gold resource of 4 Mt.

The IWLTSF will comprise a tailings storage facility surrounded by the mine waste dump. It will be formed by the construction of two (2) zones within the waste dump. From the inside, the materials will comprise two zones nominated as 1 and 2. Zone 1 would typically consist of oxide mine waste, moisture conditioned and compacted 'clayey' material placed in discrete layers, nominally 300 mm thick, which will form the inner liner. This zone will be nominally 6 m wide with some possible variation in width dependent on the type of construction equipment that is used and any controlling safety criteria. The internal batter slope will be formed at 1:2.5 (V:H). The internal finished surface of Zone 1 has to be suitable to accept the placement of the 1 mm HDPE liner.

The next zone (Zone 2), nominally 30 m wide, supports Zone 1 and will comprise run of mine waste placed in 1 m lifts with a rock limit of 750 mm with sufficient fines to fill any voids. Zone 2 and general run of mine waste provide support for the overall structure.

The general run of mine waste will be constructed based on the adopted mining plan and waste dump configuration, with no particular controls provided by the IWLTSF, with the external batter slopes at a maximum of 1:3.0 (V:H).

The natural subgrade over the base of the facility, after topsoil and any unsuitable materials are removed, will be shaped to form a crossfall across the base to facilitate flows within the underdrainage system. A compacted layer of low permeability clayey material (Zone 1) will then be placed over the base of the IWLTSF prior to placement of the HDPE base liner.

Water will be removed from the facility and pumped back to the processing plant via a decant structure comprised of slotted concrete well liners with select filter rock surround. The recommended average water recovery should not be less than 83 tph.

1.3 Scope of the Operations Manual

The Operations Manual for Plant Staff 'this document' details the requirements for personnel who have the responsibility for day-to-day operation and maintenance of the IWLTSF.

The objectives of the day-to-day management for the IWLTSF are:

i) Ensuring the IWLTSF and all associated infrastructure are operated, maintained and monitored to achieve the design objectives.

ii) Ensuring the IWLTSF is operated in accordance with the design parameters that have been provided by the Owner for use in the design of the IWLTSF. Where changes in the parameters are proposed, the process plant management must advise the designers in order that the impact of the changes can be fully assessed; and

iii) Ensuring the facility is operated and maintained to remove water ponding against the upstream embankment.

This document also sets out the requirements for operating the IWLTSF including TSM aspects comprising:

i) Water recovery from the IWLTSF.

ii) Tailings placement/deposition.

iii) The routine daily inspections and monitoring.

iv) The objectives of the daily inspection and monitoring program.

1.4 Roles and Responsibilities

The individual responsibilities for the IWLTSF for this project are detailed in Table 1.

TABLE 1: INDIVIDUAL RESPONSIBILITIES

Staff Designation	Operation	Maintenance	Surveillance & Reporting	Emergency Response
General Manager	√	√	√	√
Process Plant Manager / Process Plant Superintendent	√	√	√	√
Process Plant Foreman	√	√	√	√
Operators	√	√	√	√
Maintenance Manager / Maintenance Superintendent (electrical, instrumentation, pumping and piping)		√		√
Mine Manager / Mine Superintendent (Earthworks)		√		√
Environmental Manager / Environmental Superintendent			√	√

TABLE 1: INDIVIDUAL RESPONSIBILITIES

Staff Designation	Operation	Maintenance	Surveillance & Reporting	Emergency Response
Security Manager / Security Superintendent				√
Emergency Response Team				√
Design Consultant			√	√

1.5 Operator Training

All operators of the IWLTSF and associated components and contractors working on the IWLTSF must complete the requisite training, competency testing and be aware of the emergency procedures prior to being allowed to work on the IWLTSF and associated components.

The Process Plant Manager is responsible for ensuring that the training, competency testing and emergency awareness of operators and contractors is completed.

Personnel inspecting the IWLTSF should be advised of the regulatory requirements for the facility as part of their induction and training. Copies of the regulatory Licence and/or Lease Conditions relevant to the IWLTSF are attached to this document in Appendix 2. The General Manager and Process Plant Manager / Process Plant Superintendent must insert these documents in Appendix 2 of this Operations Manual and must ensure that each time the regulatory conditions are changed (renewed, amended or updated), the documents are changed and the staff are advised of the changes and the training confirmation records updated accordingly.

2 GUIDELINES, CODES OF PRACTICE AND STANDARDS

The following Guidelines, Codes of Practice and Standards are relevant to the operation of the IWLTSF:

i) Australian National Committee on Large Dams (ANCOLD) document: 'Guidelines on Tailings Dams - Planning, Design, Construction, Operation and Closure' (2019).

ii) Department of Mines and Petroleum Western Australia (DMP), 'Code of Practice, Tailings Storage Facilities in Western Australia' (2013).

3 SUMMARY OF OPERATING PROCEDURES

3.1 IWLTSF

The following considerations have been incorporated into the design of the IWLTSF for MIT.

i) To optimise tailings storage capacity and reduce the risks associated with embankment stability and seepage, tailings will be deposited from the embankment and along the perimeter of the storage.

ii) Tailings deposition and beaching will be controlled such that the supernatant water is ponded away from the engineered embankment. Tailings will be deposited such that the in-situ densities within the stored tailings and the water return for reuse in the process plant is maximised.

iii) Tailings in the form of a slurry will be discharged subaerially (discharge exposed to air) and or sub-aqueously (discharge to slurry/water) depending on the slurry and water levels at the point of discharge from the upstream face of the main embankment. Tailings will be deposited in discrete layers from numerous spigot point discharges.

At the proposed start-up of the IWLTSF, tailings deposition will commence from the north-eastern embankment to fill the low-lying area. Deposition will then be extended along the southern and western embankments and ultimately move around the entire perimeter of the IWLTSF to raise the tailings beach and force the supernatant pond towards the rock filter decant. The discharge points must be regularly moved to ensure the even development of sloped tailings beaches. This deposition and water recovery regime will continue as the perimeter embankments are raised to the final crest level.

Depending on the decommissioning plan adopted for the IWLTSF, it may be necessary to alter the deposition philosophy near the end of the mine life. Appropriate procedures shall be developed if changes to deposition or freeboard criteria are required. If necessary, appropriate government authorities shall be advised of any changes, especially to freeboard criteria. As tailings deposition progresses, there may be a requirement for the deposition locations to be moved in order to maximise the utilisation of the tailings storage area.

Tailings discharge or spigotting is to be carried out such that the supernatant pond is maintained around the decant facility and associated pump at all times. The supernatant pond is to be maintained below the perimeter containment embankment and bunds at all times.

The IWLTSF has been sized to accommodate storm events. The IFD obtained from the BOM indicates the 1 in 100 AEP 72-hour storm is approximately 227 mm. Assuming the IWLTSF is to be operated such that the supernatant pond is maintained away from the perimeter embankment, then the minimum DEMIRS freeboard requirements comprise the total of the following:

i) Operational Freeboard (lowest embankment crest RL to the tailings beach) 300 mm.

ii) Beach Freeboard (tailings beach to the supernatant pond after the 1 in 100 AEP 72-hour storm) 200 mm.

iii) The 1 in 100 AEP 72-hour storm 227 mm on top of the normal operating supernatant pond.

The total, minimum freeboard, on top of the normal operating supernatant pond is therefore 0.5 m.

The height from the embankment crest at any stage of the IWLTSF operation, including construction periods, to the tailings solids and supernatant pond retained in the IWLTSF, will vary. At the completion of construction for each stage, the computed freeboard height (vertical distance from the embankment crest to the tailings solids and supernatant pond) will have to be determined.

It must be understood that:

i) Water recovery must be maximised at all times.

ii) The minimum freeboard requirement must be maintained at all times.

The tailings storage area will assume the form of a truncated prism with a depressed cone in the top surface.

Frequent inspections (a minimum of once per shift) should be made of the:

i) Tailings lines.

ii) Return water lines.

iii) Discharge points.

iv) Decant system.

v) The position of the supernatant pond in relation to the water recovery system.

vi) The perimeter containment embankment.

vii) HDPE liner integrity.

viii) The underdrainage system and underdrainage sump.

ix) Monitoring and instrumentation.

The embankments should be inspected once per day. If seepage has occurred, particular attention should be paid to the embankments in the vicinity of the seepage. Only by regular inspection and appropriate remedial action can the performance of the water return system be optimised and operational problems avoided.

Operation, safety and environmental aspects should be periodically reviewed during an inspection by a suitably experienced and qualified engineer. This inspection should be done at least every year.

The operational objectives of the design of the tailings storage located at MIT are:

i) Provide a safe, stable and erosion resistant landform.

ii) Providing return water to the plant.

iii) Maximising the in-situ dry density of the tailings which in turn maximises the storage capacity of the tailings facility.

iv) Minimise environmental impacts from the IWLTSF i.e. seepage etc.

3.2 Related Documents

This document will ultimately be part of the Tailings Management Master Plan (TMMP) and the related documents are:

i) IWLTSF Design Document.

ii) Operations Manual for Process Plant Management.

iii) Scope of Works for construction of Earthworks.

A plan showing the location of the Assembly Points in the event of an emergency is to be prepared by the Process Plant Management. This plan should be designated Figure 1 and placed behind the text of the report in Appendix 1.

Regulatory Licence and Lease Conditions are to be placed behind the text of the report in Appendix 2.

The forms which are relevant to this Operations Manual are provided in Appendix 3 and comprise the following templates:

i) Daily Inspection Log Sheet (OMPPS1).

ii) Operations Personnel Contact Details (OMPPS2).

iii) Training Confirmation Record (OMPPS3).

The content of these templates is considered to be the reasonable minimum to be used to monitor the performance of the IWLTSF. The content of the templates can be modified by the site management, if required, to meet any additional site-specific requirements.

4 OPERATING METHODOLOGY

4.1 Background to Tailings Deposition

The method of deposition of tailings into the IWLTSF is one of the major controlling factors to achieve or exceed the design requirements. The method of tailings deposition influences the in-situ dry density within the stored tailings and water return for reuse in the process plant.

It is essential that a detailed understanding of the various components of the tailings system is acquired to understand the tailings deposition. The tailings system components include:

i) Tailings pipeline from the process plant to the IWLTSF, including the associated valves in this pipeline which direct tailings to the various distribution points.

ii) Spigot operation and the spigotting (tailings deposition) process.

iii) Flushing procedures for the tailings pipeline(s) and spigots.

4.2 Tailings Pipeline

For MIT tailings are transported from the process plant to the IWLTSF via a large diameter HDPE pipe (NB approximately OD … mm PN …) to the embankment where the tailings are to be discharged. This pipeline is contained within a system of bunds to enable any spillage or leakage to be contained. An access track is located outside the bunds to facilitate pipeline inspections and maintenance. This track extends from the process plant to the embankment of the IWLTSF and onto the crest of the embankment.

At the crest of the IWLTSF embankment, the pipe divides via a manifold into two distribution lines to distribute the tailings to the active deposition points. The distribution lines are known as the A and B lines. The manifold also provides for flushing capabilities for water sourced from the return water line from the decant facility to the process plant.

The tailings distribution lines comprise lengths of welded HDPE pipe (OD … mm PN …).

Teed off-takes or spigots are to be located at 40 m intervals in the discharge area on the embankment.

4.2.1 Spigotting Process

Tailings are deposited subaerially depending on the slurry water level within the IWLTSF at the time of discharge. The tailings should be deposited at a low velocity from numerous spigot discharge points. Deposition should occur for a period of two to three days from each group of spigots. Each spigot comprises a DN …. mm hose with clamp to shut off the flow.

The design and operation of the pumping and piping system will dictate the number of spigots which can be opened at any one time. Ideally, tailings deposition should be from multiple spigot points. Deposition from a single point discharge is not recommended.

As the IWLTSF is HDPE-lined on the upstream slope of perimeter embankment and on the storage area, care should be taken to ensure that the tailings are not discharged so as to damage the earthworks or allow tailings slurry flow to erode the perimeter containment bunds. Conductor pipes (slotted) can be utilised to ensure the tailings are deposited away from the toe of the embankment.

4.2.2 Tailings Line Flushing

At the completion of the sequential deposition on each embankment and following the changeover to the alternative embankment, the inoperative tailings line should be flushed with water until it is clean. The flushing operation will be supervised by the Process Plant Foreman.

4.3 Water Management

4.3.1 Decant Operation

The IWLTSF is provided with a decant pump, located within slotted concrete well liners with select filter rockfill surround, which removes supernatant water and discharges that water directly to the process water pond in the process plant. There is a trade-off between the size of the decant pond, the clarity of the supernatant water and evaporation losses. Factors to be considered in the management of the decant operation are:

i) Little or no pond around the decant facility is likely to produce turbid or dirty water in the water return.

ii) A large pond around the decant will produce clear water but evaporation losses from it will be high.

iii) The water pond should not be so large that the storm freeboard volume is compromised.

The location of the decant pond will be controlled by the tailings discharge sequence. The process of tailings deposition is to ensure that the pond is positioned around the decant facility and it is maintained in that position. The pond is positioned by altering the location of the deposition point around the perimeter of the storage, as appropriate.

During the initial start-up, a temporary pump may be required until water can enter the decant structure.

4.3.2 Water Recovery

The pond around the decant facility should be maintained at the smallest practical operational size to maximise water return to the plant and allow the tailings beaches to drain, dry and desiccate.

The size of the pond will be largely governed by the operational requirements for maintaining some water cover and the efficiency of the decant system in removing water from the tailings storage. Other controlling factors will be:

i) Evaporation from the surface of the pond.

ii) Variations to the input of tailings slurry (percent solids).

iii) Rainfall events.

4.3.3 Storm Events

The IWLTSF has been sized to accommodate storm events and the minimum total freeboard comprising the operational freeboard and storm freeboard for the IWLTSF is 0.8 m.

The vertical distance between the embankment crest and the adjacent deposited tailings beach or standing water level which corresponds with this level will have to be determined, after construction for each embankment crest level.

Water recovery must be maximised at all times.

The minimum freeboard requirement must be maintained at all times.

4.3.4 Underdrainage System

The IWLTSF is provided with an underdrainage system over an HDPE basin liner. The underdrainage system comprises a Flownet over the entire IWLTSF basin. The Flownet discharges to a perimeter drain at the perimeter embankment toe. Underdrainage water flows under gravity to outfall pipework and hence into a liner downstream sump. The following should be noted regarding operation of the underdrainage system.

- The value at the underdrainage outfall to the lined sump should be left open. The valve should only be closed to allow sump and pump maintenance.
- The lined sump should have a minimum freeboard of 0.5 m.
- The pump at the lined sump will deliver underdrainage water back into the IWLTSF and hence back to the plant. Alternatively water can be pumped directly back to the process water dam at the plant.
- The lined sump should be inspected each shift to ensure the pump is operational and the underdrainage outfall is flowing (i.e. note water flow rate and water clarity).

4.4 Inspections

A minimum of two (2) inspections must be carried out on each day, one during the day shift and one during the night shift. Inspections must be executed by trained staff, namely the Process Plant Foreman on each shift or by a designated trained operator. The date and time of each inspection is to be entered into the Process Plant Foreman's logbook and is to be signed by the person allocated to undertake the inspection on that shift to ensure the requirements have been undertaken. The Daily Inspections must cover the following:

i) The pipelines (tailings delivery line and water return line) to and from the tailings storage facility.
ii) Bunding arrangements.
iii) Leak detection.
iv) Pumps.
v) Spigots and valves.
vi) Spigotting and deposition.
vii) Location and size of the supernatant water pond.
viii) The decant and decant pump.
ix) The underdrainage sump and pump.
x) The embankment crest, upstream and downstream face.
xi) Seepage from the embankment toe, if any.
xii) The general integrity of the embankment i.e. any new cracking, any new seepage (daily).
xiii) Any changes to existing cracking or seepage.
xiv) Process Water Pond.

Any leaks or failures of the tailings pipeline, damage to the bunds or HDPE liner in the underdrainage sump or process water dam in the plant or abnormally high water levels in the pond must be immediately reported to the following personnel or project equivalents, as appropriate, and an incident report completed:

i) Maintenance Manager.
ii) Process Plant Manager/Process Plant Superintendent.
iii) Environmental Manager/Environmental Superintendent.

4.4.1 Tailings and Return Water System

All tailings lines and water return lines should be located in bunded corridors. The tailings lines, particularly on the embankment crests of the IWLTSF, are sensitive to temperature and the expansion and contraction of this line can cause leaks and in extreme situations, failure of the pipeline.

The underdrainage and process water ponds must also be inspected to ensure that the water from the IWLTSF water return pipes is clear and the level of the water in the pond is at or below the design level. High water levels, above the design water level, must be reported. The HDPE liner to the underdrainage and process water pond is also susceptible to damage from animals. Any damage noted during the inspection must immediately be reported to the personnel listed in Section 4.4 (Maintenance Manager, Process Plant Manager/Process Plant Superintendent and Environmental Manager/Environmental Superintendent) and an incident report completed.

4.4.2 Decant System

The position and size of the pond in relation to the decant facility must be inspected at least once per shift. Any abnormalities must be immediately reported to the maintenance and process plant personnel.

4.4.3 Embankment

As part of each inspection of the IWLTSF, the containment embankment, including berms and batter slopes, must be visually assessed. The presence of any new cracking or other features such as seepage, embankment erosion or scour (caused by tailings deposition or rainfall runoff) or any other obvious changes to the physical state of the embankment since the previous inspection, must be entered into the Process Plant Foreman's logbook and immediately reported to the following personnel:

i) Maintenance Manager.

ii) Process Plant Manager/Process Plant Superintendent.

iii) Environmental Manager/Environmental Superintendent.

iv) Design Consultant.

4.4.4 Seepage

Monitoring bores are installed adjacent to the IWLTSF to monitor groundwater levels and quality. The integrity of these bores must be routinely checked to ensure the bores remain intact and are not damaged. It is the responsibility of the Environmental staff to measure groundwater levels on a monthly basis and collect water samples for analysis on a quarterly basis.

4.4.5 Instrumentation

The instrumentation and monitoring bores installed into embankment and close to the IWLTSF must be inspected for damage. Any damage must be reported to the following personnel:

i) Maintenance Manager.

ii) Process Plant Manager/Process Plant Superintendent.

iii) Environmental Manager/Environmental Superintendent.

4.5 Warning Signs and Fencing

Warning signs are recommended at all entrances to the facility. The IWLTSF may require fencing to prevent trespass by stocks, if any.

Fencings and warning signs must be checked daily, and any observed damage must be immediately reported to the relevant personnel or project equivalents, as appropriate, and an incident report completed.

5 EMERGENCY ACTION PLAN

5.1 Response Actions

In the event of an emergency, the site emergency response team must immediately be notified and advised of the nature of the emergency to enable the appropriate emergency action plan to be implemented. The site emergency response plan contains the details presented in the following sections such that response activities are coordinated with operations personnel.

At the time of the emergency, the Process Plant Foreman or his designated (trained operator) representative is to ensure that:

i) All personnel and Contractors who were or are working in or around the location of the emergency are accounted for.

ii) Personnel Contact Details are provided on form OMPPS2 appended to this document. This form must be reviewed quarterly as a minimum and must be updated immediately in the event of personnel leaving or joining the operation.

iii) All mine-based personnel listed in Table 1 are immediately contacted and advised of the nature of the emergency and any assistance required is requested.

All personnel who are working in the vicinity of the emergency are expected to be present at the muster points and are expected to be aware of other assembly points around the IWLTSF and the relevant reporting procedures. Emergency assembly points are shown on Figure … in Appendix 1 of this document.

A trigger action response plan (TARP) will be developed to provide further guidance on actions to be taken relating to operation of the IWLTSF (refer to Appendix 4). The TARP must be linked with actions outlined in the Dam Safety Emergency Plan (DSEP, refer to Appendix 5).

5.2 Tailings Storage

The embankment has been designed with adequate factors of safety against failure under normal operating and seismic load conditions, appropriate for the location of the IWLTSF.

Normal operating conditions refers to the tailings surface and surface of the supernatant water pond being within the freeboard requirements.

The probability of embankment failure during normal operations is very low, given that:

i) The embankment construction has been or should have been carried out in accordance with the design.

ii) The implementation of the tailings operation methodology (Section 2), including the routine inspections and maintenance practices are adhered to as set out in the Operations Manual.

However, in the unlikely event of embankment failure, the flow of tailings from the storage will be controlled by the degree of saturation of the tailings at the time of failure.

Action to control a small-scale embankment failure and limit environmental damage would include:

i) Assessing the requirement to shut down the process plant or reduce process plant throughput.

ii) Diversion of tailings deposition to areas not affected by the small-scale embankment failure.

iii) Construction of bunds by earthmoving equipment to divert and contain the tailings.

iv) Contacting a suitably qualified geotechnical organisation for technical assistance.

v) Deployment of pumps to recover tailings water as appropriate and return it either to the IWLTSF if structurally sound, or to the plant water storage facilities if evaporation and/or dilution is impractical.

vi) Undertaking a thorough inspection of the area with or without a specialist, depending on the scale of the failure, prior to the commencement of any repairs.

vii) Undertaking remedial and repair work of the damaged embankment or affected area.

viii) Clean up of tailings as soon as practicable after embankment repairs have been completed and the storage is considered in a safe condition.

ix) Preparing an incident report, detailing all factors prior to the incident and the situation after clean-up. The report should identify causes of the problem and what actions will be taken to prevent a similar occurrence. This report should detail the ongoing monitoring program to fully assess the impact of the incident.

x) Advising all appropriate government departments as necessary of the incident, reviewing the conditions of the operating licence and lease conditions to ensure that the timing of reports and content of reports meets the regulatory requirements.

Action to control a large-scale embankment failure and to limit environmental damage would include:

i) Shut down of the process plant.

ii) Construction of bunds by earthmoving equipment to divert and contain the tailings.

iii) Contacting a suitably qualified geotechnical organisation for technical assistance.

iv) Advising the relevant regulatory authorities.

v) Deployment of pumps to recover tailings water and returning it to the IWLTSF if structurally sound or to the plant water storage facilities if evaporation and/or dilution is impractical.

vi) Undertaking a thorough inspection of the area with the assistance of a geotechnical specialist prior to the commencement of any repairs.

vii) Repairing the damaged embankment.

viii) Cleaning up of tailings as soon as practicable after the embankment repairs have been completed.

ix) Preparing an incident report, detailing all factors prior to the incident and the situation after clean-up. The report should identify causes of the problem and what actions will be taken to prevent a similar occurrence. This report should detail the ongoing monitoring program to fully assess the impact of the incident.

x) Advising all appropriate regulatory authorities as necessary of the incident.

xi) Reviewing conditions of any licence or lease conditions in respect of the timing of advising the regulatory authorities and the contents of that notification (reporting criteria).

It must be stressed however, that the safe operation of the IWLTSF relies upon the implementation of operational procedures which comprise tailings deposition, decant operation and routine inspections and maintenance, as set out in the Operations Manual to minimise the potential for a catastrophic event such as a failed embankment.

5.3 Tailings Lines and Return Water Lines

The tailings lines from the process plant to the tailings storage and the return water lines from the decant facilities to the process water dam are to be located inside bunded, open trenches to contain any spillage of materials resulting from leaks or burst pipes during operation. In the event of pipeline failure, the Process Plant Superintendent is to be notified and the affected pipeline is to be shut down until repaired and the spilled materials collected and/or pumped, as appropriate, and deposited in the IWLTSF.

5.4 Process Water Dam

The decant pump is operated manually and run at all times. The pump is only switched off:

i) During plant shutdowns or maintenance periods.

ii) When dirty water is pumped into the process water tank or when embankment construction is scheduled in accordance with the design.

Alternative pumping equipment and pump locations may be required during periods of pump maintenance or when embankment construction work is being undertaken.

6 INCIDENT REPORTING

The objective of regular inspections by the designated process plant staff and monitoring by the environmental staff is to identify any problems prior to them causing a major impact on the operation or integrity of the IWLTSF and associated infrastructure.

The inspections may result in the identification of an event that may require reporting to senior staff and in some cases to relevant regulatory authorities.

Appendix 1:
Emergency Assembly Points

Appendix 2: Regulatory Licence and Lease Conditions

Appendix 3:
Operations Manual Forms
Process Plant Staff

PROJECT : **INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT : **DELTA LITHIUM LIMITED (DLI)**

LOCATION : **MT IDA PROJECT - GOLD, WA**

SUBJECT : **DAILY INSPECTION LOG SHEET** **OMPPS1**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AE
Subject	Operations Manual
Revision	1

Date:
Shift Supervisor:
Time:
Inspection by:
Employee Number:
Shift Number:
Verified by:

Item	**Criteria**	**Operating/Defective YES/NO**		**Comments**
		N/S	**D/S**	
Roadways	Condition		Y/N	
Downstream areas	Any seepage/wet areas		Y/N	
	Any spillages		Y/N	
Pipelines	Leaks?	Y/N	Y/N	
Decant	Pumps operating	Y/N	Y/N	
	Discharge water clarity	Y/N	Y/N	
Tailings discharge	Location, no. of spigots?	Y/N	Y/N	
Freeboard	Pond position		Y/N	
	Depth (estimate)		Y/N	
	Operational freeboard (at wall ≥1.0 m) (Estimate)		Y/N	
Embankments	Any distress? Any cracking? Any Slumping?		Y/N	
Fauna	Any deaths		Y/N	
Flora	Any new distress		Y/N	
Monitoring	Damage to instruments		Y/N	

NOTES :
Please provide any comments or notes relating to the tailings storage facility

Appendix 4:
Trigger Action Response Plan (TARP)

	If any of the below triggers are exceeded please stop the task and contact supervisor immediately	TRIGGER ACTION RESPONSE PLAN - IWLTSF The Operations, Geotechnical or Management team may escalate the TARP levels based on any observed monitoring data beyond what is explicitly described in this TARP				
	Trigger	Normal State	Level 1 Trigger	Level 2 Trigger (Reportable incident)	Level 3 Trigger Reportable Incident-activate ERP	
1	Embankment Walls					
1.1	Crack on embankment crest and accessible benches (visual)**	No cracks or deformation that pose a risk	Visible hairline cracks observed	Minor crack or bulge formed (100mm width)	Localised failure or major crack or bulge formed (>100mm width)	
1.2	Pond freeboard*	Freeboard is more than 0.5 m.	Freeboard is equal or less than 0.5 m	Freeboard is equal or less than 0.3 m	Imminent overtopping	
1.3	Seepage or Water Emergence**	No change to current extent of water emergence		Water emergence flow rate increases and or areas of water emergence increasing	Water emergence draws fines - signs of piping	
1.4	Liner Integrity	No visible damage (i.e. punctures etc)	Minor repairable damage (i.e. punctures etc)	Significant damage which could compromise containment (e.g. large tares)	Seepage flow due to significant liner damage	
1.5	Survey prisms*	No movement detected	Movement (perpendicular to embankment) exceeding 25mm/week or 100mm cumulative	Movement (perpendicular to embankment) exceeding 50mm/week or 200mm cumulative		Deformation based on DE review
2	Return water pond / Underdrainage Sump					
2.1	Pond freeboard*	Freeboard is more than 0.5 m.	Freeboard is equal or less than 0.5 m	Freeboard is equal or less than 0.3 m	Imminent overtopping	
2.2	Crack (visual)**	No cracks or deformation that pose a risk	Visible hairline cracks observed	Minor crack or bulge formed (100mm width)	Localised failure or major crack or bulge formed (>100mm width)	
3	General					
3.1	Rainfall*	Normal rainfall	Rainfall less than 1:100 yr. 72 hr event (227 mm)	Rainfall equal to 1:100 yr. 72 hr event (227 mm)-Significant pond on TSF		Rainfall above 1:100 yr. 72 hr event (227 mm)(PMP 4 hr. event, 630 mm) - Significant pond on TSF
3.2	Seismic event*	No seismic activity detected	Vibrations from pit blasts exceed 50 mm/s	Earthquake (ML < 5 at > 40 km or ML < 6 at > 200 km)		Earthquake (ML > 5 at < 60 km or ML > 6 at < 200 km)
	Responsible party	Response (Normal)	Level 1 Response	Level 2 Response	Level 3 Response Reportable Incident-activate ERP	
	Process Supervisor	Maintain routine/normal visual checks in the field - daily. Update daily conditions at TSF scheduled daily meetings.	Complete a field inspection Monitor crack widths and extent daily Carry out daily inspections and start specific monitoring in risk area Notify Process Superintendent, PM and DE Update daily conditions at TSF scheduled daily meetings.	Review instrumentation data. Complete full field inspection If warning is real, advise DE, PSuper and PM and provide field inspection information Raise awareness of change in embankment issues with relevant stakeholders. Assess requirement to additional decant pumps in TSF	Intensify monitoring frequency and visual inspections Increase frequency of information update Act on recommendation of DE Assess requirement to additional decant pumps in TSF	
	Design Engineer		Recommend monitoring regime Evaluate findings from field inspection Consider causes and impacts Review analysis Consider possible remedial actions and go forward plan	Review and comment on monitoring data Evaluate findings from field inspection Prepare and recommend remedial action Review data, request specific element to be inspect by Process Supervisor and agree remedial plans with Process Superintendent Consider possible remedial actions and go forward plan	Review and comment on monitoring data Prepare Response and Mitigation plan Update remedial action plans Site visit. Site to monitor and oversee remedial action plan prior to Design Engineer arriving on site	
	Processing Superintendent	Be available for consultation	Adjust operation plan if necessary Notify Process Manager Install monitoring systems (e.g. piezometers) and carry out monitoring, data collection if seepage observed	Isolation of affected area above and below potential failure zone. Inform/update to Design Engineer, follow the recommendations from Design Engineer Inform/update to Processing Manager and General Manager Follow recommendations from geotechnical engineer on duty.	Secure area at risk to prevent entry Adjust or cease tailings deposition Inform/update to Design Engineer, follow the recommendations from Design Engineer Inform/update to Processing Manager, follow the recommendations from Processing Manager Inform/update General Manager.	Ensure implementation and monitor progress to Red Dirt Metals Corporate recommendations.
	Processing Manager			Notify General Manager as applicable	Follow Design Engineer direction and liaise when required with General Manager	Evacuate personnel and equipment from TSF if required Ensure all personnel are aware and confirm to evacuation exclusion zone.
	Mining Manager			To be notified as applicable	Routine report to General Manager Follow Design Engineer and General Manager recommendations	Evacuate personnel and equipment from affected area. Ensure TSF evacuation and access control are implemented. Routine report to General Manager
	General Manager			To be notified as applicable	Routine report to Red Dirt Metals Corporate	Ensure TSF evacuation and access control are implemented. Routine report to Gold Fields Corporate

Responsible for:
* QA and TSF engineers, and/or survey team
** QA, TSF engineers TSF Construction team
*** QA, TSF engineers, Concentrator TSF team

Appendix 5:
Dam Safety Emergency Plan (DSEP)

DAM SAFETY EMERGENCY PLAN (DSEP)

MT IDA PROJECT - GOLD

WESTERN AUSTRALIA

Delta Lithium Limited

PER2024-0325AD Rev 1

1 INTRODUCTION

This Dam Safety Emergency Plan (DSEP) applies to the Integrated Waste Landform Tailings Storage Facility (IWLTSF) at the Mt Ida Project - Gold (MIT) owned by Delta Lithium Limited (DLI). This is a live document, which version is presented as part of the design of staged embankment raises on the facility. The DSEP should be reviewed at least annually.

2 RESPONSIBILITIES

Operational responsibilities for the IWLTSF have been allocated to:

- Tailings deposition and decant operation: Process Plant Manager / Process Plant Supervisor
- Routine inspections and monitoring: Process Plant Foreman
- Surveillance and safety reporting: CMW or an independent 3rd Party
- Routine maintenance: DLI Maintenance Manager / Maintenance Superintendent

An emergency response would typically be initiated by the Process Plant Manager or Process Plant Supervisor and the emergency coordinated by a delegated Emergency Services Coordinator.

3 EMERGENCY IDENTIFICATION, EVALUATION & CLASSIFICATION

The IWLTSF has been designed with an adequate factor of safety against failure but unpredictable events due to nature or human intervention may compromise the integrity of the facility. For this reason, a matrix of responses is required to be actioned should such an event occur. To assist with this several levels of alert have been provided where a different level of awareness and notification is required.

3.1 Emergency Action Plans

One alert level and two levels of action have been identified:

Level 1	**Alert Status (early indications)**
Level 2	**Damage Apparent (possible impending failure)**
Level 3	**Catastrophic – Dam Failure is or has occurred**

Procedures have been identified for each level of emergency in Figures C1, C2 and C3 (at the back of this document).

3.2 Reporting Procedures

3.2.1 Level 1 ~ Alert

Any unusual behaviour in the operation of the facility should always be evaluated. The following events fall into this category:

- New seepage is occurring from the embankment.
- New wet soft areas have developed on the embankment.
- Minor cracking on the crest or batter slopes of the embankment.
- Movement readings indicate a significant increase in movement (refer TARP document).

- Lack of freeboard on IWLTSF (i.e. operational freeboard =/<0.3 m).

If any of the above are observed, immediate action should be taken in accordance with the Level 1 Action Plan (Figure C1).

3.2.2 Level 2 ~ Damage Apparent

The advancement from a Level 1 to a Level 2 indicates the dam is suffering some distress. Care should be taken not to be complacent in identifying a potential Level 2 event, since it is possible that a Level 2 situation can progress to a Level 3 in a short period of time where it would be impossible to prevent an incident.

In this category damage is already occurring, or has occurred, and there is potential for damage to a section of the dam to occur (partial dam weakening). The following are indicative of a Level 2 category:

- Sudden increase in the volume of seepage flow, erosion is noted.
- Flowing seepage water noted from upper sections of the embankment.
- Seepage water is cloudy or is discoloured, tailings observed in the water (indicating possible internal piping).
- Localised slumping is evident of the embankment crest or batter slopes.
- Sinkholes or other movements occur in deposited tailings.
- Discontinuity of alignment of dam crest or profile is noted in excess of 100mm.
- Collected rainfall is in danger of overtopping the dam, or significant overtopping of the dam is occurring from wave action and/or wind set up.

If any of the above take place immediate action is required in accordance with Level 2 Action Plan (Figure A2). The undertaking of any repair or remedial works shall only be initiated if it is SAFE to do so especially if heavy equipment is to be used. Keep clear unless absolutely necessary.

Restrict access to IWLTSF, notify downstream personnel (i.e. at the plant), close potentially affected roads, advise government agencies and design consultant.

3.2.3 Level 3 ~ Embankment Failure or Break

This level of emergency is called for when one or more of the following has occurred, access to be limited:

- Embankment collapse;
- Breach of embankment is starting to occur, resulting in loss of tailings or floodwater;
- Overtopping and/or erosion of the embankment;
- Outflow of tailings and/or rainwater;
- Mobilisation and outflow of tailings due to liquefaction by earthquake.

Actions must be taken immediately in accordance with Level 3 Action Plan (Plate A3) including advising downstream personnel, close roads, advise design consultants, government agencies. Appoint an Emergency Services Coordinator. Restrict access to the dam and priorities those who enter the area, set up road blocks to IWLTSF area. Enter with extreme care and initiate hazard initiatives and management plan.

4 NOTIFICATION

As detailed above, notification of an emergency situation to relevant authorities and organisations is the responsibility of the Process Plant Manager. The contact details of all individuals and organisations are maintained in the site emergency management plan.

- Process Plant Manager / Process Plant Supervisor – DLI
- Process Plant Foreman – DLI
- Regional Inspector of Mines DEMIRS, DWER
- CMW Geosciences Pty Limited (Perth Office) or Dams Safety Adviser

5 ACCESS AND COMMUNICATIONS

Access to IWLTSF is from the plant site which is located to the west of the facility. The mine operates an extensive two-way radio and an internal phone system.

6 INUNDATION

Based on the analyses performed as part of the IWLTSF design, a dam break could reach the pits to the southwest of the IWLTSF but is not likely to reach the plant site. A 'worst case' dam break involving tailings and storm water is likely to flow the north away from the pit and plant areas.

The following consequences of a dam break are considered most likely:

- Loss of human life is possible although not expected. There is potential for loss of life of mining personnel visiting the IWLTSF. The population at risk (PAR) is expected to be low (<1).
- Environmental impact with the breach being expected to flow towards the east and north, resulting in the contamination of soils and vegetation, requiring environmental 'clean-up'.
- Economic loss due to mine and plant shutdown, production loss, and repairs of damaged section of IWLTSF and local access roads.

A preliminary inundation plan is shown below.

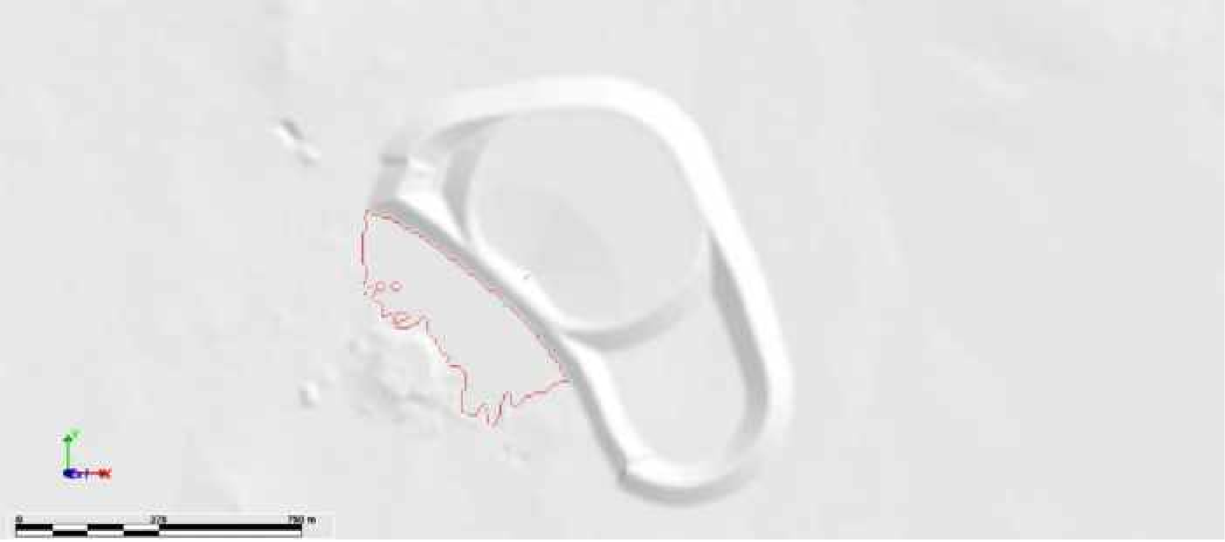


Figure 1: Inundation Plan

7 PREVENTATIVE ACTIONS

Possible preventative actions for various trigger levels are provided in Table 1 below.

TABLE 1: PREVENTATIVE ACTIONS

Trigger Level	Issue	Actions
1	• New seepage is occurring from the embankment	• Monitor decant pond level and extent on IWLTSF • Reduce decant water pond, as appropriate • Monitor seepage for flow and turbidity
	• Minor cracking of embankment	• Monitor cracks for additional movement; Escalate to Level 2 if movement continues
	• Lack of freeboard	• Reduce decant water pond level
2	• Sudden increase in seepage, turbid seepage occurring from the embankment	• Monitor decant pond level and extent on IWLTSF • Reduce decant water pond, as appropriate • Monitor seepage for flow and turbidity
	• Slumping of embankment (sinkholes etc)	• Buttress the embankment downstream of the slump; Escalate to Level 3 if movement continues
	• Imminent overtopping of embankment	• Reduce decant water pond level on facility; Escalate to Level 3 if pumps etc can't cope (i.e. level continues to rise)
		All of the above: notification of personnel from downstream (i.e. plant)
3	• Embankment collapsing • overtopping of embankment	• Evacuation of personnel from downstream of IWLTSF and restrict access to IWLTSF

The following completes the DSEP:

- Dam location and description summary
- Inundation plan

IWLTSF4 – Dam Safety Plan – Summary Information

Location:	Mt Ida Project - Gold
	IWLTSF approx. centre at 6,778,750 m N and 253,950 m E, MGA Zone 51J

Description:

The IWLTSF has been designed to store a minimum of 4 Mt of tailings. At an estimated slurry dry density of 1.3 t/m^3, a storage volume of 3.48 Mm^3 the facility will have a storage capacities of 4.52 Mt which is sufficient to store the gold resource of 4 Mt.

The IWLTSF will comprise a tailings storage facility surrounded by the mine waste dump. It will be formed by the construction of two (2) zones within the waste dump. From the inside, the materials will comprise two zones nominated as 1 and 2. Zone 1 would typically consist of oxide mine waste, moisture conditioned and compacted 'clayey' material placed in discrete layers, nominally 300 mm thick, which will form the inner liner. Zone 2 will be nominally 30 m wide, supports Zone 1 and will comprise run of mine waste placed in 1 m lifts with a rock limit of 750 mm with sufficient fines to fill any voids.

The natural subgrade over the base of the facility, after topsoil and any unsuitable materials are removed, will be shaped to form a crossfall across the base to facilitate flows within the underdrainage system. A compacted layer of low permeability clayey material (Zone 1) will then be placed over the base of the IWLTSF prior to placement of the HDPE base liner.

Water will be removed from the facility and pumped back to the processing plant via a decant structure comprised of slotted concrete well liners with select filter rock surround. The recommended average water recovery should not be less than 83 tph.

Spillway: No spillway

Catchment Area: 29 ha (approx.)

Consequence Category: High C

Alert Levels:

Level 1	Alert Status (early indications)
Level 2	Damage Apparent (possible impending failure)
Level 3	Catastrophic – Dam Failure is or has occurred

Notification Protocols: Refer to flowcharts at front of DSEP

Flood Plain Name: Not applicable

Consequences of Dam Failure:

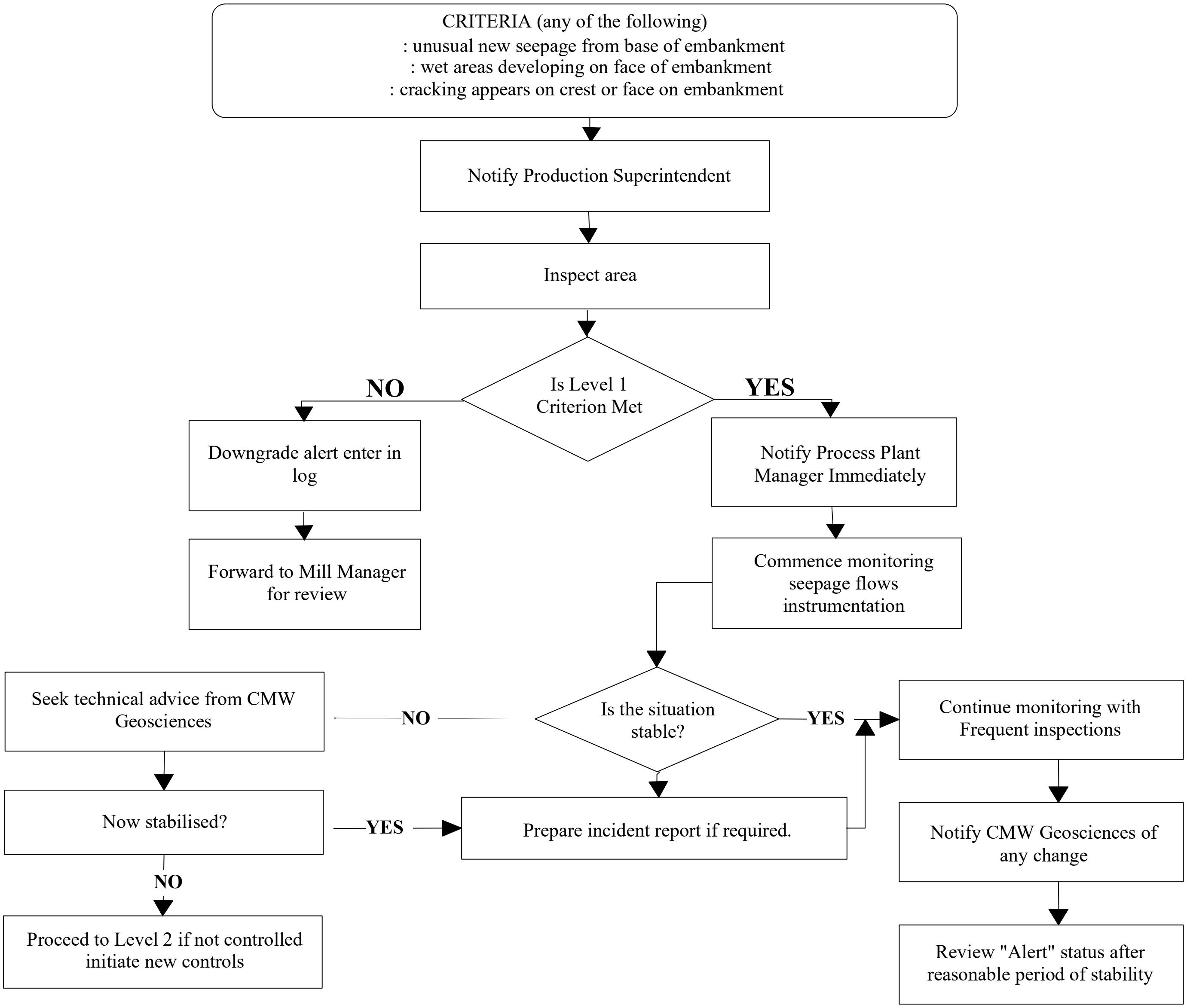
A 'worst case' dam break involving tailings and storm water is likely to flow the north away from the pit and plant areas.

LEVEL 1 - ACTION PLAN
STATUS "ALERT"

Process Plant Manager: **04.. … …**

Construction Manager: **04.. … …**

CMW Geosciences: **(08) 6555 4920**

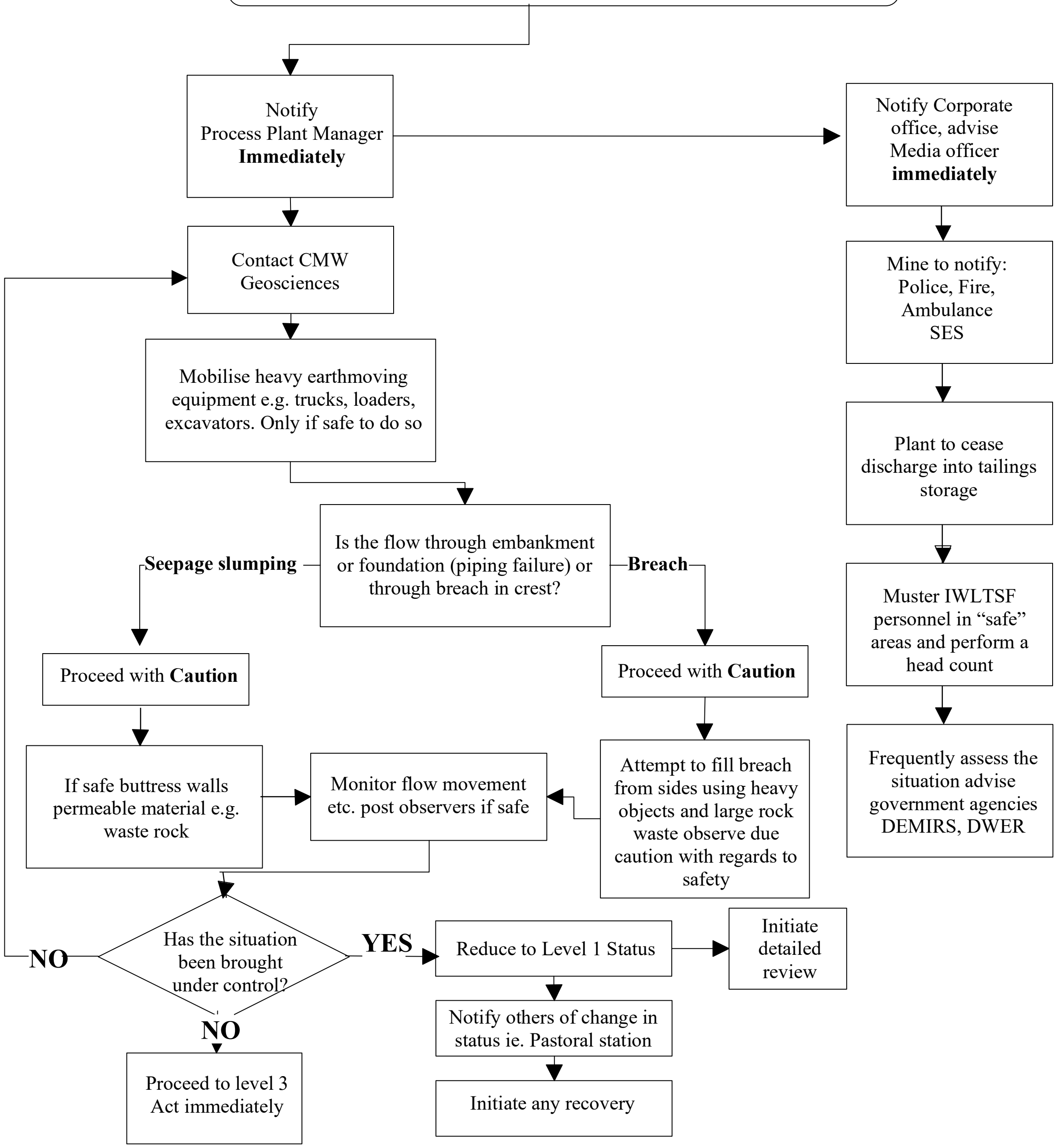


LEVEL 2 – DAM SAFETY EMERGENCY PLAN
STATUS: "DAMAGE HAS OCCURRED"

Process Plant Manager:	**04.. … …**
Construction Manager:	**04.. … …**
SES (Generic):	**132 500**
CMW Geosciences:	**(08) 6555 4920**

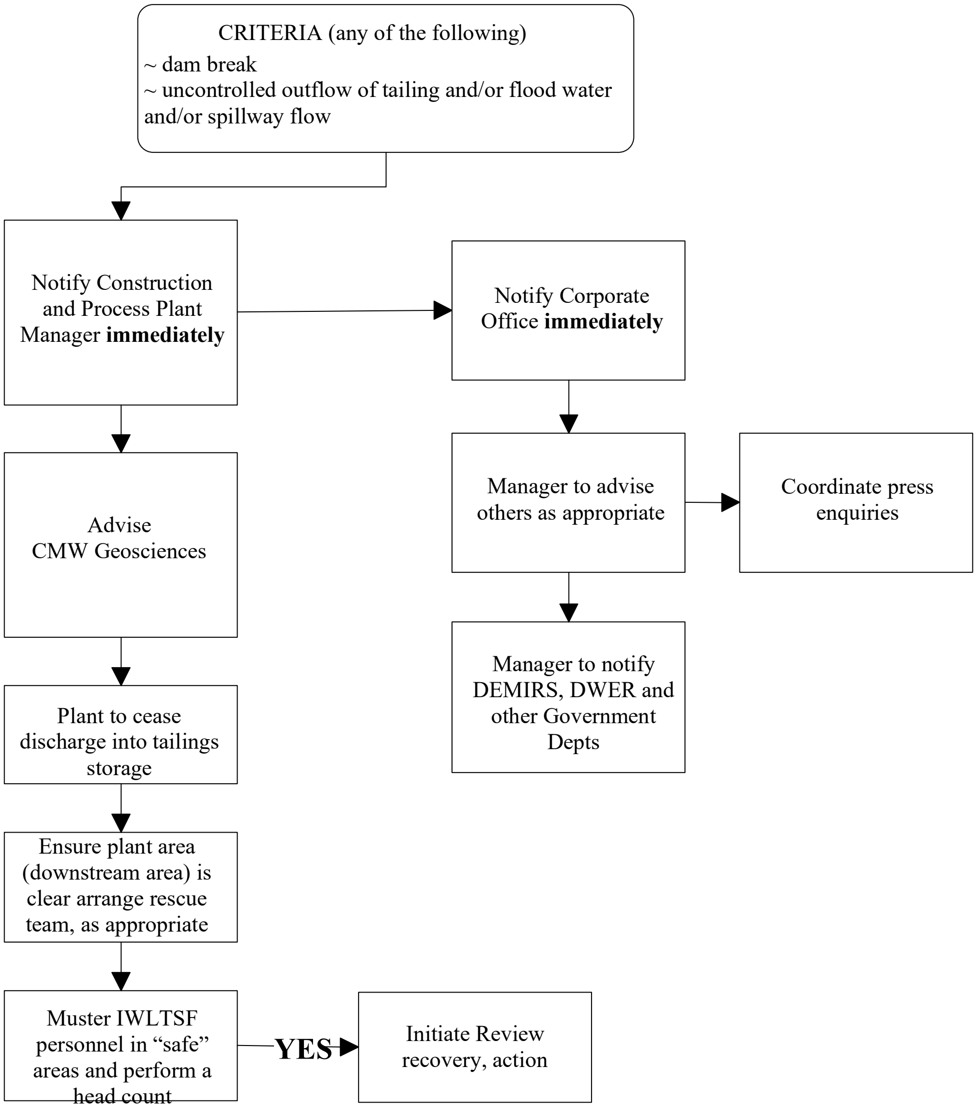
CRITERIA (any of the following)

: erosion hole formed water
: leakage >50 litres per second
: overtopping of dam imminent, or waves overtopping
: breach of dam imminent
: increasing seepage flow rate, turbid flows
: slumps on dam face
: discontinuity of dam alignment



LEVEL 3 - ACTION PLAN
STATUS: “DAM FAILURE”

Process Plant Manager:	**04.. … …**
Construction Manager:	**04.. … …**
SES (Generic):	**132 500**
CMW Geosciences:	**(08) 6555 4920 / 0499 311 109**



5.0 EMERGENCY CONTACT NUMBERS as at 2024

Delta Lithium Limited (DLI)
Process Plant Manager
Currently: …
Mobile number: 04.. … …
Email:

…
Construction Manager
Currently: …
Mobile number: 04.. … …
Email:

DLI Head Office

Phone number: …

Consultants

[redacted]

Review Consultant: to be appointed, as appropriate
Mobile phone number: -

SES Emergency Line 132 500
Local SES 132 500
Mine Rescue -
Work phone: -
Mobile phone: -

DEMIRS
Inspector: -
Phone Number: -

DWER
Inspector: -
Phone Number: -

Appendix K:
Operations Manual – Management

18 December 2024

INTEGRATED WASTE LANDFORM TAILINGS STORAGE FACILITY (IWLTSF)

MT IDA PROJECT - GOLD

WESTERN AUSTRALIA

OPERATIONS MANUAL

PROCESS PLANT MANAGEMENT

Delta Lithium Limited

PER2024-0325AE Rev 1

TERMINOLOGY AND ABBREVIATIONS

The following terminology and abbreviations are defined as stated, unless otherwise indicated:

AEP	Annual Exceedance Probability
ANCOLD	Australian National Committee on Large Dams
ARI	Average Recurrence Intervals
AS	Australian Standard
BOM	Bureau of Meteorology
COP	Code of Practice
DLI	Delta Lithium Limited
DXF	Drawing Exchange Format
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety, previously referred to as DMP
DMP	Department of Minerals and Petroleum
DSEP	Dam Safety Emergency Plan
DWER	Department of Water and Environmental Regulation (from 1 July 2017), previously referred to as Department of Environment Regulation (DoER)
FoS	Factor of Safety
IFD	Intensity Frequency Duration
IWLTSF	Integrated Waste Landform Tailings Storage Facility
LOM	Life of Mine
m/a	Metres per annum
m^3/d	Cubic meters per day
MIT	Mt Ida Project - Gold
Mm^3	Million cubic meters
Mt	Million tonnes
Mtpa	Million tons per annum
NAF	Non-Acid Forming
OD	Outside Diameter
oh/a	Operating hours per annum, assumed as 8,059 hrs
OHS	Occupational Health and Safety
OM	Operating Manual
OMPPM	Operating Manual Process Plant Management

OMPPS	Operating Manual Process Plant Staff
Owner	DLI
P80	80% passing, and refers to a particular particle size as stated (i.e. a P80 of 105 microns means 80% of the total weight of materials is finer than 105 microns)
Pa	Per annum
PPE	Personal Protective Equipment
RL	Relative Level
SG	Specific Gravity
SPD	Soil Particle Density
SWL	Standing Water Level
t/m^3	Tonnes per cubic metre
TARP	Trigger Action Response Plan
TMMP	Tailings Management Master Plan
tpa	Tonnes per annum
tpd	Tonnes per day
IWLTSF	Tailings Storage Facility
TSM	Tailings Storage Management

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES (BEHIND TEXT)

1 INTRODUCTION

1.1 Summary

This document presents the details of the operating procedures for the Integrated Waste Landform Tailings Storage Facility (IWLTSF) at the Mt Ida Project - Gold (MIT) owned by Delta Lithium Limited (DLI). The project is located about 85 km northwest of Menzies and 200 km northwest of Kalgoorlie in the Goldfields region of WA.

The Operating Manuals for the IWLTSF describe the operating procedures recommended for the safe management and control of the IWLTSF. The provisions of the Operating Manuals must be strictly adhered to by DLI (Owner) and the storages must be constructed and operated strictly in accordance with the provisions of the Operations Manuals and in accordance with the design. The consultant involved in the design (CMW Geosciences Pty Limited – CMW) shall not be liable in any respect whatsoever for any damage to or failure in the operations of the tailings and water storages resulting from failure of the Owner, its servants or agents to comply with the provisions of the design and Operating Manuals for these facilities.

1.2 IWLTSF Design

The IWLTSF will comprise a tailings storage facility surrounded by the mine waste dump. It will be formed by the construction of two (2) zones within the waste dump. From the inside, the materials will comprise two zones nominated as 1 and 2. Zone 1 would typically consist of oxide mine waste, moisture conditioned and compacted 'clayey' material placed in discrete layers, nominally 300 mm thick, which will form the inner liner. This zone will be nominally 6 m wide with some possible variation in width dependent on the type of construction equipment that is used and any controlling safety criteria. The internal batter slope will be formed at 1:2.5 (V:H). The internal finished surface of Zone 1 has to be suitable to accept the placement of the 1 mm HDPE liner.

The next zone (Zone 2), nominally 30 m wide, supports Zone 1 and will comprise run of mine waste placed in 1 m lifts with a rock limit of 750 mm with sufficient fines to fill any voids. Zone 2 and general run of mine waste provide support for the overall structure.

The general run of mine waste will be constructed based on the adopted mining plan and waste dump configuration, with no particular controls provided by the IWLTSF , with the external batter slopes at a maximum of 1:3.0 (V:H).

The natural subgrade over the base of the facility, after topsoil and any unsuitable materials are removed, will be shaped to form a crossfall across the base to facilitate flows within the underdrainage system. A compacted layer of low permeability clayey material (Zone 1) will then be placed over the base of the IWLTSF prior to placement of the HDPE base liner.

Water will be removed from the facility and pumped back to the processing plant via a decant structure comprised of slotted concrete well liners with select filter rock surround. The recommended average water recovery should not be less than 83 tph.

Based on Tables 1 and 2 of the DMP (2013) code, The IWLTSF is assigned a hazard rating of 'Category 1 - Medium' based on a maximum embankment height of 22 m (RL485 m). It is assigned a 'High C' consequence category based on ANCOLD (2019).

1.3 Storage Requirements and Tailings Properties

Tailings will be discharged into the IWLTSF at approximately 44.5% solids, at a rate of 0.67 Million tonnes per annum (Mtpa) over a storage life of 6 years, for a total of approximately 4 Million tonnes (Mt). The tailings discharge is expected to be non-acid forming (NAF).

1.4 Regulatory Setting

To allow the IWLTSF for the MIT to be constructed and operated, the facility will require approves from the DEMIRS and DWER.

1.5 Scope of the Operations Manual

The Operations Manual for Process Plant Management (OMPPM) 'this document' details the requirements for plant management who have the responsibility for:

i) Ensuring the tailings storage facility and all associated infrastructure is operated, maintained and monitored to achieve the design objectives.

ii) Ensuring the facility is operated in accordance with the parameters that have been provided by the client for use in the design of the tailings storage facility. Where changes in the parameters are proposed, the process plant management must advise the designers in order that the impact of the changes can be fully assessed.

iii) Ensuring that the Life of Mine (LOM) requirements are committed to a Tailings Management Master Plan (TMMP) and any changes to the IWLTSF, and all associated infrastructure are documented in the TMMP.

iv) Ensuring that additional storage requirements are planned, designed, budgeted for and constructed well in advance of the expected availability of the additional capacity.

v) Ensuring that the annual engineering audit is completed.

This document also sets out, in broad terms, the technical details associated with the design of the storages and the technical requirements for operating the storage facility including:

i) Tailings storage management, placement of the tailings and water recovery during the LOM.

ii) Objectives and requirements of the monitoring program.

Please note that this document is a high-level document which addresses the operation of the IWLTSF in general terms. It is the responsibility of DLI to supplement the details in this document with the specific design and operating details the for the associated infrastructure (electrical, instrumentation, pumping and piping, including valves) for the tailings delivery and distribution pipelines, spigot offtakes, water return pump, water return pipelines, including the operation of all switches and valves associated with this IWLTSF.

1.6 Appendices

The following documents are appended, or are to be appended when available, to this Operations Manual:

i) Appendix 1 – Regulatory Licence / Lease Conditions

ii) Appendix 2 – Design Drawings

iii) Appendix 3 – Operations Manual for Process Plant Staff

iv) Appendix 4 – Operations Manual for Process Plant Management

v) Appendix 5 – Emergency Assembly Points

vi) Appendix 6 – As-Built Drawings

2 ROLES AND RESPONSIBILITIES

2.1 Organisational Structure

The organisational structure for DLI is detailed below in Figure 1.

Figure 1 – Organisational Structure

DLI to insert the organisational structure in here

2.2 Roles and Responsibilities

The individual responsibilities for the IWLTSF for this project are detailed in **Error! Reference source not found.**.

TABLE 1: INDIVIDUAL RESPONSIBILITIES

Staff Designation	Operation	Maintenance	Surveillance & Reporting	Emergency Response
General Manager	√	√	√	√
Process Plant Manager / Process Plant Superintendent	√	√	√	√
Process Plant Foreman	√	√	√	√
Operators	√	√	√	√
Maintenance Manager / Maintenance Superintendent (electrical, instrumentation, pumping and piping)		√		√
Mine Manager / Mine Superintendent (Earthworks)		√		√
Environmental Manager / Environmental Superintendent			√	√

TABLE 1: INDIVIDUAL RESPONSIBILITIES

Staff Designation	Operation	Maintenance	Surveillance & Reporting	Emergency Response
Security Manager / Security Superintendent				√
Emergency Response Team				√
Design Consultant			√	√

2.3 Training and Competency

The Process Plant Manager has the responsibility for ensuring the training and competency of all the personnel relevant to the day-to-day operation of the IWLTSF is completed.

The Process Plant Manager will ensure the various departments (Process Plant, Maintenance, Mining, Environmental, and Security) are each aware of their respective duties and roles and shall confirm that the training and competency of the relevant personnel within these departments has been completed.

The Process Plant Manager also has the responsibility to ensure the training and competency of contractors is completed prior to work being undertaken on the IWLTSF or the associated infrastructure.

All personnel involved with the IWLTSF must be aware of visual indicators (leaking pipes, high solution levels, embankment cracking, seepage etc.) of the performance of the IWLTSF.

2.4 Document Control

The Process Plant Manager or his appointed designate has the responsibility for all document control for the IWLTSF, including the Operating Manuals. The documents which make up the TMMP comprise the following:

i) Design documents, including drawings and technical specifications.

ii) Operating Manuals.

iii) Construction records.

iv) Managing Change Documents.

2.5 Managing Change Documents

2.5.1 Modifications to Design and/or Operation

No changes shall be made to the design or operation of the IWLTSF without the written approval of the Process Plant Manager, the General Manager and IWLTSF Designers where the proposed change to the IWLTSF materially affects the design or the operation of the facility.

Where design standards change, the designers shall contact the Process Plant Manager and the General Manager and advise of the changes required to bring either the design or operation of the facilities into line with current standards.

All approved changes to the design and/or operation of the IWLTSF, no matter how minor, must be thoroughly documented and recorded in the master document control sheet for the IWLTSF.

The procedures for making changes to the design and operation of the IWLTSF comprise:

i) Submission of a written Request for Change to the Process Plant Manager. The Request for Change Submission must outline the proposed change, the reason for the change, the expected impact (if any) of the change and the expected benefit (if any) of the change.

ii) Process Plant Manager will decide if the proposed change has any impact, either positive or negative, and determine the value of the benefits of the proposed change.

iii) If the proposed change has no material effect on the design and/or operation of the IWLTSF, the Request for Change Submission can be implemented and the relevant design and operational documents updated as required and the change noted in the master document.

iv) If the proposed change materially affects the design and/or operation of the IWLTSF, the Request for Change Submission will be forwarded to the General Manager and IWLTSF Designers with the comments of the Process Plant Manager, for action as appropriate.

v) Where the Request for Change Submission affects the design of the IWLTSF, the IWLTSF Designers will review the submission and make the necessary changes, ensuring that any impacts not envisaged by the Process Plant Manager are noted on the submission. The revised documents and the submission will be returned to the Process Plant Manager. The revised documents will be appended to the TMMP document and the amendments noted on the document control sheet.

vi) Where the Request for Change Submission affects the operation of the IWLTSF, the IWLTSF Designers will review the submission and note the changes, ensuring that any impacts not envisaged by the Process Plant Manager are noted on the submission. The revised documents and the submission will be returned to the Process Plant Manager. The revised documents will be appended to the TMMP document and the amendments noted on the document control sheet.

vii) Where the Request for Change Submission affects the operation of the IWLTSF, the training and competency procedures will be reviewed to assess whether changes need to be made. Where changes are required, the relevant documents will be amended and the amendments noted on the document control sheets.

2.5.2 Regulatory Changes

Changes in the regulatory requirements will be passed to the Process Plant Manager to be assessed, processed and documented using the same procedures as outlined in Section 2.5.1 above.

2.5.3 Ownership and Designation Changes

Changes in the ownership or changes to the organisational structure or designation hierarchy (Table 1) will be passed to the Process Plant Manager, processed and documented using the same procedures as outlined in Section 2.5.1 above.

3 IWLTSF DESIGN

The IWLTSF design for MIT was prepared based on consideration of the environment, geological settings, site topography, mine development plan and expected tailings characteristics. The IWLTSF is a single IWLTSF structure surrounded and encapsulated by mine waste.

3.1 Design Objectives

The operational design objectives of the IWLTSF in MIT are to:

i) Provide a safe, stable and erosion resistant landform.

ii) Providing return water to the plant.

iii) Maximising the in-situ dry density of the tailings which in turn maximises the storage capacity of the tailings facility.

iv) Minimise the environmental footprint. Minimise environmental impacts from the IWLTSF i.e. seepage etc.

3.2 Guidelines, Codes of Practice and Standards

The following Guidelines, Codes of Practice and Standards are relevant to the operation of the IWLTSF:

i) Department of Mines and Petroleum Western Australia (DMP), ‘Code of Practice, Tailings Storage Facilities in Western Australia’ (2013).

ii) Australian National Committee on Large Dams (ANCOLD) document: ‘Guidelines on Tailings Dams - Planning, Design, Construction, Operation and Closure’ (2019).

3.3 Design Parameters

Factors that are considered in the raising of the IWLTSF design:

i) Annual tailings production of 0.67 Mtpa;

ii) Total tailings production of 4 Mt;

iii) Tailings deposited at 44.5% solids;

iv) Tailings density of 1.3 t/m^3 (dry);

v) Tailings beach slope of 1% to 2%;

vi) Minimum total freeboard of 0.5 m.

3.4 Description of Design

3.4.1 IWLTSF Storage Characteristics

The IWLTSF has been designed to store a minimum of 4 Mt of tailings. At an estimated slurry dry density of 1.3 t/m^3, a storage volume of 3.48 Mm^3 the facility will have a storage capacities of 4.52 Mt which is sufficient to store the gold resource of 4 Mt.

The footprint areas, storage volumes and storage capacities of IWLTSF are shown in Table 2.

TABLE 2: STORAGE CAPACITIES

Stage	Crest RL (m AHD)	Area (Ha) ofIWLTSF in Lease	Basin Area (ha)	Storage Volume (Mm^3)	Storage Capacity (Mt)
Final	485.0	28.9	25.9	3.48	4.52

3.4.2 Embankment Geometry

The IWLTSF will be formed by the construction of two (2) zones within the waste dump. From the inside, the materials will comprise two zones nominated as 1 and 2. Zone 1 would typically consist of oxide mine waste, moisture conditioned and compacted ‘clayey’ material placed in discrete layers, nominally 300 mm thick, which will form the inner liner. This zone will be nominally 6 m wide with some possible variation in width dependent on the type of construction equipment that is used and any controlling safety criteria. The internal batter slope will be formed at 1:2.5 (V:H). The internal finished surface of Zone 1 has to be suitable to accept the placement of the 1 mm HDPE liner.

The next zone (Zone 2), nominally 30 m wide, supports Zone 1 and will comprise run of mine waste placed in 1 m lifts with a rock limit of 750 mm with sufficient fines to fill any voids. Zone 2 and general run of mine waste provide support for the overall structure.

The general run of mine waste will be constructed based on the adopted mining plan and waste dump configuration, with no particular controls provided by the IWLTSF, with the external batter slopes at a maximum of 1:3.0 (V:H).

The natural subgrade over the base of the facility, after topsoil and any unsuitable materials are removed, will be shaped to form a crossfall across the base to facilitate flows within the underdrainage system. A compacted layer of low permeability clayey material (Zone 1) will then be placed over the base of the IWLTSF prior to placement of the HDPE base liner.

3.4.3 Geomembrane

The compacted clay in the starter embankment, Zone 1, which is overlain by the geomembrane (HDPE liner), effectively forms a double liner system.

3.4.4 Underdrainage

The underdrainage water collection system is comprised of Flownet and a protective layer of Bidim A44 geotextile and associated slotted collection pipes placed over the HDPE liner to capture water that percolates through the tailings stack during the operation of the facility.

A cushion layer of oxide mine waste is then placed over the area designated for the decant causeway and decant filter. The decant causeway can be constructed from either Zone 2 or general run of mine waste.

The underdrainage has been designed with a system capacity of 1.5 L/s or 90 L/min.

3.4.5 Water Recovery System

The decant filter (Zone 3) will ideally comprise hard durable competent rock with a maximum particle size not exceeding 500 mm, preferably 70% passing 200 mm, 20% passing 75 mm and non-plastic fines (silt and clay finer than 0.075 mm), < 3% with a soil particle density greater than 2.5 t/m^3 and preferably geochemically inert. The rock is to be loose placed in lift thicknesses not exceeding 2 m and spread to form a uniform layer. The sizing and performance of the rock ring is governed by several relationships based around the following:

- Cross-sectional area of the rock ring filter (length, height and width of the filter).
- Maximum operating capacity of the water recovery pump, which in turn determines the velocity or flow rate through the filter.
- Internal storage volume of the rock ring which determines the residence time of the water in the filter.

The key to success for an efficient decant filter is having a large cross-sectional area to reduce the flow, such that the sand, silt and clay fractions are unable to remain in suspension. In other words, the flow through the filter has to be very low. Water clarity inside the rock ring and through the rock ring filter is a function of the velocity of the water flow through the rock.

The rock filter can be backfilled with tailings and buried when the IWLTSF is decommissioned/rehabilitated.

3.5 Hazard Rating

Based on the DMP Code of Practice (2013), the hazard ratings for The IWLTSF have been assessed as 'Category 1 – Medium'.

Based on the above considerations and Table 1 of ANCOLD (2019), a 'Medium' damage is assigned. It is assigned a 'Significant' consequence category based on ANCOLD (2019) which, for the purposes of design, is upgraded to a 'High C' consequence category.

3.6 Drawings

Details of the IWLTSF design, construction and proposed operation are presented on the Design Drawings included in Appendix 2 of this document, and in the Scope of Works, CMW ref. PER2024-0325AC Rev 0 dated 11 December 2024, presented in a separate document. These documents are also provided in Appendices B and C, respectively, in the Design Report, CMW ref. PER2024-0325AB Rev 0 dated 11 December 2024.

The "as-built construction drawings" must be appended to this Operating Manual and inserted into Appendix 6, when construction is complete for each stage. They should, as a minimum, include:

i) General Arrangement and layout plan.

ii) Starter embankment details.

iii) Drainage details.

iv) Decant facility details.

v) Access road and ramp details.

3.7 Scope of Works

The Scope of Works, CMW ref. PER2024-0325AE Rev 0 dated 11 December 2024, details the elements of the IWLTSF design for construction.

3.8 Geochemistry

3.8.1.1 Mine Waste

A geochemistry study has been undertaken for the key rock units to be mined for lithium from the proposed Timoni Pit and Sister Sam Pit (collectively referred to as Baldock Open Pits), which include oxide and transitional materials, and fresh felsic (pegmatites), mafic (anorthosite) and metamorphic (amphibolite) lithotypes. The findings were summarised in a CMW report ref. PER2023-0213AD Rev 0 dated 14 May 2024 (CMW 2024).

It is expected that DLI will commission a new geochemistry study for the gold-bearing ores.

3.8.1.2 Tailings Slurry

DLI has commissioned MBS Environmental to undertake geochemical characteristics analysis for laboratory gold tailings slurry. The tests were carried out using the combination of approximately 3 kg sample of the tailings slurry derived from the Oxide/Transitional deposits, and 2 kg sample from the Fresh deposits.

3.9 Summary of Operating Procedures

This section provides a summary of the operating methodology of the tailings storage. For details, refer to the Operations Manual for Process Plant Staff (OMPPS) in Appendix 3.

To optimise tailings storage capacity and reduce the risks associated with embankment stability and seepage, tailings will be deposited from the embankment and along the perimeter of the storage as depicted in the drawings.

Tailings deposition and beaching will be controlled such that the supernatant is maintained away from the engineered perimeter embankment. Tailings will be deposited such that the insitu densities within the stored tailings and the solution return for reuse in the process plant, is maximised.

The following considerations have been incorporated into the design of the IWLTSF in MIT:

i) Tailings in the form of a slurry will be discharged subaerially (discharge exposed to air) and or sub-aqueously (discharge to slurry/solution) depending on the slurry and solution levels at the point of discharge from the upstream face of the main embankment. Tailings will be deposited in discrete layers from numerous spigot point discharges. The discharge points will be regularly moved to ensure the even development of sloped tailings beaches.

ii) Tailings discharge or spigotting is to be carried out such that a supernatant solution pond is maintained around the decant filter rock ring. The decant pump is located inside this facility.

iii) Depending on the decommissioning plan adopted for the storage, it may be necessary to alter the deposition philosophy near the end of the mine life. Appropriate procedures shall be developed if changes to deposition or freeboard criteria are required. If necessary, appropriate government authorities shall be advised of any changes. As tailings deposition progresses, there may be a requirement for the deposition locations to be moved in order to maximise the utilisation of the tailings storage area.

iv) The IWLTSF has been sized to accommodate storm events and the minimum total freeboard comprising the operational freeboard and storm freeboard of 0.8 m must be maintained. The vertical distance between the embankment crest and the adjacent deposited tailings beach or supernatant level will have to be determined, post-construction, for each embankment crest level.

v) The tailings storage area will assume the form of a truncated prism with a depressed cone in the top surface.

vi) Frequent inspections (a minimum of once per shift) should be made of the tailings lines, water return lines, discharge points, decant system, the position of the supernatant pond in relation to the decant recovery system and the perimeter containment embankment.

vii) The embankment should be inspected once per shift. If seepage has occurred, particular attention should be paid to the embankment in the vicinity of the seepage. Only by regular inspection and appropriate remedial action can the performance of the solution return system be optimised and operational problems avoided.

viii) Operation, safety and environmental aspects should be periodically reviewed during an inspection by a suitably experienced and qualified engineer. This inspection should be done at least every year.

ix) The operational design objective of the tailings storage located in MIT is to provide a water return solution to the plant and maximise the in-situ density of the tailings which in turn maximises the storage capacity of the tailings facility.

3.10 Storm Events

The IWLTSF has been sized to accommodate storm events. The IFD obtained from the BOM indicates the 1 in 100 AEP 72-hour storm is approximately 227 mm. Assuming the IWLTSF is to be operated such that the supernatant pond is maintained away from the perimeter embankment, then the minimum DEMIRS freeboard requirements comprise the total of the following:

i) Operational Freeboard (lowest embankment crest RL to the tailings beach) 300 mm.

ii) Beach Freeboard (tailings beach to the supernatant pond after the 1 in 100 AEP 72-hour storm) 200 mm.

iii) The 1 in 100 AEP 72-hour storm 227 mm on top of the normal operating supernatant pond.

The total, minimum freeboard, on top of the normal operating supernatant pond is therefore 727 mm, say 0.8 m.

The supernatant pond level within the IWLTSF should be as low as practicable to ensure volume is available within the IWLTSF storage to accommodate storm events without breaching or otherwise impacting on the minimum freeboard requirements.

The vertical distance between the embankment crest and the adjacent deposited tailings beach or standing water level which corresponds with this level will have to be determined, after construction for each embankment crest level.

4 MONITORING AND AUDIT REQUIREMENTS

4.1 General

The following section details the requirements for monitoring and auditing of the IWLTSF such that the storage is operated and maintained to achieve the design objectives. The Hazard Category of the IWLTSF dictates the monitoring and audit requirements. See Table 3 for the required list of documented procedures.

TABLE 3: MONITORING AND AUDITING REQUIREMENTS

Activity	Recommended Frequency
Routine Inspection of IWLTSF	Once per shift (twice daily)
Plant Management Inspection of IWLTSF	Once per month
Operational Audit of IWLTSF	Annual
Groundwater Monitoring	Standing water level (SWL) once per month, quarterly water quality sampling and testing or as per the DWER Licence
Monitoring Instrumentation (VWPs)	Once per month
Environmental Aspects	Once per month

The forms which are relevant to these requirements are provided in the Appendices and comprise the following templates:

OMPPS Forms, which are located in Appendix 3 of this document.

i) Daily Inspection Log Sheet (OMPPS1)
ii) Operations Personnel Contact Details (OMPPS2)
iii) Training Confirmation Record (OMPPS3)

OMPPM Forms, which are located in Appendix 4 of this document.

i) Operating Manual Completion Form (OMPPM1)
ii) Operating Manual Update Form (OMPPM2)
iii) Monthly Inspection Log Sheet (OMPPM3)
iv) Outline of Yearly Audit Criteria (OMPPM4)
v) Incident Reporting Sheet (OMPPM5)

All of the forms should be filled in and retained as hard copies on site for the life of the mine. Any issues of concern or unusual occurrences observed at any time should be reported to Process Plant Management for their review, and if required, the IWLTSF designers should be contacted for assistance or advice. Any planned or taken actions must be recorded.

4.2 Daily Inspections

The requirements for daily inspections are explained in the Appendix 3 of the Operations Manual for Plant Staff (OMPPS). It is expected the plant staff that have responsibility for the general day to day operation and maintenance of the IWLTSF, shall perform the daily inspections and complete the daily inspection log (Daily Inspection Log Template (OMPPS1)).

The process plant management has the responsibility for verifying that these inspections are occurring, and that they are following the requirements as set out in Section 2.0 of the OMPPS (Appendix 3 of this document).

4.3 Production Monitoring

The following information from the process plant should be recorded monthly as a minimum, or more frequently if possible:

i) Ore treatment, measured in dry tonnes.

ii) Tailings density, measured as percentage solids and filtered tailings moisture content.

iii) Solution return from all sources from the tailings storage to the process plant, measured in cubic metres.

These details are required to ensure that the operation of the IWLTSF is in accordance with the design parameters and other details in the Design Report.

These details will assist in the completion of the yearly audit and in the monitoring of the current and future storage capacity requirements.

4.4 Environmental Monitoring

4.4.1 Climatic Data

If a weather station is located on site, the following information is to be collected daily, or at the end of each month as a minimum:

i) Rainfall.

ii) Evaporation.

4.4.2 Water Quality and Standing Water Level

Water quality sampling and testing is required to be performed on the monitoring bores located in and around the tailings storage, and of any seepage or surface water upstream or downstream from the facility.

Water quality requirements, including frequency and quality limits, are stipulated in the licence conditions by regulatory authorities (Appendix 2). At the time of renewing or updating the licence, all conditions should be reviewed such that any changes to the monitoring regime and criteria are noted and acted upon.

SWL readings should be taken monthly and also at the time of quarterly water quality sampling. The data obtained from water levels and quality should be plotted as soon as possible and reviewed to allow identification of any changes. Where newly recorded information deviates significantly from the previously established trend, the reading should be checked, the area inspected, and the information reported to Process Plant Management for consideration and action.

4.4.3 Dust Monitoring

Monitoring of airborne dust will be undertaken through daily visual inspections by the Site Environmental Officer. Sampling and analysis will be undertaken if required in the licence conditions.

4.5 Storage Monitoring

Detailed surveys of the tailings surface should be performed on an annual basis as a minimum, such that the tailings insitu density can be reconciled from the tonnage of tailings deposited and the storage volume consumed. In addition, an as-built survey should be performed on any construction works.

4.6 Monthly Inspections

It is recommended that monthly inspections of the IWLTSF and associated documentation be carried out by Plant Management to ensure the facility is being operated and maintained to meet the design objectives, and that documentation procedures are being followed. Refer to the Monthly Inspection Log Sheet (OMPPM3) in Appendix 4.

4.7 Engineering Inspections

It is a requirement of the DMP (2013) COP and ANCOLD (2019) Guidelines that an inspection and audit by a qualified Geotechnical or Engineering specialist be carried out annually as a minimum. This Audit shall include the aspects outlined on OMPPM4 in Appendix 4.

The Audit will also need to include assessment of the environmental conditions of the licence, and report any environmental damage, in particular any seepage or water quality problems.

5 MAINTENANCE

5.1 General

The purpose of the maintenance program for the IWLTSF is to identify the key components of the facility whether they are civil, mechanical, electrical or instrumentation and then detail the predictive and event-driven maintenance requirements.

The responsibility for reporting defects and/or event-driven maintenance requirements rests with the operators of the facility. The maintenance department deals with routine predictive maintenance.

5.2 Maintenance Parameters

[To be completed by the Maintenance Department]

5.3 Routine and Predictive Maintenance

[To be completed by the Maintenance Department]

5.4 Documentation and Reporting

[To be completed by the Maintenance Department]

6 CONSTRUCTION STAGES

For the details of the embankment characteristics and construction stages, reference should be made to the relevant drawings and Scope of Works applicable to initial construction works which are located in Appendix B and Appendix C of the Design Report.

The design of the IWLTSF is based on construction of a waste dump from the proposed Direct Shipped Ore (DSO) and construction of the underdrainage pipework beneath the waste dump. The internal perimeter embankments, completion of the underdrainage and HDPE lining will follow during the construction of the processing plant. For the details of the embankment characteristics and construction stages, reference should be made to the relevant drawings and scope of works applicable to initial construction works which are located in Appendix 2 and Appendix 5 of the CMW report referenced PER2024-0325AB Rev 1 dated 18 December 2024 (Design Report).

It is anticipated, based on the current production parameters used in the design (refer to Section 1.2) and assuming that the IWLTSF is correctly operated, that the initial construction and lining of the Stage 1 internal embankments could provide storage for up to 2 years of operation with construction of Stage 2 embankments undertaken in Year 2 of operation, providing additional storage of 2.3 years.

7 OCCUPATIONAL HEALTH AND SAFETY CONSIDERATIONS

Occupational Health and Safety (OHS) requirements for working in the vicinity of the IWLTSF should comprise the following minimum requirements:

i) Appropriate Mandatory Signs (Blue and White), Warning Signs (Black and Yellow), Danger Signs (Black, Red and White) and First Aid Signs (Green and White) to be clearly displayed.

ii) Personal Protective Equipment (PPE) appropriate to the tasks being undertaken to be worn at all times by all workers in the area.

iii) Appropriate first aid facilities (Showers and Eye Wash) to be located in the area.

iv) Radio contact to be maintained at all times between personnel working in the area and their respective supervisors.

Warning signs are recommended at all entrances to the facility. The IWLTSF may require fencing to prevent trespass by stocks, if any.

8 EMERGENCY ACTION PLAN

8.1 Response Actions

In the event of an emergency, the site emergency response team must immediately be notified and advised of the nature of the emergency to enable the appropriate emergency action plan to be implemented. The site emergency response plan contains the details presented in the following Sections, such that response activities are coordinated with operations personnel.

At the time of the emergency, the Process Plant Foreman or his designated (trained operator) representative is to ensure that:

i) All personnel and contractors who were or are working in or around the location of the emergency are accounted for. Personnel Contact Details are provided on form OMPPS2 appended to this document. This form must be reviewed quarterly as a minimum and must be updated immediately in the event of personnel leaving or joining the operation.

ii) All mine-based personnel listed in Table 1 are immediately contacted and advised of the nature of the emergency and any assistance required is requested.

All personnel who are working in the vicinity of the emergency are expected to be present at the muster points and are expected to be aware of other assembly points around the IWLTSF and the relevant reporting procedures. Emergency assembly points are shown on Figure … in Appendix 5 of this document.

A trigger action response plan (TARP) and Dam Safety Emergency Plan (DESP) will be developed to provide further guidance on actions to be taken relating to operation of the IWLTSF (refer to Appendix 4 of the Operations Manual - Process Plant Staff).

8.2 Tailings Storage

The embankment has been designed with an adequate factor of safety against failure under normal operating and seismic load conditions, appropriate for the location of the IWLTSF. Normal operating conditions refers to the tailings surface and surface of the supernatant water pond being within the freeboard requirements. The probability of embankment failure during normal operations is very low, given that:

- The embankment construction has been or should have been carried out in accordance with the design.
- The implementation of the tailings operation methodology, including the routine inspections and maintenance practices are adhered to as set out in the Operations Manual for Process Plant Staff.

However, in the unlikely event of embankment failure, the flow of tailings from the storage will be controlled by the degree of saturation of the tailings at the time of failure.

Action to control a small-scale embankment failure and limit environmental damage would include:

i) Assessing the requirement to shut down the process plant, or reduce process plant throughput.

ii) Diversion of tailings deposition to areas not affected by the small-scale embankment failure.

iii) Construction of bunds by earthmoving equipment to divert and contain the tailings.

iv) Contacting a suitably qualified geotechnical organisation for technical assistance.

v) Deployment of pumps to recover tailings water as appropriate and return it either to the IWLTSF if structurally sound, or to the plant water storage facilities if evaporation and or dilution is impractical.

vi) Undertaking a thorough inspection of the area with or without a specialist, depending on the scale of the failure, prior to the commencement of any repairs.

vii) Undertaking remedial and repair work of the damaged embankment or affected area.

viii) Clean up of tailings as soon as practicable after embankment repairs have been completed and the storage is considered in a safe condition.

ix) Preparing an incident report, detailing all factors prior to the incident and the situation after clean-up. The report should identify causes of the problem and what actions will be taken to prevent a similar occurrence. This report should detail the on-going monitoring program to fully assess the impact of the incident.

x) Advising all appropriate government departments as necessary of the incident, review the conditions of operating licence and lease conditions to ensure that the timing of reports and content of reports meets the regulatory requirements.

Action to control a large-scale embankment failure and to limit environmental damage would include:

i) Shut down of the process plant.

ii) Construction of bunds by earthmoving equipment to divert and contain the tailings.

iii) Contacting a suitably qualified geotechnical organisation for technical assistance.

iv) Advising the relevant regulatory authorities.

v) Deployment of pumps to recover tailings water and returning it to the IWLTSF if structurally sound or to the plant water storage facilities if evaporation and/or dilution is impractical.

vi) Undertaking a thorough inspection of the area with the assistance of a geotechnical specialist prior to the commencement of any repairs.

vii) Repairing the damaged embankment.

viii) Cleaning up of tailings as soon as practicable after the embankment repairs have been completed.

ix) Preparing an incident report, detailing all factors prior to the incident and the situation after clean-up. The report should identify causes of the problem and what actions will be taken to prevent a similar occurrence. This report should detail the on-going monitoring program to fully assess the impact of the incident.

x) Advising all appropriate regulatory authorities as necessary of the incident.

xi) Reviewing conditions of any licence or lease conditions in respect to the timing of advising the regulatory authorities and the contents of that notification (reporting criteria).

It must be stressed however, that the safe operation of the IWLTSF relies upon the implementation of operational procedures which comprise tailings deposition, decant operation and routine inspections and maintenance, as set out in the Operations Manual for Process Plant Staff, to minimise the potential for a catastrophic event such as a failed embankment.

8.3 Tailings Lines and Return Water Lines

The tailings lines from the process plant to the tailings storage and the return water lines from the decant facilities to the process water dam are to be located inside bunded, open trenches to contain any spillage of materials resulting from leaks or burst pipes during operation. In the event of pipeline failure, the Process Plant Superintendent is to be notified and the affected pipeline is to be shut down until repaired and the spilled materials collected and/or pumped, as appropriate, and deposited in the IWLTSF.

8.4 Process Water Dam

The decant pump is operated manually and run at all times. The pump is only switched off:

i) During plant shutdowns or maintenance periods.

ii) When dirty water is pumped into the process water tank or when embankment construction is scheduled in accordance with the design.

Alternative pumping equipment and pump locations may be required during periods of pump maintenance or when embankment construction work is being undertaken.

9 INCIDENT REPORTING

The objective of regular inspections by the designated process plant staff and monitoring by the environmental staff is to identify any problems prior to them causing a major impact on the operation or integrity of the IWLTSF and associated infrastructure.

The inspections may result in the identification of an event that may require reporting to senior staff and in some cases to relevant regulatory authorities.

10 CLOSURE

The closure and rehabilitation for the IWLTSF will be undertaken in accordance with regulatory guidelines and all applicable ministerial conditions and various commitments made by DLI.

At this stage, given the current position with known technology, the method for closing and covering the IWLTSF appears to be:

i) Remove excess supernatant water from the IWLTSF.

ii) Cover the facility with mine waste or similar. The closure process may take some time as the shear strength of the tailings may not be sufficient to support large mining equipment. Smaller equipment is recommended to be deployed.

iii) Establish a vegetative cover.

The final level of the liner and soil cover mine waste will need to be sufficient to adequately cover the tailings.

Any incident water falling either directly onto the IWLTSF or reporting to the IWLTSF from the reduced catchment, can be temporarily contained and discharged via a spillway, if required.

The practicalities of the option presented above and other options which may arise as a result of changes in technology, as well as the final surface level, embankment and spillway (if required) level, as appropriate, will need to be determined during the later operational years since the in-situ density and volume of the tailings may be greater than or less than the design parameters.

It is expected that the key design criterion for the IWLTSF cover will be resistance to erosion in order to create a stable landform.

For the embankment, benches are generally not recommended at closure as they tend to focus erosion from surface water runoff and mitigating measures such as armoured spillways or drop structures are expensive to construct and difficult to maintain. Deep ripping along the contour of the slopes is effective in mitigating slope erosion, provided rock mulch / rock armour is present. The segmentation of the top surface of the final landform by construction of low bunds may be considered as an additional measure to promote infiltration of rain events and mitigate erosion from channelling of surface runoff.

Rehabilitation will likely be undertaken in stages as the tailings consolidate. Cover construction can be commenced once the tailings surface has sufficiently consolidated to permit access to earthmoving equipment. Rehabilitation/decommissioning (closure) plans will be continually updated by DLI to incorporate successful procedures identified in site-specific trials throughout the life of the project.

11 REFERENCES

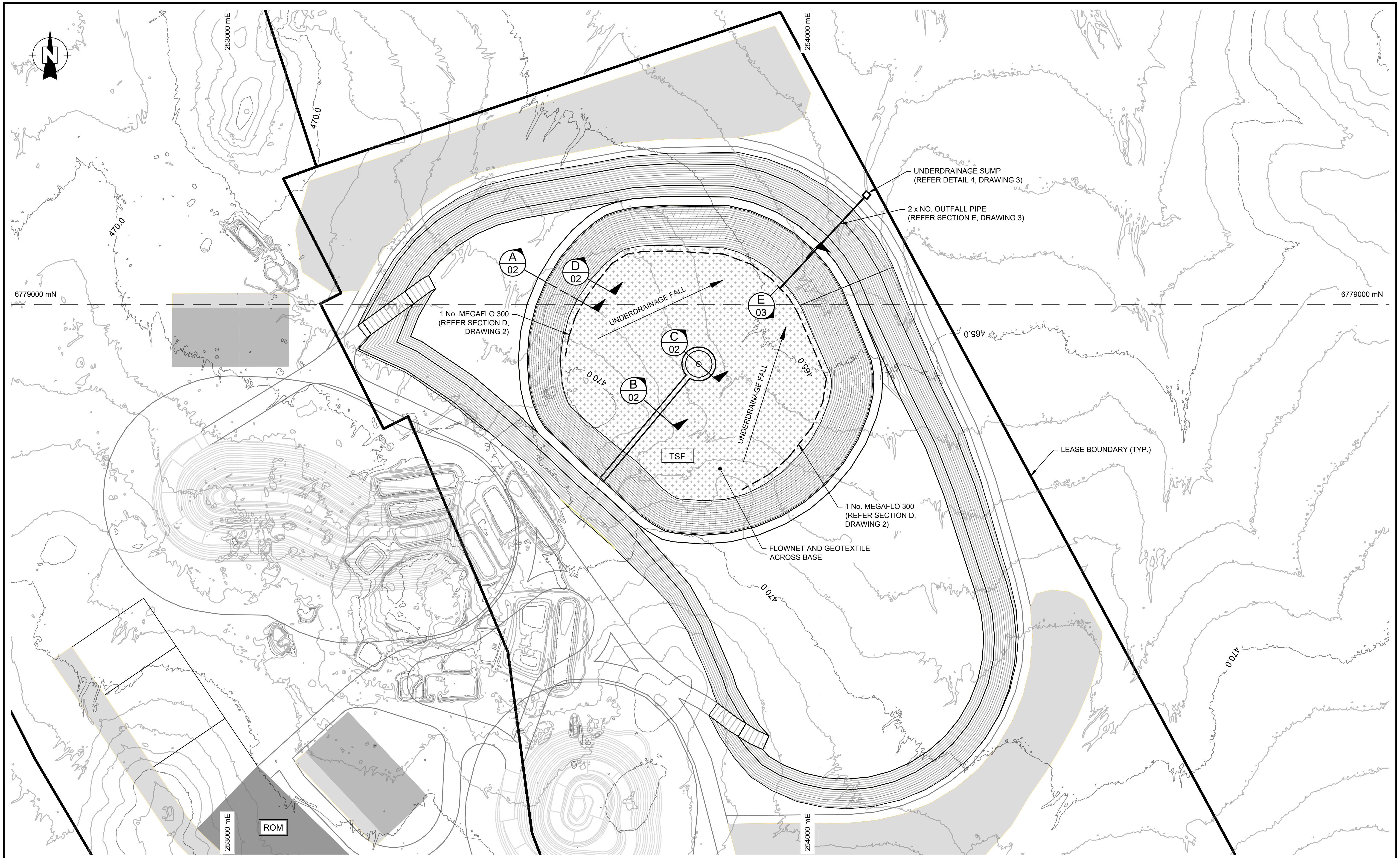
This document has been prepared, as appropriate, using the following documents:

1. DEMIRS (2013) ‘Code Of Practice – Tailings Storage Facilities in Western Australia’ (COP).

2. ANCOLD (2019) ‘Guidelines on Tailings Dams - Planning, Design, Construction, Operation and Closure’

Appendix 1:
Regulatory Licence and Lease Conditions

Appendix 2:
Design Drawings



NOTES:

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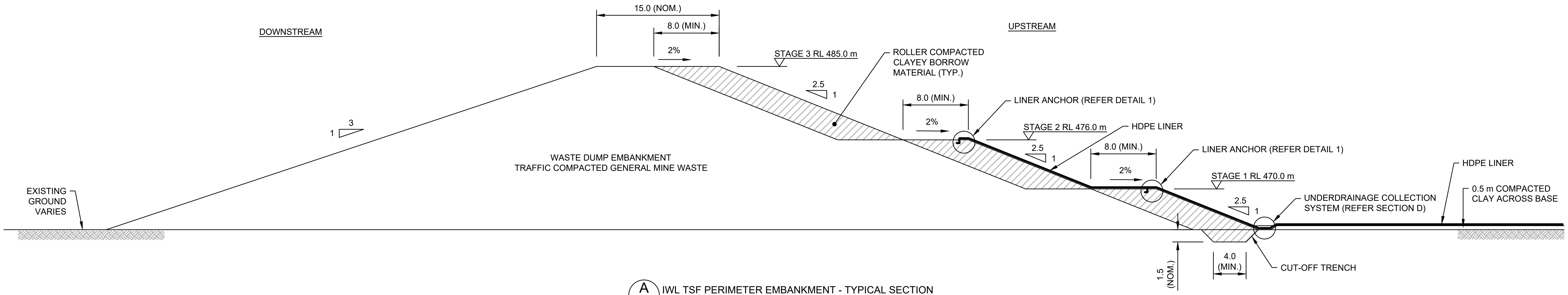
2. COORDINATE SYSTEM: MGA ZONE 51, GDA94

1:6000 — 0 60 120 180 240 300 m

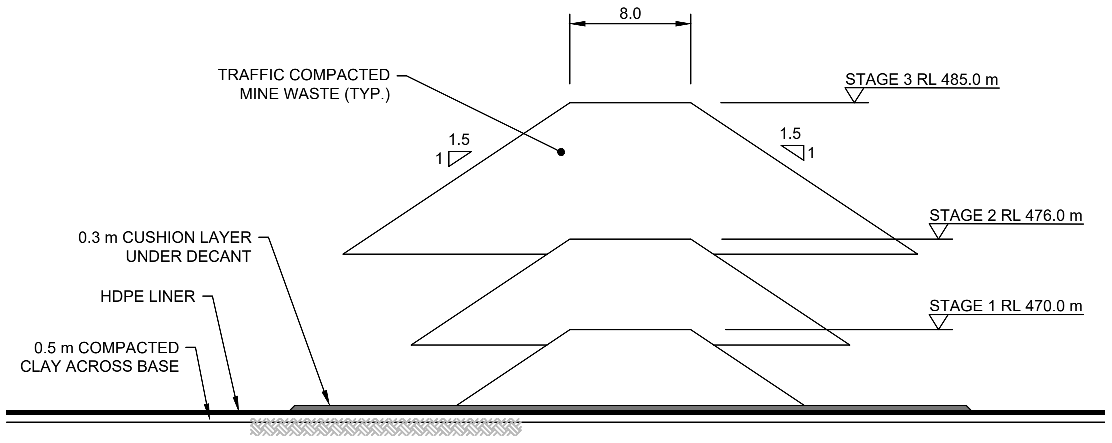
Land & Marine Geological Services Pty Ltd (L&MGSPL)

CMW Geosciences

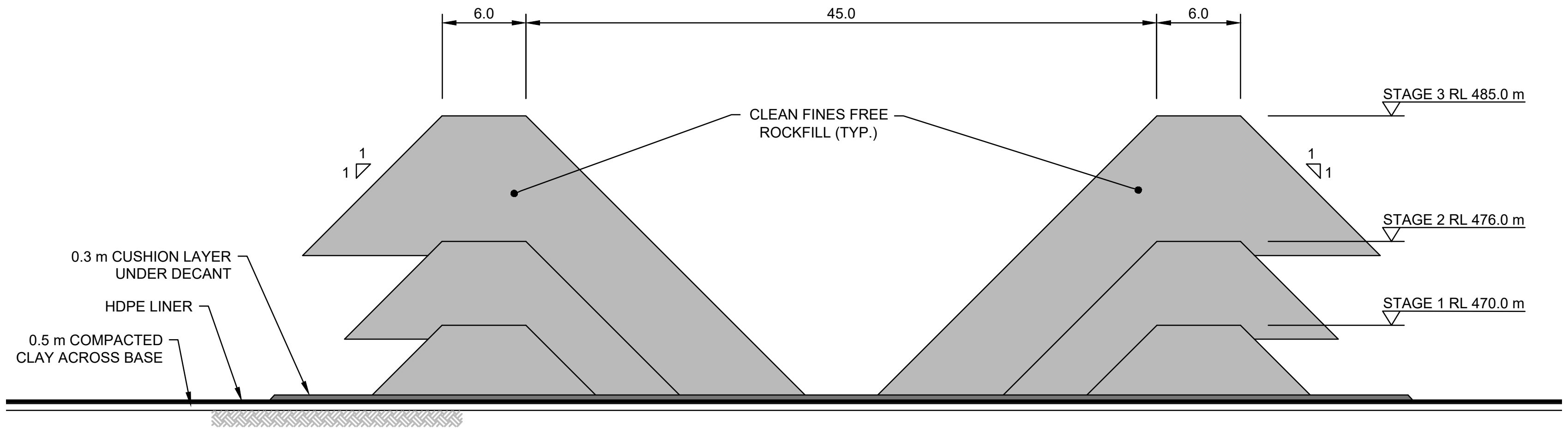
CLIENT:	**DELTA LITHIUM LIMITED (DLI)**	DRAWN:	DE	PROJECT:	PER2024-0325
PROJECT:	**MT IDA PROJECT - GOLD**	CHECKED:	CL	DRAWING:	01
		REVISION:	0	SCALE:	1:6000
TITLE:	**TSF PLAN**	DATE:	18.12.24	SHEET:	A3 L



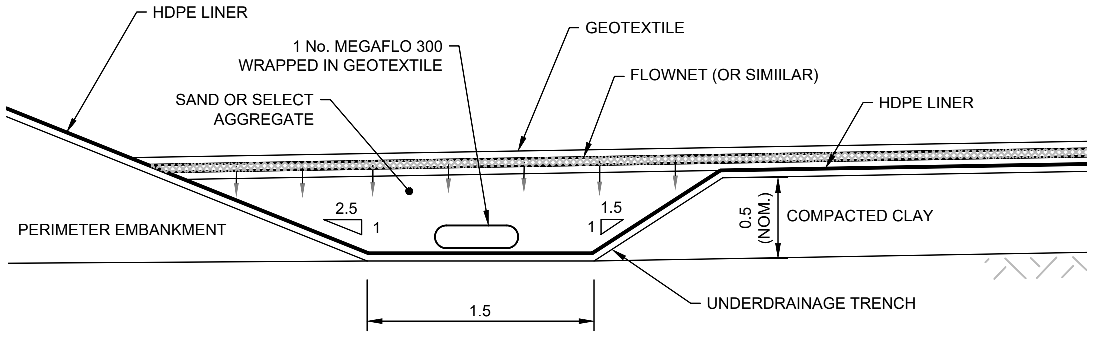
A 01 IWL TSF PERIMETER EMBANKMENT - TYPICAL SECTION
1:500



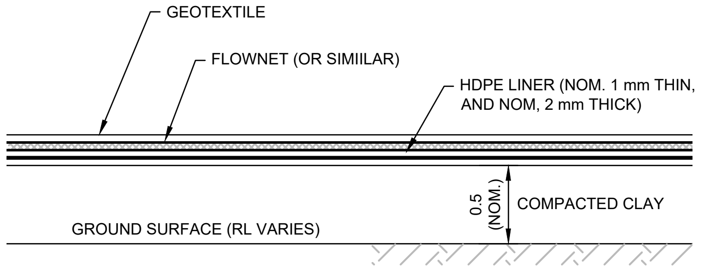
B 01 DECANT ACCESSWAY - TYPICAL SECTION
1:500



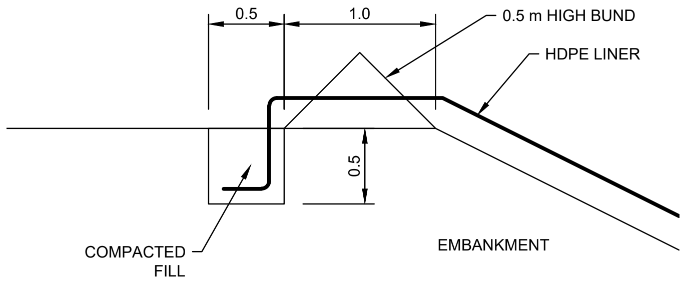
C 01 ROCK RING DECANT - TYPICAL SECTION
1:500



D 01 UNDERDRAINAGE COLLECTION SYSTEM - TYPICAL SECTION
1:50



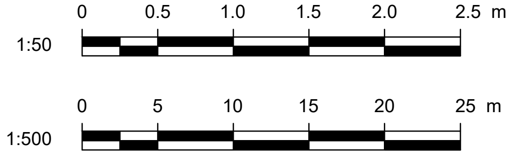
2 - LINER AND FLOWNET SYSTEM - TYPICAL SECTION DETAIL
1:50



1 - HDPE ANCHOR - TYPICAL DETAIL
1:50

NOTES:

1. ALL DIMENSIONS IN METRES UNO



Land & Marine Geological Services Pty Ltd (L&MGSPL)

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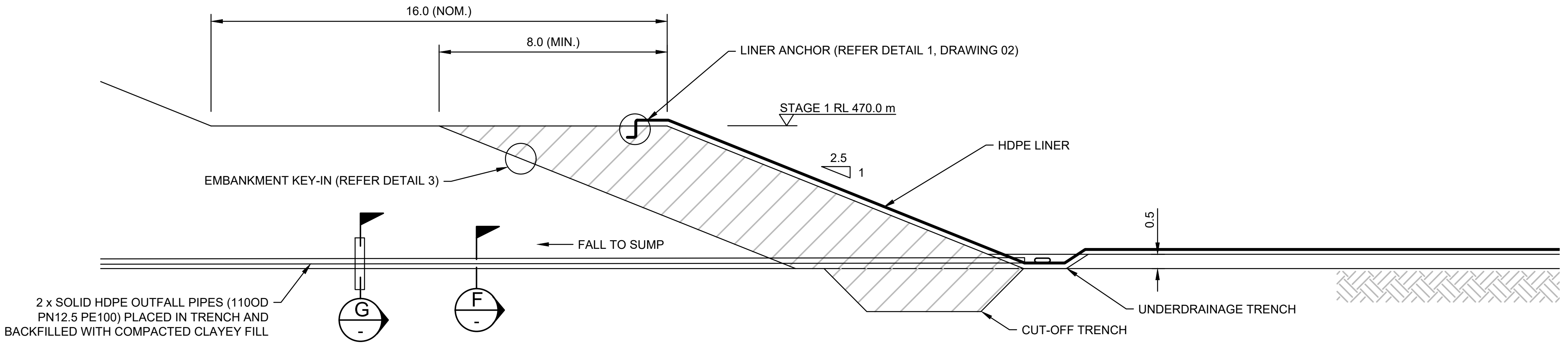
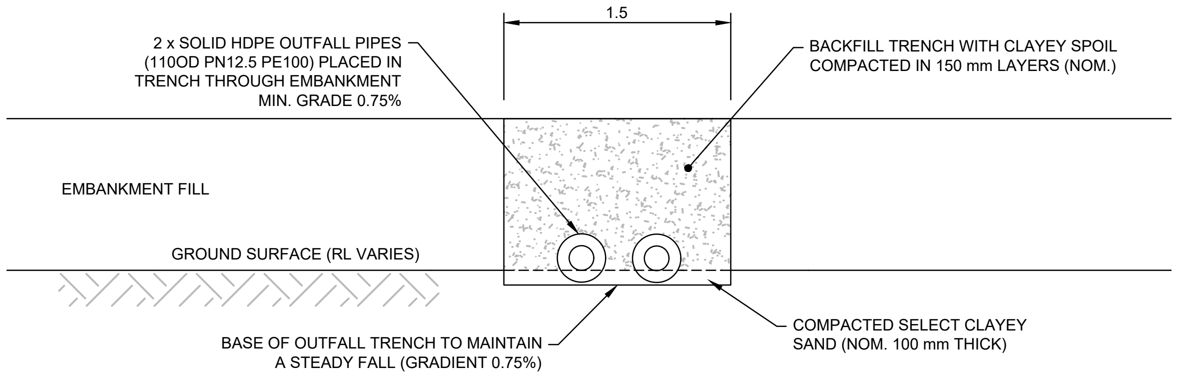
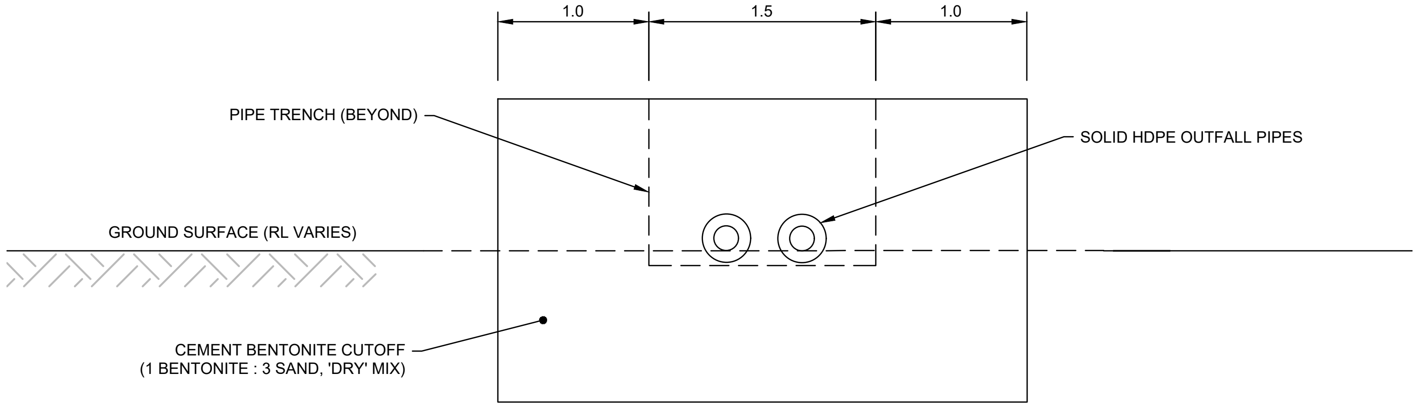
PROJECT:	**MT IDA PROJECT - GOLD**	CHECKED:	CL	DRAWING:	02
		REVISION:	0	SCALE:	AS SHOWN
TITLE:	**TSF SECTIONS AND DETAILS - SHEET 1**	DATE:	18.12.24	SHEET:	A3 L



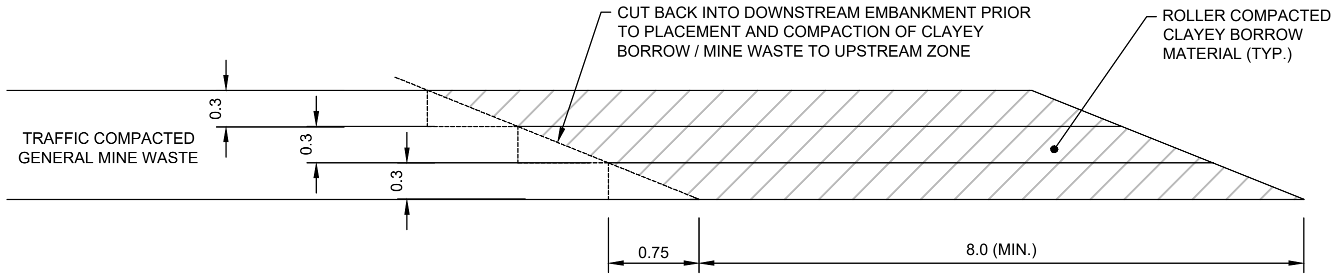
E
01
UNDERDRAINAGE OUTFALL PIPE THROUGH EMBANKMENT - TYPICAL SECTION
1:200



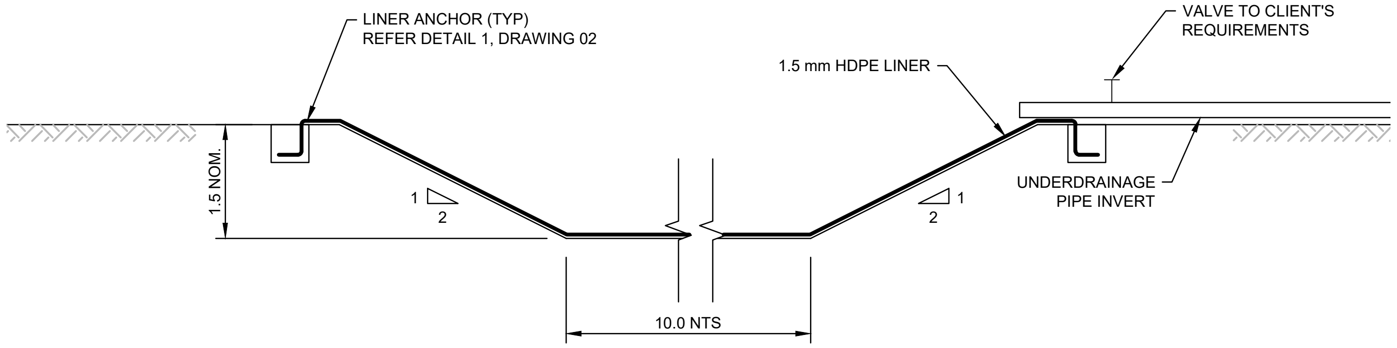
F
03
OUTFALL PIPE TRENCH (THROUGH EMBANKMENT) - TYPICAL SECTION
1:50



G
03
CEMENT BENTONITE CUTOFF - TYPICAL SECTION
1:50



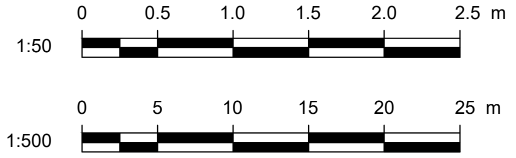
3
-
EMBANKMENT KEY-IN - TYPICAL SECTION DETAIL
1:100



4
-
UNDERDRAINAGE SUMP - TYPICAL DETAIL
1:100

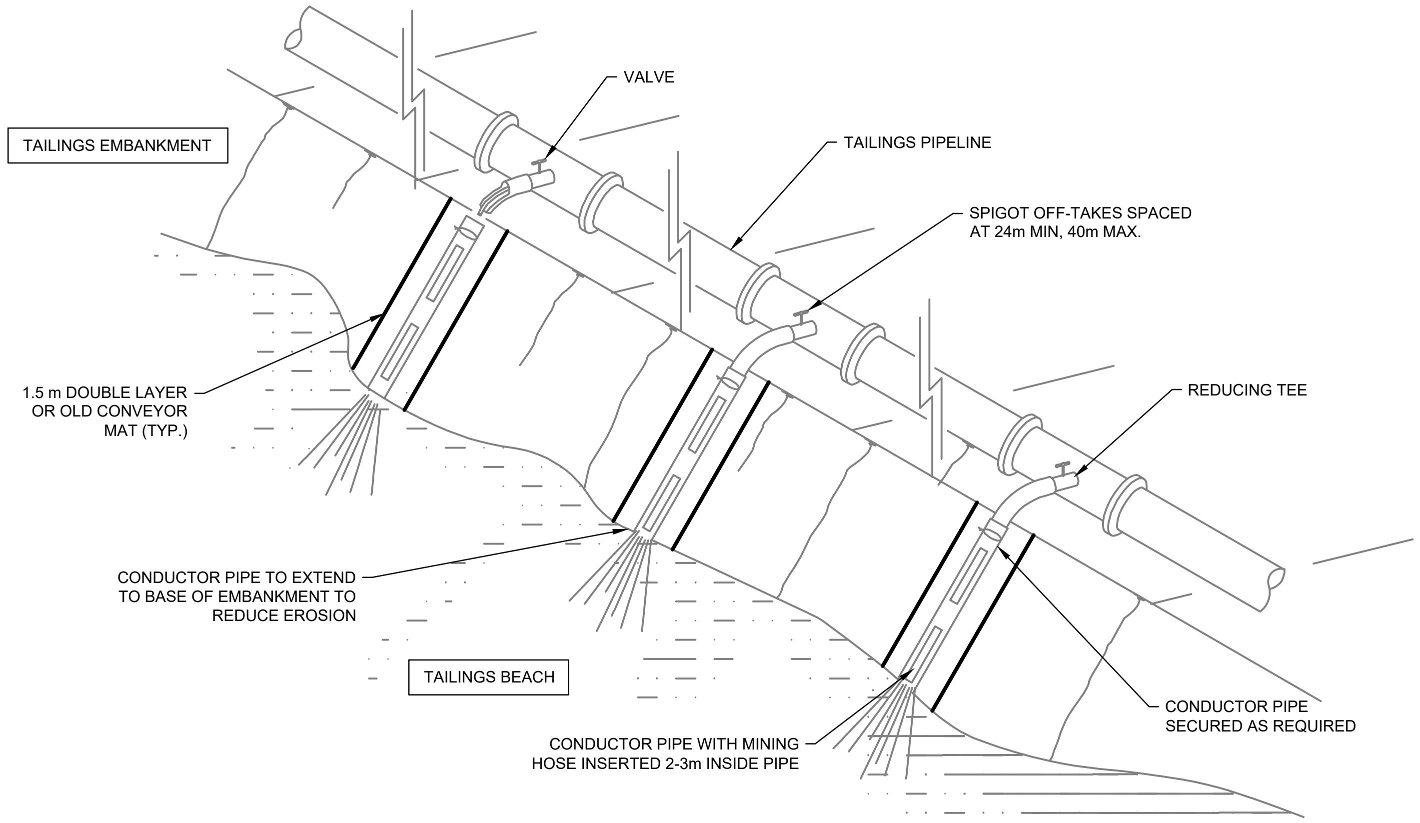
NOTES:

1. ALL DIMENSIONS IN METRES UNO



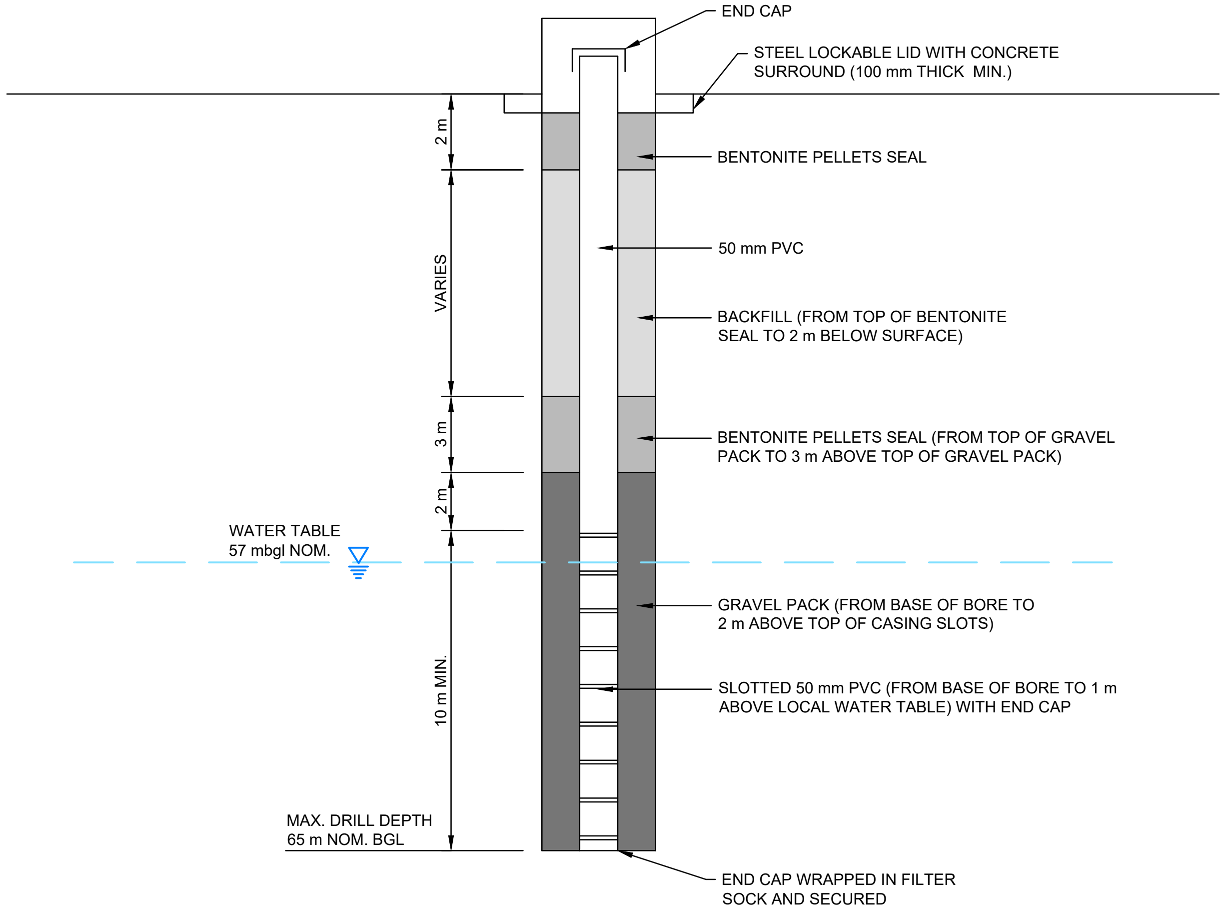
Land & Marine Geological Services Pty Ltd (L&MGSPL)

CLIENT: **DELTA LITHIUM LIMITED (DLI)**
PROJECT: **MT IDA PROJECT - GOLD**
TITLE: **TSF SECTIONS AND DETAILS - SHEET 2**
DRAWN: DE
CHECKED: CL
REVISION: 0
DATE: 18.12.24
PROJECT: PER2024-0325
DRAWING: 03
SCALE: AS SHOWN
SHEET: A3 L

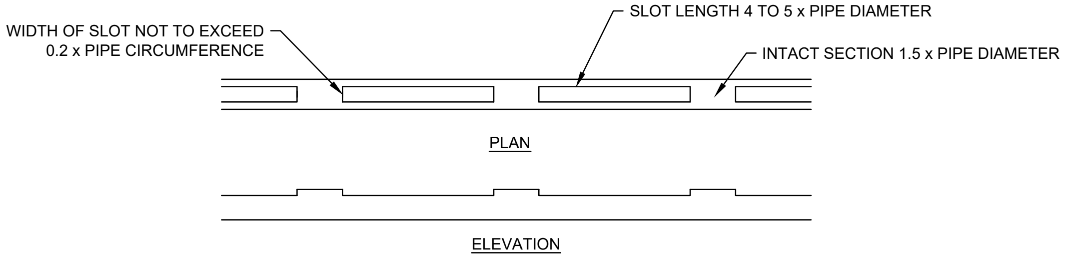


PROPOSED SPIGOT ARRANGEMENT
ISOMETRIC VIEW (NTS)

NOTE - MONITORING BORE LOCATIONS TO BE DETERMINED BY PROJECT HYDROGEOLOGIST



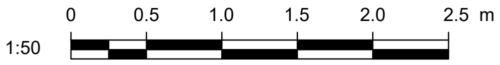
MONITORING BORE - TYPICAL DETAIL
NTS



CONDUCTOR PIPE (SLOTTED PVC) - TYPICAL DETAIL
1:50

NOTES:

1. ALL DIMENSIONS IN METRES UNO



Land & Marine Geological Services Pty Ltd (L&MGSPL)

CMW Geosciences

CLIENT: **DELTA LITHIUM LIMITED (DLI)**	DRAWN: DE	PROJECT: PER2024-0325
PROJECT: **MT IDA PROJECT - GOLD**	CHECKED: CL	DRAWING: 04
	REVISION: 0	SCALE: AS SHOWN
TITLE: **TSF SECTIONS AND DETAILS - SHEET 3**	DATE: 18.12.24	SHEET: A3 L

Appendix 3:
Operations Manual Forms
Process Plant Staff

PROJECT : **INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT : **DELTA LITHIUM LIMITED (DLI)**

LOCATION : **MT IDA PROJECT - GOLD, WA**

SUBJECT : **DAILY INSPECTION LOG SHEET** **OMPPS1**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AE
Subject	Operations Manual
Revision	1

Date:
Shift Supervisor:

Time:
Inspection by:
Employee Number:

Shift Number:
Verified by:

Item	**Criteria**	**Operating/Defective YES/NO**		**Comments**
		N/S	**D/S**	
Roadways	Condition	■	Y/N	
Downstream areas	Any seepage/wet areas	■	Y/N	
	Any spillages	■	Y/N	
Pipelines	Leaks?	Y/N	Y/N	
Decant	Pumps operating	Y/N	Y/N	
	Discharge water clarity	Y/N	Y/N	
Tailings discharge	Location, no. of spigots?	Y/N	Y/N	
Freeboard	Pond position	■	Y/N	
	Depth (estimate)	■	Y/N	
	Operational freeboard (at wall ≥1.0 m) (Estimate)	■	Y/N	
Embankments	Any distress? Any cracking? Any Slumping?	■	Y/N	
Fauna	Any deaths	■	Y/N	
Flora	Any new distress	■	Y/N	
Monitoring	Damage to instruments	■	Y/N	

NOTES :
Please provide any comments or notes relating to the tailings storage facility

Appendix 4:
Operations Manual Forms
Process Plant Management

PROJECT	**: INTEGRATED WASTE LANDFORM TSF (IWLTSF)**	Date	18-Dec-24
		Job No	PER2024-0325
OWNER	**: DELTA LITHIUM LIMITED (DLI)**	File	PER2024-0325AD
		Subject	Operations Manual
LOCATION	**: MT IDA PROJECT - GOLD, WA**	Revision	1
SUBJECT	**: COMPLETION SHEET**	**OMPPM1**	

For and on behalf of ………………………………………….………............................,
I, …………………………………………………………………………(Registered Manager), do hereby confirm that
an Operating Manual for the Integrated Waste Landform Tailings Storage Facility (IWLTSF) has been prepared
in accordance with the current edition of the Guide to preparation of design report for TSF (DMP August 2015),
Guide to Departmental requirements for the management and closure of TSF (DMP August 2015), and
Code of Practice Tailings Storage Facilities in Western Australia (DMP 2013).
A copy of the Manual is stored at ....
and is available for inspection by any authorised personnel.

Signature: .... **(Registered Manager)**

Signature of Witness: …..

Name of Witness: …...

Date: …................

REGISTER OF TSF DESIGN/OPERATION CHANGES (OMPPM2)

All changes to the design and/or operation of TSF, no matter how minor, must be thoroughly documented, approved and recorded in this Register.

PROJECT	**: MT IDA PROJECT - GOLD, WA**	**DATE**	**18-Dec-24**
LOCATION	**: MT IDA PROJECT - GOLD, WA**		

DATE OF CHANGE	DETAILS OF DOCUMENT WHICH HAS BEEN CHANGED	DESCRIPTION OF CHANGE	APPROVED BY

PROJECT : **INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT : **DELTA LITHIUM LIMITED (DLI)**

LOCATION : **MT IDA PROJECT - GOLD, WA**

SUBJECT : **MONTHLY INSPECTION LOG AND MONITORING SHEET- PROCESS PLANT MANAGEMENT** **OMPPM3**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AD
Subject	Operations Manual
Revision	1

Date:
Shift Supervisor:
Time:
Inspection by:
Employee Number:
Shift Number:
Verified by:

Item	Description of Inspection Activity	Comments	Remedial Works	
			Start	**Finish**
1.0	**Embankments**			
	Is cracking, slumping or other distress present around the embankment crests and benches? If yes, is it new cracking or existing cracking? Has existing increased in extent?			
	Is the freeboard above the designated level? (Based on DMIRS criteria that is 0.3 m, operational freeboard (at embankment)			
	Is staining or discolouration present on any of the downstream batter slopes of the embankments?			
	Is water ponding at the downstream toe of any of the embankments?			
	Is there evidence of seepage or seepage water flow from the downstream toe of any of the embankments? If yes, is it new or existing seepage? Has existing increased in extent?			
2.0	**Tailings Deposition**			
	Is the distribution of the tailings on the beaches as required by the operations manual?			
3.0	**Decant System**			
	Is the supernatant water positioned around the decant facility?			
	Is the supernatant surface (within the storage) as planned, or is there excess water on the storage?			
	Can the decant system handle storm runoff in addition to the reclaim water efficiently?			
4.0	**Process Plant Information**			
	Ore processed for the month (tonnes)			
	Average tailings slurry density, measured in percentage solids			
	Water return from the tailings storage to the process plant (in tonnes and m^3)			
	Compare the water return to the target of 25% of slurry water inflow (on an average annual basis). Any comments? Corrections required to operations?			
5.0	**Monitoring**			
	Have the water levels in the monitoring bores been measured and data entered to the appropriate sheet?			
	Has the water quality data from the monitoring bores been checked and data entered into the appropriate spreadsheet?			
	Has the VWP piezometer data been downloaded from the data loggers and uploaded to a spreadsheet?			
7.0	**Climatic Data**			
	Has the site rainfall been recorded entered daily into spreadsheet? monthly total?			
8.0	**Other Aspects**			
	Comments			

PROJECT **: INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT **: DELTA LITHIUM LIMITED (DLI)**

LOCATION **: MT IDA PROJECT - GOLD, WA**

SUBJECT **: YEARLY AUDIT INSPECTION LOG** **OMPPM4**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AD
Subject	Operations Manual
Revision	1

Date:
Shift Supervisor:

Time:
Inspection by:
Employee Number:

Shift Number:
Verified by:

ITEM	CRITERIA	Comments	Compliance	Non-Compliance
TSF	Any spillages?			
	Any cracking?			
	Any erosion?			
	Any defects?			
	Other defects?			
Access Roads	Condition of access road to the TSF			
	Condition of access roads on/around the TSF			
Tailings/Water Pipeline	Pipeline integrity			
	Spigot and valve integrity			
	Satisfactory discharge of tailings			
	Integrity of bunding to TSF			
Decant Structure	Satisfactory operation of pump			
	Integrity of decant structure			
	Water Clarity			
Decant Pond	Pond level			
	Pond size			
	Pond location			
Tailings Deposition	Active tailings delivery line			
	No. of active discharge spigots/outfalls			
	Available tailings freeboard			
	Spigot discharge even/uneven?			
Process Plant	Ore processed for the month (tonnes)			
	Average tailings density (% solids)			
	Average tailings density (% solids)			
Climatic Data	Rainfall measured and recorded daily and monthly total given to the mill			
	Evaporation measured and recorded daily and monthly total given to the mill			
Documentation	Daily and monthly logs complete			
	All proformas up to date and available			
	Emergency preparedness			
	Check existing documentation for design, construction and operation			
Monitoring	Monitoring bore data measured and recorded?			
	Water quality from the monitoring bore checked / tested and recorded?			
	Data from survey prisms measured and recorded?			
Regulatory	Check current licence and lease conditions for compliance			

PROJECT : **INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT : **DELTA LITHIUM LIMITED (DLI)**

LOCATION : **MT IDA PROJECT - GOLD, WA**

SUBJECT : **YEARLY AUDIT INSPECTION LOG** **OMPPM4**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AD
Subject	Operations Manual
Revision	1

Date: **Shift Supervisor:**	**Time:** **Inspection by:** **Employee Number:**	**Shift Number:** **Verified by:**

ITEM	CRITERIA	Comments	Compliance	Non-Compliance
Data for Reporting	Survey Data (3D DXF format) for each TSF			
	Plant throughput for previous year			
	Projected plant through put for present year			
	Projected plant through put for next year			
	Slurry density previous year			
	Slurry density present year			
	Slurry density next year			
	Active TSFs			
	Inactive TSFs			
	Decommissioned TSFs			
Other Items				

PROJECT **: INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT **: DELTA LITHIUM LIMITED (DLI)**

LOCATION **: MT IDA PROJECT - GOLD, WA**

SUBJECT **: INCIDENT REPORT FORM - TSF / EVAPORATION POND** **OMPPM5**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AD
Subject	Operations Manual
Revision	1

INSPECTORATE ☐ COLLIE ☐ KARRATHA ☐ KALGOORLIE ☐ PERTH ☐ PILBARA

STORAGE DATA	Name of Mine:			
	Phone number:			
	Name of person completing report:			
	Name of facility:			
	Storage area:	(m^2)		
	Facility type:	Tailings storage	☐	
		Evaporation pond	☐	
		Other	☐	
	Status:	Operational	☐	
		Decommissioned	☐	
		Date decommissioned	☐	
	Layout:	Ring dyke (paddock)	☐	
		Single spigot	☐	
		Multi-spigot	☐	
		Other	☐	
	Water recovery:	Gravity decant	☐	
		Pumped decant	☐	
		Pump on pontoon	☐	
		Other	☐	
	Type of tailings stored:	Gold	☐	
		Nickel	☐	
		Lead/Zinc/Copper	☐	
		Iron Ore	☐	
		Alumina	☐	
		Mineral Sand	☐	
		Other	☐	
	Annual production rate:	(Mtpa)		
	Water quality:	ph		
		TDS	(mg/l)	
	Known hazardous chemicals:			
EMBANKMENT FAILURE INCIDENTS	Embankment failure dimensions (L measured along crest)		L x W x H (m)	
	Failure mode:	Embankment sliding	☐	
		Sliding through foundation	☐	
		Embankment erosion	☐	
		Piping	☐	
		Overtopping	☐	
		Other	☐	
	Describe failure event (eg. Initiation point, sequence of events etc) :			

PROJECT : **INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT : **DELTA LITHIUM LIMITED (DLI)**

LOCATION : **MT IDA PROJECT - GOLD, WA**

SUBJECT : **INCIDENT REPORT FORM - TSF / EVAPORATION POND** **OMPPM5**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AD
Subject	Operations Manual
Revision	1

WATER ISSUES IN THE VICINITY BEFORE EMBANKMENT FAILURE OCCURRING	Seepage/leakage through:	Embankment	☐	
		Foundation	☐	
		Buried pipes	☐	
		Other	☐	
	Estimated quantity of seepage:			litres/sec
		Moist/damp	☐	
		Wet only	☐	
	Control methods (describe):			
	Rainfall in the previous 72 hours:			(mm)
	Downstream ponding adjacent to failure?	Yes	☐	
		No	☐	
	Upstream pond located:	Against failure embankment	☐	
		Away from failure embankment	☐	
		Distance		(m)
		Other	☐	
	Freeboard behind crest:	To top of tailings		(m)
		To top of water		(m)
FOUNDATION GEOLOGY	Describe foundation geology in immediate failure area (soil/rock types, weathering, etc.):			
CONSTRUCTION DETAILS OF EMBANKMENT THAT FAILED	Construction completion date:			
	Overall embankment height:			(m)
	Slope angle in failure area:			(degrees)
	Embankment designed by:	Experience	☐	
		Geotechnical methods	☐	
	Embankment construction materials and methods (describe):			
	Date of most recent geotechnical review:			
	By:			
OTHER INCIDENTS	Pipe failure		☐	
	Return water pond overflow		☐	
	Overtopping with no embankment failure		☐	
	Other (describe)		☐	
RESULTS OF THE INCIDENT	Type of material released:	Tailings	☐	
		Saline water	☐	
		Other (describe)	☐	
	Duration of release:	<1 hour	☐	
		1 to 2 hours	☐	
		2 to 6 hours	☐	
		6 to 24 hours	☐	
		>24 hours	☐	
	Amount or volume of material released:			(t/m^3 / bcm)
	Released material contained:	Yes	☐	
		No	☐	
	Maximum distance travelled by:	Tailings	☐	(km)
		Water	☐	(km)

PROJECT : **INTEGRATED WASTE LANDFORM TSF (IWLTSF)**

CLIENT : **DELTA LITHIUM LIMITED (DLI)**

LOCATION : **MT IDA PROJECT - GOLD, WA**

SUBJECT : **INCIDENT REPORT FORM - TSF / EVAPORATION POND** **OMPPM5**

Date	18-Dec-24
Job No	PER2024-0325
File	PER2024-0325AD
Subject	Operations Manual
Revision	1

ENVIRONMENTAL DAMAGE	Describe environmental impact and downstream facilities that are affected
MONITORING DETAILS	Signs of failure observed or monitored prior to failure:
	Monitoring methods used:
	Summarise observations or monitoring results:

SKETCH PLAN OF FACILITY SHOWING EXTENT OF FAILURE AREA

Show the following on the above sketch plan :

- Extent of embankment and tailings material failure as appropriate
- All access ways into underground mines (shafts, declines, sink holes, intake and exhaust rises, etc)
- All tailings storage facilities
- Evaporation ponds, water storage facilities (including thickeners)
- Open pits, waste dumps
- Offices, accommodation, etc.
- Roads, airfields
- Buildings (eg. Mill, concentrator, workshops, etc) and fuel storage areas
- Direction of surface drainage flow
- Indicate True North direction and approximate scale

Additional Comments:

Appendix 5:
Emergency Assembly Points

Appendix 6:
As-Built Drawings

APPENDIX 3. Historic Tailings Report (Mine Earth, 2023)

MINE EARTH

The mine closure specialists

Red Dirt METALS

MT IDA LITHIUM PROJECT

HISTORIC TAILINGS ASSESSMENT

FEBRUARY 2023

MINE EARTH
Unit 1, 94 Forsyth St
O'Connor WA 6163

[redacted]

100% of Mine Earth's carbon footprint has been voluntarily offset by the planting of native trees

Mine Earth Pty Ltd (ACN 141 633 696)

[redacted]

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

Mine Earth was commissioned by Red Dirt Metals Limited to characterise the historical tailings at the Mt Ida Lithium project (the Project). The Project is located approximately 100 km north-west of Menzies in the Goldfields Region of Western Australia (WA). The Project area has been historically mined and a large stockpile of historical tailings (tailings) is present.

The objectives of the assessment were to:

- Describe the historical tailings area.
- Characterise the physical, chemical and geochemical characteristics of the tailings.
- Develop recommendations for placement of tailings and associated requirements for rehabilitation and closure.

Tailings characteristics

The physical and chemical characteristics of the tailings material were assessed from 6 locations on the tailings stockpile at three depth intervals: 0 to 0.5 m, 0.5 to 1.0 m and 1.0 to 1.5 m. The samples from each depth interval were bulked from each sampling location to provide six samples for analysis of geochemical characteristics.

The key characteristics of the tailings materials are summarised as follows:

- All samples classified as ‘extremely saline’.
- Variable sodicity, ranging from non-sodic to sodic.
- A ‘moderately slow’ drainage capacity, with a high potential for hard-setting.
- Observations from site indicate that the tailings are prone to dusting and erosion by surface water flow.
- The tailings are classified as non acid-forming and typically had low contents of total metals, below NEPC (2013) health investigation levels for soil contaminants.
- In one sample, the mercury content was over 100 times the average crustal abundance, however the concentration was below the NEPC health investigation level.
- Water soluble metal concentrations were typically below the ANZECC and ARMCANZ (2000) guideline values for Livestock Drinking Water aside from minor exceedances in cobalt, selenium and mercury, though these concentrations were only marginally above the limit of detection.

Tailings management recommendations

The tailings materials are highly saline, have a moderately slow drainage capacity, are prone to dusting, have a high propensity for hard-setting and have minor exceedances of guideline concentrations for some water-soluble metals.

The historical tailings materials are therefore not considered suitable for use a surface rehabilitation material. It is recommended that the historic tailings are encapsulated within the WRL.

TABLE OF CONTENTS

Figures

Tables

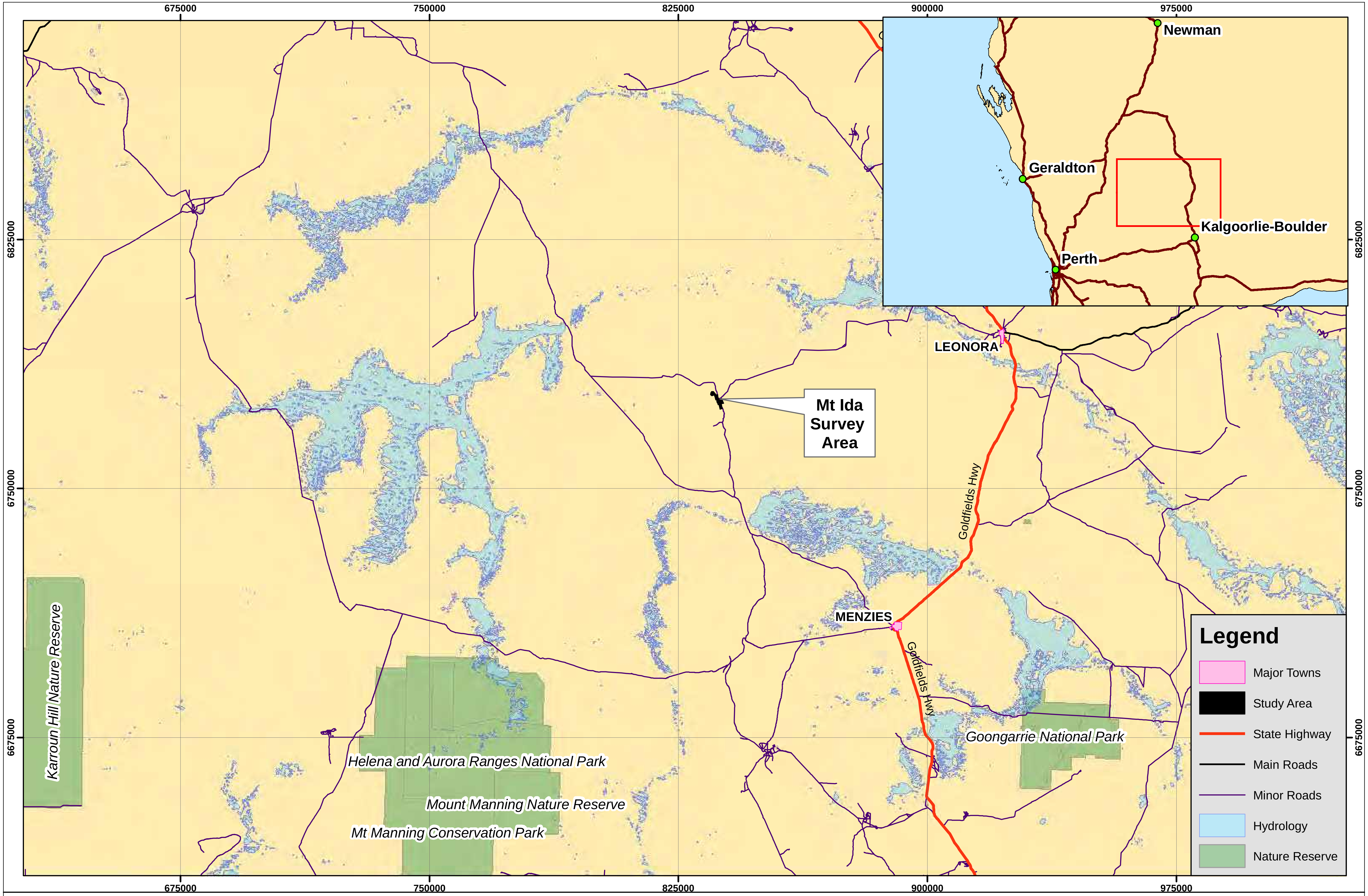
Appendices

1 INTRODUCTION

Red Dirt Metals Limited are the proponents of the proposed Mt Ida Lithium project (the Project), located approximately 100 km north-west of Menzies in the Northern Goldfields region of Western Australia (WA) (Figure 1). The Project area has been historically mined for gold and a large stockpile of historical tailings is present. Mine Earth was commissioned to assess the physical, chemical and geochemical characteristics of the historical tailings, to determine requirements for historical tailings management, rehabilitation and placement at closure.

This report includes:

- A description of the historical tailings area.
- A description of the methods used for sample collection and analysis.
- In-situ tailings descriptions.
- A description of tailings physical characteristics including texture, structure, structural stability, hydraulic conductivity and hard-setting characteristics.
- A description of tailings chemical characteristics including pH, electrical conductivity, organic matter, exchangeable cations, exchangeable sodium percentage and plant-available nutrients.
- Tailings geochemical characteristics including the potential for acid formation and metalliferous drainage.
- Tailings management recommendations.



MINE EARTH

Date: 20/01/2023

Author: H. Crisp

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994

N

0 75 150 Kilometers

1:1,000,000 at A3

Regional Location

Figure 1

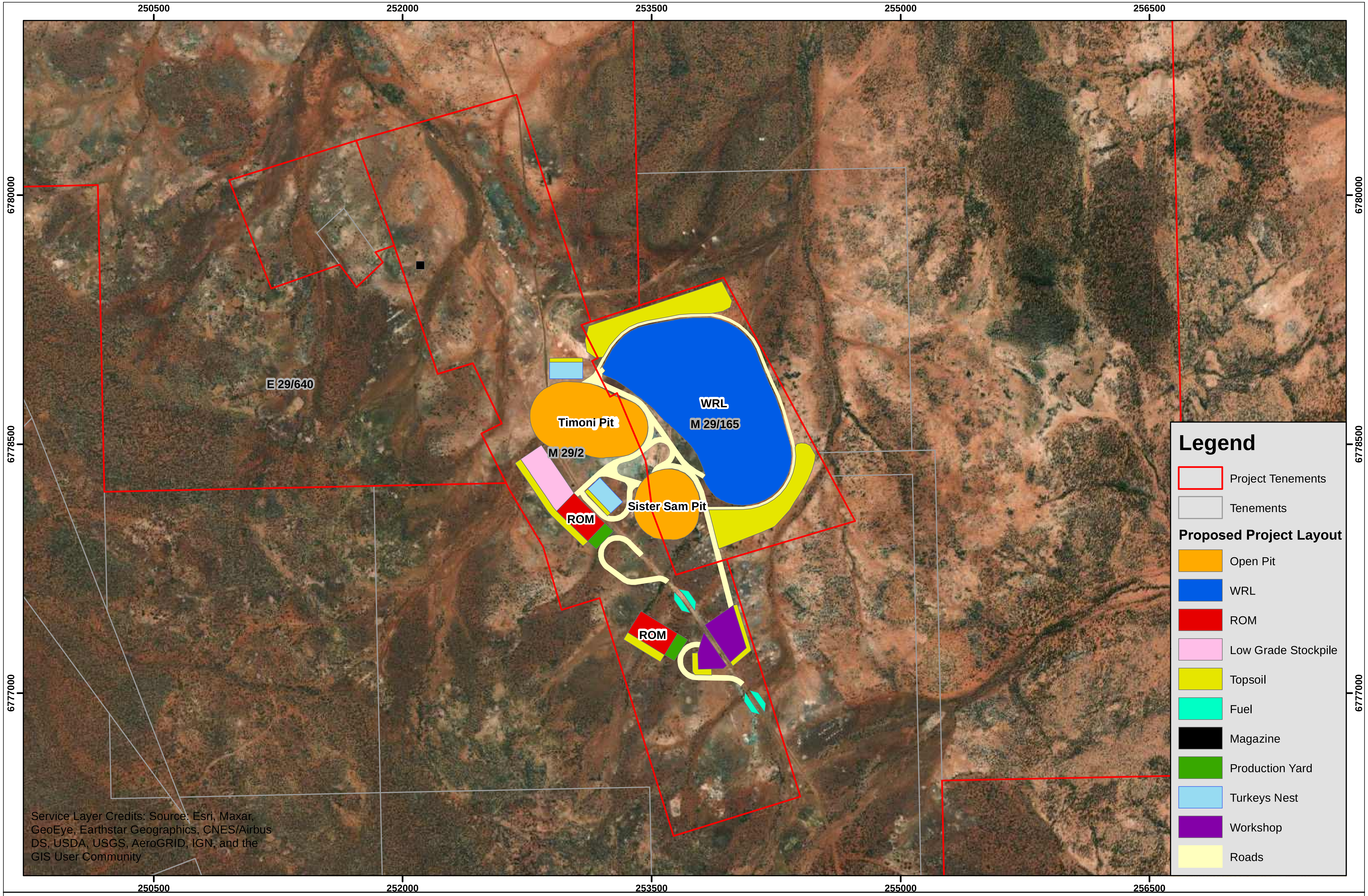
2 DESCRIPTION OF STUDY AREA

2.1 Project Description

The Project area has been historically mined for gold since the 1890s, with the historic tailings deposited in a dry uncontained stack at numerous stages throughout the history of the site. The origin and exact dates of deposition for much of the tailings material is unknown, With the material derived from processing of ore from nearby historical shafts and the Mt Ida Battery Sands.

The tailings stack and surrounding evaporation ponds, constructed from tailings, encompass an area of approximately 16 ha with an approximate volume of 400,000 tonnes and are located on M29/02 and M29/165.

The tailings stack is situated within the proposed mining footprint for Red Dirt's Mt Ida lithium project and will need to be relocated as part of the proposed mining operation. The proposed mine layout will include two pits, a waste rock landform (WRL), ROM pads, low grade stockpiles, topsoil stockpiles and other mine infrastructure (Figure 2). Characterisation of the tailings is therefore required to determine requirements for historical tailings management, rehabilitation and placement at closure.



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

MINE EARTH

Date: 20/01/2023
Author: H. Crisp

Coordinate System: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

N

0 1.5 3 Kilometers
1:20,000 at A3

Proposed Project Layout and Tenements

Figure 2

3 MATERIALS AND METHODS

3.1 Sampling Regime

The historic tailings and surrounding evaporation ponds cover an area of approximately 16 ha (Figure 3). Samples of the tailings were collected using a hand auger at the locations shown on Figure 3 from three depth intervals: 0 to 0.5 m, 0.5 to 1 m and 1 to 1.5 m.

3.2 Test Work and Procedures

Laboratory test work on the sampled tailings was conducted at the Mine Earth in-house laboratory for physical parameters and sent to the CSBP Soil and Plant Laboratory for analysis of chemical parameters and to the Intertek laboratory for analysis of geochemical parameters.

Laboratory based tailings analyses included:

- Physical characteristics:
    - Texture
    - Structural stability (Emerson Dispersion Test)
    - Saturated hydraulic conductivity
    - Soil strength (Modulus of rupture)
- Chemical characteristics:
    - pH
    - Electrical conductivity
    - Organic carbon
    - Exchangeable cations
    - Plant available nutrients (N, P, K and S)
    - Total metal concentrations
- Geochemical characteristics:
    - Total sulphur, chromium(II)-reducible sulphur (CRS)
    - Total carbon, carbonate-carbon
    - Acid neutralising capacity (ANC)
    - Net acid generation (NAG)
    - Multi-element concentration
    - Soluble metals and metalloids
    - Cyanide concentration

All test work was conducted in accordance with standard analytical procedures to assess the potential for acid formation and metalliferous drainage, and soil properties related to the support of plant growth (Rayment, 2011). Descriptions of relevant soil classification categories that have been used as a comparison for determining suitability of tailings for plant growth are detailed in Appendix A.

The three sample depth intervals were composited into one sample from each location for the geochemical analysis, i.e. a total of six samples were analysed.

All external laboratory results for the tailings samples are provided in Appendix B.

MINE EARTH

Date: 20/01/2023
Author: H. Crisp

Coordinate System: GDA 1994 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA 1994

N

0 100 200 400 Meters
1:2,500 at A3

Tailings Sample Locations

Figure 3

4 RESULTS AND DISCUSSION

The tailings have been historically deposited in the area shown on Figure 3. A portion of the surface is vegetated with salt tolerant species (approximately 10 to 15% cover on tailings stockpile area), but the majority of the tailings surface is uncovered, unconsolidated and was observed to be experiencing both wind and water erosion. The tailings surface at each of the sampling locations is shown in Plates 1 to 6. The tailings varied in colour from 'grey' to 'pinky red'. The historic tailings are predominantly in one large pile surrounded by a series of smaller evaporation ponds that have been constructed from the tailings materials (Figure 3).

The physical, chemical and geochemical characteristics of the tailings materials are presented in the following sections and discussed in relation to relevant soil characterisation parameters and potential for acid and metalliferous drainage.

4.1 Physical characteristics

4.1.1 Texture

Soil texture describes the proportions of sand, silt and clay (the particle size distribution) within the <2 mm fraction of a soil, or in this case a tailings material. The particle size distribution and resulting textural class is an important factor influencing most physical, and many chemical and biological properties. Soil structure, water holding capacity, hydraulic conductivity, strength, fertility, erodibility and susceptibility to compaction are some of the factors closely linked to the texture of a soil material.

The texture of the Mt Ida historic tailings material is equivalent to a 'loamy sand', comprised mainly of fine sand sized particles (71 to 88%) with minor amounts of clay (3 to 11%) and silt (9 to 20%) (Table 1 and Appendix B).

4.1.2 Structural Stability

The structural stability of a soil / tailings and its susceptibility to structural decline is complex and depends on the net effect of a number of properties, including the amount and type of clay present, organic matter content, chemistry and the nature of disturbance. Soil / tailings aggregates that slake and, particularly those that disperse, indicate a weak soil structure that is easily degraded. These materials should be seen as potentially problematic when used as a rehabilitation medium, particularly if left exposed at the surface.

The Emerson Aggregate Test identifies the potential slaking and dispersive properties of soil / tailings aggregates. The dispersion test identifies the properties of the tailings materials under a worst-case scenario, where severe stress is applied to the material. Generally, samples allocated into Emerson Classes 1 and 2 are those most likely to exhibit dispersion of the clay sized fraction and will therefore be the most problematic.

The tailings samples were all identified as Emerson Class 5 (Table 1), indicating that the tailings slake but are not prone to dispersion of the clay fraction in their current state. It should be noted however, that the high salinity of the historic tailings may have a flocculating effect, reducing the propensity for dispersion of the clay fraction. The potential for dispersion may therefore increase if salts are leached from the tailings material.

Plate 1 Tailings at site T1

Plate 2 Tailings at site T2

Plate 3 Tailings at site T3

Plate 4 Tailings at site T4

Plate 5 Tailings at site T5

Plate 6 Tailings at site T6

Table 1 Soil texture and Emerson Test Class for selected tailings samples

Site #	Depth (m)	Equivalent soil texture	Approximate clay content (%)	Emerson Test Class[1]
T01	0 – 0.5	Loamy sand	3	Class 5
	0.5 – 1.0			Class 5
	1.0 – 1.5			Class 5
T02	0 – 0.5			Class 5
	0.5 – 1.0			Class 5
	1.0 – 1.5			Class 5
T03	0 – 0.5	Loamy sand	8	Class 5
	0.5 – 1.0			Class 5
	1.0 – 1.5			Class 5
T04	0 – 0.5			Class 5
	0.5 – 1.0			Class 5
	1.0 – 1.5			Class 5
T05	0 – 0.5	Loamy sand	11	Class 5
	0.5 – 1.0			Class 5
	1.0 – 1.5			Class 5
T06	0 – 0.5			Class 5
	0.5 – 1.0			Class 5
	1.0 – 1.5			Class 5

[1] Class 5 - aggregate slakes but does not disperse, no dispersion of remoulded soil, soil:water suspension remains dispersed

4.1.3 Hydraulic conductivity

Hydraulic conductivity (K_{sat}) refers to the saturated permeability of soil / tailings, or the ability of water to infiltrate and drain through the soil matrix, and is dependent on soil properties such as texture and structure (Moore, 1998). Freely draining materials with high K_{sat} values will generally be less susceptible to surface runoff and erosion. Slow draining materials with low K_{sat} values, are more likely to experience waterlogging, increased surface runoff and erosion.

Saturated hydraulic conductivity was determined for selected tailings samples. Drainage classes were determined for each sample according to their K_{sat} (Hunt, N and Gilkes, R, 1992) (Table 2).

The K_{sat} of the tailings materials ranged from 7.2 to 14.8 mm/hr, indicating a drainage classification of ‘moderately slow’ for all samples (Table 2).

Table 2 Saturated hydraulic conductivity (K_{sat}) for selected tailings samples

Site #	Depth (m)	K_{sat} (mm/hr)	Drainage Class[1]
T01	0 – 0.5	14.8	Moderately slow
T03	0 – 0.5	10.4	Moderately slow
T05	0 – 0.5	7.2	Moderately slow

1. (Hunt, N and Gilkes, R, 1992)

4.1.4 Soil strength

A modified Modulus of Rupture (MOR) test was conducted on selected samples of the historic tailings. This test is a measure of strength upon drying and identifies the tendency of the tailings to hard-set following disturbance, wetting and drying cycles. A MOR of over 60 kPa has been described as the critical value for distinguishing potentially problematic soils in agricultural scenarios (Cochrane & Alymore, 1997). Restricted germination and root penetration into the tailings matrix is a likely consequence of a high modulus of rupture. Two of the three tailings samples tested recorded MOR values above the 60 kPa threshold, indicating a propensity to hard-set with repeated wetting / drying cycles (Table 3).

Table 3 Modulus of Rupture (soil strength) of selected tailings samples.

Site #	Depth (m)	Modulus of rupture (kPa)[1]
T01	0 – 0.5	274
T03	0 – 0.5	32
T05	0 – 0.5	281

1. Values above the threshold of 60kPa are identified as potentially hard-setting (Cochrane and Aylmore 1997).

4.2 Chemical characteristics

4.2.1 Tailings pH and Electrical Conductivity

Tailings pH (H_2O) measures the acidity or alkalinity of the material in relation to suitability for plant growth. Ratings for pH are based on the Land Evaluation Standards for Land Resource Mapping categories (van Gool, 2005).

Tailings $pH_{1:5}$ (H_2O) ranged from pH 7.3 (classified as ‘neutral’) to pH 8.5 (‘moderately alkaline’). There was no consistent change in pH of the historic tailings with depth to the maximum sample depth of 1.5m (Figure 4).

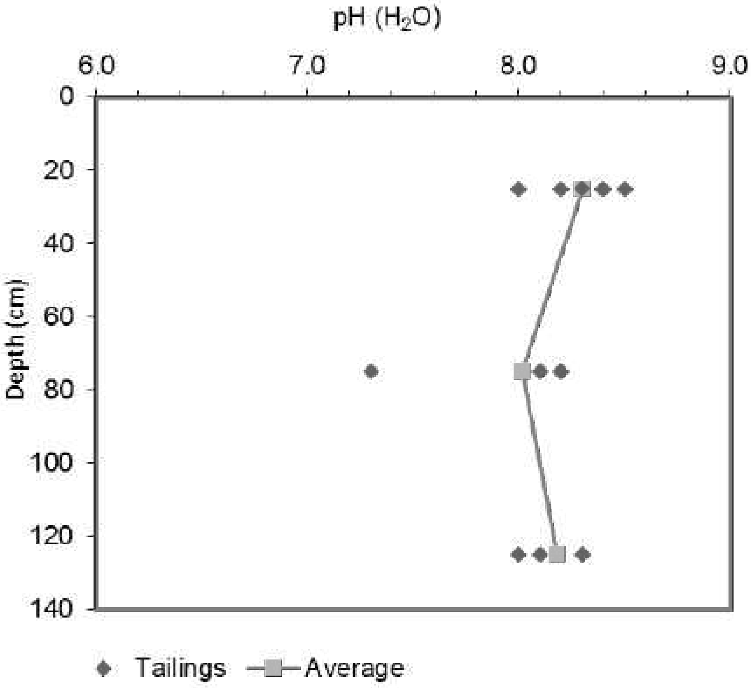


Figure 4 Individual and average $pH_{1:5}$ (H_2O) of tailings with depth

Electrical conductivity (EC) is a measurement of the soluble salts. Individual $EC_{1:5}$ values of the tailings ranged from 2.69 dS/m to 7.43 dS/m, with all samples classified as 'extremely saline', based on the standard USDA and CSIRO electrical conductivity categories (Appendix A). Salinity generally decreased with depth throughout the historic tailings profiles, indicating evapo-concentration of salts at and close to the tailings surface (Figure 5).

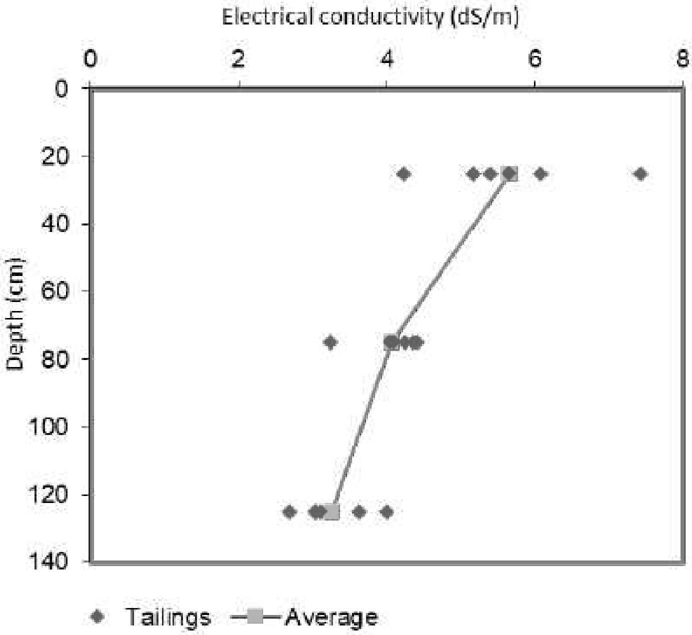


Figure 5 Individual and average electrical conductivity$_{1:5}$ (dS/m) of tailings samples with depth

4.2.2 Organic Matter

The organic matter content of soil is an important factor influencing many physical, chemical and biological soil characteristics. Directly derived from plants and animals, its functions in soil include supporting the micro and macro fauna and flora populations, increasing the water retention capacity, buffering pH and improving soil structure.

The organic matter content of the tailings was determined as a measure of the soil organic carbon percentage (SOC%). The SOC% of the tailings samples was low (ranging from 0.2 to 0.3%), as would be expected for tailings samples (Figure 6).

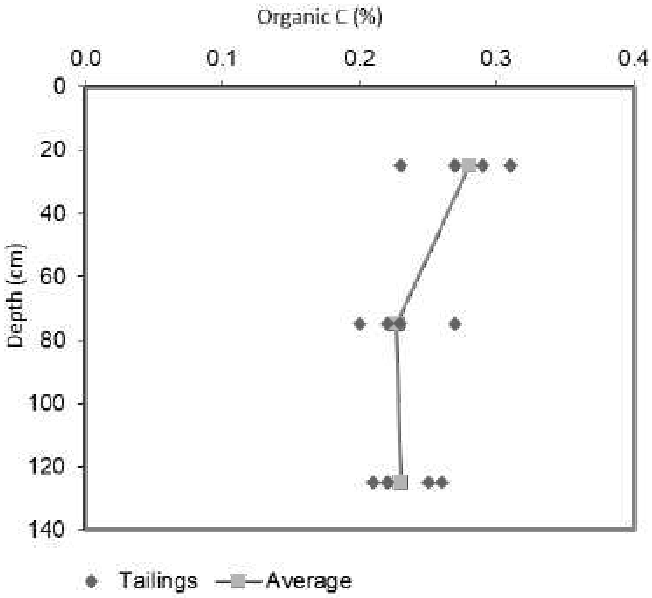


Figure 6 Individual and average Soil Organic Carbon (%) concentration of tailings samples with depth

4.2.3 Exchangeable Cations and Exchangeable Sodium Percentage

Exchangeable cations, held on clay surfaces and within organic matter, are an important source of soil fertility and can influence the physical properties of a soil / tailings material. Generally, if cations such as Ca^{2+}, Mg^{2+} and K^+ are dominant on the clay exchange surfaces, the soil will typically display increased physical structure and stability, leading to increased aeration, drainage and root growth (Moore, 1998). If Na cations (Na^+) are dominant on exchange surfaces and the exchangeable sodium percentage (ESP) exceeds more than 6% of the total exchangeable cations, then the material is considered to be 'sodic', which can lead to poor physical properties (i.e. dispersion, hardsetting and erosion in clay-rich materials). ESP values over 15% are classified as 'highly sodic'.

The tailings were classified as 'non-sodic' to 'sodic' with ESP values ranging from 4.2 to 8.7% (Table 4). When considering the ESP results in combination with the Emerson test classes in Section 4.2.4, it can be seen that the tailings are considered to have a relatively low risk of clay dispersion. However, as mentioned in Section 4.1.2, it is important to consider that the high salinity of the tailings may have a flocculating effect on the clay fraction. The propensity for clay dispersion, particularly for the sodic tailings, may therefore increase if salts are leached from the tailings.

Table 4 Exchangeable cations and ESP of selected samples. Shading of ESP values denotes non-sodic, sodic and highly sodic classifications

Site #	Depth (cm)	Exchangeable cations (meq/100g)				eCEC (meq/100g)	ESP (%)
		Ca	Mg	K	Na		
T1	50-100	7.81	1.13	0.14	0.79	9.87	8.0
T3	50-100	5.67	0.33	0.15	0.27	6.42	4.2
T5	50-100	10.09	1.92	0.19	1.16	13.36	8.7

4.2.4 Macro-nutrients

The most important macro-nutrients for plant growth are nitrogen (N), phosphorus (P), potassium (K), and sulphur (S). These nutrients are largely derived from the soil mineral component and organic matter. Native plant species have a number of physiological adaptations that enable them to be productive in areas where the supply of macronutrients is limited. There is limited information available which details the specific nutritional requirements for native plant species in the semi-arid zone of WA. Therefore, the use of analogue sites is an effective way to baseline the nutritional requirements of native plant species within the study area.

Most (>98%) N in soils organic (Moore, 1998). Plant-available forms of inorganic N (nitrate and ammonium) are produced via mineralisation of soil organic matter.

The plant-available N concentrations of the tailings were variable, but generally low, ranging from 14 mg/kg to 267 mg/kg nitrate (Figure 7) and from 0.5 mg/kg to 17 mg/kg ammonium (Figure 8). Average nitrate and ammonium concentrations both decreased with depth.

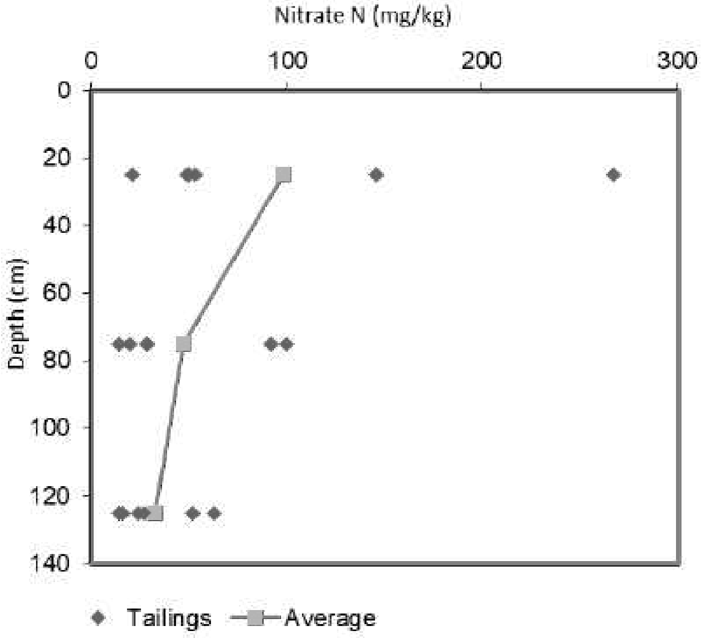


Figure 7 Individual and average Nitrate-N (mg/kg) concentrations in tailings with depth

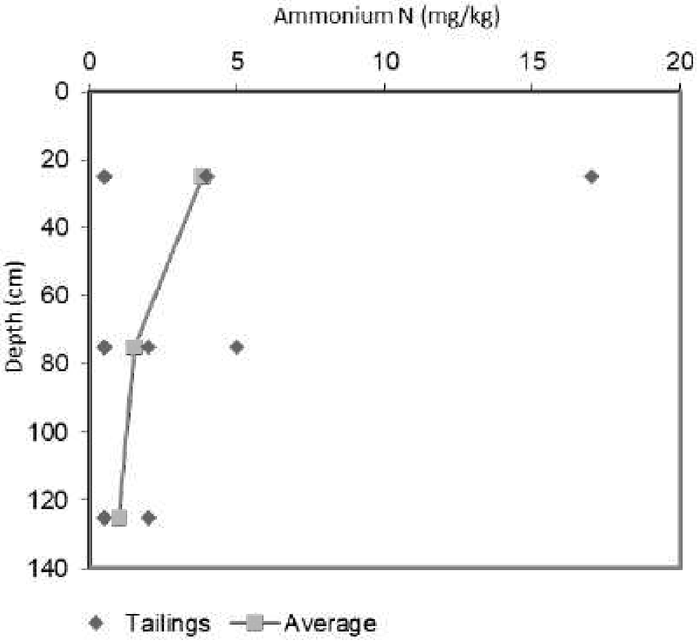


Figure 8 Individual and average Ammonium-N (mg/kg) concentration of tailings with depth

Phosphorus is essential for the growth of vegetation as it plays a key role in the formulation of energy producing organic compounds. Adequate phosphorus nutrition enhances many aspects of plant physiology, including the fundamental processes of photosynthesis, nitrogen fixation, flowering, fruiting (including seed production), and maturation (Brady, N. and Weil, R., 2002).

The plant-available phosphorus concentrations of the historic tailings were classed as low (Moore, 1998) (Figure 9), with individual values ranging from 1 to 5 mg/kg.

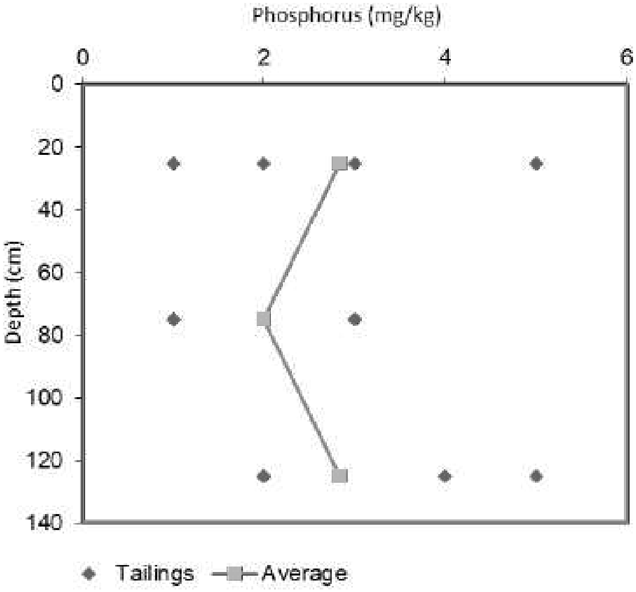


Figure 9 Individual and average plant-available phosphorus (mg/kg) concentration of tailings with depth

Potassium (K) plays a critical role in a number of plant physiological processes. Adequate amounts of K have been linked to improved drought tolerance, better resistance to certain fungal diseases and greater tolerance to insect pests (Brady, N. and Weil, R., 2002).

The plant-available K concentrations of the tailings ranged from low to high (low rating: <90 mg/kg, high rating: >200 mg/kg (Moore, 1998)) with individual values ranging from 127 to 2,358 mg/kg (Figure 10).

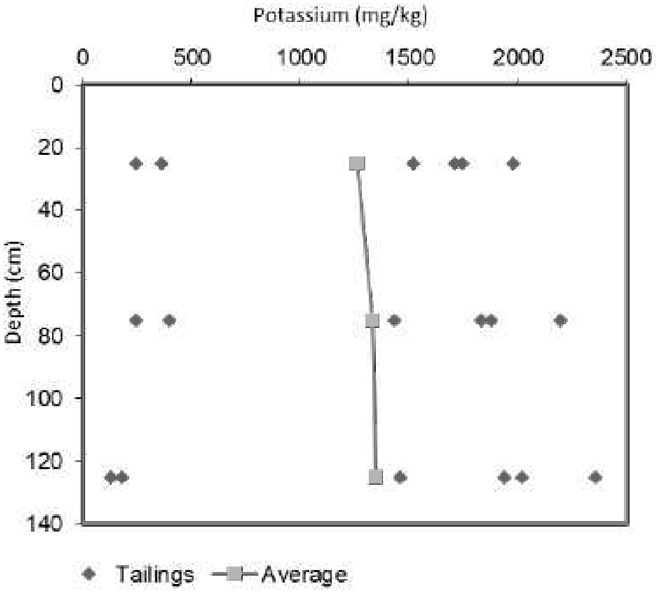


Figure 10 Individual and average plant-available potassium (mg/kg) concentration of tailings with depth

Plant-available sulfur (S) (i.e. sulfate) concentrations measured for the tailings were very high, ranging from 2,597 mg/kg to 9,173 mg/kg (Figure 11).

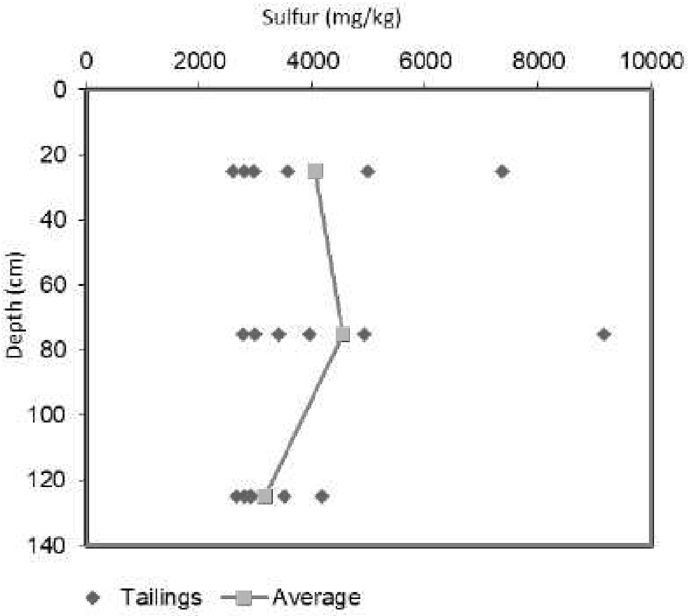


Figure 11 Individual and average plant-available sulfur (mg/kg) concentration of tailings with depth

4.3 Comparison to local soils

As a point of comparison, the chemical and physical characteristics of the tailings material relative to those of local surface soils (Mine Earth, 2023) are summarised in Table 5. Many of the physical and chemical characteristics of the historical tailings are relatively similar to those of the surface soils within the Project area, with the major differences being the very high salinity, lower hydraulic conductivity and higher soil strength.

Table 5 Range and average values for tailings chemical and physical characteristics and comparison to local surface soils

Parameter	Unit	Tailings range	Tailings average	Local soil average (20 samples) [1.]	Comparison of tailings to local soil values [1.]	Suitability of tailings to support plant growth
Ammonium Nitrogen	mg/kg	0.5 - 17	2.1	3.7	Slightly lower	Suitable
Nitrate Nitrogen	mg/kg	14 - 267	59.2	31	Slightly higher	Suitable
Plant-available Phosphorus	mg/kg	1 - 5	2.6	10	Lower	Suitable
Plant-available Potassium	mg/kg	127 - 2,358	1,312	152	Higher	Suitable
Sulfur (plant-available sulphate)	mg/kg	2,597 - 9,173	3,914	151	Higher	Suitable
Organic Carbon	%	0.2 - 0.3	0.25	0.49	Slightly lower	Suitable
Salinity	dS/m	2.69 - 7.43	4.32	0.79	Much higher	Only suitable for salt tolerant species
pH (H_2O)	pH units	7.3 - 8.5	8.2	7.29	Slightly higher (more alkaline)	Suitable
eCEC	meq/100g	6.4 - 13.4	9.9	10.84	Similar	Suitable
ESP	%	4.2 - 8.7	7.0	5.19	Similar	Suitable
Structural stability	Emerson Class	Class 5	Class 5	Classes 2, 3a, 3b, 5 and 6	Similar	Suitable
Hydraulic conductivity	Drainage class	Moderately slow	10.8	75.0	Lower	Suitable, but likely to have higher surface runoff than local soils
Soil strength	kPa	4.8 - 108	23.8	195.9	Higher	Not suitable

1. (Mine Earth, 2023)

4.4 Geochemical characteristics

4.4.1 Acid base accounting

The acid-base accounting results for the tailings samples are presented in Table C1 in Appendix C.

The $pH_{1:2}$ of the six tailings samples ranged from pH 7.9 to 8.2. The $EC_{1:2}$ was reported in the range of 5.90 to 8.40 mS/cm.

Total sulfur values were reported between 0.55% (sample T3C) and 1.17% (sample T6C). Four samples were tested for Chromium Reducible Sulfur (CRS). The CRS results indicate that the amounts of sulfides are negligible to trace level, with a maximum reported CRS value of 0.17% (sample T4C).

The comparison between total carbon and carbonate-carbon shows that most of the carbon is present in the form of carbonates. Carbonate-carbon ranged from 0.21% (sample T6C) to 0.34% (sample T3C).

Where available, CRS was used to calculate the maximum potential acidity (MPA). For two samples CRS was unavailable and the MPA was calculated based on total sulfur, which is likely an overestimation of potential acidity.

Based on the acid-base accounting using the ratio method, samples were classified as (Price, 2009):

- NAF when the ANC/MPA ratio is equal or greater than 2.
- PAF when the ANC/MPA ratio is less than 2.

All six tailings samples were classified as non-acid-forming (NAF).

4.4.2 Multi-element analysis

4.4.2.1 Total metals

The multi-element assay data was assessed against general background levels, based on a scale derived from the Geochemical Abundance Index method (GAI) (Forstner, Ahlf, & Calmano, 1993). This scale was used to compare the multi-element composition of the tailings with the average crustal abundance (ACA) for each element. The ACA values are derived from those values typically recorded for soils, regolith and bedrock derived from unmineralised terrain (Reimann & Caritat, 1998) (Bowen, 1979). The results are presented as enrichments over ten times the ACA (equivalent approximately to a GAI of 3) and over 100 times the ACA (approximately a GAI of 6) for a broader context of elemental enrichment.

Multi-element results compared against the ACA are presented in Table C2A in Appendix C. Elemental enrichment over ten times the ACA was reported for arsenic, antimony and copper in samples T1C and T6C. Both samples also reported enrichment over 100 times the ACA in bismuth, while all other samples reported enrichment over ten times the ACA in bismuth. Elemental enrichment over 100 times the ACA was reported for mercury in sample T6C while elemental enrichment over ten times the ACA was reported for mercury in samples T1C and T5C.

For context, reported element contents were also compared against the NEPC (2013) health investigation levels for soil contaminants (Appendix C - Table C2B). Although the mercury content was over 100 times the ACA, it was below the health investigation level. The chromium content of 468 mg/kg in sample T6C exceeded the Recreational C criterion of 300 mg/kg, though the criterion is specifically for chromium (VI) and the reported chromium content is unspecified. All other elements were reported below the respective criterion.

4.4.2.2 Water soluble metals

The samples underwent water extraction testwork, employing a solid:water ratio of 1:2 (w/w) with the results presented in Appendix C - Table C3. For context, the results were compared against the Livestock Drinking Water Guideline (ANZECC and ARMCANZ, 2000). Most samples showed element concentrations to be typically below, or close to, the respective detection limits (generally within 0.1-10 µg/L). Due to the high salinity of the samples (up to 10.40 mS/cm), the detection limits were increased due to the required dilution of the sample for analysis. Samples T1C and T6C generally reported higher concentrations of most elements than the other samples. This is particularly notable for cobalt with concentrations one order of magnitude higher for T1C (0.862 mg/L) and T6C (1.346 mg/L) than for the other samples, with sample T6C exceeding the respective guideline value of 1 mg/L.

Exceedances of the Livestock Drinking Water Guideline were also observed for other elements including selenium and mercury, though these concentrations were only marginally above the limit of detection. Total dissolved solids and sulfate concentrations were reported above the respective guideline criterion; however, salinity is reported at comparable levels in local groundwater (Advisian, 2022).

Total cyanide concentrations were reported in the range of 0.07-0.13 mg/L. There is no ANZECC and ARMCANZ (2000) guideline value for Livestock Drinking Water for total cyanide, however the guideline value for Recreational Water Quality is 0.1 mg/L. All samples tested were at, or below this criterion.

It should be noted that the samples of the tailings material were taken from the top 1.5 m. It is possible that the total and water-soluble metal concentrations may differ in the tailings material at greater depth.

4.4.3 Mineralogy

A mineralogical assessment via powder x-ray diffraction has been conducted on samples T4C and T6C. Results are presented in Table C4 in Appendix C.

Sample T4C contained dominant calcic amphibole, major quartz and a range of accessory minerals including clays (predominantly smectite), chlorite, micas, Fe-Mg amphibole, plagioclase, ankerite-dolomite. A number of trace components were identified such as kaolinite, talc, calcite, halite and gypsum.

Sample T6C contained dominant quartz and a large range of accessory minerals, similar to sample T4C, in addition to kaolinite, serpentine, talc, calcic amphibole, gypsum, jarosite, goethite and halite.

It should be noted that, whilst serpentine was identified as an accessory mineral in sample T6C, it has the potential to display fibrous forms.

The high salinity reported by the tailings samples can be attributed to the presence of halite and gypsum, as identified in the mineralogical assessment.

Minerals such as gypsum and jarosite indicate the presence of historic sulphide oxidation, even though no sulphides were identified in the samples; whilst calcite and ankerite-dolomite can both contribute to the pH buffering capacity of the samples.

5 HISTORICAL TAILINGS MANAGEMENT

The tailings materials are highly saline, have a moderately slow drainage capacity, are prone to dusting, have a high propensity for hard-setting and have minor exceedances of comparative guideline concentrations for some water-soluble metals. It is possible however, that higher metal concentrations may be present at greater depths within the tailings profile.

The historical tailings materials are therefore not considered suitable for use a surface rehabilitation material. It is recommended that the historic tailings are covered with waste rock or encapsulated within the WRL.

6 REFERENCES

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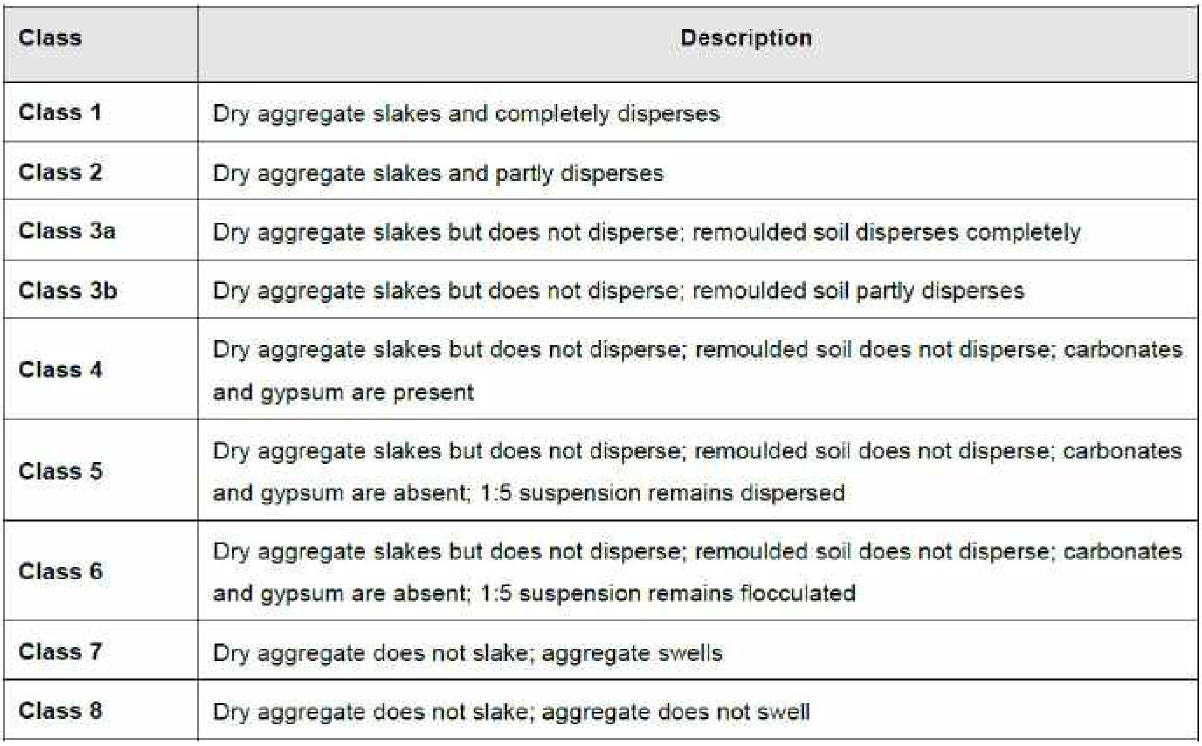
Appendix A

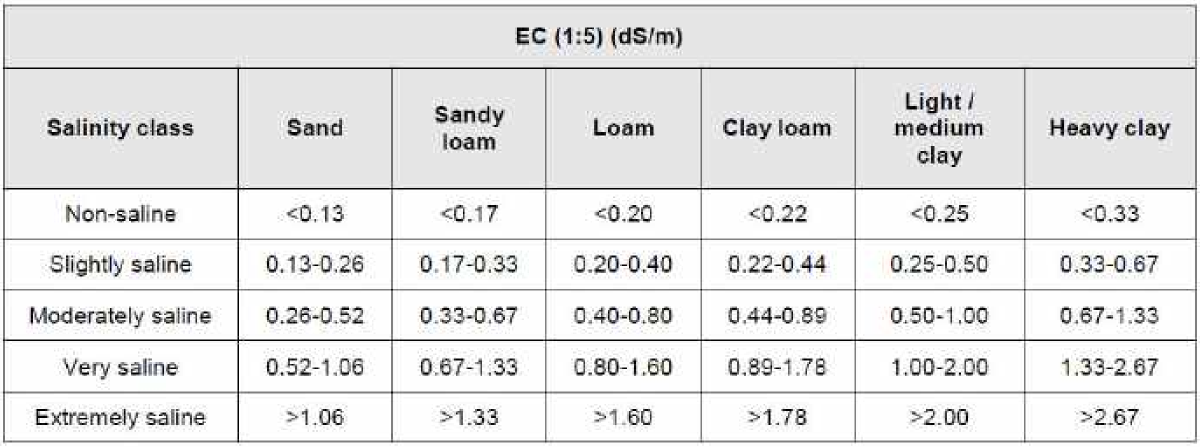
Soil analysis classifications

Emerson Dispersion Test Classes (Moore 1998)



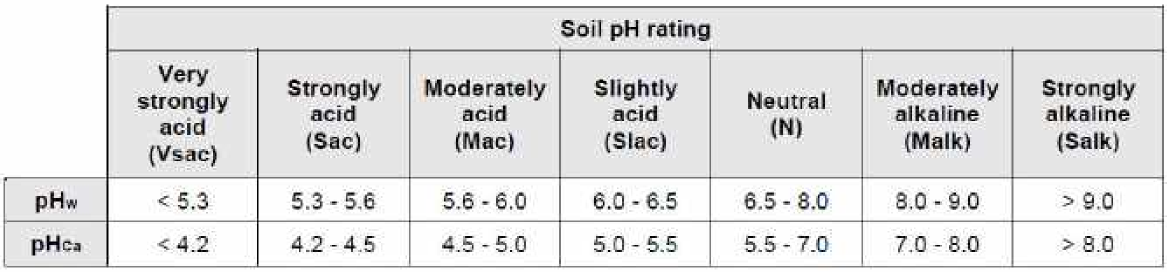
Class	Description
Class 1	Dry aggregate slakes and completely disperses
Class 2	Dry aggregate slakes and partly disperses
Class 3a	Dry aggregate slakes but does not disperse; remoulded soil disperses completely
Class 3b	Dry aggregate slakes but does not disperse; remoulded soil partly disperses
Class 4	Dry aggregate slakes but does not disperse; remoulded soil does not disperse; carbonates and gypsum are present
Class 5	Dry aggregate slakes but does not disperse; remoulded soil does not disperse; carbonates and gypsum are absent; 1:5 suspension remains dispersed
Class 6	Dry aggregate slakes but does not disperse; remoulded soil does not disperse; carbonates and gypsum are absent; 1:5 suspension remains flocculated
Class 7	Dry aggregate does not slake; aggregate swells
Class 8	Dry aggregate does not slake; aggregate does not swell

Soil Electrical conductivity classes (based on standard USDA and CSIRO categories)



	EC (1:5) (dS/m)					
Salinity class	**Sand**	**Sandy loam**	**Loam**	**Clay loam**	**Light / medium clay**	**Heavy clay**
Non-saline	<0.13	<0.17	<0.20	<0.22	<0.25	<0.33
Slightly saline	0.13-0.26	0.17-0.33	0.20-0.40	0.22-0.44	0.25-0.50	0.33-0.67
Moderately saline	0.26-0.52	0.33-0.67	0.40-0.80	0.44-0.89	0.50-1.00	0.67-1.33
Very saline	0.52-1.06	0.67-1.33	0.80-1.60	0.89-1.78	1.00-2.00	1.33-2.67
Extremely saline	>1.06	>1.33	>1.60	>1.78	>2.00	>2.67

Soil pH classes



	Soil pH rating						
	Very strongly acid (Vsac)	**Strongly acid (Sac)**	**Moderately acid (Mac)**	**Slightly acid (Slac)**	**Neutral (N)**	**Moderately alkaline (Malk)**	**Strongly alkaline (Salk)**
pH$_{w}$	< 5.3	5.3 - 5.6	5.6 - 6.0	6.0 - 6.5	6.5 - 8.0	8.0 - 9.0	> 9.0
pH$_{Ca}$	< 4.2	4.2 - 4.5	4.5 - 5.0	5.0 - 5.5	5.5 - 7.0	7.0 - 8.0	> 8.0

Appendix B

Laboratory Analysis Certificates

MINERALS
TEST REPORT

CLIENT

NICOLE DE KEVER
MINE EARTH PTY LTD
[redacted]

JOB INFORMATION

JOB CODE : 1960.0/2221834
NO. SAMPLES : 18
NO. ELEMENTS : 59
CLIENT ORDER NO. : MID-2206 (Job 1 of 1)
SAMPLE SUBMISSION NO. : MID-2206
PROJECT : MOUNT IDA
SAMPLE TYPE : Various
DATE RECEIVED : 06/10/2022
DATE TESTED : 02/11/2022 - 19/12/2022
DATE REPORTED : 19/12/2022
DATE PRINTED : 19/12/2022

REPORT NOTES

[redacted]

Accredited for compliance with ISO/IEC 17025 - Testing.
Company Accreditation Number 3244

SIGNIFICANT FIGURES

It is common practice to report data derived from analytical instrumentation to a maximum of two or three significant figures. Some data reported herein may show more figures than this. The reporting of more than two or three figures in no way implies that figures beyond the least significant digit have significance.

For more information on the uncertainty on individual reported values, please contact the laboratory.

MEASUREMENT OF UNCERTAINTY

Measurement of uncertainty estimates are available for most tests upon request.

SAMPLE STORAGE

All solid samples (assay pulps, bulk pulps and residues) will be stored for 60 days without charge. Following this samples will be stored at a daily rate until clients written advice regarding return, collection or disposal is received. If storage information is not supplied on the submission, or arranged with the laboratory in writing the default will be to store the samples with the applicable charges. Storage is charged at $4.00 per m3 per day, expenses related to the return or disposal of samples will also be charged. Current disposal costs including packaging in a Class2 waste disposal facility is charged at $175.00 per m3.

Samples received as liquids, waters or solutions will be held for 60 days free of charge then disposed of, unless written advice fo return or collection is received.

LEGEND	X	= Less than Detection Limit	NA	= Not Analysed
	SNR	= Sample Not Received	UA	= Unable to Assay
	LNR	= Lab Not Received	>	= Value beyond Limit of Method
	DTF	= Result still to come	+	= Extra Sample Received Not Listed
	I/S	= Insufficient Sample for Analysis		

UNITS	ppm for Solid Samples	= mg/Kg
	ppb for Solid Samples	= µg/Kg
	ppm for Liquid Samples	= mg/L
	ppb for Liquid Samples	= µg/L

ELEMENTS	Ag	Ag	Al	Al	ANC	As
UNITS	ppm	ug/l	ppm	mg/l	kgH2SO4/t	ppm
DETECTION LIMIT	0.05	0.1	50	0.01	1	0.5
DIGEST	4A/	18Ws2/	4A/	18Ws2/	ANCx/	4A/
ANALYTICAL FINISH	MS	MS	OE	OE	VOL	MS
SAMPLE NUMBERS						
0001 T1C	0.67		3.21%		23	113.9
0002 T2C	0.38		6.67%		36	4.5
0003 T3C	0.50		6.72%		35	1.2
0004 T4C	0.47		6.46%		27	2.1
0005 T5C	0.63		6.73%		37	1.4
0006 T6C	0.54		3.74%		24	214.7
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3		0.2		0.05		
0014 T2C HNO3		X		0.11		
0015 T3C HNO3		X		0.06		
0016 T4C HNO3		X		0.08		
0017 T5C HNO3		0.6		0.11		
0018 T6C HNO3		0.2		0.07		
CHECKS						
0001 T4C HNO3		X		0.05		
0002 T6C	0.71		3.59%		25	205.1
STANDARDS						
0001 GWS-5						
0002 OREAS 903	0.43		5.70%			51.6
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5					105	
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank		X		X		
0002 Control Blank	X		X		0	X

ELEMENTS	As	B	B	Ba	Ba	Bi
UNITS	ug/l	ppm	mg/l	ppm	ug/l	ppm
DETECTION LIMIT	1	50	0.01	0.1	0.5	0.01
DIGEST	18Ws2/	FP1/	18Ws2/	4A/	18Ws2/	4A/
ANALYTICAL FINISH	MS	OE	OE	MS	MS	MS
SAMPLE NUMBERS						
0001 T1C		X		131.0		32.75
0002 T2C		X		92.8		0.76
0003 T3C		X		98.3		1.35
0004 T4C		X		89.1		0.70
0005 T5C		X		104.4		0.74
0006 T6C		X		152.8		36.50
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3	12		1.02		28.1	
0014 T2C HNO3	X		0.52		26.6	
0015 T3C HNO3	1		0.50		26.5	
0016 T4C HNO3	1		0.54		29.6	
0017 T5C HNO3	X		0.52		26.8	
0018 T6C HNO3	19		0.97		15.6	
CHECKS						
0001 T4C HNO3	1		0.54		28.8	
0002 T6C		X		140.7		35.41
STANDARDS						
0001 GWS-5						
0002 OREAS 903				194.4		9.19
0003 AMIS0272		X				
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank	X		X		X	
0002 Control Blank		X		X		X

ELEMENTS	Bi	C	CO3	C-Acinsol	C-CO3	Ca
UNITS	ug/l	%	mgCaCO3/L	%	%	ppm
DETECTION LIMIT	0.05	0.01	1	0.01	0.01	50
DIGEST	18Ws2/		18Ws2/	C71/		4A/
ANALYTICAL FINISH	MS	/CSA	VOL	CSA	/CALC	OE
SAMPLE NUMBERS						
0001 T1C		0.28		0.07	0.22	1.56%
0002 T2C		0.28		X	0.27	5.91%
0003 T3C		0.34		X	0.34	5.79%
0004 T4C		0.25		0.01	0.23	5.83%
0005 T5C		0.30		0.01	0.29	5.73%
0006 T6C		0.22		0.01	0.21	1.90%
0007 T1C RAW			X			
0008 T2C RAW			X			
0009 T3C RAW			X			
0010 T4C RAW			X			
0011 T5C RAW			X			
0012 T6C RAW			X			
0013 T1C HNO3	X					
0014 T2C HNO3	X					
0015 T3C HNO3	X					
0016 T4C HNO3	X					
0017 T5C HNO3	X					
0018 T6C HNO3	X					
CHECKS						
0001 T4C HNO3	X					
0002 T6C		0.22		0.05	0.16	1.85%
STANDARDS						
0001 GWS-5			X			
0002 OREAS 903						6067
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170		0.21				
0009 OREAS 277				0.12		
BLANKS						
0001 Control Blank	X		X			
0002 Control Blank		X		X	X	X

ELEMENTS	Ca	Cd	Cd	Cl	Co	Co
UNITS	mg/l	ppm	ug/l	mg/l	ppm	ug/l
DETECTION LIMIT	0.01	0.02	0.2	5	0.1	1
DIGEST	18Ws2/	4A/	18Ws2/	18Ws2/	4A/	18Ws2/
ANALYTICAL FINISH	OE	MS	MS	VOL	MS	MS
SAMPLE NUMBERS						
0001 T1C		0.76			33.4	
0002 T2C		0.33			42.8	
0003 T3C		0.53			43.0	
0004 T4C		0.43			41.4	
0005 T5C		0.32			43.4	
0006 T6C		0.66			43.8	
0007 T1C RAW				1395.00		
0008 T2C RAW				1917.00		
0009 T3C RAW				1164.00		
0010 T4C RAW				2185.00		
0011 T5C RAW				2192.00		
0012 T6C RAW				2178.00		
0013 T1C HNO3	626.52		X			862
0014 T2C HNO3	740.95		X			73
0015 T3C HNO3	666.33		X			71
0016 T4C HNO3	774.07		0.2			49
0017 T5C HNO3	769.29		X			93
0018 T6C HNO3	659.94		0.3			1346
CHECKS						
0001 T4C HNO3	733.50		X			50
0002 T6C		0.64			42.7	
STANDARDS						
0001 GWS-5						
0002 OREAS 903		0.21			137.8	
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank	X		X	X		X
0002 Control Blank		X			X	

ELEMENTS	ColourChange	Cr	Cr	Cu	Cu	EC
UNITS	NONE	ppm	mg/l	ppm	mg/l	mS/cm
DETECTION LIMIT	0	1	0.1	0.5	0.01	0.01
DIGEST	ANCx/	4A/	18Ws2/	4A/	18Ws2/	Ws2/
ANALYTICAL FINISH	QUAL	MS	MS	MS	MS	MTR
SAMPLE NUMBERS						
0001 T1C	No	282		1911.8		6.31
0002 T2C	No	138		157.6		7.46
0003 T3C	No	134		157.4		5.90
0004 T4C	No	126		153.1		7.86
0005 T5C	No	150		238.3		7.64
0006 T6C	No	468		1611.5		8.40
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3			X		0.10	
0014 T2C HNO3			X		X	
0015 T3C HNO3			X		X	
0016 T4C HNO3			X		X	
0017 T5C HNO3			X		X	
0018 T6C HNO3			X		0.06	
CHECKS						
0001 T4C HNO3			X		X	
0002 T6C	No	467		1646.2		8.63
STANDARDS						
0001 GWS-5						
0002 OREAS 903		79		6693.5		
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						0.31
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank			X		X	
0002 Control Blank		X		X		X

ELEMENTS	EC	F	F	Fe	Fe	Final-pH
UNITS	mS/cm	ppm	mg/l	%	mg/l	NONE
DETECTION LIMIT	0.01	50	0.1	0.01	0.01	0.1
DIGEST	18Ws2/	FC7/	18Ws2/	4A/	18Ws2/	ANCx/
ANALYTICAL FINISH	MTR	SIE	SIE	OE	OE	MTR
SAMPLE NUMBERS						
0001 T1C		55		6.39		2.7
0002 T2C		153		8.96		3.3
0003 T3C		178		8.25		3.6
0004 T4C		203		7.93		3.2
0005 T5C		179		8.28		3.6
0006 T6C		94		7.98		2.6
0007 T1C RAW	8.18		0.3			
0008 T2C RAW	7.99		0.1			
0009 T3C RAW	5.99		X			
0010 T4C RAW	8.95		0.1			
0011 T5C RAW	8.94		0.1			
0012 T6C RAW	10.40		0.4			
0013 T1C HNO3					0.16	
0014 T2C HNO3					0.12	
0015 T3C HNO3					0.12	
0016 T4C HNO3					0.22	
0017 T5C HNO3					0.14	
0018 T6C HNO3					0.07	
CHECKS						
0001 T4C HNO3					0.21	
0002 T6C		91		7.63		2.6
STANDARDS						
0001 GWS-5	0.32		0.6			
0002 OREAS 903				4.09		
0003 AMIS0272						
0004 AMIS0341		3547				
0005 ANC-5						2.1
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank	X		X		X	
0002 Control Blank		X		X		1.9

ELEMENTS	Fizz-Rate	HCO3	Hg	K	K	Li
UNITS	NONE	mgCaCO3/L	ug/l	ppm	mg/l	ug/l
DETECTION LIMIT	1	2	1	20	0.1	0.5
DIGEST	ANCx/	18Ws2/	18Ws2/	4A/	18Ws2/	18Ws2/
ANALYTICAL FINISH	QUAL	VOL	MS	OE	OE	MS
SAMPLE NUMBERS						
0001 T1C	X			4343		
0002 T2C	1			5445		
0003 T3C	1			6551		
0004 T4C	1			5893		
0005 T5C	1			6030		
0006 T6C	X			4836		
0007 T1C RAW		31				
0008 T2C RAW		14				
0009 T3C RAW		15				
0010 T4C RAW		14				
0011 T5C RAW		13				
0012 T6C RAW		30				
0013 T1C HNO3			1		22.1	14.2
0014 T2C HNO3			X		67.8	44.3
0015 T3C HNO3			X		60.9	41.8
0016 T4C HNO3			X		72.3	49.2
0017 T5C HNO3			7		69.1	44.1
0018 T6C HNO3			2		27.6	13.7
CHECKS						
0001 T4C HNO3			X		68.0	48.5
0002 T6C	X			4671		
STANDARDS						
0001 GWS-5		92				
0002 OREAS 903				3.28%		
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank		2	X		X	5.1
0002 Control Blank				X		

ELEMENTS	Li	Mg	Mg	Mn	Mn	Mo
UNITS	ppm	ppm	mg/l	ppm	mg/l	ppm
DETECTION LIMIT	0.1	20	0.01	1	0.001	0.1
DIGEST	4A/	4A/	18Ws2/	4A/	18Ws2/	4A/
ANALYTICAL FINISH	MS	OE	OE	MS	MS	MS
SAMPLE NUMBERS						
0001 T1C	9.0	2.10%		497		5.2
0002 T2C	20.4	2.46%		1827		1.1
0003 T3C	20.3	2.04%		1652		1.2
0004 T4C	21.1	2.23%		1484		1.1
0005 T5C	21.7	2.33%		1574		1.1
0006 T6C	10.2	3.02%		566		3.1
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3			142.95		0.070	
0014 T2C HNO3			68.37		0.039	
0015 T3C HNO3			54.52		0.053	
0016 T4C HNO3			102.17		0.066	
0017 T5C HNO3			89.40		0.045	
0018 T6C HNO3			281.29		0.096	

CHECKS						
0001 T4C HNO3			96.56		0.076	
0002 T6C	9.7	2.87%		541		3.2

STANDARDS						
0001 GWS-5						
0002 OREAS 903	17.6	7029		728		4.1
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						

BLANKS						
0001 Control Blank			X		X	
0002 Control Blank	X	X		X		X

ELEMENTS	Mo	MPA	Na	Na	NAG	NAGpH
UNITS	ug/l	kgH2SO4/t	ppm	mg/l	kgH2SO4/t	NONE
DETECTION LIMIT	0.5	1	20	0.1	1	0.1
DIGEST	18Ws2/		4A/	18Ws2/	NAGx/	NAGx/
ANALYTICAL FINISH	MS	/CALC	OE	OE	VOL	MTR
SAMPLE NUMBERS						
0001 T1C		20	5050		0	8.46
0002 T2C		17	1.25%		0	10.40
0003 T3C		17	1.17%		0	10.48
0004 T4C		20	1.32%		0	10.32
0005 T5C		17	1.33%		0	10.50
0006 T6C		36	5906		0	7.74
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3	25.8			1420.4		
0014 T2C HNO3	32.0			1166.1		
0015 T3C HNO3	27.3			769.6		
0016 T4C HNO3	29.4			1402.4		
0017 T5C HNO3	41.9			1371.5		
0018 T6C HNO3	14.5			1770.0		
CHECKS						
0001 T4C HNO3	29.5			1319.1		
0002 T6C		36	5879		0	7.68
STANDARDS						
0001 GWS-5						
0002 OREAS 903			308			
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3					23	2.59
0007 GWS-5						
0008 AMIS0170		14				
0009 OREAS 277						
BLANKS						
0001 Control Blank	X			X		
0002 Control Blank		X	X		6	5.06

ELEMENTS	NAG(4.5)	NAPP	Ni	Ni	OH	P
UNITS	kgH2SO4/t	kgH2SO4/t	ppm	mg/l	mg/l	ppm
DETECTION LIMIT	1	1	0.5	0.01	1	20
DIGEST	NAGx/		4A/	18Ws2/	18Ws2/	4A/
ANALYTICAL FINISH	VOL	/CALC	MS	MS	VOL	MS
SAMPLE NUMBERS						
0001 T1C	0	-3	218.0			118
0002 T2C	0	-19	88.8			496
0003 T3C	0	-18	96.7			442
0004 T4C	0	-7	92.9			423
0005 T5C	0	-20	99.1			424
0006 T6C	0	12	292.8			118
0007 T1C RAW					X	
0008 T2C RAW					X	
0009 T3C RAW					X	
0010 T4C RAW					X	
0011 T5C RAW					X	
0012 T6C RAW					X	
0013 T1C HNO3				X		
0014 T2C HNO3				X		
0015 T3C HNO3				X		
0016 T4C HNO3				X		
0017 T5C HNO3				X		
0018 T6C HNO3				X		
CHECKS						
0001 T4C HNO3				X		
0002 T6C	0	11	284.2			111
STANDARDS						
0001 GWS-5					X	
0002 OREAS 903			53.3			1032
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3	19					
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank				X	X	
0002 Control Blank	0	0	X			X

ELEMENTS	P	Pb	Pb	ANCslurry	NAGpHfnl	NAGpHin
UNITS	mg/l	ppm	ug/l	NONE	NONE	NONE
DETECTION LIMIT	0.2	0.5	5	0.1	0.1	0.1
DIGEST	18Ws2/	4A/	18Ws2/	ANCx/	NAGx/	NAGx/
ANALYTICAL FINISH	MS	MS	MS	MTR	MTR	MTR
SAMPLE NUMBERS						
0001 T1C		65.2		2.67	8.46	7.11
0002 T2C		183.2		3.32	10.40	7.60
0003 T3C		179.3		3.56	10.48	7.71
0004 T4C		143.0		3.17	10.32	7.55
0005 T5C		150.8		3.58	10.50	7.58
0006 T6C		53.8		2.61	7.74	6.84
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3	X		X			
0014 T2C HNO3	X		X			
0015 T3C HNO3	X		X			
0016 T4C HNO3	X		X			
0017 T5C HNO3	X		X			
0018 T6C HNO3	X		19			
CHECKS						
0001 T4C HNO3	X		X			
0002 T6C		50.5		2.59	7.68	6.82
STANDARDS						
0001 GWS-5						
0002 OREAS 903		11.1				
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5				2.11		
0006 NAG Std 3					2.59	2.59
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank	X		X			
0002 Control Blank		X		1.88	5.06	4.82

ELEMENTS	pH	pH	pH Drop	S	S	S
UNITS	NONE	NONE	NONE	%	ppm	mg/l
DETECTION LIMIT	0.1	0.1	0.1	0.01	50	0.1
DIGEST	Ws2/	18Ws2/	ANCx/		4A/	18Ws2/
ANALYTICAL FINISH	MTR	MTR	MTR	/CSA	OE	OE
SAMPLE NUMBERS						
0001 T1C	8.2		4.3	0.66	5858	
0002 T2C	8.0		4.5	0.57	4669	
0003 T3C	7.9		3.7	0.55	4619	
0004 T4C	8.1		3.5	0.65	8754	
0005 T5C	8.0		4.1	0.55	4880	
0006 T6C	7.9		4.1	1.17	9320	
0007 T1C RAW		8.0				909.1
0008 T2C RAW		8.1				685.4
0009 T3C RAW		8.1				664.5
0010 T4C RAW		8.1				734.4
0011 T5C RAW		8.1				710.9
0012 T6C RAW		7.9				1130.4
0013 T1C HNO3						959.3
0014 T2C HNO3						673.5
0015 T3C HNO3						642.3
0016 T4C HNO3						748.3
0017 T5C HNO3						717.7
0018 T6C HNO3						1097.2
CHECKS						
0001 T4C HNO3						701.0
0002 T6C	7.9		4.1	1.17	9558	
STANDARDS						
0001 GWS-5		8.8				
0002 OREAS 903					4656	
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5	8.9					
0008 AMIS0170				0.46		
0009 OREAS 277						
BLANKS						
0001 Control Blank		5.5				0.1
0002 Control Blank	5.6			X	X	

ELEMENTS	SO4	Sb	Sb	Se	Si	Si
UNITS	mg/l	ppm	ug/l	ug/l	%	mg/l
DETECTION LIMIT	0.3	0.05	0.1	5	0.1	0.05
DIGEST	18Ws2/	4A/	18Ws2/	18Ws2/	FP1/	18Ws2/
ANALYTICAL FINISH	OE	MS	MS	MS	OE	OE
SAMPLE NUMBERS						
0001 T1C		3.67			32.2	
0002 T2C		0.23			25.6	
0003 T3C		0.24			26.6	
0004 T4C		0.25			26.4	
0005 T5C		0.29			26.0	
0006 T6C		2.21			29.3	
0007 T1C RAW	2723.5					
0008 T2C RAW	2053.3					
0009 T3C RAW	1990.7					
0010 T4C RAW	2200.2					
0011 T5C RAW	2129.8					
0012 T6C RAW	3386.5					
0013 T1C HNO3	2873.9		0.6	14		7.05
0014 T2C HNO3	2017.8		0.3	7		1.65
0015 T3C HNO3	1924.2		0.2	7		1.37
0016 T4C HNO3	2241.8		0.1	8		1.53
0017 T5C HNO3	2150.0		0.2	X		1.73
0018 T6C HNO3	3287.0		0.5	28		8.26
CHECKS						
0001 T4C HNO3	2100.2		X	8		1.45
0002 T6C		2.17			29.7	
STANDARDS						
0001 GWS-5						
0002 OREAS 903		1.58				
0003 AMIS0272					29.3	
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank	0.3		X	X		X
0002 Control Blank		X			X	

ELEMENTS	Sn	Sn	Sr	Sr	Th	Th
UNITS	ppm	ug/l	ppm	ug/l	ppm	ug/l
DETECTION LIMIT	0.1	1	0.05	0.2	0.01	0.05
DIGEST	4A/	18Ws2/	4A/	18Ws2/	4A/	18Ws2/
ANALYTICAL FINISH	MS	MS	MS	MS	MS	MS
SAMPLE NUMBERS						
0001 T1C	10.3		36.97		0.88	
0002 T2C	1.3		78.43		0.68	
0003 T3C	1.3		79.92		0.62	
0004 T4C	1.2		81.02		0.64	
0005 T5C	1.5		82.09		0.65	
0006 T6C	8.1		37.19		0.92	
0007 T1C RAW						
0008 T2C RAW						
0009 T3C RAW						
0010 T4C RAW						
0011 T5C RAW						
0012 T6C RAW						
0013 T1C HNO3		X		967.2		X
0014 T2C HNO3		X		600.6		X
0015 T3C HNO3		X		485.3		X
0016 T4C HNO3		X		616.8		X
0017 T5C HNO3		X		648.3		X
0018 T6C HNO3		X		673.1		X
CHECKS						
0001 T4C HNO3		X		616.9		X
0002 T6C	7.4		36.44		0.88	
STANDARDS						
0001 GWS-5						
0002 OREAS 903	2.7		79.08		13.14	
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank		X		X		X
0002 Control Blank	0.1		X		X	

ELEMENTS	Ti	Tl	Tl	TotAlk	U	U
UNITS	ppm	ppm	ug/l	mgCaCO3/L	ppm	ug/l
DETECTION LIMIT	5	0.02	0.1	5	0.01	0.05
DIGEST	4A/	4A/	18Ws2/		4A/	18Ws2/
ANALYTICAL FINISH	OE	MS	MS	/CALC	MS	MS
SAMPLE NUMBERS						
0001 T1C	1601	0.20			0.96	
0002 T2C	7479	0.16			0.19	
0003 T3C	7151	0.17			0.17	
0004 T4C	6790	0.17			0.17	
0005 T5C	7181	0.17			0.19	
0006 T6C	1831	0.19			0.60	
0007 T1C RAW				31		
0008 T2C RAW				14		
0009 T3C RAW				15		
0010 T4C RAW				14		
0011 T5C RAW				13		
0012 T6C RAW				30		
0013 T1C HNO3			X			1.65
0014 T2C HNO3			X			X
0015 T3C HNO3			X			X
0016 T4C HNO3			X			X
0017 T5C HNO3			X			X
0018 T6C HNO3			X			1.16
CHECKS						
0001 T4C HNO3			X			X
0002 T6C	1842	0.18			0.63	
STANDARDS						
0001 GWS-5						
0002 OREAS 903	1982	0.66			7.62	
0003 AMIS0272						
0004 AMIS0341						
0005 ANC-5						
0006 NAG Std 3						
0007 GWS-5						
0008 AMIS0170						
0009 OREAS 277						
BLANKS						
0001 Control Blank			X			X
0002 Control Blank	X	X			X	

ELEMENTS	V	V	Zn	Zn
UNITS	ppm	mg/l	ppm	mg/l
DETECTION LIMIT	1	0.1	1	0.1
DIGEST	4A/	18Ws2/	4A/	18Ws2/
ANALYTICAL FINISH	MS	MS	MS	MS
SAMPLE NUMBERS				
0001 T1C	125		209	
0002 T2C	271		231	
0003 T3C	262		235	
0004 T4C	253		218	
0005 T5C	257		218	
0006 T6C	138		185	
0007 T1C RAW				
0008 T2C RAW				
0009 T3C RAW				
0010 T4C RAW				
0011 T5C RAW				
0012 T6C RAW				
0013 T1C HNO3		X		X
0014 T2C HNO3		X		X
0015 T3C HNO3		X		X
0016 T4C HNO3		X		X
0017 T5C HNO3		X		X
0018 T6C HNO3		X		X

CHECKS				
0001 T4C HNO3		X		X
0002 T6C	132		184	

STANDARDS				
0001 GWS-5				
0002 OREAS 903	76		25	
0003 AMIS0272				
0004 AMIS0341				
0005 ANC-5				
0006 NAG Std 3				
0007 GWS-5				
0008 AMIS0170				
0009 OREAS 277				

BLANKS				
0001 Control Blank		X		X
0002 Control Blank	X		X	

METHOD CODE DESCRIPTION

Method Code Date Tested	Analysing Laboratory NATA Laboratory Accreditation	NATA Scope of Accreditation
/CALC **09/11/22 06:53**	Intertek Genalysis Perth **3244 3237** No digestion or other pre-treatment undertaken. Results Determined by calculation from other reported data.	*
/CSA **19/12/22 11:29**	Intertek Genalysis Perth **3244 3237** Induction Furnace Analysed by Infrared Spectrometry	**ENV_W061(Per), MPL_W161(Adl)**
18Ws2/MS **19/12/22 11:05**	Intertek Genalysis Perth **3244 3237** 18hr Water Extraction using a sample:water ratio of 1:2. Analysed by Inductively Coupled Plasma Mass Spectrometry.	
18Ws2/MTR **19/12/22 11:29**	Intertek Genalysis Perth **3244 3237** 18hr Water Extraction using a sample:water ratio of 1:2. Analysed with Electronic Meter Measurement	
18Ws2/OE **17/11/22 11:46**	Intertek Genalysis Perth **3244 3237** 18hr Water Extraction using a sample:water ratio of 1:2. Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.	
18Ws2/SIE **10/11/22 08:54**	Intertek Genalysis Perth **3244 3237** 18hr Water Extraction using a sample:water ratio of 1:2. Analysed by Specific Ion Electrode.	
18Ws2/VOL **10/11/22 08:40**	Intertek Genalysis Perth **3244 3237** 18hr Water Extraction using a sample:water ratio of 1:2. Analysed by Inductively Coupled Plasma Volumetric Technique	
4A/MS **03/11/22 15:24**	Intertek Genalysis Perth **3244 3237** Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Tubes. Analysed by Inductively Coupled Plasma Mass Spectrometry.	**MPL_W002, MS_IM_001(Per), *(Adl)**

METHOD CODE DESCRIPTION

Method Code **Date Tested**	**Analysing Laboratory** **NATA Laboratory Accreditation**	**NATA Scope of Accreditation**
4A/OE **03/11/22 15:24**	Intertek Genalysis Perth **3244 3237** Multi-acid digest including Hydrofluoric, Nitric, Perchloric and Hydrochloric acids in Teflon Tubes. Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.	**MPL_W002, ICP_IM_001(Per), *(Adl)**
ANCx/MTR **09/11/22 15:38**	Intertek Genalysis Perth **3244 3237** Acid Neutralizing Capacity Digestion Procedure. Analysed with Electronic Meter Measurement	**ENV_W035**
ANCx/QUAL **09/11/22 15:38**	Intertek Genalysis Perth **3244 3237** Acid Neutralizing Capacity Digestion Procedure. Analysed by Qualitative Inspection	**ENV_W035**
ANCx/VOL **09/11/22 15:38**	Intertek Genalysis Perth **3244 3237** Acid Neutralizing Capacity Digestion Procedure. Analysed by Volumetric Technique.	**ENV_W035**
C71/CSA **02/11/22 15:27**	Intertek Genalysis Perth **3244 3237** Digestion by hot acid(s) and Induction Furnace Analysed by Infrared Spectrometry	**ENV_W063**
FC7/SIE **03/11/22 19:00**	Intertek Genalysis Perth **3244 3237** Alkaline fusion (Nickel crucible) specific for Fluorine. Analysed by Specific Ion Electrode.	**ENV_W012**
FP1/OE **02/11/22 03:34**	Intertek Genalysis Perth **3244 3237** Sodium peroxide fusion (Zirconia crucibles) and Hydrochloric acid to dissolve the melt. Analysed by Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry.	**MPL_W011, MS_IM_001**
NAGx/MTR **07/11/22 10:25**	Intertek Genalysis Perth **3244 3237** Net Acid Generation Extraction of samples with H2O2 Analysed with Electronic Meter Measurement	**ENV_W036**

METHOD CODE DESCRIPTION

Method Code Date Tested	Analysing Laboratory NATA Laboratory Accreditation	NATA Scope of Accreditation
NAGx/VOL **07/11/22 10:25**	Intertek Genalysis Perth **3244 3237** Net Acid Generation Extraction of samples with H2O2 Analysed by Volumetric Technique.	**ENV_W036**
Ws2/MTR **19/12/22 11:29**	Intertek Genalysis Perth **3244 3237** Water Extraction using a sample:water ratio of 1:2. Analysed with Electronic Meter Measurement	*

* Denotes not on Scope of Accreditation

Job: 1960/2221834

Project: Mount Ida (MID-2206)

SAMPLES:

6 samples were received on 6/10/22.

SAMPLE PREPARATION:

Samples were dried at 45°C overnight in a forced-fan oven then crushed to -2mm nominal. Approximately 300g was then pulverised to -75µm using a steel bowl.

Water extract was performed on crushed samples and prepared using a sample:water ratio of 1:2 w/v and an 1 or 18hr bottle rolling time (Ws2/ or 18Ws2/). Bottles were left to settle for 1 day and the supernatant then decanted off the top and filtered (0.2 µm membrane).

ANALYSES

The samples underwent solid analyses and water extraction subsequently analysed for the following:

Solids

- 4A/MS samples were analysed for Ag, As, Ba, Bi, Cd, Co, Cr, Cu, Mn, Mo, Ni, P, Pb, Sb, Sn, Sr, Th, Tl, U, V and Zn
- 4A/OE samples were analysed for Al, Ca, Fe, K, Mg, Na, S and Ti
- FP1/OE samples were analysed for B and Si
- Fluoride analysis was performed by carbonate fusion and dissolution (FC7/) and read by selective ion electrode (/SIE)
- Total-C, total-S by Carbon and Sulphur analyser (/CSA), following method ENV_W061.
- C-Acinsol (acid insoluble carbon – C71/) by Carbon and Sulphur analyser after removal of carbonates and soluble organic carbon using hot hydrochloric acid.
- C-CO_3 Calculation; C-CO_3 = Total C - C-Acinsol
- Acid Neutralising Capacity (ANC+) in accordance with a modified AMIRA protocol. The test work was performed on -2mm sieved samples, whereas the fizz rating on pulps. After HCl addition, around 20ml of water was added to each sample. They were then heated for 2hrs at 80°C - 90^{o}C. The samples were left to cool to room temperature before the Slurry-pH (ANC slurry) were measured. The allowance range of Final pH after digestion was pH 0.8 – 4.
- Net Acid Generation (NAGx/) by hydrogen peroxide oxidation, followed by titration with NaOH. NAG was heated at 150 ^{o}C (1hr) and 250 ^{o}C (1hr). The pH of the suspension was recorded after overnight standing in 15% H_2O_2 (NAGpHin) and again after digestion and final voluming (NAGpHfnl).

Water Extracts

- 18Ws2/MS samples were analysed for Ag, As, Ba, Bi, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, P, Pb, Sb, Se, Sn, Sr, Th, Tl, U, V and Zn
- 18Ws2/OE samples were analysed for Al, B, Ca, Fe, K, Mg, Na, S and Si
- 18Ws2/ samples were analysed for: forms of Alkalinity, Chloride, Electrical Conductivity, Fluoride, pH.
- Ws2/ samples were analysed for: pH and Electrical Conductivity.

DIGESTIONS:

MPL_W002 (4A/), MPL_W011 (FP1/), W012 (FC7/SIE), ENV_W063 (C71), ENV_W036 (NAGx/), Modified AMIRA ANC+, following client's requests (1960_ANC+).

(*Reference: ARD Test Handbook, AMIRA International, May 2002*)

ANALYTICAL FINISHES:

- Metals by MS_IM_001 (/MS), ICP_IM_001 (/OE)
- Alkalinity forms (HCO_3, CO_3, OH, and Total) were determined by titration, expressed in units of mg($CaCO_3$)/L by method ENV_W007
- pH and Electrical Conductivity (EC) were read by metered instrumentation using the respective method codes ENV_W001 and ENV_W002
- Chloride was determined by in-house argentometry method code ENV_W004
- Fluoride in solution was read by ion selective electrode using method number ENV_W011

OBSERVATIONS:

Acidity was not determined because all the sample pH>5.

4 mL of 0.5M HCl were used to digest ANC+ sample in order to achieve the required Final pH range of 0.8 - 4.

Applied HCl loading equivalents

mL 0.5M HCl	*ANC Kg(H_2SO_4)/tonne*
4	*50*

RESULTS:

Results are expressed in units: µg/L (18Ws2/MS), mg/L (18Ws2/MS, 18Ws2/OE, 18Ws2/F, 18Ws2/Cl), ppm (4A/MS, 4A/OE, FP1/OE, FC7/SIE), % (4A/MS, FP1/OE, CSA, C71, C-CO_3), KgH_2SO_4/t (ANC+/, NAGx), mS/cm (18Ws2/EC, Ws2/EC), pH unit (18Ws2/, Ws2/), mg($CaCO_3$)/L (18Ws2/Alkalinity).

The results included the assay of blanks and international reference standards: CRM-TMDW-500 (18Ws2/MS), ICP-AM-MISA6 (18Ws2/OE), CCV-1-B-500 (18Ws2/OE), OREAS 903 (4A), AMIS0272 (FP1), OREAS 277 (C71), AMIS 0341 (FC7), AMIS 0170 (CSA), and in-house reference standards: GWS-5 (18Ws2/: pH, EC, F, Alkalinity; Ws2/: pH, EC), ANC-5 (ANC+), NAG std-3 (NAG), Cl-1000 (18Ws2/Cl).

[redacted]

MINERALS
TEST REPORT

CLIENT

STACEY GREGORY
MINE EARTH PTY LTD
PO Box 404
FREMANTLE, W.A. 6959
AUSTRALIA

JOB INFORMATION

JOB CODE : 1960.0/2225462
NO. SAMPLES : 6
NO. ELEMENTS : 5
CLIENT ORDER NO. : MID-2206 (Job 1 of 1)
SAMPLE SUBMISSION NO. : MID-2206
PROJECT : MOUNT IDA
SAMPLE TYPE : Various
DATE RECEIVED : 23/11/2022
DATE TESTED : 08/12/2022 - 16/12/2022
DATE REPORTED : 05/01/2023
DATE PRINTED : 05/01/2023

REPORT NOTES

[redacted]

SIGNIFICANT FIGURES

It is common practice to report data derived from analytical instrumentation to a maximum of two or three significant figures. Some data reported herein may show more figures than this. The reporting of more than two or three figures in no way implies that figures beyond the least significant digit have significance.

For more information on the uncertainty on individual reported values, please contact the laboratory.

MEASUREMENT OF UNCERTAINTY

Measurement of uncertainty estimates are available for most tests upon request.

SAMPLE STORAGE

All solid samples (assay pulps, bulk pulps and residues) will be stored for 60 days without charge. Following this samples will be stored at a daily rate until clients written advice regarding return, collection or disposal is received. If storage information is not supplied on the submission, or arranged with the laboratory in writing the default will be to store the samples with the applicable charges. Storage is charged at $4.00 per m3 per day, expenses related to the return or disposal of samples will also be charged. Current disposal costs including packaging in a Class2 waste disposal facility is charged at $175.00 per m3.

Samples received as liquids, waters or solutions will be held for 60 days free of charge then disposed of, unless written advice fo return or collection is received.

LEGEND

X	= Less than Detection Limit		NA	= Not Analysed
SNR	= Sample Not Received		UA	= Unable to Assay
LNR	= Lab Not Received		>	= Value beyond Limit of Method
DTF	= Result still to come		+	= Extra Sample Received Not Listed
I/S	= Insufficient Sample for Analysis			

UNITS

ppm for Solid Samples = mg/Kg
ppb for Solid Samples = µg/Kg
ppm for Liquid Samples = mg/L
ppb for Liquid Samples = µg/L

ELEMENTS	Hg	Hg	CN-Tot	CN-WAD	FreeCN	Se
UNITS	ppb	ppm	mg/l	mg/l	mg/l	ppm
DETECTION LIMIT	1	0.1	0.01	0.01	1	0.01
DIGEST	AR005/	AR005/	Ws5/	Ws5/	Ws5/	SE1/
ANALYTICAL FINISH	MSHg	OEHg	COL	COL	VOL	MS
SAMPLE NUMBERS						
0001 T1C	>2000	4.6	0.13	0.03	1	2.20
0002 T2C	209		0.08	0.03	X	0.38
0003 T3C	163		0.07	0.02	X	0.36
0004 T4C	116		0.11	0.04	X	0.46
0005 T5C	667		0.08	0.03	X	0.37
0006 T6C	>2000	6.3	0.09	0.02	X	2.11

CHECKS

0001 T5C	669		0.08	0.03	X	0.40

STANDARDS

0001 IS-024			9.20			
0002 HgSTD-8	>2000	3.0				
0003 OREAS 97.01						0.61
0004 Se 0.1ppm						0.10
0005 Se 1.0 ppm						0.95

BLANKS

0001 Control Blank	X		X	X	X	X

METHOD CODE DESCRIPTION

Method Code	**Analysing Laboratory**	**NATA Scope of Accreditation**
Date Tested	**NATA Laboratory Accreditation**	
AR005/MSHg	Intertek Genalysis Perth	*
08/12/22 09:05	**3244 3237**	
	0.5 gram mini Aqua-Regia digest. Analysed by Inductively Coupled Plasma Mass Spectrometry.	
AR005/OEHg	Intertek Genalysis Perth	
08/12/22 09:05	**3244 3237**	
	0.5 gram mini Aqua-Regia digest. Analysed by Inductively Coupled Plasma OES.	
SE1/MS	Intertek Genalysis Perth	**MPL_W005, MS_IM_001**
08/12/22 07:56	**3244 3237**	
	Aqua-Regia digest followed by Precipitation and Concentration. Specific for Selenium. Analysed by Inductively Coupled Plasma Mass Spectrometry.	
Ws5/COL	Intertek Genalysis Perth	*
15/12/22 14:30	**3244 3237**	
	Water Extraction using a sample:water ratio of 1:5. Analysed by UV-Visible Spectrometry.	
Ws5/VOL	Intertek Genalysis Perth	*
15/12/22 14:30	**3244 3237**	
	Water Extraction using a sample:water ratio of 1:5. Analysed by Volumetric Technique.	

* Denotes not on Scope of Accreditation

RESULTS OF POWDER ANALYSIS

4 samples supplied by Mine Earth Unit Trust on 16/12/2022. Lab Job No. N5758.
Samples submitted by Julia Heide. Your Job: MID-2206.
Unit 1, 94 Forsyth Street O"CONNOR WA 6163

	Method	**Sample 1** **T1C**	**Sample 2** **T3C**	**Sample 3** **T4C**	**Sample 4** **T6C**
	Job No.	*N5758/1*	*N5758/2*	*N5758/3*	*N5758/4*
Chromium Reducible Sulfur (% S_{CR})	Inhouse method S20	0.03	0.13	0.17	0.05

Notes:

1. ppm = mg/Kg dried sample
2. All results as dry weight DW - samples were dried at 40oC for 24-48hrs prior to crushing and analysis.
3. Methods from Rayment and Lyons, Soil Chemical Methods - Australasia
4. Analytical procedures are sourced from Sullivan L, Ward N, Toppler N and Lancaster G. 2018. National acid sulfate soils guidance: national acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. CC B
5. Analysis conducted between sample arrival date and reporting date.
6. ** NATA accreditation does not cover the performance of this service.
7. .. Denotes not requested.
8. This report is not to be reproduced except in full.
9. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer SCU.edu.au/eal/t&cs or on request).
10. Results relate only to the samples tested.
11. This report was issued on 21/12/2022.

NATA
ACCREDITATION
Accreditation No. 14960
Accredited for compliance
with ISO/IEC 17025 - Testing

[redacted]

Results

The quantitative results shown in the table below have been normalised to 100 %, and the values shown represent the relative proportion of the crystalline material in the sample. Totals greater or less than 100 % are due to rounding errors.

Results in the table preceded by an asterisk indicate a larger than usual uncertainty in regard to the quantity of the phase reported; for some of the minor and trace phases it may also indicate an uncertainty in regard to the presence of the phase itself.

Mineral or mineral group	Sample 1	Sample 2
	T4C	T6C
	Mass%	
Clay minerals	2	2
Chlorite	6	5
Kaolinite	< 1	5
Serpentine	0	1
Annite - biotite - phlogopite	4	1
Muscovite and/or illite	< 1	5
Talc	< 1	5
Calcic amphibole	52	5
Mg-Fe amphibole	2	1
Plagioclase	9	6
K-feldspar and/or rutile	1	1
Quartz	21	57
Calcite	< 1	0
Ankerite - dolomite	1	1
Gypsum	< 1	2
Jarosite	0	1
Goethite	0	2
Ilmenite and/or magnesite	1	0
Halite	< 1	1

Comments

Some amorphous material is likely present.
'Clay minerals' appears to be mainly smectite.
The quartz content in sample **T6C** is likely slightly overestimated.

Appendix C

Geochemical Analysis Results

TABLE C1 - ACID FORMATION POTENTIAL RESULTS

SampleID	Interval (m)	Lith Group	pH (1:2)	EC (1:2) [mS/cm]	Total-S (%)	Cr(II)-Red S (%)	Total-C (%)	CO3-C (%)	Carb-ANC	ANC	NAG-pH 4.5	NAG-pH 7.0	NAG-pH	MPA	ANC / MPA	NAPP kg H2SO4/t	AFP Category
									kg H2SO4/tonne		kg H2SO4/tonne						
			ITK	ITK	ITK	EAL	ITK	ITK	calc	ITK	ITK	ITK	ITK	calc	calc	calc	
T1C	0-1.5	Historic Tailings	8.2	6.31	0.66	0.03	0.28	0.22	18	23	0	0	8.5	0.9	19.6	-22.1	NAF
T2C	0-1.5	Historic Tailings	8.0	7.46	0.57	-	0.28	0.27	22	36	0	0	10.4	17.4	1.3	-18.6	NAF
T3C	0-1.5	Historic Tailings	7.9	5.90	0.55	0.13	0.34	0.34	28	35	0	0	10.5	4.0	7.0	-31.0	NAF
T4C	0-1.5	Historic Tailings	8.1	7.86	0.65	0.17	0.25	0.23	19	27	0	0	10.3	5.2	3.6	-21.8	NAF
T5C	0-1.5	Historic Tailings	8.0	7.64	0.55	-	0.3	0.29	24	37	0	0	10.5	16.8	1.4	-20.2	NAF
T6C	0-1.5	Historic Tailings	7.9	8.40	1.17	0.05	0.22	0.21	17	24	0	0	7.7	1.5	11.2	-22.5	NAF

Notes:

EC = Electrical Conductivity; ANC = Acid Neutralisation Capacity; NAG = Net Acid Generation; AFP = Acid Formation Potential; NAF = Non Acid Forming; PAF = Potentially Acid Forming.

Cr(II)-Red-S = Cr(II)-Reducible-S; NC = Not Calculated

pH-(1:2) and EC-(1:2) values correspond to pH and EC measured on sample slurries prepared with deionised-water, and a solid:solution ratio of ***ca.*** **1:2 (w/w)**.

All results expressed on a dry-weight basis, except for pH-(1:2), EC-(1:2), and NAG-pH.

Calculated Carbonate-ANC values assume that all CO3-C is associated with Ca/Mg-carbonates (i.e. 'non-ferroan-carbonates').

TABLE C2A - MULTI-ELEMENT RESULTS

SampleID	Interval (m)	Lith Group	S (%)	Ca (%)	Mg (%)	K (%)	Na (%)	Fe (%)	Al (%)	Si (%)	Ti (%)	Li (ppm)	As (ppm)	Sb (ppm)	Se (ppm)	Mo (ppm)	B (ppm)	F (ppm)
		Average Crustal Abundance											6	0.2	0.4	2	15	200
		Analytical Laboratory	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK
T1C	0-1.5	Historic Tailings	0.59	1.56	2.10	0.43	0.5	6.39	3.21	32.2	0.16	9.0	113.9	3.67	2.2	5.2	<50	55
T2C	0-1.5	Historic Tailings	0.47	5.91	2.46	0.54	1.3	8.96	6.67	25.6	0.75	20.4	4.5	0.23	0.38	1.1	<50	153
T3C	0-1.5	Historic Tailings	0.46	5.79	2.04	0.66	1.2	8.25	6.72	26.6	0.72	20.3	1.2	0.24	0.36	1.2	<50	178
T4C	0-1.5	Historic Tailings	0.88	5.83	2.23	0.59	1.3	7.93	6.46	26.4	0.68	21.1	2.1	0.25	0.46	1.1	<50	203
T5C	0-1.5	Historic Tailings	0.49	5.73	2.33	0.60	1.3	8.28	6.73	26	0.72	21.7	1.4	0.29	0.37	1.1	<50	179
T6C	0-1.5	Historic Tailings	0.93	1.90	3.02	0.48	0.6	7.98	3.74	29.3	0.18	10.2	214.7	2.21	2.11	3.1	<50	94

SampleID	Interval (m)	Lith Group	Cu (ppm)	Zn (ppm)	Cd (ppm)	Pb (ppm)	Hg (ppm)	Ni (ppm)	Cr (ppm)	Co (ppm)	Mn (ppm)	Ag (ppm)	Bi (ppm)	P (ppm)	Sr (ppm)	Ba (ppm)	Sn (ppm)	V (ppm)	Tl (ppm)	Th (ppm)	U (ppm)
		Average Crustal Abundance	30	90	0.4	35	0.06	50	70	8	1,000	0.07	0.06	800	250	500	4	90	0.6	9	2
		Analytical Laboratory	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK
T1C	0-1.5	Historic Tailings	1911.8	209	0.76	65.2	4.60	218	282	33.4	497	0.67	32.75	118	36.97	131	10.3	125	0.2	0.88	0.96
T2C	0-1.5	Historic Tailings	157.6	231	0.33	183.2	0.21	88.8	138	42.8	1827	0.38	0.76	496	78.43	92.8	1.3	271	0.16	0.68	0.19
T3C	0-1.5	Historic Tailings	157.4	235	0.53	179.3	0.16	96.7	134	43	1652	0.5	1.35	442	79.92	98	1.3	262	0.17	0.62	0.17
T4C	0-1.5	Historic Tailings	153.1	218	0.43	143	0.12	92.9	126	41.4	1484	0.47	0.7	423	81.02	89.1	1.2	253	0.17	0.64	0.17
T5C	0-1.5	Historic Tailings	238.3	218	0.32	150.8	0.67	99.1	150	43.4	1574	0.63	0.74	424	82.09	104.4	1.5	257	0.17	0.65	0.19
T6C	0-1.5	Historic Tailings	1611.5	185	0.66	53.8	6.30	292.8	468	43.8	566	0.54	36.5	118	37.19	152.8	8.1	138	0.19	0.92	0.6

Notes:

ACA = Average Crustal Abundance

Reimann, C. and Caritat, P., 1998. *Chemical elements in the environment* . 1. Berlin: Springer-Verlag.
Bowen, H. J. M., 1979. *Environmental Geochemistry of the elements.* Acadaemic Press, New York

▢	enrichment of over 10 times the ACA for respective element
▨	enrichment of over 100 times the ACA for respective element

TABLE C2B - MULTI-ELEMENT RESULTS SCREENED AGAINST HIL (NEPM 2013)

		Ag	Al	As	B	Ba	Bi	Cd	Co	Cr*	Cu	F	Fe	Hg
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		0.05	50	0.5	50	0.1	0.01	0.02	0.1	1	0.5	50	10	0.1
NEPM 2013 Health Investigation Level for Soil Contaminants														
Recreational C		-	-	300	20000	-	-	90	300	300	17000	-	-	80
Residential B		-	-	500	40000	-	-	150	600	500	30000	-	-	120
Commercial / Industrial D		-	-	3000	300000	190000**	-	900	4000	3600	240000	-	-	730
Sample site	**Lithology**													
T1C	Historic Tailings	0.67	32105	113.9	<50	131	32.75	0.76	33.4	282	1911.8	55	63900	4.6
T2C	Historic Tailings	0.38	66739	4.5	<50	92.8	0.76	0.33	42.8	138	157.6	153	89600	0.2
T3C	Historic Tailings	0.5	67203	1.2	<50	98.3	1.35	0.53	43	134	157.4	178	82500	0.2
T4C	Historic Tailings	0.47	64627	2.1	<50	89.1	0.7	0.43	41.4	126	153.1	203	79300	0.1
T5C	Historic Tailings	0.63	67321	1.4	<50	104.4	0.74	0.32	43.4	150	238.3	179	82800	0.7
T6C	Historic Tailings	0.54	37449	214.7	<50	152.8	36.5	0.66	43.8	468	1611.5	94	79800	6.3

		Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Th	Tl	U	V	Zn
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		1	0.1	0.5	0.5	0.01	0.5	0.1	0.2	0.01	0.1	0.05	1	1
NEPM 2013 Health Investigation Level for Soil Contaminants														
Recreational C		19000	-	1200	600	-	700	-	-	-	-	-	-	30000
Residential B		14000	-	1200	1200	-	1400		-	-	-	-	-	60000
Commercial / Industrial D		60000	5100**	6000	1500	410**	10000	610000**	-	-	-	-	7200**	400000
Sample site	**Lithology**													
T1C	Historic Tailings	497	5.2	218	65.2	3.67	2.2	10.3	36.97	0.88	0.2	0.96	125	209
T2C	Historic Tailings	1827	1.1	88.8	183.2	0.23	0.38	1.3	78.43	0.68	0.16	0.19	271	231
T3C	Historic Tailings	1652	1.2	96.7	179.3	0.24	0.36	1.3	79.92	0.62	0.17	0.17	262	235
T4C	Historic Tailings	1484	1.1	92.9	143	0.25	0.46	1.2	81.02	0.64	0.17	0.17	253	218
T5C	Historic Tailings	1574	1.1	99.1	150.8	0.29	0.37	1.5	82.09	0.65	0.17	0.19	257	218
T6C	Historic Tailings	566	3.1	292.8	53.8	2.21	2.11	8.1	37.19	0.92	0.19	0.6	138	185

Notes

* Chromium (VI)

** from US EPA 2009 Regional Screening Levels

TABLE C3 - WATER EXTRACTION RESULTS

SampleID	Interval (m)	Lith Group	pH (1:2)	EC (mS/cm)	TDS mg/L	Alkalinity (as mg/L CaCO3)	Cl (mg/L)	SO4 (mg/L)	F (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Na mg/L	Fe (mg/L)	Al (mg/L)	Mn (mg/L)	Si (mg/L)	As (µg/L)	Sb (µg/L)	Se (µg/L)	Mo (µg/L)	B (mg/L)
			ITK	ITK	calc	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK
T1C	0-1.5	Historic Tailings	8.0	8.18	5481	31	1395	2724	0.3	626.5	143.0	22.1	1420.4	0.16	0.05	0.07	7.05	12	0.6	14	25.8	1.02
T2C	0-1.5	Historic Tailings	8.1	7.99	5353	14	1917	2053	0.1	741.0	68.4	67.8	1166.1	0.12	0.11	0.04	1.65	<1	0.3	7	32.0	0.52
T3C	0-1.5	Historic Tailings	8.1	5.99	4013	15	1164	1991	<0.1	666.3	54.5	60.9	769.6	0.12	0.06	0.05	1.37	1	0.2	7	27.3	0.50
T4C	0-1.5	Historic Tailings	8.1	8.95	5997	14	2185	2200	0.1	774.1	102.2	72.3	1402.4	0.22	0.08	0.07	1.53	1	0.1	8	29.4	0.54
T5C	0-1.5	Historic Tailings	8.1	8.94	5990	13	2192	2130	0.1	769.3	89.4	69.1	1371.5	0.14	0.11	0.05	1.73	<1	0.2	<5	41.9	0.52
T6C	0-1.5	Historic Tailings	7.9	10.4	6968	30	2178	3387	0.4	659.9	281.3	27.6	1770.0	0.07	0.07	0.10	8.26	19	0.5	28	14.5	0.97

SampleID	Interval (m)	Lith Group	Cu (µg/L)	Zn (µg/L)	Cd (µg/L)	Pb (µg/L)	Hg (µg/L)	Ni (µg/L)	Cr (µg/L)	Co (µg/L)	Ag (µg/L)	Bi (µg/L)	Sn (µg/L)	Sr (µg/L)	Ba (µg/L)	P (µg/L)	Tl (µg/L)	V (µg/L)	Th (µg/L)	U (µg/L)
			ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK	ITK
T1C	0-1.5	Historic Tailings	100	<100	<0.2	<5	1	<10	<100	862	0.2	<0.05	<1	967.2	28.1	<200	<0.1	<100	<0.05	1.65
T2C	0-1.5	Historic Tailings	<10	<100	<0.2	<5	<1	<10	<100	73	<0.1	<0.05	<1	600.6	26.6	<200	<0.1	<100	<0.05	<0.05
T3C	0-1.5	Historic Tailings	<10	<100	<0.2	<5	<1	<10	<100	71	<0.1	<0.05	<1	485.3	26.5	<200	<0.1	<100	<0.05	<0.05
T4C	0-1.5	Historic Tailings	<10	<100	0.2	<5	<1	<10	<100	49	<0.1	<0.05	<1	616.8	29.6	<200	<0.1	<100	<0.05	<0.05
T5C	0-1.5	Historic Tailings	<10	<100	<0.2	<5	7	<10	<100	93	0.6	<0.05	<1	648.3	26.8	<200	<0.1	<100	<0.05	<0.05
T6C	0-1.5	Historic Tailings	60	<100	0.3	19	2	<10	<100	1346	0.2	<0.05	<1	673.1	15.6	<200	<0.1	<100	<0.05	1.16

CN-Total (mg/L)	CN-WAD (mg/L)	Free CN (mg/L)
ITK	ITK	ITK
0.13	0.03	1
0.08	0.03	<1
0.07	0.02	<1
0.11	0.04	<1
0.08	0.03	<1
0.09	0.02	<1

Notes:

EC = Electrical Conductivity

TDS=Total dissolved solids, calculated based on EC*670 in mg/L

Water Extraction Testwork corresponds to slurries prepared from coarse crushings **(-2 mm nominal)**, and high-purity deionised water (HPDW) at a solid:water ratio of **1:2 (w/w)**.

Test slurries agitated via end-over-end tumbling for 18 hrs, and then left to 'still-stand' overnight prior to decanting supernatants for vacuum filtration (0.45 µm membrane) for analysis.

Laboratory limits of reporting were increased due to the high salinity and required dilution of the samples.

🟨 Highlights exceedance of Livestock Drinking Water Guideline (ANZECC and ARMCANZ 2000)

TABLE C4 - MINERALOGY RESULTS

SampleID **Interval (m)** **Lithology**	**T4C** **0-1.5m** **Historic tailings**	**T6C** **0-1.5m** **Historic tailings**
Dominant (>50%)	calcic amphibole	quartz
Major (50-20%)	quartz	
Minor (20-10%)		
Accessory (10-1%)	clay minerals chlorite annite-biotite-phlogopite Fe-Mg-amphibole plagioclase K-feldspar +/- rutile ankerite-dolomite ilmenite +/- magnesite	clay minerals chlorite annite-biotite-phlogopite Fe-Mg-amphibole plagioclase K-feldspar +/- rutile ankerite-dolomite kaolinite serpentine muscovite +/- illite talc calcic amphibole gypsum jarosite goethite halite
Trace (<1%)	kaolinite muscovite +/- illite talc calcite halite gypsum	

Attachment 4: Mt Ida Project: PAF Management Procedure

DELTA LITHIUM

MT IDA LITHIUM PROJECT | ENVIRONMENTAL PROCEDURE – POTENTIALLY ACID FORMING MATERIAL MANAGEMENT

Tenements:	M29/2, M29/165, M29/444
EGS Code:	S0223209
Revision No:	1
Date:	25/09/2024

Green Values Australia

[redacted]

File name	DLI-MI-EN-PRO-0006
Author	[redacted]
Project manager	[redacted]
Client name	Mt Ida Gold Pty Ltd
Project name	Mt Ida Project
Document title	Mt Ida Lithium Project Environmental Procedure – Potentially Acid Forming Material Management
Revision number	1
Project number	220057

This Procedure forms part of Delta Lithium Limited Corporate Standards and describes the procedures specification that shall be used for all works within the Mt Ida Project.

DOCUMENT CONTROL

[redacted]

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

No table of figures entries found.

1 PURPOSE AND SCOPE

This procedure has been prepared by Mt Ida Gold Pty Ltd (MIG), a wholly owned subsidiary of Red Dirt Metals (RDM), to support the implementation of the Mt Ida Lithium Project (the Project). The purpose of this procedure is to outline the process of identification, management and disposal for Potentially Acid Forming (PAF) waste rock material for the Project. For the purposes of this procedure, PAF waste rock material is classified as material with a total sulphur assay greater than 0.3%.

This plan supports the Environmental Management Plan DLI-MI-EN-PLN-0001 (EMP).

Compliance with this procedure is mandatory and applies to all MIG employees and contractors.

1.1 Objectives

The objectives of this procedure are to:

- Identifying relevant legal obligations in relation to PAF material management and the processes in place to ensure these obligations are met,
- Detailing how to plan and undertake earthworks for appropriate PAF management.

2 DEFINITIONS

Table 2-1: Terms of Reference

Term	Definition
AER	Annual Environmental Report
ANC	Acid Nuetralising Capacity
DMIRS	Department of Mines, Industry Regulation and Safety
EMP	Environmental Management Plan
GIS	Geographic Information System
GPS	Global Positioning System
MIG	Mt Ida Gold Pty Ltd
NAF	Non Acid Forming
PAF	Potentially Acid Forming
RDM	Red Dirt Metals Limited
the Project	Mt Ida Lithium Project
WRD	Waste Rock Dump

3 PLANNING

3.1 Legal and Other Requirements

The procedure is designed to meet all commitments, legal requirements and the expectations of external stakeholders made for the Project. The relevant Commonwealth and State legislation to this procedure are summarised below:

- *Biodiversity Conservation Act 2016 (WA)*
- *Environmental Protection Act 1986 (WA)*
- *Mining Act 1978 (WA)*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA)*

3.2 Roles and Responsibilities

Overall responsibility for the implementation of this procedure rests with the MIG Environment Department. All MIG personnel and contractors shall meet the requirements of this procedure. Management actions stated in this procedure may be delegated by the MIG Environment Department to specific personnel. Key personnel including Managers, Superintendents and Supervisors shall ensure that all management actions are undertaken to a satisfactory standard and that all personnel are aware. Table 3-1 below provides a summary of the roles and responsibilities.

Table 3-1: Roles and Responsibilities

Role	Responsibility
Environment Dept.	• Provide advice and assistance to the supervisors and operators on the implementation of this procedure onsite; • Provide training to key personnel on this procedure; • Conduct annual audits and raise corrective actions as required; • Prepare a PAF close-out report post completion of Waste Rock Dump (WRD).
Mining Operations	• Overall responsibility for implementation of this procedure; • Management of PAF placement.
Geology Superintendent and Senior Engineer	• Sampling and classification of PAF material, marking out PAF material and monitoring contractors during WRD construction;

Role	Responsibility
	• Assist with annual audits, inspections and raising corrective actions as required; and • Report the progress of PAF material identification, material movements and management to the MIG Environment Department via regular progress meetings and entering information into the material movement's database.
Mining Contractor	• Ensure compliance with the procedure; • Ensure all relevant personnel are aware of the requirements of the procedure through education material and training; • Ensure experienced and competent operators are utilised to conduct earthworks; • Ensure correct placement of PAF material; • Ensure WRD is constructed in accordance with this Procedure; and • Maintain all documentation (hard copy, electronic and emails) for inspection during audits.
Operational staff (Pit technicians, spotters, digger/truck/bulldozer operators)	• Conduct material identification, sampling and earthworks in accordance with the procedure • Report and document any PAF material to the Contractor supervisor and MIG; and • Attend training as required.

3.3 Training, and Awareness

All personnel are required to undertake the MIG induction before they commence work on the Project. The information contained in the Induction and regular awareness presentations include photographs and descriptions of weeds that occur within the Project footprint.

An environmental training matrix is maintained and MIG's training management system ensures MIG employee and contractor induction and training requirements are maintained and follow up inductions conducted every second year to ensure ongoing compliance with the EMP.

4 IMPLEMENTATION AND OPERATION

4.1 Mine Material Chracterisation

The waste rock characterisation assessment completed by Mine Earth outlined the key waste rock units as oxide and transitional material, and fresh felsic (pegmatites), mafic (anorthosite) and metamorphic (amphibolite) lithotypes (Mine Earth, 2023). The key findings and recommendations for geochemistry (Mine Earth, 2023):

- All oxide samples were classified as non-acid forming (NAF). The sulphur in the weathered oxide zone was associated with gypsum, as supported by the mineralogical assessment. The oxide's acid and metalliferous drainage risk are low; however, salinity has been demonstrated to be high.
- Water extraction testwork showed that soluble metals and metalloids were generally low, though elevated Al and Sr were reported in 1 and 2 samples, respectively. All transitional samples were classified as NAF, and the acid, metalliferous and saline drainage risk for the transitional rock is low. Only two transitional samples (out of 38) in the drilling database displayed enrichment over ten times the average crustal abundance (ACA) for Au, Li and Ta.
- All fresh felsic samples were classified as NAF. Fresh felsic waste rock commonly displayed enrichment over ten times and over 100 times the ACA in Bi, Cs, Li, Tl, Rb and Ta. Elevated F was reported in the water extraction testwork in the pegmatite.All fresh mafic samples with <0.3% S were classified as NAF. NAF fresh mafic waste rock (<0.3% S) poses a low risk of acid, metalliferous and saline drainage.
- Fresh mafic waste rock with sulphur ≥0.3% should conservatively be classified as potentially-acid forming (PAF), however this constitutes only a small total volume of the waste volume (being less than 1.3% of the total waste material).
- Some elemental enrichments for fresh mafic rock were observed, most commonly in Cs and Li. Water extraction testwork showed that levels of soluble metals and metalloids were generally low, though elevated F was reported in one mafic sample.
- All fresh metamorphic samples with <0.3% S were classified as NAF. NAF fresh metamorphic waste rock (<0.3% S) poses a low risk of acid, metalliferous and saline drainage.
- Fresh metamorphic waste rock with sulphur ≥0.3% should conservatively be classified as potentially-acid forming (PAF).

- No enrichments in elements for fresh metamorphic rock were observed. Water extraction testwork showed that soluble metals and metalloids were generally low, though elevated Se was reported in one metamorphic sample.

A summary of the lithology for key waste rock units in summarised in Table 4-1.

Table 4-1: Summary of findings and recommendations for key waste rock units (Mine Earth, 2023c)

Lithology Group	Oxide	Transitional	Felsic	Mafic	Metamorphic
Proportion by Volume, %	74%	12%	14%		
Erosional Stability	Low	Low-Moderate	High	High	High
Acid Forming Potential	NAF	NAF	NAF	NAF <0.3% S PAF ≥0.3% S	NAF <0.3% S PAF ≥0.3% S
Salinity	High	Moderate	Low	Low	-
Metalliferous Drainage	Low	Low	Moderate	Low	-

The WRL has limited to nil underlying groundwater, which limits the potential preferential pathways for dispersion. Suitable encapsulation in PAF will reduce potential risks to the surrounding surface water features. Hole STRD005, located at the northern edge of the WRD, intersected groundwater at 39 metres below ground level (mbgl). Other holes in close proximity and in the pit areas had water levels approximately 60 mbgl.

It is considered that the risk of PAF volumes is low, and the most appropriate management measure for the material will be:

- Ongoing monitoring and characterisation during implementation against a cut-off grade of 0.3% S, in line with Table 4-1.
- Implement co-deposition of potential PAF material and ensure that the material is suitably encapsulated within the WRL footprint. Mine Earth (2023) identified that a number of the rock types show a surplus of acid-neutralising capacity, which will support such an approach.

Table 4-2 provides a summary of the materials placed on the WRD on an annual basis. Any PAF material is likely to occur in the final year, and can be consolidated with the NAF material.

Table 4-2: Distribution of PAF and NAF material in Mbcm for the principal weathered zones and the ore for the year of operation (Mine Earth, 2023)

Year	Oxide		Transitional		Fresh		Ore	
	NAF	PAF	NAF	PAF	NAF	PAF	NAF	PAF
1	1.92	-	-	-	-	-	0.023	-
2	1.85	-	0.07	-	-	-	0.023	-
3	0.07	-	0.07	-	1.68	0.10	0.023	-

4.2 Co-Mingling PAF Management

PAF shall be co-mingled considering the high level of Acid Nuetralising Capacity of the NAF material. The following principles shall be incorporated into the design of the WRD:

- Potentially Acid Forming (PAF) waste will be co-dumped with Non-Acid Forming (NAF) waste and waste with an Acid Neutralising Capacity (ANC). The dilution and potential neutralisation of PAF waste by co-mingling with NAF and ANC waste will avoid the creation of a concentrated cell of PAF waste that could be potentially harmful if exposed. Initial overburden characterisation indicates relatively small volumes of PAF.
- A 5m deep layer of NAF waste will encapsulate the co-mingled (NAF, PAF and ANC) waste.
- The WRD will appear as low elevated landform on the eastern side of the mine pit voids.
- The maximum landform slope angle will be no greater than 17° and 10 m wide berms at 10 m vertical intervals.
- Low-moderate stability transitional material (~12% of the total waste rock volume) shall be placed on final landform slopes but will require the incorporation of durable rock armour. The transitional waste shall be used on flat landform surfaces.
- A 1m deep layer of selected growing medium will sheet the surface of the landforms with a rock armouring on landform crests. This landform surface will then be revegetated.
- NAF fresh material (felsic, mafic and metamorphic) are expected to display high erosional stability and will be prioritised for the outer slopes of the WRD, with transitional material utilised for the top (flat) surface; this approach will provide approximately 1.6m of fresh material for the outer slopes and 4.4m of transitional for the top surface.

4.3 Final Inspection

Annual audits and random inspections will be carried out at the WRD to check that material is being stored appropriately and to confirm the integrity and effectiveness of the co-mingling process.

The key criteria is the management of suitable material. Table 4-3 provides an estimation of the available material suitable for outer embankments of the WRD. As the fresh material will be the final material mined, the placement of this material directly on the outer slopes will be undertaken without additional handling of material.

To verify correct thickness of material, the waste rock balance shall be re-assessed quarterly and just prior to and after completion (i.e. prior to and after capping). The survey data shall be provided to the Geology and Engineering Departments and checked against the mine plan to verify that all PAF has been placed correctly.

Table 4-3: Waste Rock Balance

WRD Section	Area (m^2)	Material type	NAF Waste Volume (Mlcm)	Bulking Factor	Waste volume + bulk (Mlcm)	Depth of material (m)
Outer slopes	217,000	Fresh	0.67	30%	0.87	1.6
Top (flat surface)	546,000	Transitional	0.73[1]	30%	0.95	4.4

Details on the volume (by aerial extent and thickness) and location of the PAF material shall be captured in the Environmental Form – PAF Management Signoff DLI-MI-EN-FRM-0005 and it must be signed off by all relevant parties prior to the next rehabilitation steps progressing.

Details of PAF management and materials for WRD construction shall be included in the Annual Environmental Report (AER) submitted to the Department of Mines, Industry Regulation and Safety (DMIRS).

4.4 Monitoring and Audits

MIG will continue to routinely test and review total sulphur content of ore and waste rock and will regularly monitor and review the acid generating/neutralising properties of waste rock materials to ensure that reactive materials are appropriately managed. Mine Earth (2023) identified that ongoing sampling and analysis of waste material should be undertaken during

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[1] Based on an estimated 9% PAF within the fresh material, calculated from the proportion of PAF intersected in waste characterisation report (Mine Earth 2023c)

operation as this will assist in filling the gaps due to the lack of sample availability encountered during the pre-development works, update any block models and assist in identifying an unanticipated AMD management issues.

Sampling frequency varies with the volume of material extracted (MEND, 2009). Based on the MEND guidelines, an indicative minimum number of 40 samples would be recommended for the pit shell.

An example of a continuous monitoring plan is shown as Table 4-4.

Table 4-4: Example of continuous monitoring plan

Waste	Lithology	Total Volume	No Samples	%S	NAGpH
Oxide					
Fresh					
Fresh					
Ore					

To verify that the PAF management is operating effectively, run-off from the WRD will be tested for acidity, salinity and heavy metals via a monitoring bore adjacent to the WRD. Under normal conditions, with evaporation exceeding rainfall in every month, no discharge is anticipated. However, during prolonged rain and / or rain events exceeding 25 mm, the quality of water which collects at the base of the waste rock dump will be regularly monitored and tested for acidity and salinity to identify if the PAF management is operating effectively. This will occur if the sample area is able to be accessed within safe operational controls.

Data on water quality will be recorded in the site environmental monitoring register. Aerial imagery shall be taken via a drone annually to identify if there is any acidic leaching plume from the WRD into the surrounding vegetation.

All monitoring results, including performance audits, will be included within the Annual Environmental Report submitted to DMIRS.

The monitoring plan for PAF is provided as Table 4-5.

Table 4-5: PAF Monitoring Plan

Aspect	Monitoring	Criteria	Frequency	Trigger Level
Groundwater	MIPB02, monitoring bore	Water Level, pH, TDS, heavy metals	Annual	Water Level: water level increase +25% predicted pH < 6.0 TDS: Change (+/- 10%) over 2 sampling periods. HM: 25% increase over baseline values

Aspect	Monitoring	Criteria	Frequency	Trigger Level
Surface Water	Runoff collection point from WRD	pH, TDS, heavy metals	Rainfall events greater than 25mm	pH < 6.0 TDS: Change (+/- 10%) over 2 sampling periods. HM: 25% increase over baseline values
Aerial	Aerial imagery	Visual inspection	Annual	Noticeable (>25%) increase in any plume, compared year on year

5 CHECKING

5.1 Corrective Actions and Contingencies

Where PAF material management is identified as not meeting the requirements of this procedure or issues have been detected during inspections, the contractor shall be required to submit an Incident Report. Such occurrences will be documented in the action database and investigated as per the incident reporting system with corrective actions assigned where necessary.

Where the results of monitoring indicate a deviation from this procedure, corrective actions will be undertaken upon consultation with the Geology and Mining Departments and as per this Procedure. For example, if the PAF management does not adequately contain all the PAF material, then the area may require additional capping with NAF material. Further land rehabilitation on amended areas will be carried out as determined by the MIG Environment Department upon completion of the works to a suitable standard.

Monthly inspections shall verify if the PAF management process is operating according to design. MIG will ensure contingency measures are in place for:

- Potential PAF volumes exceeding PAF cell design;
- Potential differences between design and construction of WRD; and
- No area available for PAF deposition (i.e. due to delay in construction or unforeseen volumes of PAF).

Contingency measures shall include:

- Temporary storage of PAF material bunded with NAF;
- Updating the inventory of materials at least annually to ensure adequate quantities of NAF materials are available for encapsulation of PAF material; and
- Additional testing to confirm NAF and PAF waste characterisation where there is uncertainty.

5.2 Incident Reporting

If this procedure is not followed by MIG personnel or Contractors (without written permission from the MIG Environment Department), an Incident Report will be required to be submitted to the MIG Environmental Department. Such incidents will be documented in InControl (MIG’s online incident management system) and investigated as per the incident reporting system with corrective actions assigned where necessary.

5.3 Control of Records

Inspection records, findings, MIG Incident Register and other records will also be accessed by the MIG GIS Coordinator for upload and update into the MIG GIS Database and stored as spatial data.

5.4 Audits and Inspections

Regular inspections will be undertaken by the MIG Environment Department as per Section 4 of its management plan.

MIG shall monitor compliance with this procedure through its environmental audit and inspection program.

Audit findings shall be recorded in action management system for allocation of actions and tracking actions close out.

5.5 Review

This document should be reviewed every 3 years, or when there is a change in operations that may result in an increased risk or impact from PAF materials.

MIG shall review the frequency and effectiveness of monitoring every 3 years, based on performance and trend analysis.

Any reviews of this document shall be communicated to DMIRS through the Annual Environmental Report.

6 DOCUMENT LIST

The documents referred to in this procedure are listed in the table below.

Table 6-1: Document List

Document Title	Document Number
Environmental Plan – Environmental Management Plan	DLI-MI-EN-PLN-0001
Environmental Form – PAF Management Signoff	DLI-MI-EN-FRM-0005

7 REFERENCES

Mine Earth, 2023a. Historical Tailings Assessment. Perth, Western Australia: Report for Red Dirt Metals.

Mine Earth, 2023b. Soil and Landform Assessment. Perth, Western Australia: Report for Red Dirt Metals.

Mine Earth, 2023c. Waste Characterisation. Perth, Western Australia: Report for Red Dirt Metals.

Attachment 5: CQL Commissioning Requirements

Table 2: Geomembrane (HDPE) CQA requirements

Item	Property	Standards	Frequency	Minimum Value
Conformance Quality Assurance testing (sampled at the point of manufacture or on site, as determined by the Superindendant / CQA consultant)	Thickness	ASTM D5994	One sample every 5,000 m^2 or every five rolls delivered to site – whichever is the greatest number of tests	Nom. (-5%) -10% (lowest individual for 8 out of 10 values) -15% (lowest individual for any of the 10 values)
	Asperity height	ASTM D7466		0.4 mm
	Density	ASTM D1505 / ASTM D792		0.940 g/cc
	Tensile properties (a) Yield strength (b) Break strength (c) Yield elongation (d) Break elongation	ASTM D6693 Type IV		(a) 29 kN/m (b) 21 kN/m (c) 12% (d) 100%
	Tear resistance	ASTM D1004		249 N
	Puncture resistance	ASTM D4833		534 N
	Stress crack resistance	ASTM D4833	One sample every 10,000 m^2, or resin type or manufacturing run	500 hr.
	Carbon Black Content	ASTM D4218	One sample every 5,000 m^2 or every five rolls delivered to site – whichever is the greatest number of tests	2.0 – 3.0 %
	Carbon Black Dispersion	ASTM D5596		Carbon black dispersion (only near spherical agglomerates) for 10 different views: 9 in categories 1 or 2

Item	Property	Standards	Frequency	Minimum Value
				and 1 in category 3
	Oxidation Induction Time (OIT) (a) standard OIT Or – (b) High pressure OIT	ASTM D3895 ASTM D5885	One sample every 10,000 m^2, or resin type or manufacturing run	100 min 400 min
Start-up test weld	Welding equipment	N/A	Checked daily at start of works, and whenever the welding equipment is shut-off for more than one hour. Also, after significant changes in weather conditions	N/A
	Weld conditions	N/A	Test weld strips will be required whenever personnel or equipment are changed, after any period of machine shutdown, every four hours of operation and/or wide temperature fluctuations are experienced. Minimum 1.5m continuous seam	N/A
Destructive weld testing	Onsite, hand tensiometer in peel mode	N/A	1 tab from start and finish of each weld for fusion welds	N/A
	Onsite calibrated tensiometer - weld seam strength in peel and shear. A number of destructive samples will also be tested at a NATA accredited laboratory	ASTM D6392	Every 300m (if fusion weld) Every 150m (if extrusion weld)	N/A
Non-destructive weld testing	N/A	Air pressure test, ASTM D5820	All seams over full length	N/A

Item	Property	Standards	Frequency	Minimum Value
		Vacuum box test, ASTM D5641		
Visual inspection of geomembrane	Tears, punctures, abrasions, cracks, indentations, thin spots, or other faults in the material	N/A	Every roll	Free of faults or defects
Leak detection survey	Leak detection survey across all geomembrane lined areas that have had leachate aggregate installed	ASTM D7007	Once the geomembrane has been installed and the drainage aggregate has been placed on top of the geomembrane, but before the separation layer has been installed	Identify and repair and test/resurvey all identified leaks in the lining system

Cushion/protection and separation geotextile CQA requirements

Item	Property	Standards	Frequency
Conformance Quality Assurance testing (sampled at the point of manufacture or on site, as determined by the Superintendent / CQA consultant)	Thickness	AS 3706.1	One sample per 2,500 m^2
	Mass per unit area	AS 3706.1	
	Tensile strength	AS 3706.2	One sample per 5,000 m^2
	Tear strength	ASTM D4833 AS 3706.3	
	Burst strength	ASTM D6241 AS 3706.4	
Visual inspection of geotextile	Color, thickness, tears, holes, punctures,	Visual only	Each roll during placement