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Tabba Tabba Lithium Project, WA

# TSF PRE-FEASIBILITY STUDY REPORT

Wildcat Resources Ltd


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## EXECUTIVE SUMMARY

This Pre-Feasibility Study (PFS) provides a comprehensive assessment of the proposed Integrated Waste Landform Tailings Storage Facility (IWLTFSF) for the Tappa Tappa Lithium Project in Western Australia, owned by Wildcat Resources Limited. The IWLTFSF is designed to support a total tailings storage capacity of approximately 74.1 million tonnes (Mt) over an anticipated 18-year mine life, with an annual deposition rate of approximately 3.85 Mt (dry tonnes). The facility will service a new lithium processing plant that employs dense media separation and flotation, producing thickened tailings at 55% solids content. The consolidated (dry) density of the tailings has been conservatively assumed to be 1.4 t/m<sup>3</sup>, based on laboratory testing at 55% solids content. This report has been developed in accordance with applicable guidelines issued by DEMIRS and ANCOLD (2019), and provides a preliminary basis for proceeding to detailed design. The current design is based on assumed ground conditions as the site area was not accessible for conducting geotechnical investigations.

The nominated TSF site is located within relatively flat terrain, underlain by silty sands and weathered granitic bedrock. The subsurface profile, characterised by shallow alluvium over fractured metamorphic and granitic units (subject to site geotechnical investigations), exhibits moderate to low permeability (in the order of 10<sup>-6</sup> m/s). More detailed site investigation, rock characterisation, crack propagation, and an advanced level of permeability tests like Lofgran and Leogan are highly recommended to confirm the above assumption. Based on the available information provided to CMW, Groundwater in the area is hosted in structurally controlled fractured rock aquifers, with standing water levels between 77 and 86 m AHD. Hydrogeological assessments indicate north-eastward flow and moderate yields, particularly at lithological contact zones. The site experiences semi-arid climatic conditions, with average annual rainfall of approximately 315 mm and evaporation exceeding 3,200 mm, and is dominated by ephemeral drainage features with no significant surface water constraints.

The IWLTFSF comprises three rectangular cells, each designed for staged downstream raising using zoned mine waste materials. The embankment design incorporates a final crest elevation of RL 120.5 m and a maximum height of 20.5 m. The outer shell will consist of traffic-compacted mine waste, while the upstream zone will be formed using clayey gravels compacted to specifications. The crest width is designed to be a minimum of 25 m with a 2% crossfall, and 1.5 m wide upstream benches will be included to accommodate tailings pipelines and spigots. Cell 1, which is the focus of this PFS, will provide a storage capacity of approximately 21.9 Mt. The combined three cells will provide a total storage capacity of 78.47 Mt. This demonstrates that the TSF design has sufficient capacity to accommodate the full LoM tailings, with approximately 4.37 Mt of excess capacity for contingency.

Extensive seepage modelling was carried out using the Seep/W finite element modelling software, with analyses indicating that seepage losses can be effectively mitigated through the use of HDPE liners, compacted cut-off trenches, and a perimeter underdrainage system. Under fully lined conditions with adequate underdrainage, seepage rates were reduced to negligible levels (<1 m<sup>3</sup>/day). These findings were corroborated by sensitivity analyses under various operating scenarios, including 150 m and 200 m radius pond conditions. The decant system, comprising a central rock ring and pontoon pump, is designed to return up to 100% of process water under average operating conditions and maintain a maximum pond diameter of 200 m to prevent saturation near the embankment toe.

Stability assessments were conducted using limit equilibrium methods (Slope/W), evaluating both static and post-seismic conditions. The design was found to meet the minimum Factors of Safety required under ANCOLD, 2019 guidelines, with additional conservatism built into the seismic deformation analyses, which estimated a displacement of only ~10 mm under a Safety Evaluation Earthquake (SEE) event. The embankment materials were determined to be non-liquefiable and erosion-resistant, with downstream slopes of 1V:3H providing long-term stability. The tailings themselves are classified as non-plastic silty materials with moderate compressibility and Emerson Class 5 dispersity. Geochemical testing confirmed that the tailings are non-acid forming (NAF), non-leachable, and free of any NORM concerns.

A dam break assessment was completed based on both sunny-day and probable maximum precipitation (PMP) failure scenarios. The maximum estimated release volume was approximately 6.4 Mm<sup>3</sup>, with peak outflows of up to 2,500 m<sup>3</sup>/s under PMP conditions. Given the flat terrain, the run-out distances were constrained to under 1 km, and no downstream infrastructure, population centres, or sensitive receptors were identified. While the ANCOLD consequence category is classified as 'Significant', CMW has conservatively adopted a 'High C' classification for design purposes to ensure maximum risk mitigation.

The study concludes that the proposed IWLTSF can be safely constructed and operated within the project's regulatory and environmental framework. It is recommended that the next phase of work include in-situ geotechnical investigations (such as drilling, testpitting and sampling with testing including triaxial strength testing), detailed hydrogeological modelling, optimisation of drainage layout, and integration of monitoring systems, including vibrating wire piezometers and survey prisms. Closure design, water recovery performance, and embankment erosion control will also require further refinement. Overall, the proposed design offers a technically robust solution for tailings management at the Tabba Tabba Lithium Project.

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## 1.0 INTRODUCTION

### 1.1 Introduction

The Tabba Tabba Lithium Project is located approximately 50 km southeast of Port Hedland, within the Pilbara region of Western Australia, and is situated on the Wallareenya pastoral lease, which is currently used for cattle grazing. The project area is covered by mining leases M45/354, M45/375, M45/376, and M45/377, along with general purpose and miscellaneous licences including G45/359, L45/323, L45/329, L45/759, and L45/810, which support associated haul road, pipeline, and infrastructure development.

The proposed Integrated Waste Landform Tailings Storage Facility (IWLTSF) is located within the project's infrastructure zone, southeast of the main pit area. The approximate centre of the IWLTSF is at (MGA Zone 50) 705,893 mE and 7,710,918 mN. A layout plan showing the location of the proposed IWLTSF in relation to mine tenement boundaries and existing/planned operations is provided in Figure 1.

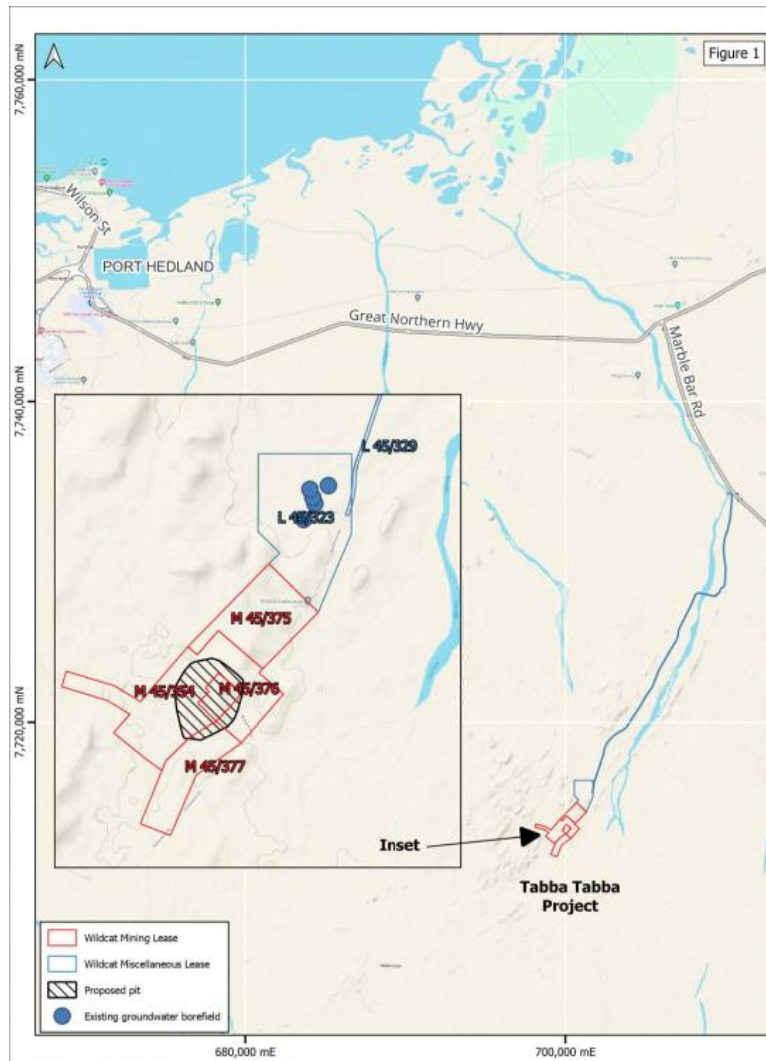


Figure 1 Tabba Tabba Project Location

The nominated TSF site lies within a generally flat to gently undulating terrain, with outcropping granite and shallow silty sands observed in some areas, particularly towards the northwestern boundary of the proposed

footprint. Granite hillocks of potential heritage significance have also been identified within the infrastructure lease area and may influence final design and development approvals.

Initially tailings will be stored in a single northern cell, with two rectangular cells located south of the proposed Cell 1 facility footprint being utilised after year 5/6. Cell 1 will cover an area of approximately 150 hectares, with the combined Integrated Waste Landform Tailings Storage Facility (IWLTSF) designed to accommodate up to 74.1 Mt of tailings. Proposed storage cells will be constructed and operated using methods consistent with the staged raising approach adopted for the current TSF. Figure 2 shows the proposed TSF layout plan.

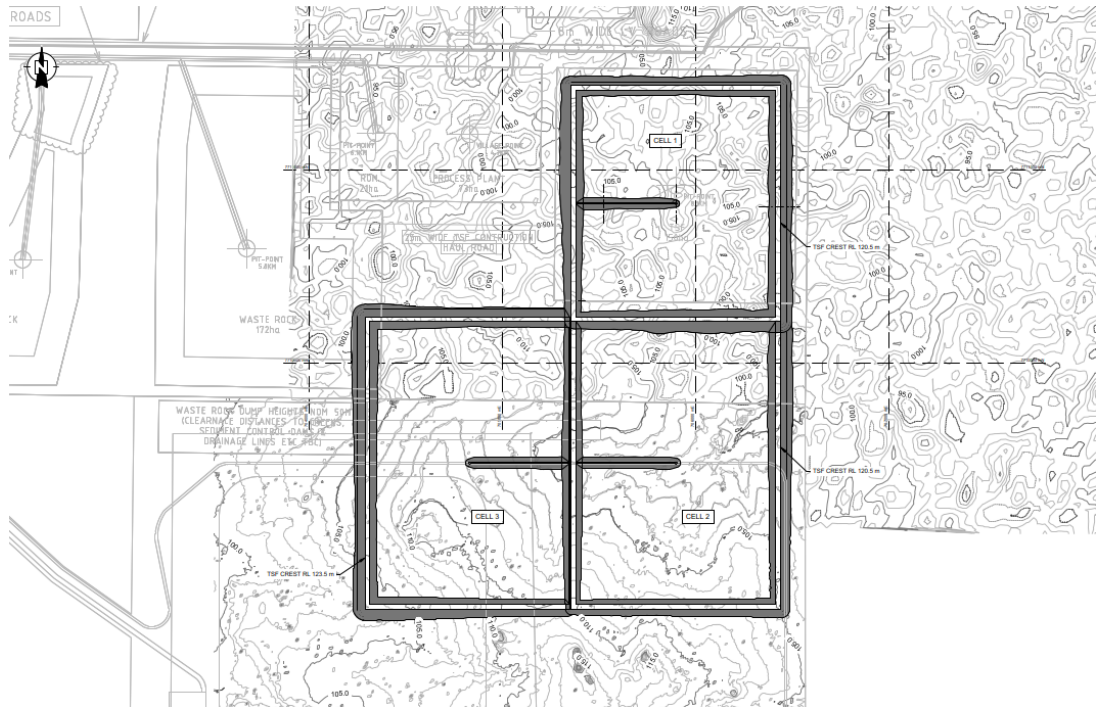


Figure 2: Proposed TSF Site Plan

## 1.2 Ownership

The Tabba Tabba Lithium Project is wholly owned by Wildcat Resources Limited (Wildcat). The development area for the proposed open pit, infrastructure, and TSF spans several granted mining and miscellaneous tenements, as outlined below:

- Mining Leases:
  - M45/354
  - M45/375
  - M45/376
  - M45/377
- General Purpose Lease:
  - G45/359 – covering infrastructure, processing plant, and TSF development areas.
- Miscellaneous Licences:
  - L45/323 – supporting the groundwater supply borefield
  - L45/329 – supporting infrastructure corridors
  - L45/759 and L45/810 – associated with haul roads, access, and services

All tenements are registered to Wildcat Resources Limited and are held under full ownership for the purpose of lithium-tantalum mining and processing. The project area was previously subject to limited mining activity (primarily for tantalum) and has since been acquired and re-permitted by Wildcat to support the current lithium development plan. The proposed IWLTSF lies entirely within the general-purpose lease G45/359, with all supporting infrastructure, including the waste rock dump and haul road, positioned within Wildcat's controlled tenure.

### 1.3 Plant Description and Operation

Mining at the Tabba Tabba Lithium Project will be conducted via open pit methods, targeting lithium-bearing pegmatite ore. Ore will be processed on-site at a proposed facility using a combination of dense media separation (DMS) and flotation to produce a spodumene concentrate.

The processing plant will include:

- Crushing and screening circuits, followed by DMS and flotation beneficiation.
- Tailings thickening, producing underflow at approximately 55% solids, which will be pumped to the Integrated Waste Landform Tailings Storage Facility (IWLTSF).

Process water will be supplied from a licensed borefield located approximately 2 km northeast of the pit, under GWL 181791, with a permitted extraction of 100,000 kL/year from the fractured rock aquifer. The plant and associated infrastructure are designed to support a 10-year mine life, with environmental controls in place for water recovery, tailings deposition monitoring, and rehabilitation planning.

### 1.4 Project Overview

Historically, the Tabba Tabba area was mined for tantalum, with operations as recent as 2015. Mining was carried out by Pilbara Minerals and Nagrom as part of a joint venture, with site rehabilitation completed in 2019 following decommissioning of the infrastructure.

Recognising the site's lithium potential, Wildcat Resources Limited (WRL) acquired the tenements in May 2023 from Global Advanced Metals Wodgina Pty Ltd and has since initiated redevelopment of the project for lithium production.

## 2.0 TSF DESIGN CONSIDERATION

### 2.1 Introduction

This report was prepared to meet the requirements of the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) and follows these guidelines:

- Department of Mines and Petroleum (2013<sup>1</sup>): "Code of Practice: Tailings Storage Facilities in Western Australia"; and,
- Department of Mines and Petroleum (2015<sup>2</sup>): "Guide to the Preparation of a Design Report for Tailings Storage Facilities (TSFs)".

Additionally, the design in this report follows the ANCOLD (2019<sup>3</sup>) guidelines titled "Guidelines on Tailings Dams Planning, Design, Construction, Operation, and Closure." The consequence category will influence water management requirements (such as freeboard and stormwater storage capacity) and the design of the geotechnical embankment.

## 2.2 Storage Capacity

Factors that are considered in the proposed IWLTSF design (total three (X3) cells):

- Total tailings production of 74.1 Mt;
- Expecting Life of Mine (LoM) will be 18 years;
- Annual tailings production of approximately 3.85 Mtpa (dry tonnes);
- Tailings deposited at 55% solids;
- Tailings design density of 1.4 t/m<sup>3</sup> (dry)\*;
- Tailings beach slope of 1.0%;
- Minimum total freeboard of 0.5 m.

Details of the storage characteristics are further discussed in Section 3.2.2.

\* Design density of 1.4 t/m<sup>3</sup> (dry) is based on tailings testwork at a solids content of 55%. Variations in solids content will affect the consolidated density. The design density assumed is assessed as conservative. The consolidated density will likely be higher.

## 2.3 Site Condition

### 2.3.1 Climate

The project site is semi-arid, characterised by hot summers, mild winters and low and variable rainfall. The mean annual evaporation rate exceeds the mean annual rainfall by an order of magnitude. The following data from Station No. 00408, namely Wallareenya has been utilised in the design (refer to Table 1 and Table 2):

- Mean annual rainfall of approx. 314.7 mm (Bureau of Meteorology (BOM<sup>4</sup>) website);
- Mean annual evaporation approx. 3,200 mm (Bureau of Meteorology (BOM<sup>4</sup>) website);
- 1:100 yr. Annual Exceedance Probability (AEP) event of 72 hr duration, 374 mm (Bureau of Meteorology (BOM<sup>4</sup>) website);
- Probable Maximum Precipitation (PMP) storm event, 6-hour duration of 1,010 mm (BOM (2002)<sup>5</sup> ‘The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method’).

Table 1: Average rainfall for Wallareenya station

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean (mm)	67.3	82.5	64.6	17.3	21.5	25.5	8.2	4	1.4	1.7	4.9	26.5	314.7
Lowest (mm)	0	0	0	0	0	0	0	0	0	0	0	0	20.3
5th %ile (mm)	0	0	0	0	0	0	0	0	0	0	0	0	129.3
10th %ile (mm)	3.6	6.6	0	0	0	0	0	0	0	0	0	0	160
Median (mm)	42	59	37.9	3	5.8	2	0	0	0	0	0	10	312.2
90th %ile (mm)	175.3	171.2	193.6	52.8	61.3	80	23	13.9	1.4	2.7	15.9	80.1	503.4
95th %ile (mm)	220.9	263.8	239.4	73.5	102.8	111.8	53.8	29.8	5.9	6	28.8	105	564.2

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Highest (mm)	294.4	379	343.4	268.2	224.8	209.9	83	47	39.4	50.8	60.7	228.6	706.3

Table 2: Average evaporation

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean (mm)	350	300	300	250	200	150	175	200	250	350	450	400	3,200

### 2.3.2 Flora and Fauna

The proposed IWLTSF and waste dump areas are located within the Chichester subregion of the Pilbara bioregion, characterised by rocky plains and spinifex-dominated vegetation. The landscape supports hard and soft spinifex grasslands, with Acacia shrublands and occasional Snappy Gum on elevated areas.

Vegetation in the area is generally sparse and low-growing, typical of the Macroy land system, and shows low sensitivity to disturbance, although past grazing, exploration, and fire have caused minor degradation. No significant conservation constraints or sensitive ecological values were identified within the project footprint.

### 2.3.3 Regional Surface Topography

The topography of the Tabba Tabba Lithium Project ranges from gently undulating rocky hills in the pit development area to broad, flat plains with shallow alluvial soils across the proposed infrastructure and IWLTSF zones. Elevation across the site varies between 100 m and 120 m AHD, with no significant terrain constraints observed within the general purpose lease.

The IWLTSF and waste dump areas are located to the southeast of the pit across a wide, relatively level plain. The landform in this region is consistent with the Macroy land system, characterised by stony plains with scattered granite outcrops and quartz surface mantles, supporting open spinifex grasslands. One notable granite hillock exists in the northwestern corner of the nominated TSF area, which may require consideration during final layout planning.

Natural surface drainage across the site is ephemeral, occurring only during major rainfall events. The broad plains gently grade eastwards towards Tabba Tabba Creek, a minor tributary system that flows in a north-eastward direction during the wet season.

### 2.3.4 Geology

Published geological mapping and site investigations indicate that the Tabba Tabba Lithium Project is geologically complex, with a combination of intrusive pegmatites, greenstone belts, metamorphic sediments, and granitic basement rocks.

The primary lithium mineralisation occurs within a southeast to northwest-striking pegmatite intrusive, dipping northeast at approximately 35 – 40°, with a maximum width of up to 70 m and extending over a surface distance of approximately 500 m. The pegmatite thins to the northwest where it is interpreted to terminate below detrital cover and granodiorite basement.

This pegmatite is hosted within a narrow, northeast-trending greenstone belt composed primarily of:

- Sheared metagabbro sills of amphibolite facies on the southwestern margin;
- Mafic schists and amphibolites of the Warrawoona Group sediments along its extent.

The greenstone sequence is bounded to the northwest by metamorphic sediments (hornfels and schists) and truncated in the southeast by granitic units associated with the Tabba Tabba Shear Zone. A significant east-west trending dolerite dyke intersects the pit area, and several local faults disrupt the continuity of the pegmatite, suggesting offset and segmentation of mineralised bodies at depth. The weathering profile across the site is relatively shallow, and minimal volumes of highly weathered (oxide) material are expected during mining.

Mapping from the 1:100,000 Wallaringa Geological Sheet (Smithies et al., 2011) was used to support stratigraphic interpretation in the area and aligns with field observations recorded during site reconnaissance and core logging (refer PER2024-0154AB Rev0).

### 2.3.5 Hydrology

The proposed IWLTFSF site is situated within a gently undulating plain where surface drainage is minimal and primarily active only during significant rainfall events. The natural drainage system comprises minor, ephemeral creeks and drainage lines that generally flow east and northeast, eventually discharging into Devil Creek during wet season events.

There are no major permanent watercourses intersecting the proposed IWLTFSF area, and no creek diversions are expected to be required for development. However, surface water management infrastructure—including drainage diversions and perimeter drains—will be required, particularly along the southern boundary of the facility, to divert rainfall runoff from upslope areas and minimise water ingress onto the waste dump and tailings facility.

Two existing surface water dams located within the tenement are used to intercept seasonal runoff along minor drainage lines. These may provide limited capacity for sediment control or supplementary water storage but are not relied upon as primary hydrological control features for the TSF area. The design and layout of the IWLTFSF will consider both the ephemeral nature of local hydrology and the need for controlled drainage pathways, especially during cyclonic or high-intensity rainfall events common in the region.

### 2.3.6 Hydrogeology

Groundwater at the Tabba Tabba Lithium Project primarily occurs within fractured rock aquifers, particularly along lithological contacts between pegmatites, gabbros, schists, and dolerite dykes. These contact zones exhibit the highest hydraulic conductivity due to structural deformation and weathering. The fractured nature of these units facilitates groundwater flow, but storage capacity is limited due to low porosity outside fracture zones.

The standing water level (SWL) in the pit area is approximately 14 m below ground level (bgl) (equivalent to 86 m AHD), with groundwater flowing northeast towards the licensed water supply borefield where SWL is around 77 m AHD. This hydraulic gradient is consistent with topography and drainage flow directions across the site.

In 2024, six monitoring bores were installed around the proposed pit for hydrogeological assessment and environmental monitoring. These bores were screened below the water table to target fractured rock units, with depths averaging 38 m. Groundwater yields were highest at the gabbro–pegmatite contact zones, with airlift yields up to 0.85 L/s in some locations.

Hydraulic conductivity values determined from slug tests vary significantly by lithology:

- Gabbro–pegmatite contacts: up to 1.02 m/day
- Metamorphic schists: 0.27 to 0.41 m/day
- Unweathered gabbro: as low as 0.014 m/day

Groundwater quality across the site is generally of sodium-chloride type, with marginal to brackish salinity. Total dissolved solids (TDS) typically range from 1,040 to 2,830 mg/L, though isolated samples (e.g., from bore TAMB003) have shown TDS levels as high as 7,740 mg/L. While groundwater meets health-based guidelines, it

exceeds aesthetic thresholds for salinity, hardness, sodium, chloride, and manganese. The aquifer is recharged via infiltration along drainage lines, with an estimated recharge rate of 4.14 mm/year, representing approximately 1.3% of annual rainfall.

### 2.3.7 Seismicity

The project area is located in a region of low to medium seismic risk. The peak ground accelerations were estimated using two sources, namely AS 1170.4 (2007<sup>6</sup>) and Geoscience Australia (2018<sup>7</sup>), ‘*The 2018 National Seismic Hazard Assessment for Australia*’.

- PGA of 0.12 g, as derived from AS 1170.4 (2007) for 1:475 years AEP
- PGA of 0.07 g, as derived from Geoscience Australia (2018) for 1:475 years AEP
- PGA of 0.204 g as derived from AS 1170.4 (2007) for 1:2,000 years AEP
- PGA of 0.12 g, as derived from Geoscience Australia (2018) for 1:2,475 years AEP

For a ‘High C’ consequence category (refer Section 3.1.1), the AS 1170.4 (2007) figures have been used from operating basis earthquake (OBE) of 1:475 years AEP and Safety Evaluation Earthquake (SEE) of 1:2,000 years AEP.

## 2.4 TSF Options

An initial examination of the IWL height was conducted in order to assess an optimum height for the facility in 2024. An assessment was performed by comparing some options with different forms and height, which had already been discussed with the client. The TSF was to store all 78 Mt the facility would have to be approximately 20.5 m height, considering all the limitations of the mining lease site.

The following summarises storage and earthworks volumes for the options examined:

- TSF design: at RL 120.5 m capacity is 56.05 Mm<sup>3</sup>, and the embankment earthwork volume is 5.26 Mm<sup>3</sup>, which provide a Storage/Earthworks ratio of 10.66.
- Alternative design: Two cells at RL 120.5 m and one cell at RL 123.5.

### 2.4.1 Option Study

A high-level options study was conducted to investigate appropriate methods for tailings storage for the project. The main option considered was an IWL (i.e. a TSF formed within a waste dump). Other options considered were a central thickened discharge, multi-cell paddock facilities with upstream raising and dry stacking.

Table 3: Advantages and Disadvantages of Options

Advantage	Disadvantage
<p>IWL:</p> <ul style="list-style-type: none"> <li>• Combines tailings and waste rock storage, reducing land disturbance footprint</li> <li>• Lower overall capital cost due to use of mine waste for embankment construction</li> <li>• Improved structural stability when designed and constructed properly</li> <li>• Easier to integrate into mine closure plans and final landform designs</li> </ul>	<p>IWL:</p> <ul style="list-style-type: none"> <li>• Higher operational oversight required during concurrent tailings and waste placement</li> <li>• Risk of contamination if seepage control measures are inadequate</li> </ul>

Advantage	Disadvantage
<ul style="list-style-type: none"> <li>Reduced visual impact and better blending with surrounding topography</li> <li>Efficient use of available materials and space within mining lease</li> </ul>	
<p>CTD:</p> <ul style="list-style-type: none"> <li>Promotes higher tailings density, reducing required storage volume</li> <li>Improved water recovery due to central decant system and thickened tailings</li> <li>Steeper beach slopes allow for smaller footprint compared to conventional TSFs</li> <li>Reduced risk of dam failure due to lower hydraulic head and smaller pond area</li> </ul>	<p>CTD:</p> <ul style="list-style-type: none"> <li>Higher capital and operating costs due to requirement for thickening equipment and pumps</li> <li>Complex operational control to maintain beach slopes and avoid overtopping</li> <li>Sensitive to changes in tailings rheology, which can affect beach formation</li> <li>Requires consistent monitoring and adjustment of discharge locations</li> <li>Limited suitability for tailings with poor thickening or stacking characteristics</li> <li>Greater wear and maintenance demand on pumping and piping systems</li> </ul>
<p>Upstream Raising of Paddock TSF:</p> <ul style="list-style-type: none"> <li>Lower initial capital cost compared to downstream or centreline raises</li> <li>Simple construction methodology using tailings as construction material</li> <li>Rapid early-stage construction and low material requirements</li> <li>Common and well-understood design in many operational settings</li> </ul>	<p>Upstream Raising of Paddock TSF:</p> <ul style="list-style-type: none"> <li>Higher risk of failure, especially under seismic loading or high phreatic conditions</li> <li>Not suitable for high-consequence or high-hazard sites (per ANCOLD guidelines)</li> <li>Relies on tailings strength—requires consistent deposition and consolidation</li> <li>Difficult to inspect and remediate internal zones after construction</li> <li>Limited long-term stability and not ideal for closure/rehabilitation landforms</li> <li>Prone to liquefaction and instability if poorly managed or saturated</li> </ul>
<p>Dry Stacking:</p> <ul style="list-style-type: none"> <li>No supernatant pond—significantly reduces risk of dam failure or catastrophic release</li> <li>Improved geotechnical stability and resistance to liquefaction</li> <li>Smaller environmental footprint and easier to progressively rehabilitate</li> <li>Lower long-term water management and closure liabilities</li> <li>Suitable for arid climates with high evaporation and low water availability</li> <li>Can be located closer to processing plant due to reduced containment requirements</li> </ul>	<p>Dry Stacking:</p> <ul style="list-style-type: none"> <li>High capital and operational costs (filtering, stacking, transport)</li> <li>Requires extensive dewatering infrastructure (e.g. filtration plants)</li> <li>Potential for dust generation if not properly managed</li> <li>Space-intensive stacking may require larger footprint for high tonnage</li> <li>Limited applicability for very fine or wet tailings difficult to filter</li> <li>More complex materials handling systems (e.g. conveyors, truck haulage)</li> </ul>

The IWL is the preferred TSF option, which was taken forward to the initial discussion and evaluation studies. The IWL option is a robust storage option with manageable environment impacts, low business and regulatory

risk, significant advantages in relation to closure, as mine waste can be readily deployed during mining for embankment construction at a relatively low cost.

## 2.5 Retaining Structure Properties

The IWLTsf for Tabba Tabba mining project comprised three (3) cell facilities, which were connected together with the dividing walls as shown in Figure 2. The current PFS SoW only covered the Cell 1 IWLTsf design. The IWL embankments will be constructed using mine waste materials sourced from ongoing pit operations. The perimeter embankment will be zoned, with a select upstream zone and a coarser downstream shell, both derived from pit-excavated waste.

The upstream zone will primarily consist of select mine waste. Due to the lack of clayey materials in the project area, the upstream face/batter will be lined with an HDPE liner.

The downstream zone will be formed from well-graded mine waste, typically described as sandy gravel with cobbles and minor fines. These materials are considered non-liquefiable under dynamic or seismic loading and are inherently erosion-resistant, making them suitable for long-term structural integrity.

Both the foundation and embankment fill materials are considered not susceptible to internal erosion or piping under anticipated operational and climatic conditions. The embankments, when constructed under controlled conditions in accordance with the technical specifications provided, are expected to perform reliably throughout the facility's operational life. Technical specifications for embankment materials and construction requirements are detailed in Appendix B.

## 2.6 Tailings Properties

### 2.6.1 Tailings Testworks

Geotechnical parameters for the IWLTsf design were derived from a laboratory testing program completed in late 2024 and it is reported in Document No. J-AU0389-002-R-RevA dated 4 February 2025. The testing was carried out on tailings samples obtained from metallurgical testwork. No prior settling test data existed for this material, making these results the primary source for assessing tailings behaviour in the facility. The testing program included physical characterisation, particle size distribution (PSD), consolidation and settlement behaviour, and Emerson Class evaluation.

Key high-level findings for PFS level are summarised below:

- The tailings are classified as non-plastic silty silt/clay, with a particle density of 2.6 t/m<sup>3</sup>.
- Initial dry density at 55% solids was measured at 0.82 t/m<sup>3</sup>, with a moisture content of approximately 81.6%.
- Air-dried tailings achieved a dry density of 1.25 t/m<sup>3</sup> after 6 days oven dried under 60 °C.
- The material exhibited no measurable linear shrinkage and was confirmed to be non-plastic (NP).
- An Emerson Class Number of 5 was recorded, indicating moderate dispersity potential.

#### **Particle Size Distribution:**

- 44% passing 75 µm
- Approximately 8% passing 0.005 mm
- Approximately 2% estimated passing 0.001 mm

#### **Consolidation and Settlement Behaviour:**

- Undrained oedometer testing produced a settled dry density of 1.32 t/m<sup>3</sup>, with a final void ratio of 0.739 at 1600 kPa.
- Drained settlement testing resulted in final dry densities around 1.30 to 1.35 t/m<sup>3</sup>, reflecting drying trends consistent with similar lithium operations.
- Additional results:
  - Drained dry density: 1.35 t/m<sup>3</sup> at 38% slurry of water return
  - Undrained dry density: 1.25 t/m<sup>3</sup> at 48% slurry of water return

#### Hydraulic and Compressibility Properties:

- Coefficient of consolidation (Cv) varied from 0.45 to 5.06 m<sup>2</sup>/year, increasing with pressure.
- Volume compressibility (Mv) decreased with pressure, from 9.19 × 10<sup>-4</sup> m<sup>2</sup>/kN at 12.5 kPa to 3.28 × 10<sup>-5</sup> m<sup>2</sup>/kN at 1600 kPa.
- Permeability (k) dropped from 5.5 × 10<sup>-9</sup> m/s to 1.5 × 10<sup>-10</sup> m/s with increasing pressure.

No CPTu or triaxial testing has been conducted to date. Future stages may include in-situ testing (e.g., dissipation or strength tests) to validate field-scale parameters. Overall, the Tabba Tabba tailings demonstrate moderate compressibility and predictable consolidation under operational conditions. These properties are consistent with tailings from comparable hard-rock lithium projects and are considered appropriate for use in the current IWLTFS design assumptions. The result of tailings test work is presented in Appendix C of this report.

## 2.6.2 Geochemistry

Geochemical characterisation of the tailings solids was conducted by ALS Environmental, with test coordination and reporting completed by Mine Waste Management Pty Ltd (MWM) on behalf of Wildcat Resources Limited (ref. J-AU0389-002-R-RevA, 2025). The testing followed a structured sampling and analysis plan and included a combination of acid-base accounting (ABA), short-term leach testing, total elemental analysis, and XRD mineralogy. ALS is a NATA-accredited laboratory, and all methods applied followed industry-standard QA/QC protocols. The following key findings were reported based on the analytical program:

- The tailings solids sample was classified as Non-Acid Forming (NAF), with very low total sulphur (<0.01 wt%) and sulphide sulphur (<0.009 wt%). The Net Acid Producing Potential (NAPP) was measured at -2.4 kg H<sub>2</sub>SO<sub>4</sub>/t, indicating a low acid generation risk.
- Paste pH and NAG pH results confirmed circum-neutral to mildly alkaline characteristics, with a pH of 8.8 and NAG pH of 6.2.
- Leachate testing indicated the tailings water is fresh to marginally brackish, with low concentrations of anions and cations. Trace metal levels were within acceptable environmental limits, with no significant metal leaching potential observed under oxidised conditions.
- The sample was free of asbestos and fibrous minerals, based on XRD screening.
- The total uranium and thorium concentrations yielded a combined radioactivity of 0.04 Bq/g, confirming that the material does not present a NORM hazard.
- The elemental composition showed no notable enrichment, with all analytes well below thresholds of environmental concern. Slight elevations in barium and manganese were observed but remain within typical crustal abundance ranges.

## 3.0 TAILINGS STORAGE FACILITY DESIGN

### 3.1 Introduction

The primary design objectives for the IWLTSF are as follows:

- Maximise water recovery by facilitating efficient drainage and return of process water to the plant, thereby enhancing the in-situ dry density of deposited tailings.
- Optimise storage capacity through strategic tailings deposition practices (e.g. cyclic spigotting), which promote higher deposition density and reduce drying times.
- Minimise environmental impact by reducing seepage losses and maximising reuse of recovered water within the processing circuit.

The general arrangement and section details for the IWLTSF raising are shown in Drawings PER2024-0154-100 to PER2024-0154-107 (refer to Appendix A). The Scope of Works and Technical Specification Document, including construction schedules and quantities, is provided in Appendix B.

### 3.2 Hazard / Consequence Rating

The proposed TSF design as an IWL is a robust concept that involves the downstream raising of the perimeter embankments, ensuring resistance to liquefaction. In accordance with the DEMIRS Code of Practice (2013<sup>1</sup>), the Tailings Storage Facility (TSF) has been assigned a hazard rating of 'Category 1 – Medium', based on the following considerations:

- Population at risk (PAR) >1 and < 10;
- Severity of damage and loss is expected to be 'Major' with
  - loss of infrastructure in the order \$100M,
  - severe impact to the mine and business in overall,
  - impact area of  $\leq 5 \text{ km}^2$ , impact duration of  $\leq 5$  years,
  - and limited impact to native flora and fauna;
- There is no potential for tailings flow into the pit and plant areas.
- Ultimate embankment height of approximately 20.5 m.

Based on the above considerations and in accordance with Table 1 of ANCOLD (2019<sup>3</sup>), a 'Medium' damage level has been assigned. This category is characterised by potential infrastructure losses in the range of \$10 million to \$100 million, significant business impacts (e.g. mill disruption), an impact area of  $\leq 5 \text{ km}^2$ , and an impact duration of less than 5 years. For a population at risk (PAR) of less than 1, this corresponds to a 'Significant' consequence category.

However, in line with a precautionary approach and to ensure the highest standard of safety, CMW has adopted a conservative classification of 'High C' for design purposes, in accordance with ANCOLD (2019<sup>3</sup>).

DAMAGE TYPE	MINOR	MEDIUM	MAJOR	CATASTROPHIC
Infrastructure (dam, houses, commerce, farms, community)	<\$10M	\$10M-\$100M	\$100M-\$1B	>\$1B
Business importance	Some restrictions	Significant impacts	Severe to crippling	Business dissolution, bankruptcy
Public health	<100 people affected	100-1000 people affected	<1000 people affected for more than one month	>10,000 people affected for over one year
Social dislocation	<100 person or <20 business months	100-1000 person months or 20-2000 business months	>1000 person months or >200 business months	>10,000 person months or numerous business failures
Impact Area	<1km <sup>2</sup>	<5km <sup>2</sup>	<20km <sup>2</sup>	>20km <sup>2</sup>
Impact Duration	<1 year	<5 years	<20 years	>20 years
Impact on natural environment	Damage limited to items of low conservation value (e.g. degraded or cleared land, ephemeral streams, non-endangered flora and fauna). Remediation possible.	Significant effects on rural land and local flora & fauna. Limited effects on: A. Item(s) of local & state natural heritage. B. Native flora and fauna within forestry, aquatic and conservation reserves, or recognised habitat corridors, wetlands or fish breeding areas.	Extensive rural effects. Significant effects on river system and areas A & B. Limited effects on: C. Item(s) of National or World natural heritage. D. Native flora and fauna within national parks, recognised wilderness areas, RAMSAR wetlands and nationally protected aquatic reserves. Remediation difficult	Extensively affects areas A & B. Significantly affects areas C & D. Remediation involves significantly altered ecosystems.

Figure 3 Screenshot from Table 1 ANCOLD 2019<sup>3</sup>

Population at Risk	Severity of Damage and Loss			
	Minor	Medium	Major	Catastrophic
<1	Very Low	Low	Significant	High C
≥1 to <10	Significant (Note 2)	Significant (Note 2)	High C	High B
≥10 to <100	High C	High C	High B	High A
≥100 to <1,000	(Note 1)	High B	High A	Extreme
≥1,000		(Note 1)	Extreme	Extreme

Figure 4 Screenshot from Table 2 ANCOLD 2019<sup>3</sup>

### 3.2.1 Drawings

The following drawings are presented in Appendix A.

Table 4: Drawings

Title	Drawing No.
IWL – Final Stage Plan	PER2024-0154-100
IWL – Stage 1 Plan	PER2024-0154-101
Sections and Details Stage 1	PER2024-0154-102
Sections and Details Final Stage	PER2024-0154-103
Pipeline & Spigot Details	PER2024-0154-104
IWL – Instrumentation Plan	PER2024-0154-105
IWL - Instrumentation Details	PER2024-0154-106
Tenement Site Plan	PER2024-0154-107

### 3.2.2 TSF Storage Characteristics

The current PFS provided the volume and capacity for each cell of IWSTSF separately. The IWLTSF has been designed to accommodate a total storage capacity of 74.1 Mt, which equates to approximately 53 Mm<sup>3</sup> of volume, based on a dry density of 1.40 t/m<sup>3</sup> and deposition rate of 4.5 Mtpa.

The storage capacities for each stage (RL level m) of the IWLTSF are shown in **Figure 5** to **Figure 7** and detailed volume and storage capacity for Cell 1 is presented in Table 5. At an estimated slurry Dry Density of 1.4 t/m<sup>3</sup>, if the facility were raised to RL 125 m, the total storage capacity would be approximately 15.67 Mm<sup>3</sup> or 9.93 Mt of tailings.

Table 5: IWLTSF Storage Characteristics (Cell 1)

Raising Stage/old Stages	Crest RL (m AHD)	Active Tailings Area (ha)	Storage Volume (Mm <sup>3</sup> )	Cumulative Volume (Mm <sup>3</sup> )	Cumulative Storage Capacity (Mt)	Cumulative Storage Life (years)
1	110	103.98	3.56	3.56	4.98	1.11
2	114.5	115.98	5.017	8.58	7.02	1.56
3	120.5	121.33	7.09	15.67	9.93	2.21

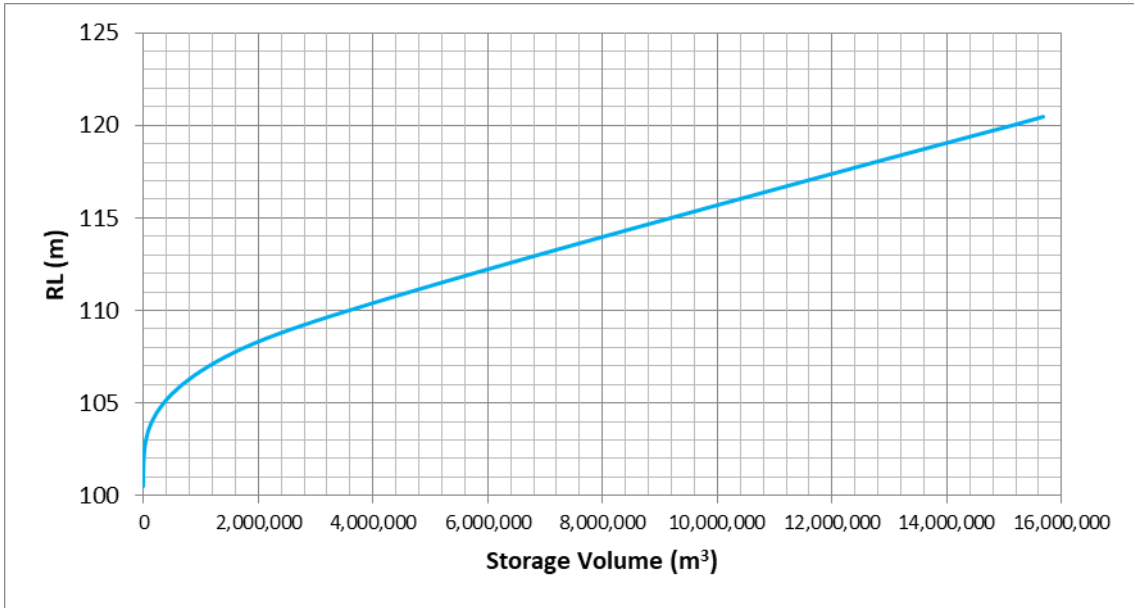


Figure 5 Tabba Tabba TSF Capacity Curve (Cell 1)

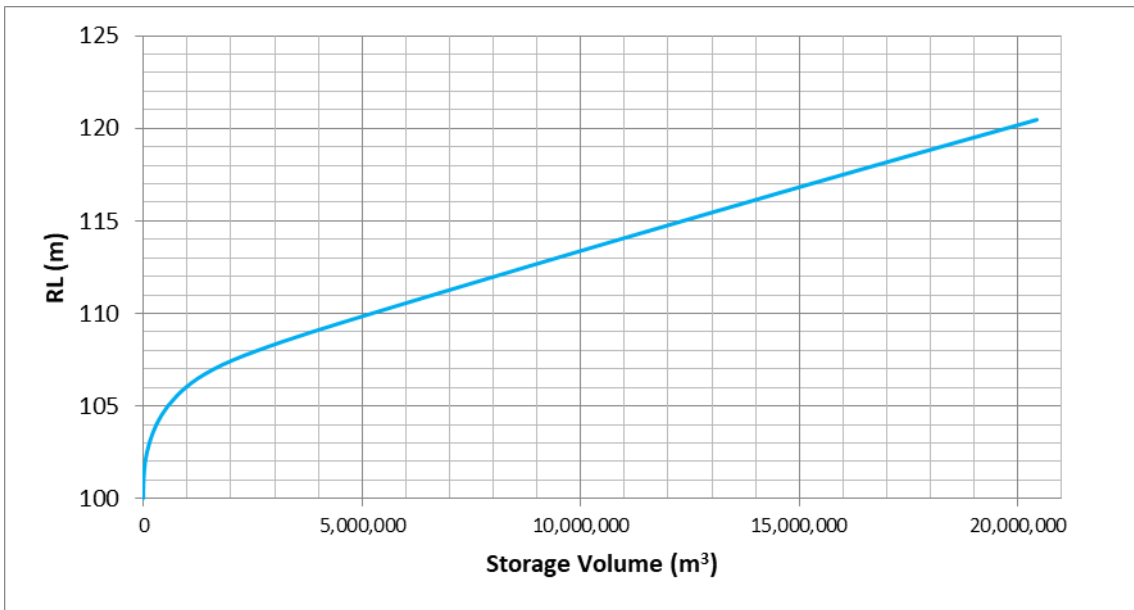


Figure 6 Tabba Tabba TSF Capacity Curve (Cell 2)

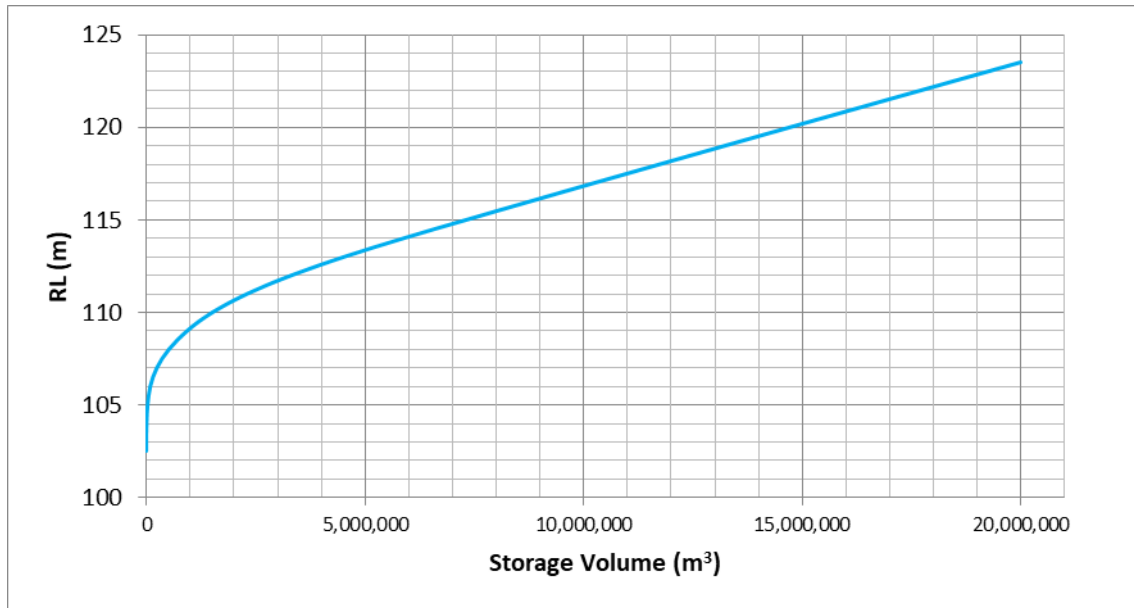


Figure 7 Tappa Tappa TSF Capacity Curve (cell 3)

A clearer snapshot for each IWLTsf cell is provided below for each single cell:

- Cell 1
  - Volume 15.67 Mm<sup>3</sup>
  - RL 120.5m
  - Capacity 21.9 Mt.
- Cell 2
  - Volume 20.43 Mm<sup>3</sup>
  - RL 120.5m
  - Capacity 28.6 Mt
- Cell 3
  - Volume 19.98 Mm<sup>3</sup>
  - RL 123.5m
  - Capacity 27.98 Mt

Based on the above capacities for each cell, the designed IWLS accommodates in total of 78.47 Mt, which is equal to 56.05 Mm<sup>3</sup> in 17.44 years.

### 3.2.2.1 Embankment Geometry

The embankment is designed to reach a final elevation of RL 120.5 m, with a maximum embankment height of approximately 20.5 m (refer to Figure 8). It will be constructed in three stages, with each stage incorporating a 1.5 m wide bench on the upstream face to accommodate the deposition line. The final landform overall slope requirements have design slopes of 1(V):2(H) upstream and 1(V):3(H) min. The embankment crest 25 m wide will have a 2% cross-fall towards the upstream side, 0.5 m (min.) high mine waste windrow at the downstream crest, and above above-ground tailings pipeline at the upstream crest.

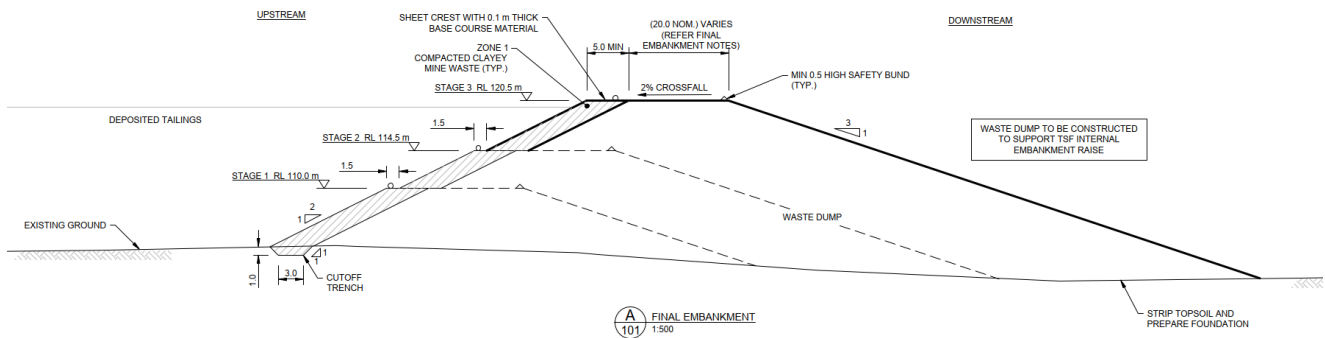


Figure 8 Section of IWLTFS in Tabbatabba Mining Project

### 3.2.3 Water Recovery System

The proposed IWLTFS will have a central decant located within the IWLTFS comprising a rock ring filter wall. Access to the decant will be by a decant accessway constructed using mine waste. The decant structure and accessway will be raised along with the perimeter embankments.

Recovered supernatant water will be returned to the plant for re-use in the process. The pumps will require a working capacity of not less than 420 tph.

### 3.2.4 Seepage Management

Seepage from the tailings storage is minimised by the incorporation of the following seepage management measures within the design.

- A cut-off trench under the upstream zone of the embankment extends around the full perimeter of the facility. This seepage cut-off trench has a depth of 1 m and will be backfilled with compacted, low permeability mine waste.
- The upstream embankment zone will be lined with HDPE liner to reduce the potential for seepage through the perimeter embankment.
- Inclusion of an underdrainage system (refer to Section 3.2.5)
- Continuous recovery of decant water from the facility and re-use in the process plant.
- Provision of temporary pumps (e.g. turret pumps) to achieve early water return from the IWL. It is estimated that water will enter the central decant in less than one month.
- 8 Vibrating Wire Piezometer (VWPs) will be installed around the IWL to provide continuous monitoring.

### 3.2.5 Underdrainage System

The design includes an underdrainage system to manage seepage, consisting of underdrainage lines installed around the perimeter embankment at the upstream toe. These lines will direct collected water to the External sumps east side of the IWLTFS downstream. The underdrainage lines will be constructed from slotted pipes (e.g., Megaflo), wrapped in geotextile, and surrounded by selected aggregate stabilised with coarse aggregate or select rock.

Pumps installed at these sumps will actively recover seepage water collected by the system and pump it back into the facility or return the recovered water to the plant.

The underdrainage system is sized based on seepage analyses and different scenarios, designed to handle an inflow equivalent to approximately 2% and 3% of the slurry water inflow, with the following nominal capacity.

- Scenario 1: Fully Lined IWLTsf pond and Embankment equal to 2.45 L/s (2% of slurry water inflow)
- Scenario 2: Fully lined running pond (200 m radius) equal to 3.68 L/s (3% of slurry water inflow)
- Scenario 3: Fully lined running pond (200 m radius) and lining starts from 20 m from the downstream toe to the level of embankment in stage 1 RL 110.5 m equal to 3.68 L/s (3% of slurry water inflow)

Each of the above scenarios already includes some sub-scenarios with the sensitivity analysis of running pond size (150 & 200 m radius) and the location of the underdrainage pipe (either under the pond or downstream area). The result of each category is also incorporated in the seepage analysis result and reported in Section 3.3.1.3.

### 3.3 Modelling and Design Studies

#### 3.3.1 Seepage Analyses

Seepage analyses were conducted to assess the potential seepage from the IWLTsf embankment at Final stage (crest level RL120.5 m, 20.5 m height). These analyses utilised the groundwater module of the GeoStudio software package, which employs 2D finite element analysis to model groundwater seepage under saturated, steady-state flow conditions. It is important to highlight that 2D modelling provides a simplified representation and does not account for 3D effects, such as seepage through geological structures like joints.

##### 3.3.1.1 Model Assumptions

The seepage analyses utilised boundary conditions defined as follows:

- Upstream Boundary Condition: CMW provided three scenarios for the Final stage of the embankment
  - Final Stage RL 120.5 mAHD;
    - The maximum water running pond of 200 m radius
    - The maximum running pond of 150 m radius;
    - The maximum running pond near the embankment downstream (0.5 m below the crust)
- Two (2) lines underdrainage system located immediately downstream of a fully lined facility;
- Three (3) lines underdrainage system located immediately downstream with different distances and locations to understand the optimised efficiency of seepage control.
- Groundwater was assumed to be at the RL 80 mbgl at the downstream toe of the embankment.
- For a conservative seepage assumption, CMW considered the downstream toe perimeter to calculate total seepage alongside the embankment's outer boundary (4066 m).
- A full mesh sensitivity analysis was conducted on the numerical model. The mesh size ranged from a maximum of 2 m to a minimum of 0.1 m in thin layers. Both triangular and quadrilateral mesh shapes were utilised in the numerical model.

These conditions provide a conservative basis for assessing seepage under extreme operational scenarios.

##### 3.3.1.2 Parameters

The material permeabilities used in the seepage analyses were primarily determined based on CMW's experience with similar materials. Where necessary, these were supplemented with assumed textbook values considered appropriate for the specific materials involved. A summary of the permeabilities used in the analyses is provided in Table 6.

Table 6: Parameters input for seepage analyses

Material Type	Permeability, k (m/s)
Tailings	$1.0 \times 10^{-06}$
Compacted Mine waste (Zone 1)	$1.0 \times 10^{-06}$
Traffic Compacted Mine Waste (Zone 2)	$1.0 \times 10^{-05}$
Surface Sandy Layer (Foundation top)	$5.0 \times 10^{-06}$
Subsurface Granite Layer (Foundation bottom)	$1.0 \times 10^{-07}$

### 3.3.1.3 Results of Seepage Analyses

The results of the comprehensive seepage analyses of the IWLTSF at RL120.5 mAHD with different conditions for decant pond size, liner, and underdrainage system are summarised in **Table 7**. The estimated seepage is measured from the downstream area of the embankment body.

Table 7: Result of Seepage Analysis

Case No.	Liner Condition	Running pond	No. Underdrainage lines	Underdrainage location	Seepage	Total (m3/day)
1-1	Decant Lined (200 m)	150	3	Immediate Downstream	0.03	122
1-2	Decant Lined (200 m)	PMP	3	Immediate Downstream	0.23	935
2-1	Decant Lined (200 m)	200	3	Downstream	0.035	142
2-2	Decant Lined (200 m)	PMP	3	Downstream	0.229	931
3-1	Decant Lined (200 m)	200	4	Downstream-Under the decant	0.019	77
3-2	Decant Lined (200 m)	PMP	4	Downstream-Under the decant	0.23	935
4-1	Decant Lined (200 m)	200	3	Downstream-After Decant Liner	0.013	53
4-2	Decant Lined (200 m)	PMP	3	Downstream-After Decant Liner	0.23	935
5-1	Decant Lined (200 m)	150	4	Immediate Downstream	0.011	45
5-2	Decant Lined (200 m)	PMP	4	Immediate Downstream	0.229	931
6-1	Full IWLTSF Lined	200	3	Downstream	$1.5E-14$	$6.1E-11$
6-2	Full IWLTSF Lined	PMP	3	Downstream	$1.2E-14$	$4.92E-11$

Case No.	Liner Condition	Running pond	No. Underdrainage lines	Underdrainage location	Seepage	Total (m <sup>3</sup> /day)
7-1	Decant and Downstream Lined RL 110m	150	3	Immediate Downstream	0.037	150
7-2	Decant and Downstream Lined RL 110m	PMP	3	Immediate Downstream	0.23	935
8-1	Decant and Downstream Lined RL 115m	200	3	Immediate Downstream	0.038	154
8-2	Decant and Downstream Lined 115m	PMP	3	Immediate Downstream	0.13	528

The seepage analysis results presented in **Table 7** show that lining the decant pond and installing underdrainage systems significantly reduce seepage losses from the IWLTFS. For cases where only the decant pond was lined with three to four underdrainage lines (Cases 1–5) or combined decant and downstream lining (Cases 7 and 8), seepage rates varied between approximately 45 to 154 m<sup>3</sup>/day (running pond of 150m), depending on the drainage layout. In contrast, scenarios with a full IWLTFS liner (Cases 6) demonstrated negligible seepage, with calculated rates approaching zero (approximately 0 m<sup>3</sup>/day). The results clearly indicate that full lining provides the most effective seepage control, while the addition of strategically located underdrainage lines further enhances performance where full lining is not feasible.

The above result confirms the seepage through the embankment body and for any vertical seepage assessment, a full comprehensive hydrogeological analysis and particle movement analysis is highly recommended by CMW.

Plots showing the phreatic surfaces within the embankments are provided in Appendix D. The analyses indicate that seepage from the facility is expected to be low. The seepage estimates are conservative, primarily influenced by the hydraulic head and the permeability of the tailings material. These conservative assumptions ensure that the design adequately addresses potential seepage risks.

#### 3.3.1.4 Seepage Mitigation

To reduce seepage from the IWLTFS, the following measures have been incorporated into the IWL design:

- **Supernatant Water Recovery System:** The system is designed for 100% slurry water return, however, with a capacity of at least 420 m<sup>3</sup>/h, which equates to approximately 35% to 41% of the slurry water discharged to the IWLTFS in addition to 1:100 AEP in a 72-hour rainfall event.
- **Cut-off Trench:** CMW acknowledged there is a variational deep cut-off trench in the downstream section of the embankment from the initial design of the embankment to minimise horizontal seepage losses.
- **IWLTFS Basin Floor Treatment:** CMW acknowledge that in-situ material in the IWLTFS basin floor is very shallow silty sand alluvium to a depth of a maximum 2m and then granite bedrock. So there is a limited chance to control seepage from the shallow alluvium.
- **HDPE Liner:** CMW considered three HDPE liner scenarios in the seepage control design for the IWLTFS, each with varying extents of coverage to assess effectiveness in reducing seepage through the basin and

embankment body. These scenarios include: (1) a liner installed only beneath the decant pond; (2) a liner beneath both the decant pond and the upstream slope of the Stage 1 embankment; and (3) a fully lined facility, including the entire basin floor and upstream embankment face. The performance of each scenario was assessed through seepage modelling, with results detailed in the seepage analysis section. These scenarios provide a comparative basis for understanding seepage risks under both partial and full lining configurations.

- Vibrating Wire Piezometers (VWPs): A total of 8 pairs of VWPs will be installed behind the upstream compacted zones of the embankments (refer to Drawing No. PER2024-0154-105) to provide early warning of seepage.

### 3.3.2 Comments in Respect to Seepage

It is recommended that the next stage of design incorporates a detailed assessment of hydrogeological and hydrological conditions to better understand the seepage dynamics through the foundation materials and the potential for vertical seepage migration into the underlying open pit.

At present, there is insufficient site-specific data to accurately quantify seepage rates through the foundation or evaluate the risk of deep percolation. This presents a key uncertainty in the design process, particularly with respect to liner system selection and overall seepage control measures. Without a clear understanding of the groundwater regime and foundation permeability characteristics, there is a risk of underestimating seepage impacts, which may compromise the long-term performance and environmental compliance of the facility.

To mitigate this risk, it is critical that stakeholders are provided with reliable data to support informed decision-making around foundation treatment and liner design. CMW considers this a significant design risk and strongly recommends that targeted hydrogeological investigations and groundwater modelling be undertaken as a priority in the next design phase.

### 3.3.3 Structural Stability

#### 3.3.3.1 Method of Analyses

Stability analyses were undertaken to assess the stability of the IWLTFSF embankment up to a maximum crest height of RL 120.5 m (i.e. at 20.5 m embankment height). The analyses were undertaken in general accordance with ANCOLD (2019<sup>3</sup>).

The analyses were carried out using the GeoStudio computer software package (Slope/W). Slope/W is a two-dimensional (2D) 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 was assessed using vertical slice limit equilibrium methods. The Morgenstern-Price method was used in the analyses.

The following cases were examined in the stability analyses for both normal operating and PMP conditions:

- Case 1: Static Analysis – Downstream failure of the IWLTFSF with a crest level of RL 120.5 m (20.5 m embankment height) under drained condition based on limit equilibrium method.
- Case 2: Static Analysis – As for Case 1, but with undrained condition.
- Case 3: Post-seismic Analysis – As for Case 1, but assume material will experience 20% of strength reduction.

The phreatic surface adopted in all cases were based on the results from the 2D seepage modelling, refer to Section 3.3.1, particularly those comments around the adoption of the phreatic surface at RL 120.5 m, the maximum embankment crest level. The tailings beaches formed will likely be sloped (modelled as an average of 1%).

### 3.3.3.2 Parameters

CMW has considered all the information currently available and has selected appropriate material characterisation based on previous experience and engineering judgement. The material characterisation used in this PFS is therefore subject to confirmation by site investigation and laboratory testing. The strength parameters adopted in the analyses under static and post-seismic conditions are summarised in Table 8 and Table 9 respectively.

No strength reduction was considered for the foundation soils. A strength reduction of 20% (Fell et al., 2005<sup>8</sup>) was applied to the post-seismic strength parameters for both Zone 1 and Zone 2 material. For sand-like tailings, assumed liquefied strengths of 0.1.

Table 8: Summary of effective and consolidated-undrained (CU) strength parameters

	Bulk unit weight (kN/m <sup>3</sup> )	Effective Strength Parameters		Consolidated Undrained Strength Parameters		
		c' (kPa)	φ' (degrees)	c (kPa)	φ (degrees)	Undrained Strength Ratio Su/σ'v
Tailings	18	0	33	0	33	-
Transition Waste (Zone A)	20	0	34	0	34	-
Traffic Compacted Mine Waste (Zone B)	20	0	40	0	40	-
Surface Sandy Layer (Foundation top)	21	0	36	-	-	0.5
Subsurface Granite Layer (Foundation bottom)	21	150	40	-	-	0.8

Table 9: Summary of post-seismic shear strength parameters

	Bulk unit weight (kN/m <sup>3</sup> )	Post-Seismic Shear Strength Parameters		
		c <sub>res</sub> (kPa)	φ <sub>res</sub> (degrees)	Undrained Strength Ratio Su/σ'v
Tailings	18	-	-	0.1
Transition Waste (Zone A)	20	0	27.2	-
Traffic Compacted Mine Waste (Zone B)	20	0	32	-

### 3.3.3.3 Results of Stability Analyses

The results of the stability analyses are summarised in Table 10, with output plots from Slope/W in Appendix E.

The results of the stability analyses indicated that the proposed IWL perimeter embankment during operation at Final stage of crest at RL 120.5 m will have adequate factor of safety (FoS) values against failure. The analyses also confirmed that the design geometry for the IWL embankment is adequate.

Table 10: Results of stability analyses

Case	Description	Factor of Safety	Recommended Factor of Safety ANCOLD (2019)
1-1	Stage 3 (final) – downstream failure at static condition (short-term undrained) with normal operating pond size	2.32	1.5
1-2	Stage 3 (final) – downstream failure at static condition (long-term drained) with normal operating pond size	2.31	1.5
1-3	Stage 3 (final) – downstream failure at post-seismic condition with normal operating pond size	1.88	1.0 - 1.2
2-1	Stage 3 (final) – downstream failure at static condition (short-term undrained) with PMP event	1.60	1.5
2-2	Stage 3 (final) – downstream failure at static condition (long-term drained) with PMP event	1.60	1.5
2-3	Stage 3 (final) – downstream failure at post-seismic condition with PMP event	1.29	1.0 - 1.2

### 3.3.3.4 Deformation Analyses

A preliminary assessment of embankment deformation due to earthquake was estimated using the Swaisgood (2003<sup>9</sup>) method. This method utilises an empirical formula based on observed crest settlement resulting from analysed ‘real’ earthquakes, with no liquefaction.

The permanent displacements and settlements expected for a 20.5 m high embankment were estimated under a Magnitude 7.5 earthquake, corresponding with a PGA loading of 0.12 g for 1: 2,000 AEP for the SEE event. The parameters were conservatively derived based on respectively the maximum earthquake magnitude as gathered by the Geoscience Australia National Seismic Hazard Assessment (NSHA18<sup>7</sup>), as well the intensity measure as outlined in AS 1170.4 (2007<sup>6</sup>).

From the analysis, it is concluded that for the highest embankment section, the deformation due to an SEE event is likely to be in the order of 10.2 mm. Such deformation is insignificant when compared with the total freeboard of 500 mm. Results of deformation analysis are presented in Appendix F.

### 3.3.3.5 General Comments in Respect to Stability

The FoS against a failure through the perimeter embankment is greatly influenced by the position of the phreatic surface. To reduce the risk of failure, the facility should be operated to ensure the phreatic surface within the perimeter embankment is as low as practical. This can be achieved by maintaining the water pond around the central decant facility such that no water ponds against the perimeter embankment. If surface water does extend to the embankment, it will only be a temporary occurrence as continuous water removal from the centre of the facility will be undertaken.

The IWLTFSF is also designed to temporarily store water following extreme storm events. While it is unlikely for water to extend to the embankment, such an occurrence is expected to be temporary due to the continuous removal of water from the IWLTFSF. The decant running pond radius must not exceed a diameter of 200 m under normal operating conditions.

### 3.3.4 Dam Break Assessment

#### 3.3.4.1 Volume Released

If an embankment breach were to occur at the final crest level, tailings would only be partially released from the storage impoundment, as the majority of the tailings beach would have dried back. In addition, remobilised tailings will behave as a thickened slurry, with some shear strength and therefore will not be as free flowing as water, which has no shear strength.

The worst-case probable maximum precipitation (PMP) rainy day failure conditions were based on the following:

- Total storage capacity of the IWLTFSF is estimated at 15.7 Mm<sup>3</sup>.
- PMP storm volume is estimated at a nominal 1,225,443 m<sup>3</sup> for the IWLTFSF Final Stage embankment. These were based on a 6-hour PMP rainfall depth of 1,010 mm over a catchment area of 121.3 ha.
- The tailings failure volume likely to be released from the IWLTFSF at the maximum height of nominally 20.5 m in the event of an embankment failure under PMP rainy day conditions, would be of the order 6.40 Mm<sup>3</sup> i.e. approximately 33 % of the impounded storage capacity plus the PMP storm volume.
- Based on T. MacDonald and J. Langridge - Monopolis (1984<sup>10</sup>), embankment breaches typically occur relatively quickly (typically 0.5 hour to 4 hours), however, in the instance of an IWLTFSF with a wide embankment development of a breach will occur over a longer period of time. Based on this methodology, it is estimated that the breach will occur over at least 6 hours.

The calculation of breach characteristics is included in Appendix H.

The Rourke and Luppnow Method (ref: H. Rourke, D. Luppnow, 2015<sup>11</sup>) for estimating volume released from the IWLTFSF was utilised to assess potential stored volume release. This method is based on a relation between the potential volume released from a IWLTFSF and the size of the decant pond. The greater the ratio of the pond area to the total area, the greater the ratio of release volume to stored volume. Table 8 presents a summary of case data used in the analyses taken from Table 5 of the referenced paper.

Table 11: Summary of Dam Break Case Study Data (ref: H Rourke, D Luppnow, 2015<sup>11</sup>)

Name	Impoundment Storage Volume (Mm3)	Release Volume (Mm3)	Release Volume relative to Stored Volume (%)	Pool Area relative to Total Area (%)
Merriespruit	7.0	0.6	9	14
Bafokeng	13.0	3.0	23	30
Mount Polley	50.0	24.4	49	72
Kolontar	1.2	0.7	58	88
Stava	0.3	0.2	67	100

It was noted from Rourke and Luppnow's analysis of past TSF failures that the release volume varies between 9% and 67% of the stored volume. The 33% of stored volume plus a PMP event, or approximately 6.41 Mm<sup>3</sup> scenario, represents a likely maximum release from an IWLTFSF in an arid region such as the Tabba Tabba

Region of WA (i.e. the water pond should not be this large as the water balance is a negative water gain and water should not accumulate on the facility).

The Rourke and Luppnow Method demonstrates that in order to mitigate the consequences of a dam break, the pond volume and area should be minimised by the adoption of good operating practices.

### 3.3.4.2 Breach Characteristics

Breach characteristics for breaches from the IWLTFSF due to a dam break were assessed utilising published empirical (algebraic) methods. These methods are based on studies of past failures to provide relationships between release volume, breach development time and peak flow; and dam height and dam factor (height x stored volume).

For IWLTFSF failure, the method of M. Rico, G. Beniti, G. Diez-Herrero (2008<sup>12</sup>) was utilised to estimate peak flow. This study was based on examining historic tailings dam failures. The peak flows estimated by M. Rico, G. Beniti, G. Diez-Herrero (2008<sup>12</sup>) are skewed with the peak occurring quickly (i.e. less than the breach development time). For comparison, if a triangular hydrograph is assumed, the flow peak is not skewed and the peak is 'normally' distributed.

Table 12 summarises the breach development time and estimated peak flows from a dam break utilising various methods.

Table 12: Results of Dam Break Analyses

Scenario	Peak Flow (m <sup>3</sup> /s) M. Rico, G. Beniti, G. Diez-Herrero 2008 <sup>(1)</sup>	Peak Flow (m <sup>3</sup> /s) triangular hydrograph <sup>(2)</sup>	Approx. Breach Development time (hrs)	Flood Volume (Mm <sup>3</sup> )
Sunny Day	2,306	480	6	5.18
Worst-Case	2,521	593	6	6.41
Notes: 1. Upper bound. 2. Lower bound.				

### 3.3.4.3 Energy Methods

The sunny day case was examined by assessing a dam break using energy methods as referenced in K. D. Seddon (2010<sup>13</sup>) and estimating the tailings run-out distance. The method presented in the paper assumes the tailings and the embankment liquefy and move as a block downstream.

The height of the block was assumed to be nominally 20.5 m for the IWLTFSF, and the run-out distance was a function of the residual shear strength and material density. For residual shear strengths of 4 kPa and 7 kPa, the run-out distances from IWLTFSF were estimated to be 0.914 km and 0.650 km, respectively.

The calculations of the run-out distances for a sunny day case are presented in Appendix H.

### 3.3.4.4 Hydraulic Modelling

The result from breach modelling indicates that the maximum (peak) run-out flow from a 'dam break' under 'worst-case' (PMP) rainy day conditions for IWLTFSF at the crest level of RL120.5 m will be approximately 6.41 x 10<sup>6</sup> m<sup>3</sup> over 6 hours.

If a breach were to occur, tailings and water would flow and distribute to the site as the area is flat. The process plant is located downstream of the western side of the IWLTFSF, inundation modelling indicates that, in the event of a breach, the flow path would likely result in the inundation of the process plant area. A preliminary inundation plan is shown in Appendix H.

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

- Loss of human life is possible, although not expected. There is potential for the loss of life of operators who work in the process plant or mining personnel visiting the IWLTFS. The PAR is expected to be > 1 and < 10.
- Economic loss due to pit and plant shutdown and production loss, and repairs of damaged sections of the IWLTFS and local access roads.
- Environmental impact with the breach being expected to flow towards the east of the IWLTFS. There is a potential for contamination of soils, vegetation and surface water requiring environmental 'clean-up'.

#### 3.3.4.5 Controls

The conditions for the IWLTFS 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 IWLTFS will minimise the risk of a perimeter embankment breach and release of saturated tailings.

IWLTFS embankment failure is not expected provided the facility is operated in accordance with the requirements set out in the TSF Operations Manual.

The water recovery system, pumps and piping must be designed for a minimum recovery of not less than 100% water return for the IWLTFS, including the additional capacity needed to recover water from design storm events.

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

#### 3.3.5 Design Acceptance Criteria

The design of the IWLTFS is based on the ANCOLD guidelines (2019<sup>3</sup>) '*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 IWLTFS, at its ultimate height of 20.5 m (RL120.5 mAHD), in accordance with Tables 1 and 2 of the DEMIRS (2013<sup>1</sup>) code results in a hazard rating of 'Category 1 – medium' (refer to Section 3.1.1). The ANCOLD (2019<sup>3</sup>) consequence rating is 'High C' (refer to Tables 1 and 2 of ANCOLD (2019<sup>3</sup>)).

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<sup>3</sup>):

- Maximum credible earthquake (MCE).
- Storage of 1:1,00 years AEP event of 72-hour duration, plus an allowance for wave run-up for 1:10 AEP and 0.5 m of additional freeboard.
- Based on DEMIRS recommendation, no spillway will be required during operations. Stormwater during operations will be largely reused in the process plant over several weeks to months. The requirement for a spillway must be reviewed as part of the closure planning.
- Minimum frequency of IWLTFS inspections in accordance with DEMIRS guidelines.

The results of the design assessments for the IWLTFSF 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 TSF Operations Manual.

The safe operation of the storage relies upon the implementation of tailings operations, management inspections, and maintenance procedures. Embankment monitoring will be performed during the operation of the IWLTFSF and will need to be extensive due to the adjacent pit downstream. The following aspects will be considered:

- Piezometers to monitor water levels.
- Level and movement triggers will be detailed in a trigger action response plan (TARP). The TARP will inform actions to be taken for specific alert levels. Alert levels will be based on the degree of movement and other relevant measurements.
- Active real-time monitoring, with data from instruments sent via telemetry to a site computer for ongoing assessment, is a recommendation for a TSF monitoring system.

The probability of major embankment failure during the life of the TSF 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 B.

### 3.3.6 Erosion Control

The final stage embankment is designed with a downstream slope 1V:3H without any additional benches, as per shown in drawing No. PER2024-0154-100 at this stage. Constructing the downstream slope at this angle using mine waste is expected to provide resistance to erosion. However, further assessments may be necessary during construction to evaluate the erodibility of the materials used in the downstream batter of the IWLTFSF to ensure long-term stability and performance.

### 3.3.7 Water Balance

A water balance analysis with an emphasis on the data from rainfall in the Tabba Tabba station for the proposed IWLTFSF 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 G.

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

- Rainfall data interpolated from the Tabba Tabba stations, 325 mm.
- Evaporation of approximately 3,375 mm.
- Tailings areas of approximately for Stage 3 is about 121 ha.
- Runoff coefficients of 0.4 (tailings) and 0.6 (catchment).
- Pool area radius equal to approximately 100 m.
- Running beaches equal to approximately 10% of the tailings area.
- Evaporation pan factor of 0.7.
- Tailings residual moisture content of 35% corresponding to the average in-situ density of 1.40 t/m<sup>3</sup> (dry).

- Tailings slurry soil content of 55%.
- Tailings production rate of 4.5 MtPa for the rest of the LoM.
- Permeability for seepage through the dam floor of  $1 \times 10^{-8}$  m/s, considering a 400 mm compacted layer (95% SMDD).
- Different Seepage rates for the final stage based on seepage analyses of different scenarios.

The results of the analysis indicate potential annual average water returns based on the rainfall data from Tabba Tabba station and liner condition as below:

- **Fully lined** pond and embankment up to level RL 110.5 m of about 42% of the tailings slurry water deposited into the facility can be expected under average climatic conditions during the operation of the IWLTFSF.
- **Decant (100 m) and running pond (10%) lined (200 m radius) pond**, about 28% of the tailings slurry water deposited into the facility can be expected under average climatic conditions during the operation of the IWLTFSF.
- **Decant (200 m) and running pond (10%) lined (200 m radius) pond**, about 26% of the tailings slurry water deposited into the facility can be expected under average climatic conditions during the operation of the IWLTFSF.
- **Decant (100 m) and running pond (10%) lined (200 m radius) pond and embankment up to level RL 110.5 m** of about 34%, of the tailings slurry water deposited into the facility can be expected under average climatic conditions during the operation of the IWLTFSF.

The results also indicate that water recovery will vary according to the management of the facility, specifically the size of the pond, running beaches, and liner extension. 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 the 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 effectiveness of the water return system is crucial for achieving a higher in-situ dry density of the tailings within the IWLTFSF. The water recovery system must have a minimum capacity of 420 tph, which is equal to 100 % of the slurry water. This ensures efficient water management and supports the operational goals of the IWLTFSF.

### 3.4 Design and Construction Details

The footprint of the IWLTFSF 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 design provides for the IWLTFSF works to be built in stages. The stages will mainly involve bulk earthworks to raise the embankments and will be carried out utilising the mining fleet (i.e. the downstream zone or waste dump). A civil contractor would likely construct the upstream compacted waste zone from materials within the waste dump footprint (i.e. this will provide the mine with flexibility as the compacted 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.

It will also be necessary to ensure that planning of upstream (or Zone 1) compacted mine waste zone embankment lifts, is coordinated with planned downstream (or Zone 2) mine waste zone embankment construction as the waste zone has to be in place prior to the placement of any upstream (Zone 1) compacted mine waste zone materials since the downstream mine waste zone provides support for the Zone 1.

A technical specification for the earthworks is included in Appendix B. The estimated volumes required for each zone are shown in Table 13.

Table 13: Estimated Quantities of Cell 1 Construction Material

Raising Stage	Volume of Roller Compacted Zone 1 Mine Waste (m <sup>3</sup> )	Volume of Traffic Compacted Zone 2 Mine Waste (m <sup>3</sup> )	Volume of Decant Accessway (m <sup>3</sup> )	Volume of Select Filter Rock (m <sup>3</sup> )
1	128,000	1,042,000	50,500	3,500
2	97,100	1,294,900	37,500	2,300
3	131,400	2,541,600	55,800	3,400

The estimated cost for each cell are summarised in Table 14, Table 15 and Table 16. The cost estimate has been prepared excluding owner's costs, superintendence, quality assurance and quality control (QA/QC), fuel, accommodation and meals, and general contingency. The detail cost estimates are attached in Appendix B.

Table 14: Summary cost for Cell 1

Stage	Options	Earthwork Price	HDPE liner	Price	Total
Stage 1	Option 1	\$ 7,196,000	Only Decant Pond lined	\$638,000	\$7,834,000
	Option 2		Decant pond and Stage 1 upstream face	\$2,230,000	\$9,426,000
	Option 3		Fully lined	\$17,346,000	\$24,542,000
Stage 2		\$ 2,010,000			
Stage 3		\$ 2,860,000			
<b>Total for cell 1:</b>					\$ 12,704,000

Table 15: Summary cost for Cell 2

Stage	Options	Earthwork Price	HDPE liner	Price	Total
Stage 1	Option 1	\$8,898,000	Only Decant Pond lined	\$638,000	\$9,536,000
	Option 2		Decant pond and Stage 1 upstream face	\$2,470,000	\$11,368,000
	Option 3		Fully lined	\$23,492,100	\$32,390,100

Stage	Options	Earthwork Price	HDPE liner	Price	Total
Stage 2		\$ 2,211,000			
Stage 3		\$ 3,146,000			
<b><i>Total for cell 2:</i></b>					\$ 15,380,000

Table 16: Summary cost for Cell 3

Stage	Options	Earthwork Price	HDPE liner	Price	Total
Stage 1	Option 1	\$8,898,000	Only Decant Pond lined	\$638,000	\$9,536,000
	Option 2		Decant pond and Stage 1 upstream face	\$2,470,000	\$11,368,000
	Option 3		Fully lined	\$23,492,100	\$32,390,100
Stage 2		\$ 2,211,000			
Stage 3		\$ 3,146,000			
<b><i>Total for cell 3:</i></b>					\$ 15,380,000

The total life-of-mine cost is dependent on the selected liner option. The cost ranges from approximately \$42.5 million for a configuration with a liner only beneath the decant pond, to approximately \$105 million for a fully lined option across all three TSF cells. This significant variation highlights the importance of conducting detailed hydrological and hydrogeological investigations, which will provide CMW with the necessary information to assess seepage risks and determine the appropriate liner and seepage control requirements for the facility.

### 3.5 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 IWLTFS 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.
- Tailings deposition is to be carried out such that the supernatant pond is maintained within and around the rock ring decant. The pond is to be maintained away from the perimeter embankment at all times.
- Water will be removed from the facility and pumped back to the process plant via a pontoon mounted decant pump located within the rock ring decant.
- The tailings storage area 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 TSF 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.

## 3.6 Design Floods

The TSF is an integrated waste landform type facility, with the tailings storage area completely surrounded by waste dumps and as such water inflow into the storage area should be by incidental rainfall only. In order that this is the case the waste dump areas should be graded away from the TSF basin. The TSF has been designed such that a 1:100 years AEP, 72-hour duration rainfall depth of 295 mm can be temporarily stored within the facility.

## 3.7 Quality Assurance

The SoW document is attached as Appendix B. 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.

# 4.0 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 3.0. The IWLTsf Operations Manual for Tabba Tabba, includes 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.
- Underdrainage flow and sumps
- The general integrity of the embankment i.e. any new cracking (daily).
- Condition of HDPE lining
- Seepage downstream of IWLTsf.
- 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.

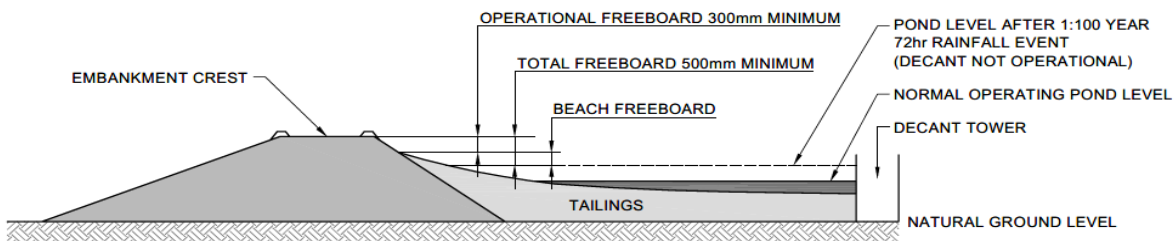
#### 4.1.2 Freeboard

The following considerations for the IWLTFS were made regarding freeboard criteria and requirements for a ‘High C’ consequence category TSF (Section 3.2) based on ANCOLD (2019<sup>3</sup>):

- The proposed IWLTFS 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<sup>3</sup>) also recommend an allowance for wave run-up for 1:10 AEP wind for a ‘High C’ consequence category TSF (refer to Section 3.2). However, it is expected that with perimeter tailings deposition and an expected beach slope of 1.0%, the separation distance between the perimeter embankments and design storm pond will be adequate to prevent wave action reaching the embankments.

Freeboard nomenclature is illustrated in Figure 9. A 1:100 years AEP, 72-hour duration rainfall depth of 374 mm was adopted for the design (BOM, 2025<sup>4</sup>). Temporary storage of stormwater volumes of approximately 454,000 m<sup>3</sup> (i.e. approx. 121.3 ha x 374 mm) on top of the TSF were considered in the design. These stormwater volumes will occupy less than 10% of the TSF basin. The TSF also has sufficient capacity to contain the probable maximum flood (PMF) of approximately 1,225,500 m<sup>3</sup> (i.e. 121.3 ha x 1,010 mm).



NOTE: FOR CASE WHERE POND IS NORMALLY LOCATED AWAY FROM ANY PERIMETER EMBANKMENTS

Figure 9: Freeboard Nomenclature

## 4.2 Dust Control

Provision for the IWLTFS construction works 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.

Based on experience with IWLTFS, dust generation from the tailings beach is not expected as the tailings are saline and a crust is likely to form on the beaches, binding the tailings surface and reducing the potential for dusting. If dust generation becomes an issue (i.e. in periods facility 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 that dust generation occurs.

## 4.3 Performance Monitoring and Instrumentation

### 4.3.1 Piezometers

Eight (8 no.) vibrating wire piezometers (VWP) will be installed immediately downstream of the existing embankments along the north and east of the facility within the waste dump footprint. These VWPs will allow the phreatic surface (if any) within the IWLTsf embankments to be monitored and stability analyses to be validated in the future. These VWPs will also give early warning of seepage from the IWLTsf.

The positions of the proposed VWP are detailed on drawing PER2024-0154-105.

The VWPs will be installed in trenches with cables running along the toe of the existing embankment to a terminal (read-out) box to the east of the facility. The terminal box is to be mounted on a pole founded on a concrete base. The terminal box will contain the data logger, which should have a minimum of 8 inputs.

The VWP piezometer water level readings will be recorded daily and downloaded monthly via a logger for analysis. The collected information should be reviewed regularly, acted upon as necessary, and reported in the annual audit. The pore pressure readings collected from the VWP, and the standing water levels recorded in the monitoring bores, are also used if required to adjust the design phreatic surfaces used in the stability analysis models.

### 4.3.2 Survey Prisms

Survey prisms provide monitoring points for vertical and horizontal deformations of an embankment. These are to be installed at a maximum of 200 m spacings along the crest of each embankment stage and measured monthly using real-time kinematic (RTK) GPS. The RTK GPS is accurate to +/-10mm, performing 180 static measurements per location.

High-resolution surveys are also to be conducted every 6 months from an unmanned aerial vehicle (UAV) or 'drone'. These provide a detailed survey of the surface of the TSF to +/- 100 mm resolution. Surveys are to be conducted at least every 6 months. Digital terrain models are prepared from the survey data and successive models can be compared to determine any deformation magnitude greater than the LIDAR limits of vertical accuracy of +/-100 mm.

### 4.3.3 Visual Inspections

Drive or walk around inspections of the IWLTsf are to be undertaken for irregularities in the normal configuration of the embankment, embankment toe areas, and tailings beach that may indicate internal erosion of the embankment or instability. In particular, any embankment cracking and damp or wet areas on batter slopes or toe areas are to be noted.

Inspections should be carried out daily, whilst documented independent inspections should be undertaken as part of an annual audit for submission to regulatory authorities.

### 4.3.4 Emergency Action Plan (EAP)

The Operations Manual (attached as Appendix I) provides a description of the operating procedures for the IWLTsf and includes Emergency Response Action Plan (ERAP). The ERAP for the process plant and the IWLTsf should be established based on the dam break assessment presented in Section 3.3.4. The ERAP should be reviewed and updated as a minimum on a yearly basis.

The ERAP should include but not limited to:

- Management responsibilities and emergency coordination.
- Muster points.

- Seeking specialist geotechnical advice.
- Emergency Plan Triggers:
  - Freeboard less than design values;
  - Elevated levels in piezometers;
  - Significant embankment distress;
  - Imminent overtopping.
- Seepage from the embankment should be investigated with potentially additional monitoring bore or VWP installed to allow further assessment by a Geotechnical Engineer, as required.

## 5.0 CLOSURE

The IWL/TSF should be decommissioned and rehabilitated to remain a safe, stable, erosion resistant and non-polluting landform in accordance with requirements of the DMIRS (2013<sup>1</sup>) and (2015<sup>2</sup>). A TSF closure plan detailing the post-closure landform design will be developed for DWER/DMIRS approval.

For this preliminary planning purposes, the following rehabilitation criteria were adopted:

- Once tailings deposition is complete and the top surface has been allowed to dry, settle and consolidate as pore water drains from the tailings mass, the top surface of the storage can be rehabilitated. Due to the segregation of tailings, consolidation settlement of tailings around the embankment (structural zone) is expected to be considerably faster with consolidation time increases with distance away from the structural zone towards the decant pond in the middle.
- Geotechnical investigation including CPTu probing on the tailings beach shall be conducted to investigate the consolidation and strength parameters of the tailings.
- Based on available tailings properties at this stage, a concaved (store and release cover) profile is favoured, combined with a store-and-release type cover system. The choice of the final profile will largely be determined by the tailings geochemistry and will be subject to a further study as part of detailed rehabilitation planning.
- A safe construction methodology of the cover layer will be developed especially over the soft fine failings in the middle third of IWL/TSF. Consolidation and the corresponding gain in shear strength around this zone will occur at a very slow rate which may necessitate commencement of cover layer prior to completion of consolidation.
- The top surface may be segmented into sub-catchments to limit runoff potential to the centre of the facility after closure. The design event for any hydrological assessment will be the 100-year and PMP rainfall events. The requirement for a spillway at closure would be subject to further studies as part of detailed rehabilitation planning.
- The downstream batter slope of the downstream waste dump will be reshaped to form an overall gradient of 1V : 3H (20o). If required, a concave embankment profile could be considered to flatten the slope.
- The batter of the reshaped embankments will be further sheeted with a nominal 300 mm-thick topsoil layer as a vegetation growth medium, ripped and seeded with local species.
- The TSF embankment batter slope and top surface will be revegetated by applying a cover system and topsoil.

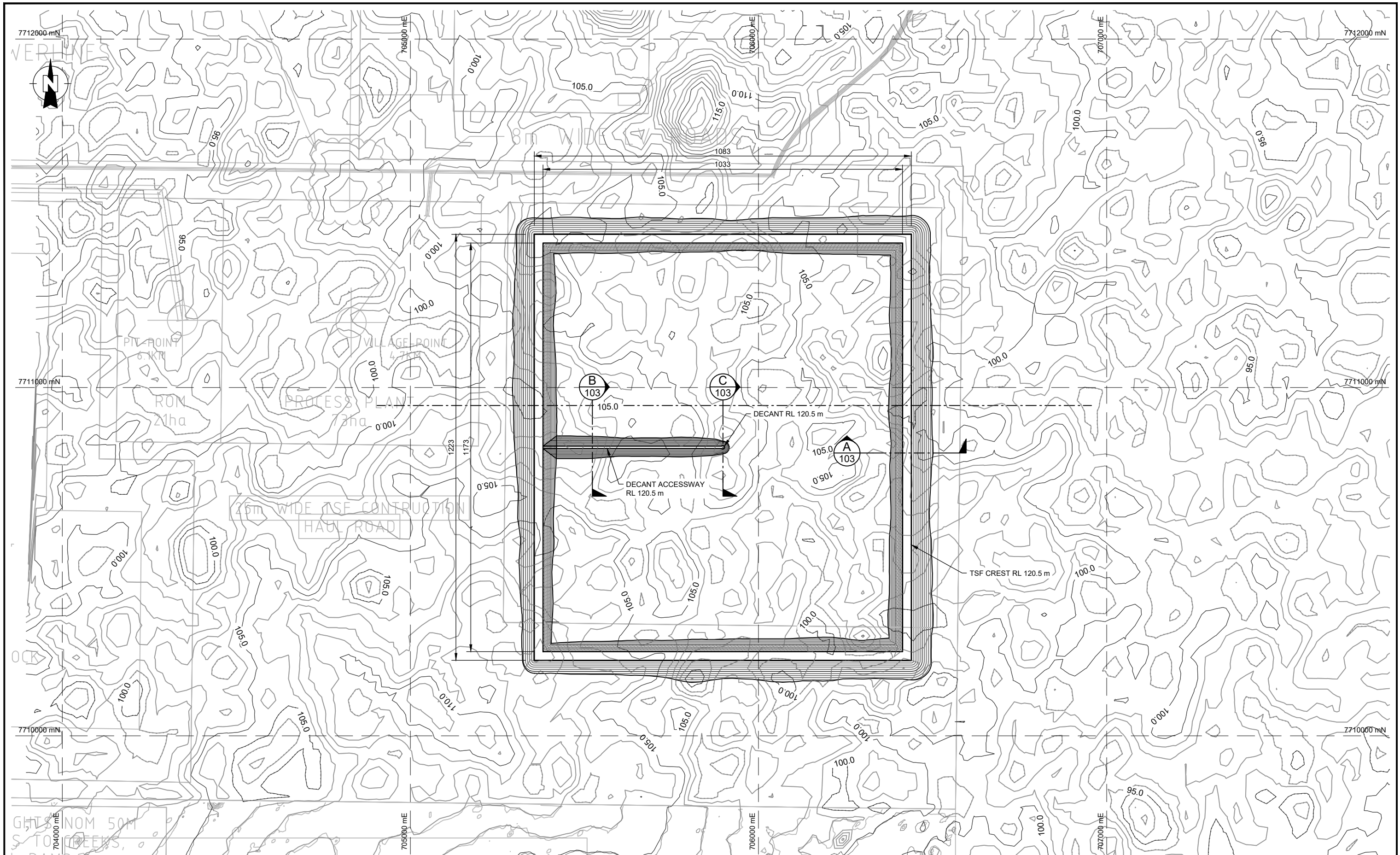
A final detailed TSF rehabilitation / closure plan will be prepared at least 12 months prior to IWL/TSF decommissioning and be submitted to the DWER/DMIRS for approval.

## 6.0 REFERENCES

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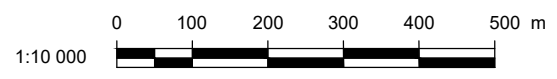
# APPENDIX A

## Drawings

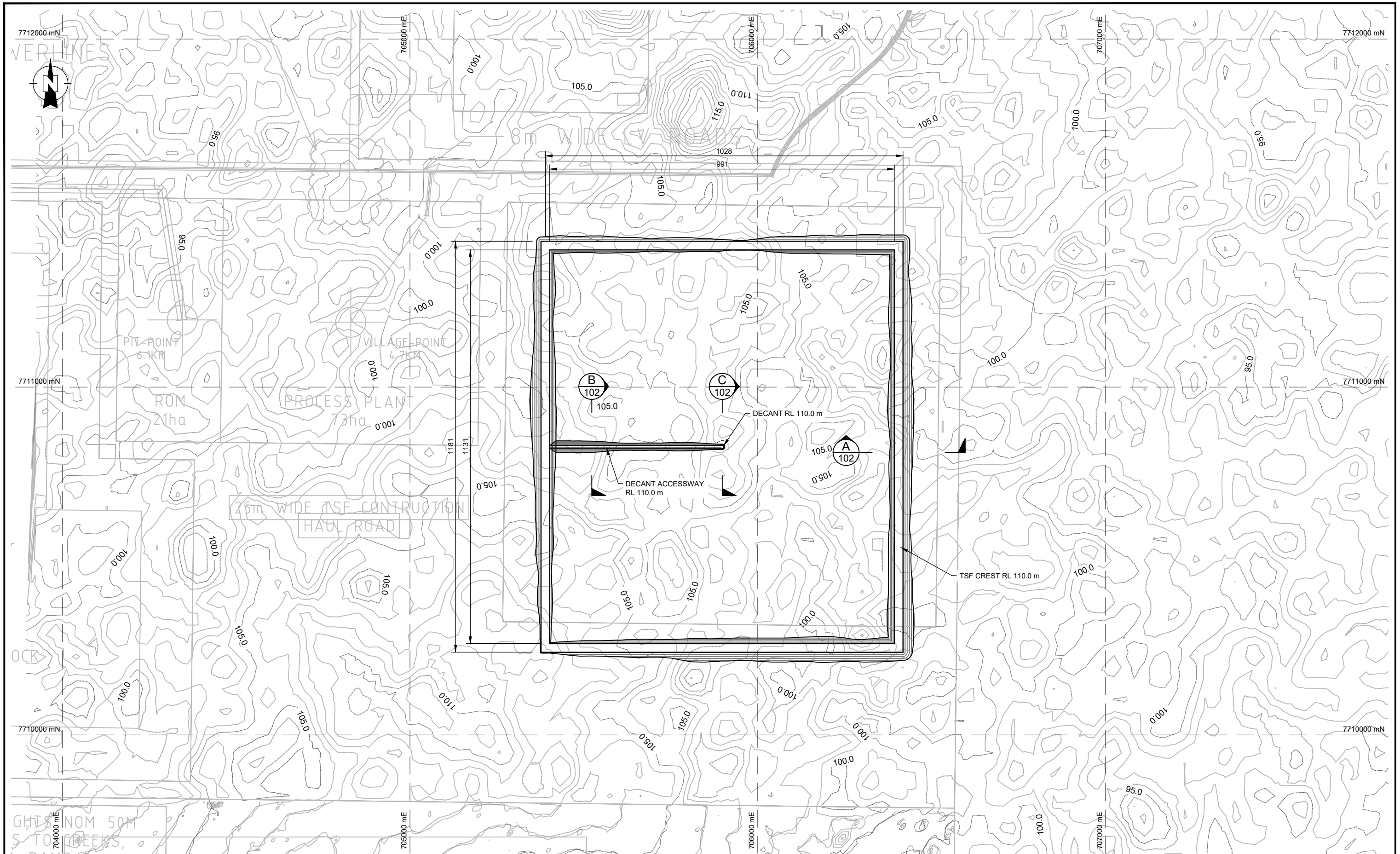


**NOTES:**

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2. BACKGROUND PLAN PROVIDED BY CLIENT "Tabba Tabba - MBG Updated Layout\_100225\_B"
3. COORDINATE SYSTEM: MGA ZONE 50, GDA94



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PROJECT:	<b>TABBA TABBA LITHIUM PROJECT</b>		CHECKED:	PA	DRAWING:	100
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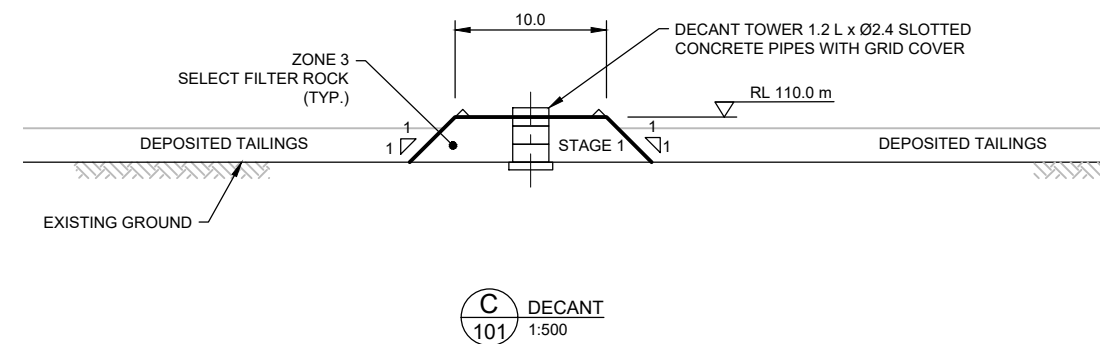
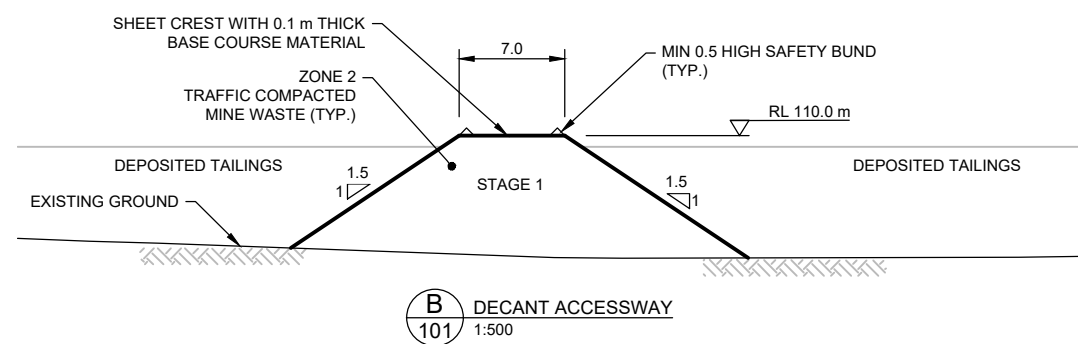
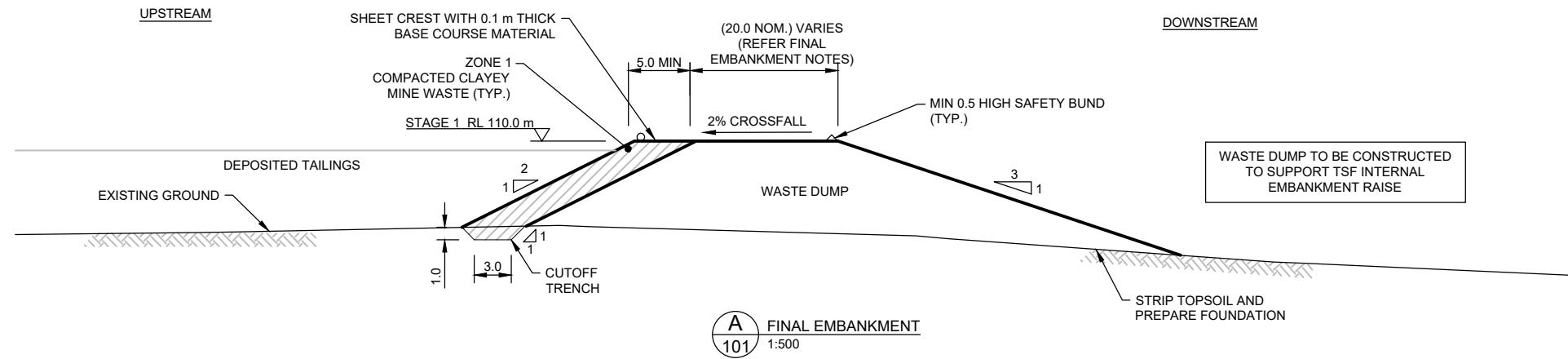


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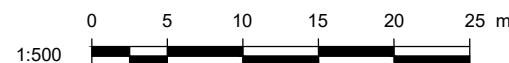


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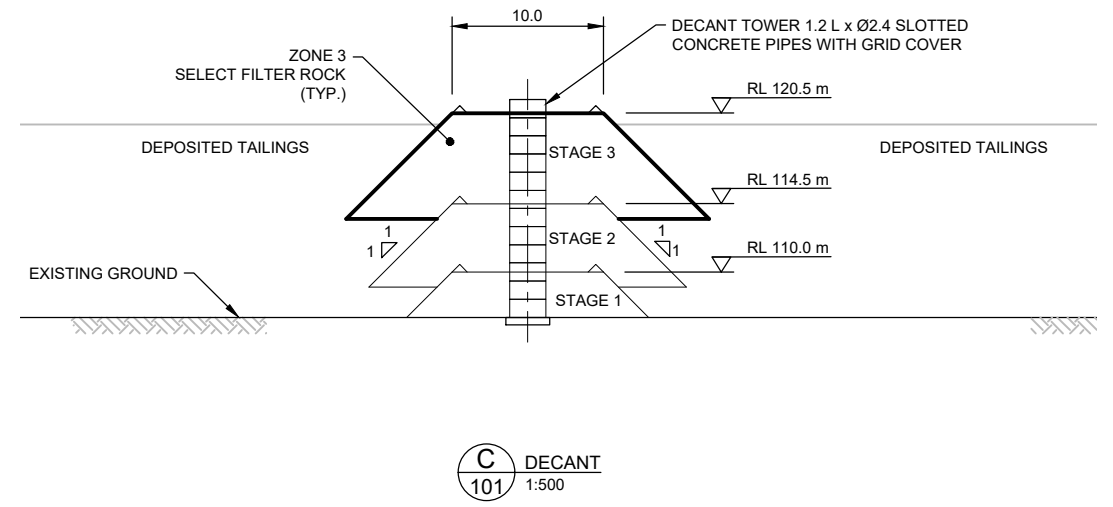
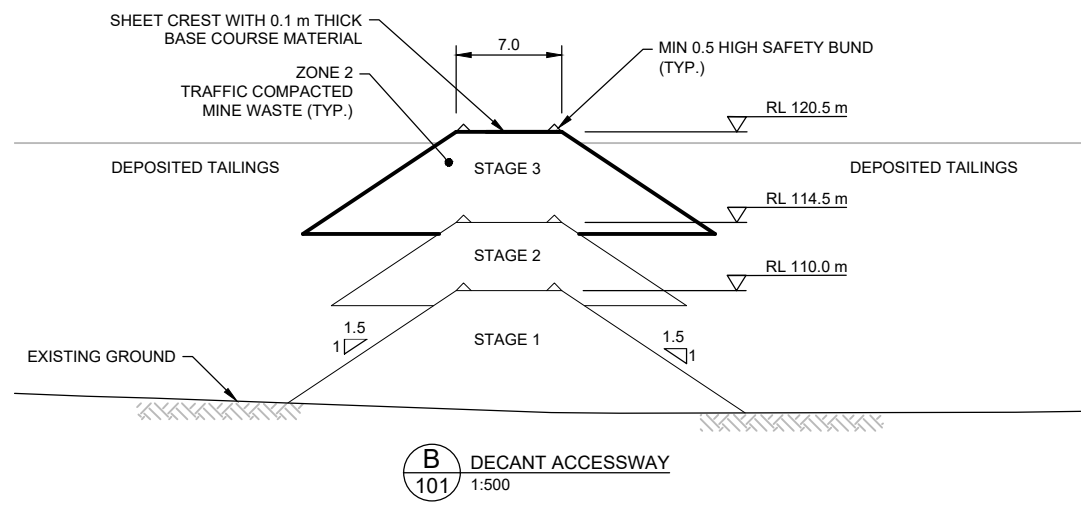
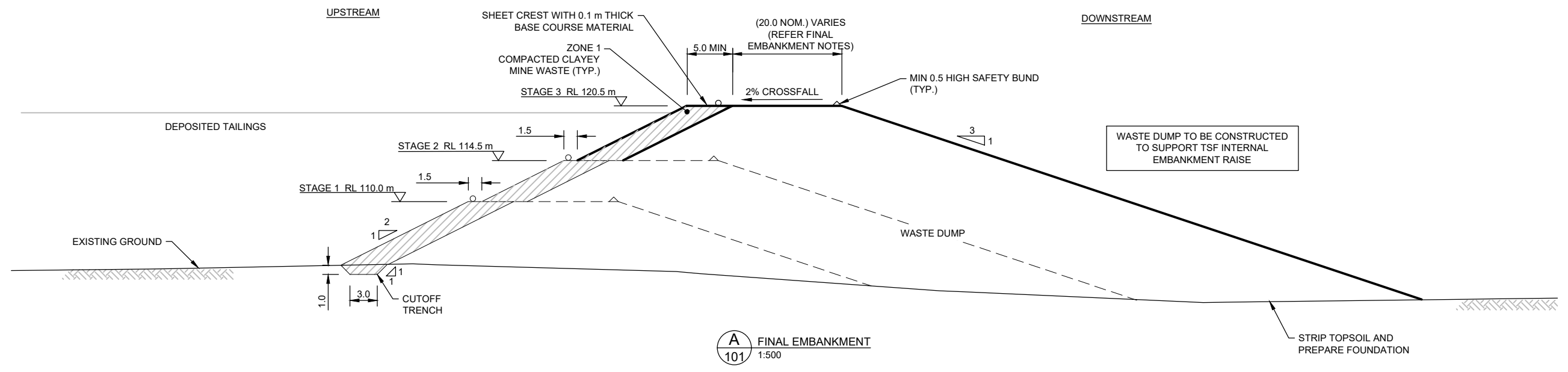


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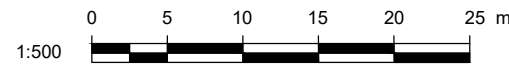


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				DATE:	13.05.25	SHEET:	A3 L

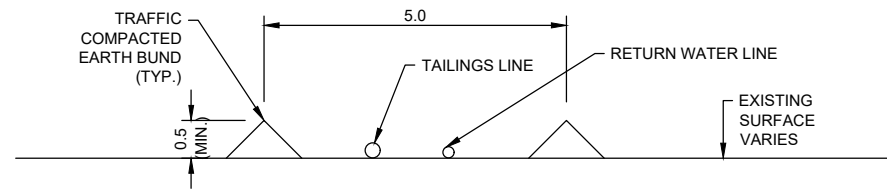


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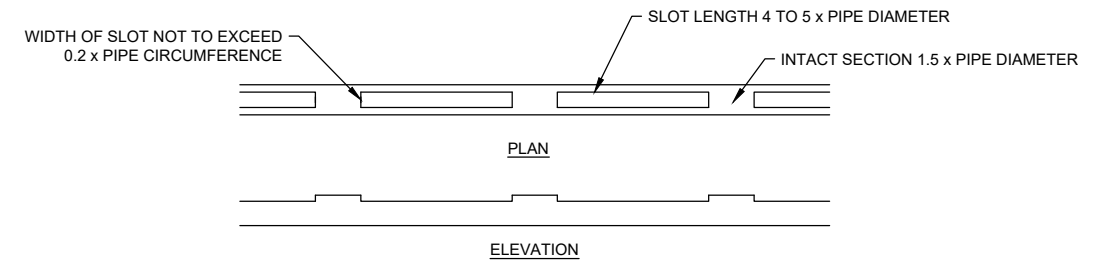
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2. ALL DIMENSION IN METRES UNLESS SPECIFIED.



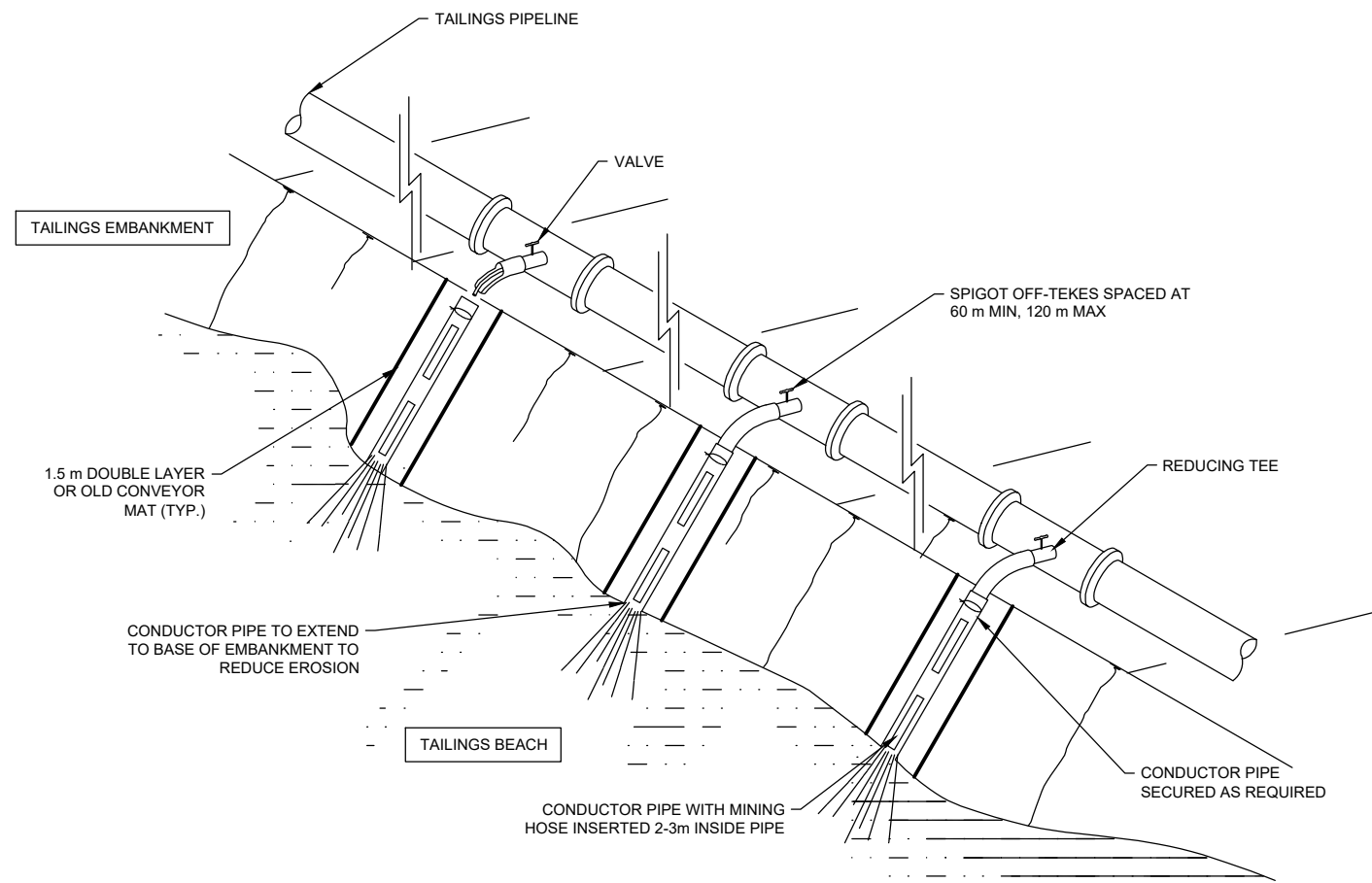
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	TITLE:	<b>TSF FINAL STAGE SECTIONS</b>		REVISION:	A	SCALE:	AS SHOWN
				DATE:	13.05.25	SHEET:	A3 L



PIPELINE BUNDING - TYPICAL SECTION  
1:100



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



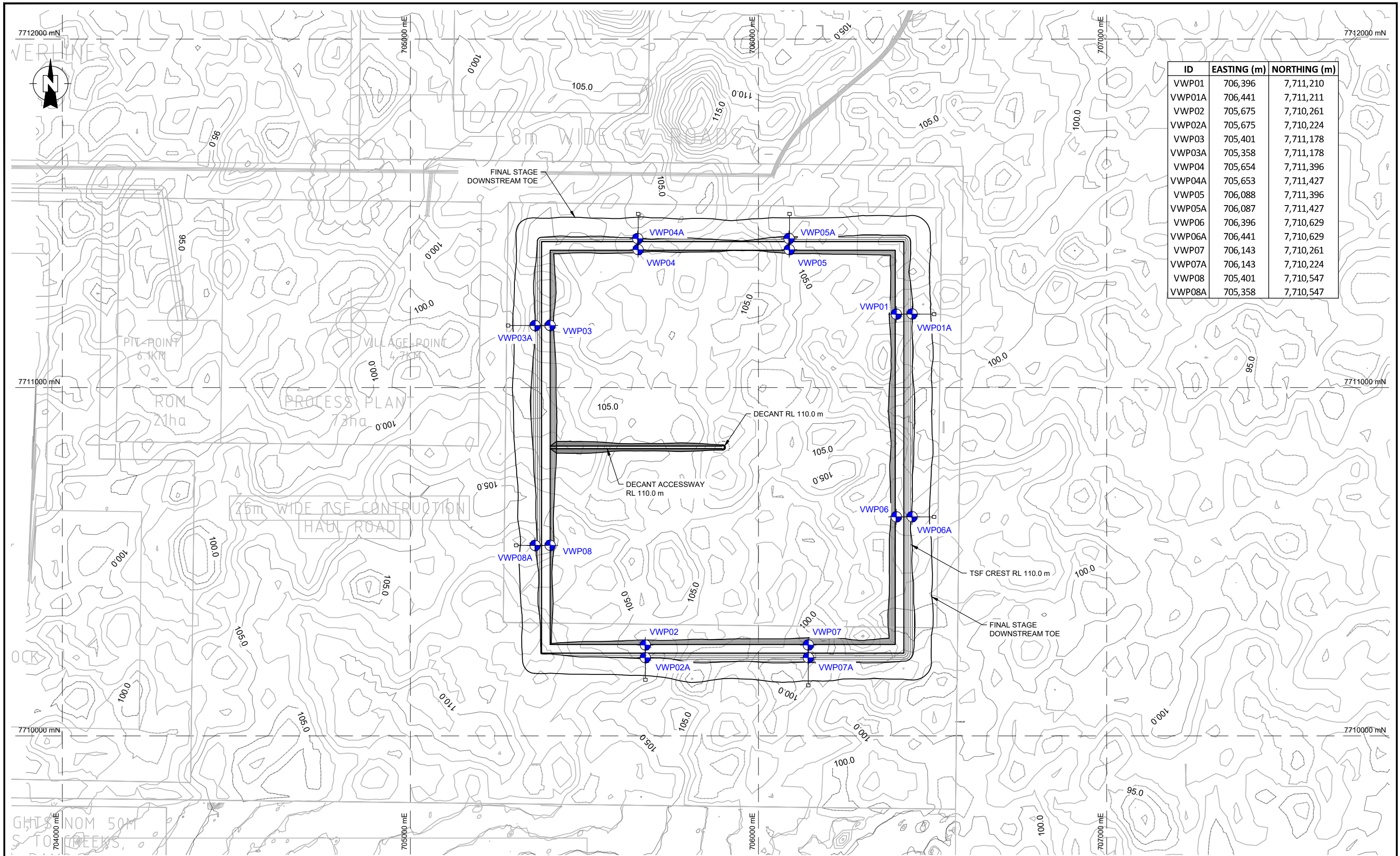
PROPOSED SPIGOT ARRANGEMENT  
ISOMETRIC VIEW (NTS)

NOTES:

1. ALL DIMENSIONS IN METRES UNLESS OTHERWISE NOTED
2. CONTOURS GENERATED FROM CLIENT SUPPLIED SURVEY  
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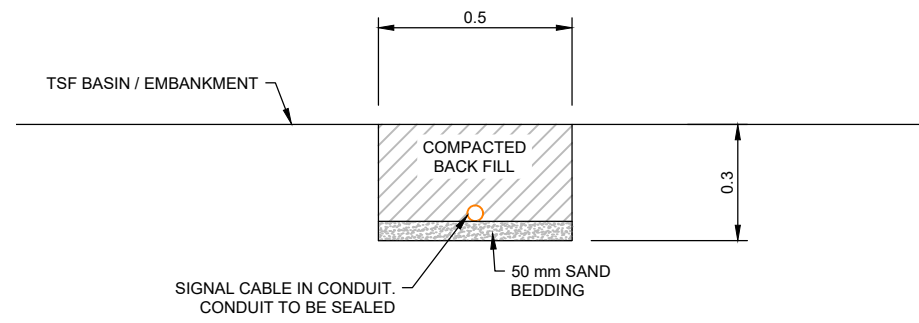


ID	EASTING (m)	NORTHING (m)
VWP01	706,396	7,711,210
VWP01A	706,441	7,711,211
VWP02	705,675	7,710,261
VWP02A	705,675	7,710,224
VWP03	705,401	7,711,178
VWP03A	705,358	7,711,178
VWP04	705,654	7,711,396
VWP04A	705,653	7,711,427
VWP05	706,088	7,711,396
VWP05A	706,087	7,711,427
VWP06	706,396	7,710,629
VWP06A	706,441	7,710,629
VWP07	706,143	7,710,261
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VWP08	705,401	7,710,547
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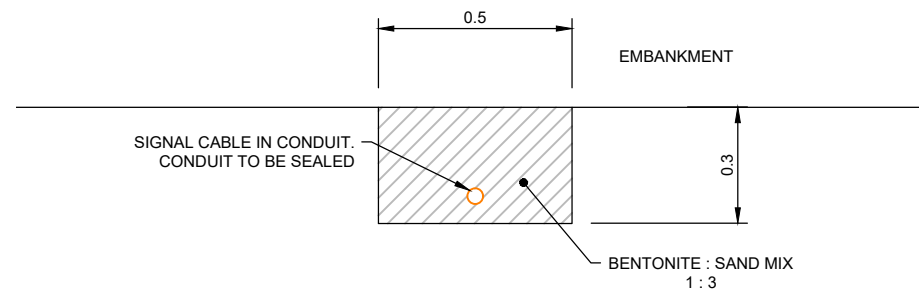
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  2. BACKGROUND PLAN PROVIDED BY CLIENT "Tabba Tabba - MBG Updated Layout\_100225\_B"
  3. COORDINATE SYSTEM: MGA ZONE 50, GDA94



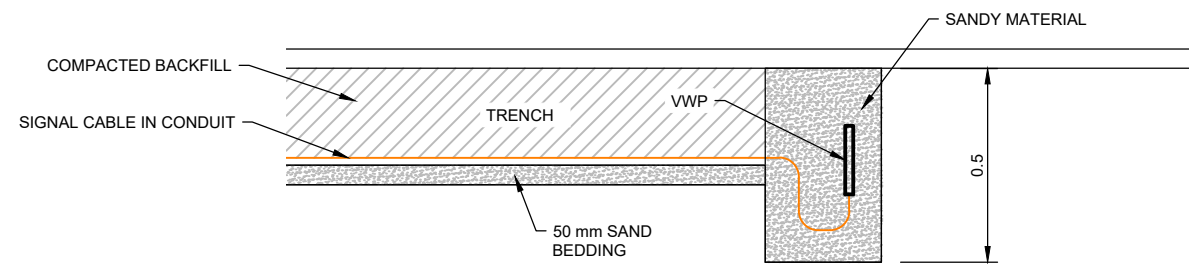
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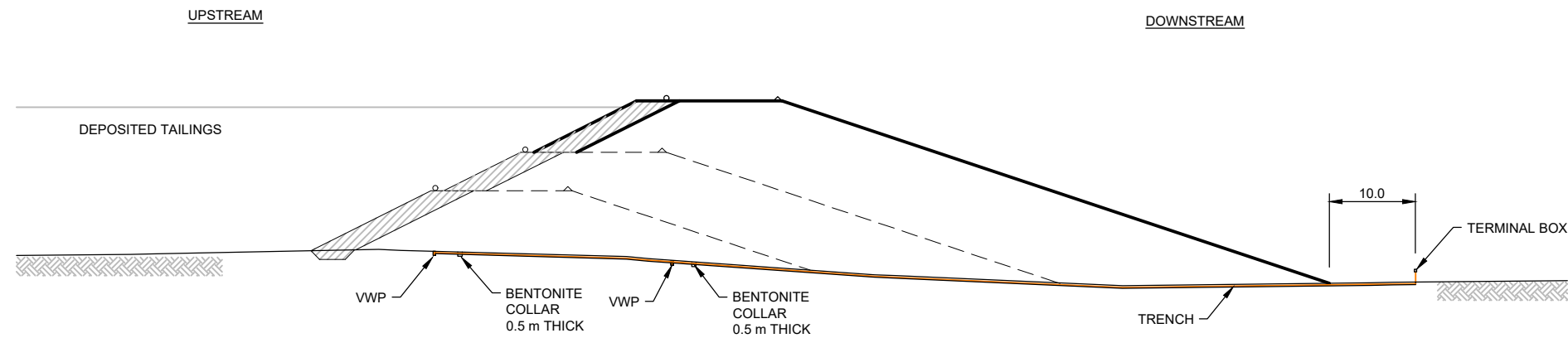
VWP TRENCH - TYPICAL DETAIL  
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BENTONITE COLLAR - TYPICAL DETAIL  
1:20



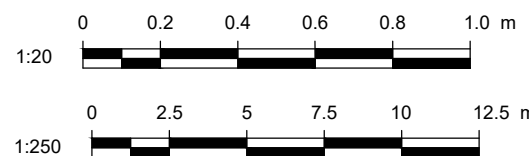
VIBRATING WIRE PIEZOMETER - TYPICAL DETAIL  
1:20



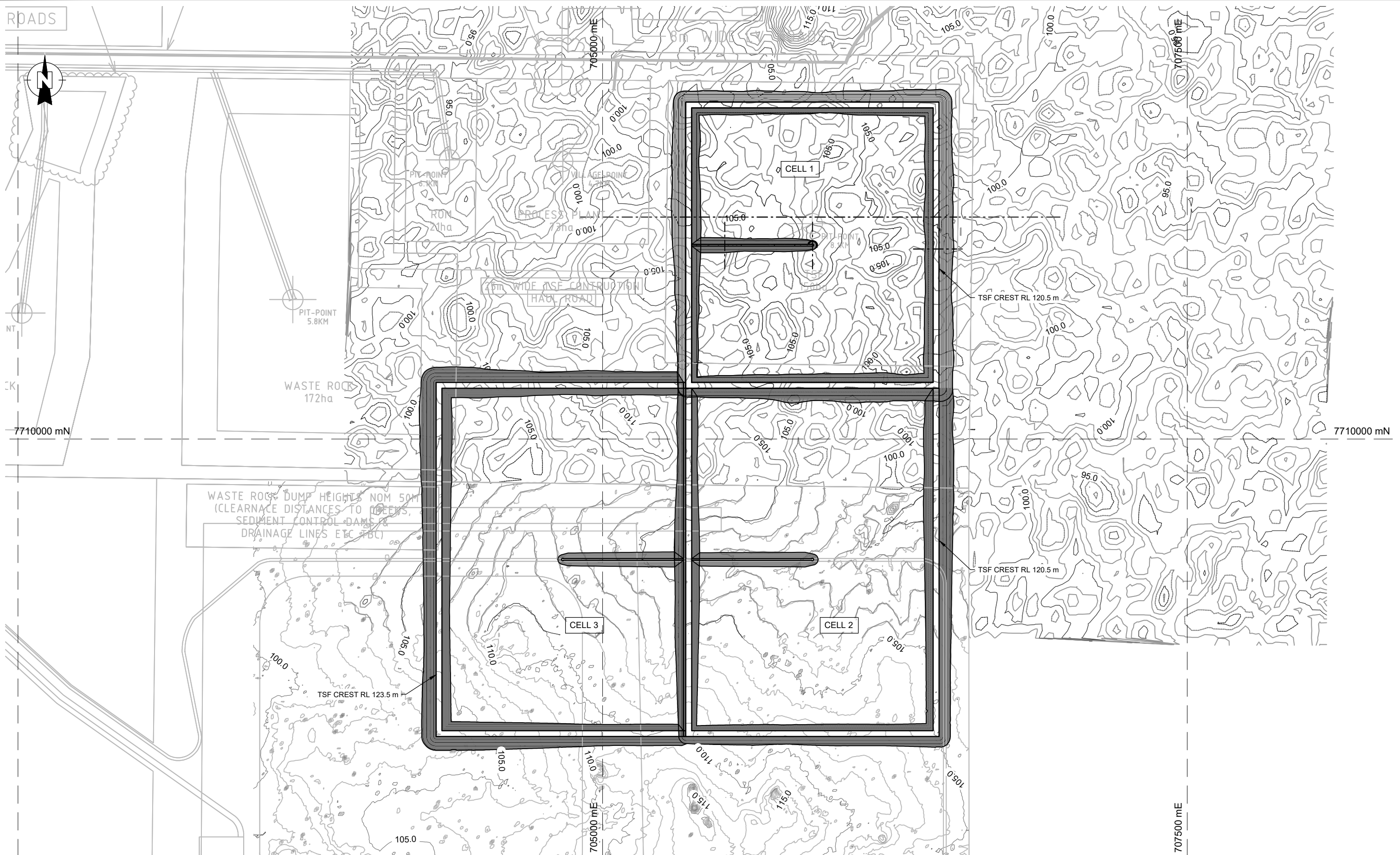
EMBANKMENT - TYPICAL SECTION  
1:750

NOTES:

1. HEAVY DUTY VIBRATING WIRE PIEZOMETER REFERS TO 3.5 BAR (50 PSI) PIEZOMETER MODEL NO. 52610530 BY DGSI
2. ARMoured SIGNAL CABLE MODEL NO. 50613586 BY DGSI
3. ALL DIMENSION IN METRES UNO

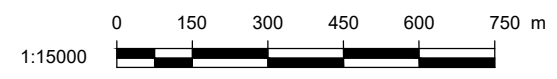


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**NOTES:**

1. CONTOURS FROM CLIENT SUPPLIED "P24072\_WILDCAT\_Tabba\_Tabba\_A1\_LIDAR\_10m\_CLIP\_3DPT" AND AVAILABLE CMW GIS "RasterT\_1\_Sec\_FeatureTo3D\_adjusted"
2. BACKGROUND PLAN PROVIDED BY CLIENT "Tabba Tabba - MBG Updated Layout\_100225\_B"
3. COORDINATE SYSTEM: MGA ZONE 50, GDA94



CLIENT:	<b>WILDCAT RESOURCES</b>	DRAWN:	DE	PROJECT:	PER2024-0154
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# APPENDIX B

## Scope of Work

14 May 2025

TAILINGS STORAGE FACILITY

TABBA TABBA LITHIUM PROJECT

# SCOPE OF WORKS AND TECHICAL SPECIFICATION

Wildcat Resources Ltd

Job No. PER2024-0154AE | Version A



[Location name]

[Address line 1]

[Address line 2]

[City] [State] [Postcode]

[Country]

Ph: [Office phone]

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## Version Control

Document version information	
Job number	PER2024-0154AE
Prepared by	Hajran Khatim, Geotechnical Engineer "[Double-click here to insert signature]"
Reviewed by	Pouyan Abbasi, Principal Geotechnical Engineer "[Double-click here to insert signature]"
Authorised by	Chris Hogg, Senior Principal Tailings Engineer "[Double-click here to insert signature]"

## Review and Update History

Revision	Date	Comments
A	14/05/2025	Initial draft for internal review
[00]	[Choose date]	[Enter text]
[00]	[Choose date]	[Enter text]
[00]	[Choose date]	[Enter text]



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## 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
DMIRS	Department of Mines, Industry, Regulation and Safety
DMIRSWA	Department of Mines, Industry, Regulation and Safety Western Australia
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
IWL	Integrated Waste Landform
WRL	Wildcat Resources Limited
NAF	Non-acid Forming
NATA	National Association of Testing Authorities
OMC	Optimum Moisture Content at which the SMDD is achieved
Owner/Principal	Wildcat Resources Limited (WRL)
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 <sup>3</sup>	Tonnes per cubic metre
TSF	Tailings Storage Facility
TSF1	Tailings Storage Facility 1
USCS	Unified Soil Classification System
WRD	Waste Rock Dump
Work / Works	The activities specified within this document as the responsibility for the Contractor

## 1.0 INTRODUCTION

This Scope of Works (SoW) outlines the requirements for the embankment construction activities necessary to achieve the finishes site grades as indicated on the Design Drawings for the proposed Integrated Waste Landform Tailings Storage Facility (IWLTSF) at the Tappa Tappa Lithium Project by Wildcat Resources Limited (WRL). The project is located approximately 50 km southeast of Port Hedland. This SoW is for the proposed Cell 1, while Cell 2 and 3 are considered for future development.

The works primarily involve bulk earthworks to construct the perimeter embankments and decant facilities for the Tailing Storage Facility /Integrated Waste Landform. All the information provided is to be read in conjunction with the Design Drawings included in the CMW report, reference PER2024-0154AD Rev A , dated 14 May 2025.

The SoW includes the supply of all materials, construction plant, equipment, labour, supervision, tools, services, warehousing (if required), testing equipment, and all other items necessary for the construction, acceptance testing, and preparation of “as-built” drawings and documentation related to the TSF raising works, as detailed in the drawings, material schedules, and technical specifications.

This Scope of Works also includes requirements for clearing and grubbing; the removal, replacement and disposal of unsuitable materials; the disposal of surplus material; and the supply, placement and compaction of embankment fill. All works must be completed to a fully operational standard, except where specifically excluded. This includes all necessary ancillary works, fittings, and the integration of all miscellaneous materials, minor components and other items—whether or not explicitly specified—where it is clearly intended by the design or evidently required to complete and commission the works.

### 1.1 Design Drawings

This SoW must be read in conjunction with the latest revisions of the following Design Drawings presented in Table 1.

Table 1: Drawings

Title	Drawing No.
IWL – Stage 1 Plan	PER2024-0154-101
Sections and Details Stage 1	PER2024-0154-102
Pipeline & Spigot Details	PER2024-0154-104
IWL – Instrumentation Plan	PER2024-0154-105
IWL - Instrumentation Details	PER2024-0154-106

### 1.2 Bill of Quantities

A preliminary estimate of quantities has been provided to allow material requirements to be gauged for staged construction. The figures have not been calculated by a Quantity Surveyor and are provided for convenience only.

### 1.3 Code of Practice

Unless otherwise specified, or shown on the drawings, the Contractor is to provide all materials and carry out all the work in accordance with the latest revisions of the relevant Australian Standard Codes.

All work under this Contract shall be performed strictly in accordance with the following specifications, drawings and other documents, which by this reference forms part of this Contract, unless expressly noted otherwise.

- AS 1289 Methods of testing soils for engineering purposes.
- AS 1726 Geotechnical site investigations.
- AS 3798 Guidelines on earthworks for commercial and residential developments.

The Works must comply with the latest version of the specified Drawings, Codes, and Standards. If no specific standards are mentioned, Australian Standards or recognized British or international standards should be followed.

Before making any changes to comply with updates to these codes or standards, the Contractor must notify the Principal (WRL) in writing. The notification should include the reason for the proposed change and a request for further instructions. The principal will determine if a change is necessary and provide direction.

## 1.4 Safety

The Contractor must:

- Carry out all works in a safe manner, in full compliance with the Owner/Principal's procedures, policies, and guidelines.
- Adhere to all applicable Acts of Parliament, Regulations, By-Laws, and Orders relating to the safety of personnel and property on or around the site.

## 1.5 Submittals

All submittals are to be provided to the Owner/Principal. The following information must be submitted by the Contractor no less than one month prior to the commencement of works:

- A description of the proposed construction procedures and sequences; and
- Details of proposed methods and construction techniques for any excavation where groundwater is anticipated, to ensure all excavations remain dry during construction. The discharge and disposal of dewatering system effluent must be coordinated with temporary stormwater management and dust control installations.

Upon completion of the works, the following must be submitted:

- All field and laboratory test results and accompanying comments, compiled in chronological order, for inclusion in the permanent project records

## 1.6 Site Location and Description

The Tabba Tabba Lithium Project is located approximately 50 km southeast of Port Hedland, within the Pilbara region of Western Australia, and is situated on the Wallareenya pastoral lease.

The proposed site will have three cells. Cell 1 will be part of this Scope of Work (SoW), while Cells 2 and 3 are considered for future developments. The proposed Integrated Waste Landform Tailings Storage Facility (IWLTSF) is located within the project's infrastructure zone, southeast of the main pit area. The approximate centre of the IWLTSF is at (MGA Zone 50) 705,893 mE and 7,710,918 mN

## 1.7 Design Summary

The Integrated Waste Landform Tailings Storage Facility (IWLTFSF) for the Tabba Tabba Lithium Project has been designed to accommodate up to 74.1 million tonnes (Mt) of tailings over an anticipated 18-year mine life, with an annual deposition rate of ~4.12 Mtpa. The facility comprises three interconnected rectangular cells.

The embankment for the proposed Integrated Waste Landform Tailings Storage Facility (IWLTFSF) at the Tabba Tabba Lithium Project is designed as a staged, zoned earth structure with a final crest elevation of RL 120.5 m and a maximum height of approximately 20.5 m. The embankment configuration follows a downstream raising approach constructed in three stages, with each lift incorporating a 1.5 m wide upstream bench to support tailings deposition lines and allow safe access during operations.

The embankment has an overall crest width of 25 m, comprising 5 m for Zone 1 (compacted low-permeability mine waste) and 20 m for Zone 2 (traffic-compacted shell material). The crest is designed with a 2% crossfall towards the upstream side, facilitating drainage and separation of surface water from operational zones. A 0.5 m high windrow will be constructed on the downstream edge for safety and operational demarcation.

The upstream slope is set at 1V:2H, and the downstream slope at 1V:3H, providing stability under both static and seismic conditions and minimizing long-term erosion potential. These slopes conform to ANCOLD (2019) guidelines and reflect standard practice for IWL structures in arid environments.

## 1.8 Site Conditions

Geotechnical investigations for the proposed IWLTFSF at the Tabba Tabba site were conducted in 2024 as part of the design program. These investigations included test pitting, reverse circulation (RC) drilling, and in-situ permeability testing, complemented by laboratory analysis of disturbed soil samples and monitoring bore logs. The subsurface profile across the IWLTFSF and infrastructure area typically includes coarse-grained alluvial sands and gravelly silts (0 – 0.5 m), cemented calcrete horizons and ferruginised nodules (0.5 – 2.0 m), and a transition to weathered metamorphic rock below ~2 m, including schists, gabbros, and pegmatites, consistent with regional greenstone geology.

RC drilling in the pit and surrounding areas revealed an average weathering depth of ~46 m, underlain by fractured rock, with initial water strikes occurring between 28–30 m. Groundwater inflow was highest at lithological contact zones, particularly between gabbro and pegmatite, where flow rates reached up to 0.85 L/s. In-situ permeability testing (slug tests) returned hydraulic conductivity values generally ranging from 0.014 to 1.02 m/day, depending on rock type and degree of fracturing. The average permeability within shallow weathered rock around the TSF footprint is estimated to be  $10^{-6}$  m/s.

## 1.9 Site Inspection

The Contractor must inspect the site and consider the following factors when pricing their work:

- The nature and requirements of the tasks to be completed.
- Conditions on and around the site.
- Access to the site.
- The types of soil and vegetation present.
- The expected or known water table level.
- The nearest sources of construction materials that meet the specifications.
- The source of water for construction purposes.

- Proper management of saline water usage, hydrocarbon storage, and dust suppression as per the principal's requirements.
- The prevailing climatic conditions at the site.

## 2.0 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 Drawings or in the Specification.
- Supply all labour, plant and materials (except those indicated as being supplied by the Principal) necessary for 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 Principal's Representative as work progresses.
- During the progress of the works, the 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

Before any works commence Contractor must undertake a survey of the existing ground which must be agreed between Principal and Contractor.

The post topsoil strip survey must be undertaken by Contractor and agreed between Principal and Contractor.

If either of these surveys are not provided by Contractor, then the Principal's Lidar survey of the existing ground will be used as a comparison surface to calculate earthworks volumes for purposes of payment. The principal will supply survey services including:

- Supply of survey datums/benchmarks.

The Contractor shall:

- Initial pegging of the embankment toes.
- Initial pickup of the embankment foundations.
- As built survey of the completed works
- Estimation of earthworks placed.
- 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 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 Contractor may undertake their own survey of any item, either in conjunction with the Principal, or separately.
- The Contractor and Principal's Representative shall 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 agreement not be reached, the difference shall be documented such that the matter can be later decided without disruption to the Contractor's programme.
- The maximum permissible horizontal deviation from the finished lines or zone boundaries shall be -0m to +0.5m.
- Vertical deviation shall be -0m to +0.2m, provided no abrupt changes in slope or level are present on any finished surface.

Measurement for payment of all embankments fill material shall be made for the compacted material, measured in place and only to the design lines and grades required (excluding 'tolerances').

## 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 2.

The maximum permissible horizontal deviation from the finished lines or zone boundaries shall be -0 m +0.5 m. Vertical deviation shall be -0 m to +0.2m, 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 2: Construction Tolerances

Construction Item	Tolerance Item	Tolerance <sup>(1)</sup>	
Perimeter Embankment	Crest Level	+200 mm, -0 mm	
	Crest Width	+500 mm, -0 mm	
	Slope <sup>(2)</sup>	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	+ 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 embankments 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 meters (m<sup>2</sup>) or cubic metres (m<sup>3</sup>) 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 delays while any works are checked.

At the completion of the works, the Contractor shall provide detailed as-built details, including hardcopy plan layout and survey information in electronic format, as well as a concise summary of item volumes.

## 3.0 MATERIALS

### 3.1 General

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, Compacted transition waste—This material must be used to construct the upstream (inner) zone of the IWLTSE, as indicated on the Design Drawings.
- Zone 2, Mine Waste (IWL) – 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.
- Waste Dump – This section of IWLTSE forms part of the WRD.
- 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 Zone 1 – Compacted Clay Material

Zone 1 Compacted Mine Waste Material for Cell 1 perimeter embankment must be sourced from active mine pit and existing stockpiles areas within Tabba Tabba site and must meet the requirements listed in Table 3.

Table 3: Properties of Zone 1 – Compacted Clay Material

Item	Test Method	Requirement
Soil Classification (USCS)	AS 1726	TBC after detail geotechnical investigation
Particle Size Distribution	AS 1289	TBC after detail geotechnical investigation
Plasticity Index	AS 1289	TBC after detail geotechnical investigation

Item	Test Method	Requirement
Liquid Limit	AS 1289	TBC after detail geotechnical investigation

Testing frequencies as per Section 7.5.

### 3.3 Zone 2 – Mine Waste

Zone 2 – Mine Waste will be sourced from mine active pit and facilities operated by WRL. The properties should meet the following conditions in Table 4.

Table 4: Properties of Zone 2 – Mine Waste

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 – Mine waste, as this material is to be traffic compacted during placement.

### 3.4 Decant Filter Rock

The Decant Filter should be geochemically inert, hard, durable, competent rock having the properties as outlined in Table 5.

Table 5: Properties of Zone 3 – Selected Filter Rock

Item	Test Method	Requirement
Soil Classification (USCS)	AS 1726	GW including Cobbles with a trace of Boulders.
Particle Size Distribution	AS 1289	100% passing 300 mm, >95% retained on 50 mm, <3% passing 0.075 mm, hard, durable competent rock with particle densities between 2.5 t/m <sup>3</sup> and 2.9 t/m <sup>3</sup> , and geochemically inert.

No testing is required for Select Filter Rock as this material is to be placed by excavator and tamped with its bucket.

### 3.5 Wearing Course

Zone 4 – Wearing Course should be well-graded laterite gravel with properties as recommended in Table 6.

Table 6: Properties of Zone 4 – 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 3 to Table 6, 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. Any material or material interface shows the potential of internal erosion must not be used in the construction works and transition layers should be added and designed. 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.

## 4.0 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 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.

#### 4.1.3 Clearing and Establishment Works

The Contractor shall, as appropriate:

- Remove all vegetable matter and scrub from the area of the proposed IWLTSE footprint. The area to be cleared shall extend approximately 5m and past the downstream toe of the embankment. All the stripped vegetation should be pushed into heaps in locations as indicated by the Owner's Representative.
- Remove all solid obstructions, tree stumps, roots and logs from beneath the footprint of the IWLTSE perimeter embankment.
- Agree with the Owner/Principal on the preferred alignment of the access roads to the IWLTSE site;
- Agree on routes of all haul roads with the Owner's Representative;

- Clear the agreed routes of all haul and access roads of all vegetation standing and fallen. Push this vegetation into heaps as approved by the Owner's Representative.
- Form up, lay base course as is necessary and do all things necessary to form and maintain haul roads linking the pit area to the site and other haul roads necessary for the works and which are approved by the Owner's Representative.
- Keep all haul roads sprayed and wetted to totally prevent the generation of airborne dust during the course of road construction and usage.
- Prepare a quality assurance and quality control programme to cover all aspects of work included within this Construction Specification for the Principals approval.
- On subsequent stages, remove gravel wear course materials from the embankment crests, and stockpile for re-use if possible.
- As required repair and maintain and do all things needed to maintain reliable and safe haul roads linking the nominated borrow areas to the works area and other haul roads necessary for the works and which are approved by the Principal's Representative;
- Prepare a quality assurance and quality control program to cover all aspects of work included within this document for the approval of the Owner/Principal's Representative; and
- Provide all things necessary to implement the approved quality control and quality assurance program.

## 4.2 Foundation Preparation

The Contractor shall, as appropriate:

- Survey and clearly peg the embankment footprint area;
- Strip topsoil from the Cell 1 footprint to a nominal depth below the natural ground surface of 0.2 m. The depth of stripping may be increased as directed by the Principal's Representative. Stockpiling of topsoil shall be in areas nominated by the Principal's Representative. Stockpiles shall have a maximum height of 2.0m and side slopes of 1 (vertical) to 1.5 (horizontal).
- Tyne, moisture condition and proof roll (typically 6 passes (min.) of a 12 tonnes vibratory roller) any areas of loose material on the prepared and surveyed surface of the embankment 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);
- On the prepared embankment crest, scarify the surface of areas on which fill is to be placed to a depth of no less than 150 mm, water as required (to within -2% / +2% of optimum moisture content (OMC)) and then compact to no less than 95% of the standard maximum dry density (SMDD); and
- Allow for keeping water from excavations by pumping, dewatering, or other suitable means, and appropriately dispose of it clear of the works.

## 4.3 Earthworks

### 4.3.1 General

The Contractor shall:

- Ensure suitable embankment material is well mixed to ensure uniform distribution of fines;

- Ensure that all materials shall be stockpiled, transported and placed in such a manner as to minimise segregation;
- Allow for keeping water from the works during construction by shaping finished surfaces with a fall to the centre of the storage;
- Allow for maintaining the borrow areas free of large accumulations of water;
- Maintain access roads, haul roads and/or ramps, as appropriate, to the designated borrow to enable the fill materials to be recovered and hauled to the work area. The contractor shall submit details of any proposed infrastructure or upgrade to the Owner/Principal's Representative prior to commencement of construction. It is envisaged that the existing infrastructure can be utilised; and
- Carry out testing to comply with the Specification and QA/QC procedures.

#### 4.3.2 Perimeter Embankment – Zone 1 Compacted Mine Waste

The Contractor shall meet the requirements listed below:

- Construct Zone 1 (upstream) of IWLTSF perimeter embankment raises using Compacted Mine Waste obtained from nominated sources (active mine pit). The embankment material shall comply with Section 3 of this SoW, and be free of unsuitable materials.
- Adjust the moisture content of the upstream materials to within the range of -2% / +2% of OMC as determined from laboratory test 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.
- Only materials approved by the Owner/Principal's Representative should be utilised in construction
- Place the Zone 1 Compacted Mine Waste material within the perimeter embankment in homogeneous horizontal layers not exceeding 0.3 m loose lift thickness;
- Placement should be continuous. If a break in fill placement allows the exposed surface to dry, the surface shall be lightly tined, moisture conditioned and compacted prior to fill placement recommencing;
- Compact each layer to achieve a minimum density ratio  $\geq 95\%$  of SMDD. Allow a minimum of 6 passes of the 12 tonnes vibratory roller for compaction. The actual number of passes of the roller to achieve a density  $\geq 95\%$  SMDD shall be determined on site using roller trials;
- Ensure that placed material which fails to meet the minimum test requirements of compaction or moisture content is reworked (moisture content adjusted and/or reworked) to meet the specified requirements. The Contractor shall maintain an up-to-date Compaction Record Log in accordance with a spreadsheet example to be provided by the Owner/Principal;
- Where a compacted layer fails to meet the requirements of this document, placement of the next layer of filling will not be approved. It will remain the responsibility of the Contractor to demonstrate management of the compaction process. Failed layers which have fill placed upon them shall be exposed by clearing the unauthorised fill and treated until moisture content and compaction targets are demonstrated to have been achieved.
- All materials shall be stockpiled, transported and placed in such a manner as to minimise segregation.
- Construct and maintain haul road(s) between the ramp at the pit area and the works at the TSF.
- Construct and maintain access ramps as required to enable the construction equipment to access the TSF. The location of these ramps shall be approved by the Principal's Representative prior to commencement of these works. The ramps may be left in place at the discretion of the Principal.

- The crests of the completed embankment shall be graded to the inside (upstream) of the storage at a 2% cross fall. A windrow of not less than 0.5 m height (or 1/2 wheel height of largest vehicle) shall be left on the outside of the crest of embankment.
- Sheet the crest of the perimeter and internal embankments, and the decant accessway with 100 mm thick laterite gravel wearing course. The laterite gravel shall be sourced from a location nominated (pit areas/waste dump area) by the Principal's Representative and from reclaimed gravel wear course materials if deemed suitable for reuse (subsequent stages).
- Carry out testing to comply with the Specification and QA/QC procedures.
- Allow for keeping water from the works during construction by shaping finished surfaces with a fall to the storage

#### 4.3.3 Perimeter Embankment – Zone 2 – Mine Waste

The Contractor shall meet the requirements listed below:

- Mechanically place Mine Waste to construct the downstream of the perimeter embankment. At the interface with Zone 1, the material shall comply with Section 3 of this SoW and be free of voided rock, oversized materials (boulders etc) and unsuitable materials.
- The mine waste should be placed in layers no greater than 300 – 500 mm thick and traffic compacted by construction equipment across the full width of the layer. Allow a minimum 4 passes of loaded dump trucks (CAT 777 or equivalent) for traffic compaction.

#### 4.3.4 Perimeter Embankment – Completion

In addition to Sections 4.3.2 and 4.3.3, the Contractor must also comply with the following requirements:

- Form windrows of adequate height on both crest edges as the works proceed to comply with mill safety and operational guidelines, typically  $\geq 0.5$  m in heights or 1/2 wheel height of the largest vehicle likely to traffic across the embankment crest (whichever is greatest). The windrows shall be raised as the works proceed. Loose edge materials shall be removed as the works proceed;
- Shape the crests of the completed perimeter embankment to the upstream (inside) of the storage, with a cross fall of at least 2%;
- A windrow of  $\geq 0.5$  m height or 1/2 the wheel height of the largest vehicle shall be left on the outside (as a minimum) of the crest of the perimeter embankment as well as both sides of the decant accessway. The windrows shall have gaps left at 30 m centres to facilitate water runoff flow to prevent ponding on the crests; and
- Sheet the embankment crests with a minimum thickness of 0.1 m of laterite gravel wearing course material. The material shall be sourced from a location nominated (pit areas/waste dump area) by the Owner/Principal's Representative and from reclaimed gravel wearing course materials if deemed suitable for reuse.

#### 4.3.5 Decant Accessway

The Contractor shall meet the requirements listed here:

- Construct the dividing wall downstream using traffic compacted Mine Waste sourced from the pit or waste dump areas. The upstream needs to be constructed using Compacted Mine Waste material sourced from the borrowing area and achieved the compacted density 95%. Well grade mine waste shall be utilised near the perimeter embankment. Hard rock waste should only be used within 200 m of the rock-ring decant.

- Zone 1 Compacted Mine Waste material should be placed in layers no greater than 0.3 m thick and compacted. The actual number of passes of a 12t vibratory roller or an approved equivalent to achieve a density greater than 95% standard compaction (AS 1289.5.1.1) shall be determined on site using roller trials.
- Construct the decant accessway using traffic compacted Mine Waste sourced from the pit or waste dump areas located adjacent to the storage. Well grade mine waste shall be utilised near the perimeter embankment. Hard rock waste should only be used within 200 m of the rock-ring decant. Decant access way will be constructed on the top of the dividing wall in first stage. No clay liner is designed for accessway as well.
- As required grade or upgrade any existing roads or ramps associated with Cell 1;
- Form the decant accessway using Zone 2 mine waste as outlined in Section 3 of this SoW. The Zone 2 Mine Waste should be placed in layers no greater than 300 - 500 mm thick and traffic compacted by construction equipment across the full width of the layer. Edge windrows are required on either side of the accessway with frequent gaps for water shedding;
- Carefully place evenly graded Zone 3 select filter rock, as outlined in Section 3 of this SoW to form the decant rock ring structure. All rock shall be carefully placed to minimise segregation.

#### 4.3.6 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.

#### 4.3.7 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, nuts, holes, depressions or protrusions.

### 4.4 Decant Structure

The decant structure will comprise a rock ring type decant. Refer to drawing PER2024-0154-102 for details.

Only clean select rock fill material (or mine waste) with a low fines content shall be placed to form the rock ring decant. Select rock fill material shall be selected clean, fines-free (<3% passing 75µm), competent rock mine waste with a well-graded particle size distribution between 50mm and 300mm. All filter rock shall be carefully placed in such a manner as to minimise segregation.

The Contractor shall:

- Construct a waste platform to support the rock ring filter wall.
- Transport all materials to construct the decant.
- Transport select decant filter rock from the designated source and place around the decant. Selected rock shall comprise clean mine waste material, free of fines, sourced from a location nominated by the Principal's Representative.

### 4.5 HDPE Liner

The work will include:

#### Option 1: Fully lined Cell 1

- The Upstream batters and cut-off trench perimeter embankments of Cell 1 will be lined up to the Crest RL
  - Stage 1: 110.0 m
  - Stage 2: 114.5 m
  - Stage 3: 120.5 m
- Total foundation-lined area is approximately 107 ha.

#### Option 2: Half-Lined Configuration

- The upstream batters will be lined to the crest of Stage 1, with the liner extending 20 m downstream from the embankment.
- A 200 m radius will be lined under the decant pond.

#### Option 3: Partially lined Configuration

- Only a 200 m radius under the decant pond will be lined.
- 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 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<sup>2</sup> 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 60o 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 90o to the embankment crests. The liner shall not be joined parallel to the embankment crest.
- 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.
- Any defective or damaged liner will be rejected and replaced at the Contractor's cost.

The following will be supplied by the Owner:

- 1.5 mm thick smooth/smooth HDPE liner.

## 4.6 Underdrainage

The Contractor must complete the installation of the underdrainage system in accordance with the Scope of Works and Technical Specifications and Drawings.

As part of the underdrainage lines (3 no.), the Contractor shall supply and install the two slotted pipes (Megaflo 450) and the geotextile covering, 10-14 mm (nom.) select aggregate, BIDIM A34 geotextile wrap, and 0.15 mm thick select rock/erosion protection cover. The underdrainage lines in the northern part of Cell 1 will be approximately 900 m long and join the HDPE solid pipes to allow flow under gravity to internal tower mine sumps.

The Contractor must also connect the discharge of the flow from the underdrainage lines to the internal collecting sump. The tower must build with precast concrete pipes with an emphasis on the details provided in the drawing.

The Contractor shall:

- The geotextile should be stored and handled in accordance with the manufacturer's specifications.
- The geotextile must not be dragged across the subgrade which could damage the geotextile.
- The subgrade to accept the underdrainage lines shall be graded 'smooth' i.e. cleared of tree stumps, large stones, and other sharp objects that could damage the geotextile and slotted pipework.
- The drain shall generally follow the slope of the ground surface.
- The geotextile should be rolled out onto the subgrade from the upslope end. The slotted pipe should be laid on the geotextile and the geotextile and pipe stabilised with drainage medium.
- The geotextile must be lapped both side-to-side and end-to-end, in the direction of aggregate placement. The minimum lap should be 0.3 m. Alternatively, adjacent panels can be sewn together rather than overlapped.
- The precast concrete should be A34 with 1800 mm Dia .X 89 mm wall thickness. Those should comprise with 1220 mm height or similar as reflected in the Drawings.

- A 150 mm precast concrete slab or similar needs to be considered for the foundation of the collecting sump.
- Traffic compacted backfill material to support the collecting tower system needs to be provided by mine waste material sloped 1:1.5 and constructing each stage.
- Aggregate must be carefully placed over the geotextile and slotted pipe to form the aggregate layer, as shown on the drawings.
- The geotextile should then be folded over, adequately lapped and stabilised with erosion protection.
- The underdrainage lines should not be trafficked or disturbed by vehicles.
- Any liner, geotextile and slotted pipe that becomes damaged or displaced during filling or other operations shall be removed and replaced.

## 4.7 Monitoring Instrumentation Section

Vibrating wire piezometers (VWP) comprise a piezometer tip and a cable extending to a measurement console (terminal box) external to the TSF embankment footprint.

Eight (8) sets of VWPs will be installed by the contractor in the embankment foundation prior to the construction of the perimeter embankments. The VWP locations and details are shown in Drawing PER2024-0154-105.

The following sequence is proposed to satisfactorily install the VWPs:

- Excavate the trenches from the terminal box to the locations where the instruments will be installed, as directed. The nominal trench dimensions are 0.5 m wide and 0.3 m deep.
- The trench base will be inspected for irregularities such as angular cobbles, which will be removed or levelled out to a reasonably smooth surface prior to placement of 50 mm layer of sand bedding.
- Cables will be threaded through 25 mm ID diameter PVC conduits and laid on the sand bedding.
- At the instrument locations, the end of the cable and the VWP will be placed in a small, shallow trench. Backfill to the installation trench will comprise silty gravel materials carefully compacted using a vibrating rammer. The end section of the conduit will be sealed with bentonite grout.
- At the terminal box location, an upright steel conduit support will be concreted into the ground, the mini-logger clamped to the top of the pole and the cable connected to the mini-logger.
- Backfill for side support and cover to the conduit will comprise excavated in-situ materials except where such material comprises angular cobbles which could potentially damage the pipe. In this instance, similar material to that used in the upstream embankment zone will be used as backfill. Two 0.5 m thick bentonite collars along the trench will be installed with a 1:3 bentonite and sand mix.

## 4.8 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).

## 4.9 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.

## 5.0 EXCLUSIONS

The following works will be performed by others:

- Removal of pipework, electrical services and other infrastructures 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 handling and operating crew 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.

## 6.0 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:

- 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.

### 6.3 Water

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.

## 7.0 QUALITY CONTROL AND QUALITY ASSURANCE

The required quality standards for implementation of this Scope of Work are the ISO 9001:2000 Standard Series and the Contractor shall comply with the requirements of these standards.

## 8.0 TESTING AND INSPECTION

### 8.1 Inspection

The Principals Representative will be entitled, at all times to inspect, examine and test the materials and workmanship being provided under the Contract. Such inspection, examination or testing, if made, shall not release the Contractor from any obligation under the Contract.

The Contractor shall co-operate with and provide full opportunity to the Principals Representative to monitor regularly the progress of the Works of the Contractor and his Subcontractors to the detailed extent necessary to satisfy progress relative to the Construction Program.

All pertinent information to enable the Principals Representative to determine the adequacy of the advance planning for material procurement, machine and manpower resources to meet the Construction Program shall be made freely available to the Principals Representative.

These requirements shall be incorporated in orders placed with Subcontractors.

### 8.2 Compacting Testing

Field density testing must be performed by the Independent Testing and Inspection Firm on the compacted embankment material to ensure the compaction criteria meets 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

### 8.3 Testing Program

Compliance tests will be carried out by a qualified technician from a NATA registered laboratory engaged by the Contractor.

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 testing must follow the requirements of Table 7 as a minimum.

Table 7: Quality Control Tests

Property	Test Method	Minimum Testing Frequency
Particle Size Distribution (PSD)	AS 1289.3.6.1	1 per 10,000 m3
Atterberg Limits incl. USCS classification	AS 1289.3.1.1, 3.2.1, 3.3.1 and 3.4.1	1 per 10,000 m3
Field Dry Density	AS 1289.5.8.1	1 per layer per 750 m3 or 2,500 m2
Density Moisture Relation		

The embankment foundation preparation will be checked for compaction, using a testing frequency of 1 field density test per 2,500 m2 per layer.

The Contractor shall, at his own expense, rework or replace materials which do not meet the compaction and other compliance requirements.

Test certificates shall be made available to the Principal's Representative on an ongoing basis throughout the construction

## 8.4 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.

## 8.5 Finishing Tolerances

Refer to Table 2 in Section 2.3.

## 8.6 Material Suitability

Prior to the placement of Zone 1 Compacted 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.

- The items shall be included in the Contractor's materials procurement schedules. The Contractor shall, upon arrival at Site to commence work, check and ensure that Principal Supplied Materials are available and will not cause any delay to the Contractor's work progress.
- Items stored by the Principal, shall be removed from the Principal's store or storage area by the Contractor when required by him or when directed by the Principal's Representative (whichever is the

sooner). However, no items shall be removed from the Principal's store or storage area by the Contractor without first obtaining authority from the Principals Representative and the Contractor shall sign receipts or other documentation required acknowledging receipt of the Free Issue Materials.

- From the time the Principal Supplied Materials are removed from the Principal's store or storage area or are delivered to the site the Contractor shall be responsible for and shall keep safely and in good order all those Principal Supplied Materials including any returnable packing or containers.
- The Contractor shall account for all Principal Supplied Materials used and shall return to the Principal in good order and condition any Principal Supplied Materials remaining unused on completion of the work. The Contractor shall be responsible for the cost of replacement or repair of any Principal Supplied Materials lost or damaged while he is responsible, therefore.
- The Contractor shall immediately notify the Principals Representative of any damaged to or loss of any of those Principal Supplied Materials at any time and shall as soon as possible specify the extent and circumstances of the damage or loss.
- Principal Supplied Materials used by the Contractor are used at the sole risk of the Contractor. Any failure to perform the Contract by the Contractor shall not be excused by any matter or thing arising from or incidental to the use of Principal Supplied Materials.

## 8.7 Additional Inspection

The Contractor must perform a random survey of the top surface of every layer to monitor fill progress.

## 9.0 PERMITS, LICENCES AND APPROVAL

Further to the general conditions of Contract, the Owner/Principal will Obtain all the government approvals relevant to the works. All other necessary permits, licenses and approvals shall be obtained by the Contractor.

## 10.0 SUBSTITUTIONS

The Contractor shall:

- Not substitute any alternative to the equipment and materials included in the Works without the prior written consent of the principal.
- Make diligent efforts to utilise the specified Materials to be incorporated into the Works but where the Contractor considers there are commercial or other advantages to be derived by the Principal, the Contractor may submit a proposal for a substitute material for approval by the Principal prior to commencement of the work. Such proposal for substitution shall be in writing and state reasons for and (if applicable) advantages of the substitute material. The Principal shall determine whether the substitute material will be permitted and such determination shall be binding and conclusive upon the Contractor.

## 11.0 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 and date of dispatch and date of arrival on site.

## 12.0 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.

## 13.0 CONSTRUCTION PROGRAM

The Contractor shall provide a construction program and indicate the following milestone dates;

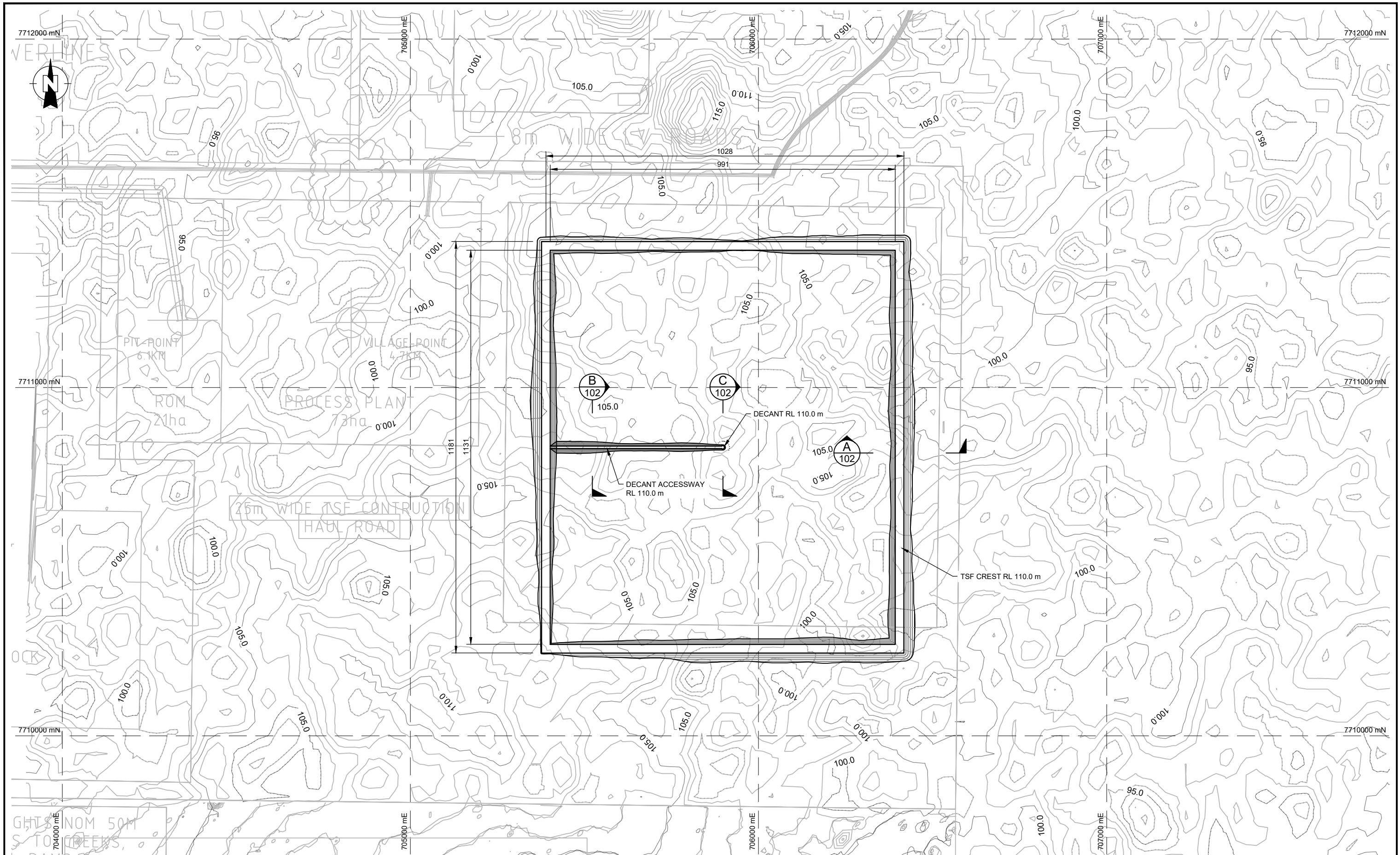
- Contract award;
- Notice to proceed with the fieldwork;
- Owner/Principal completion date; and
- Final completion date.

## 14.0 SCHEDULE OF QUANTITIES

A preliminary Schedule of Quantities (Appendix B) has been provided to allow material requirements to be gauged for the Cell 1 Stage 1 construction. 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

## Drawings

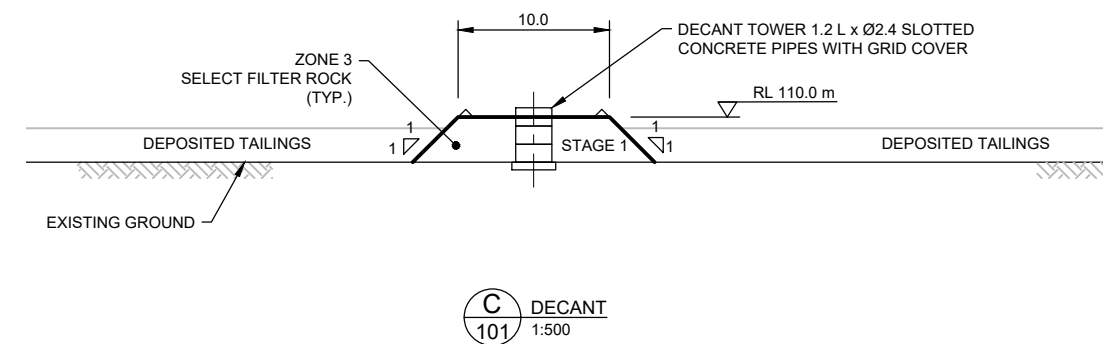
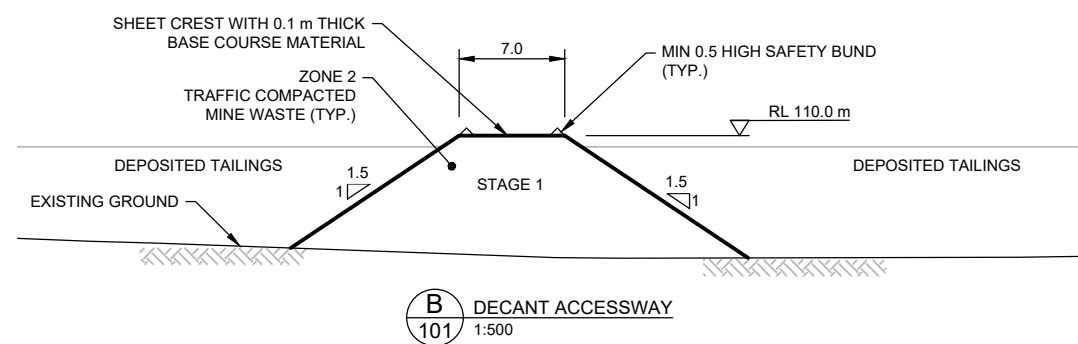
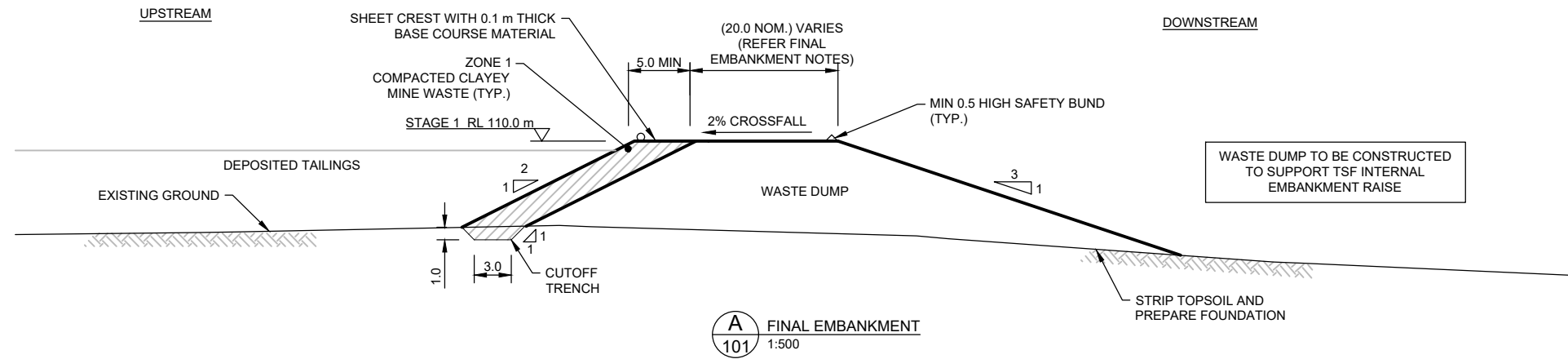


**NOTES:**

1. CONTOURS FROM CLIENT SUPPLIED "P24072\_WILDCAT\_Tabba\_Tabba\_A1\_LIDAR\_10m\_CLIP\_3DPT" AND AVAILABLE CMW GIS "RasterT\_1\_Sec\_FeatureTo3D\_adjusted"
2. BACKGROUND PLAN PROVIDED BY CLIENT "Tabba Tabba - MBG Updated Layout\_100225\_B"
3. COORDINATE SYSTEM: MGA ZONE 50, GDA94

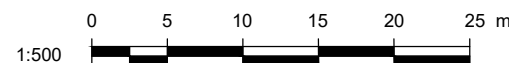


CLIENT:	<b>WILDCAT RESOURCES</b>	DRAWN:	DE	PROJECT:	PER2024-0154
PROJECT:	<b>TABBA TABBA LITHIUM PROJECT</b>	CHECKED:	PA	DRAWING:	101
TITLE:	<b>TSF CELL 1 STAGE 1 PLAN</b>	REVISION:	A	SCALE:	1:10000
		DATE:	13.05.25	SHEET:	A3 L

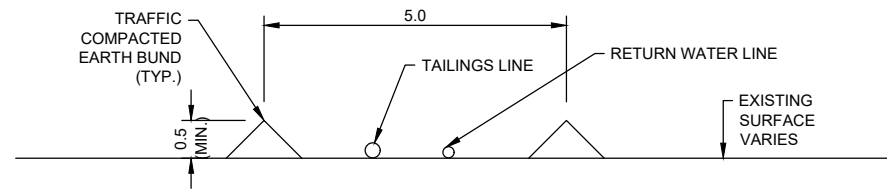


**NOTES:**

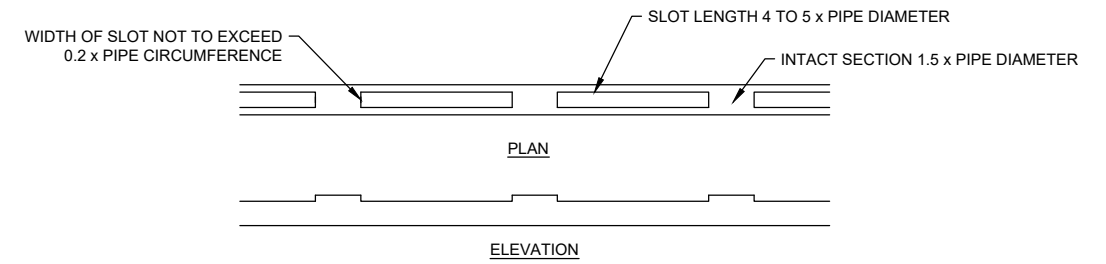
1. CONTOURS FROM CLIENT SUPPLIED "P24072\_WILDCAT\_Tabba\_Tabba\_A1\_LiDAR\_10m\_CLIP\_3DPT" AND AVAILABLE CMW GIS "RasterT\_1\_Sec\_FeatureTo3D\_adjusted"
2. ALL DIMENSION IN METRES UNLESS SPECIFIED.



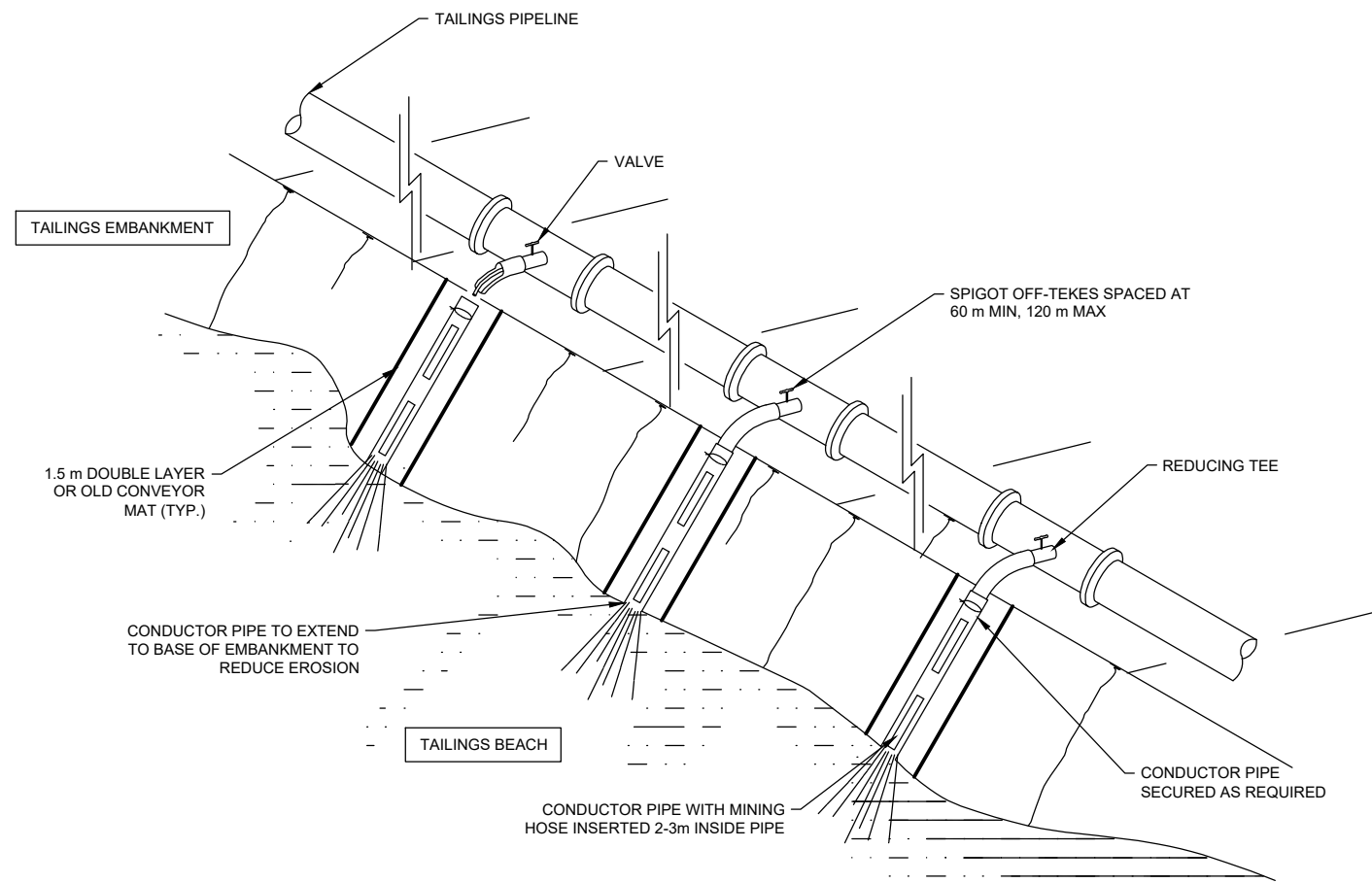
	CLIENT:	<b>WILDCAT RESOURCES</b>		DRAWN:	DE	PROJECT:	PER2024-0154
	PROJECT:	<b>TABBA TABBA LITHIUM PROJECT</b>		CHECKED:	PA	DRAWING:	102
	TITLE:	<b>TSF STAGE 1 SECTIONS</b>		REVISION:	A	SCALE:	AS SHOWN
				DATE:	13.05.25	SHEET:	A3 L



PIPELINE BUNDING - TYPICAL SECTION  
1:100



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



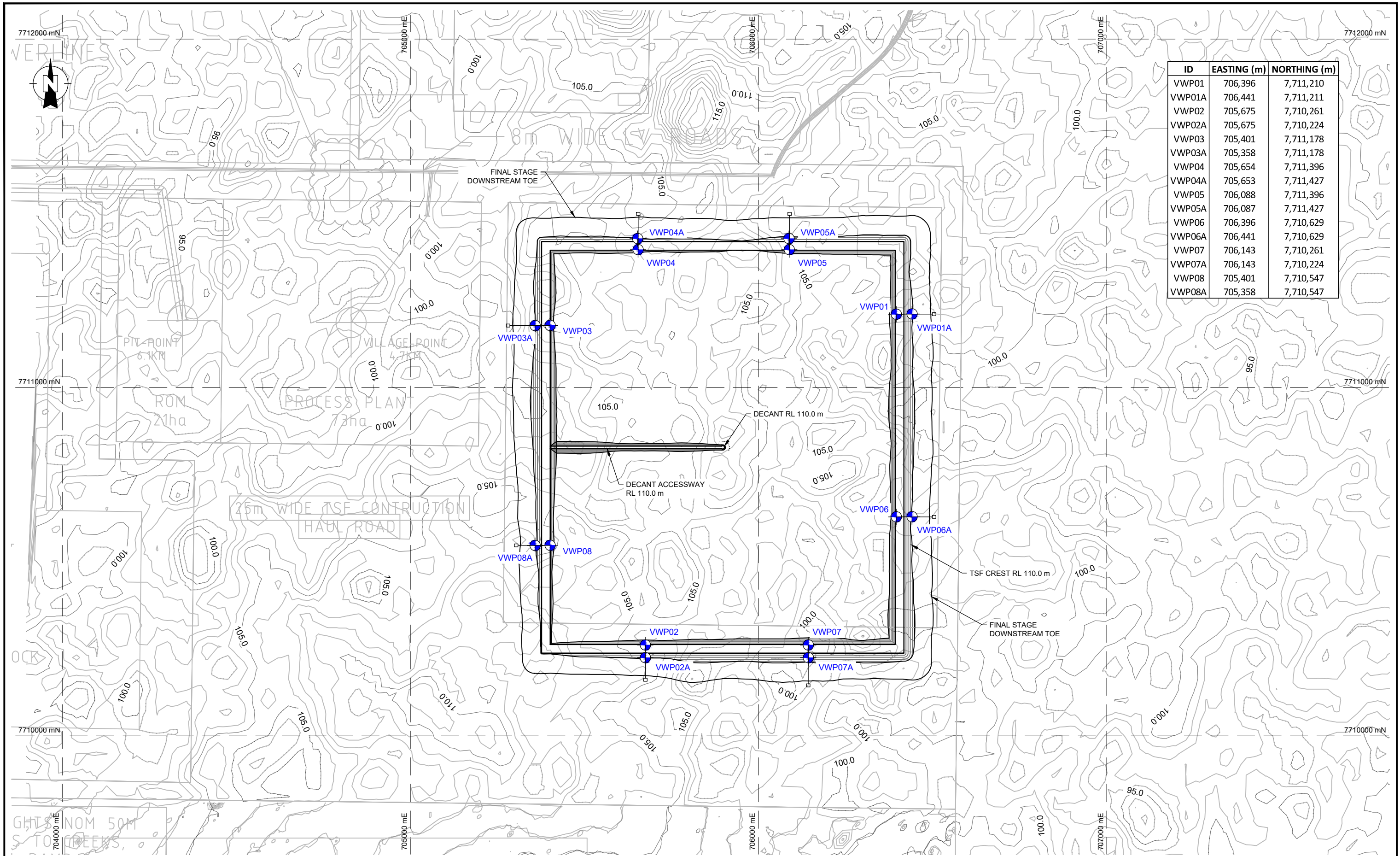
PROPOSED SPIGOT ARRANGEMENT  
ISOMETRIC VIEW (NTS)

NOTES:

1. ALL DIMENSIONS IN METRES UNLESS OTHERWISE NOTED
2. CONTOURS GENERATED FROM CLIENT SUPPLIED SURVEY  
"nft\_pts-v\_local1\_simplified\_v2"



	CLIENT:	<b>WILDCAT RESOURCES</b>	DRAWN:	DE	PROJECT:	PER2024-0154
	PROJECT:	<b>TABBA TABBA LITHIUM PROJECT</b>	CHECKED:	PA	DRAWING:	104
	TITLE:	<b>PIPELINE &amp; SPIGOT DETAILS</b>	REVISION:	A	SCALE:	AS SHOWN
			DATE:	13.05.25	SHEET:	A3 L



ID	EASTING (m)	NORTHING (m)
VWP01	706,396	7,711,210
VWP01A	706,441	7,711,211
VWP02	705,675	7,710,261
VWP02A	705,675	7,710,224
VWP03	705,401	7,711,178
VWP03A	705,358	7,711,178
VWP04	705,654	7,711,396
VWP04A	705,653	7,711,427
VWP05	706,088	7,711,396
VWP05A	706,087	7,711,427
VWP06	706,396	7,710,629
VWP06A	706,441	7,710,629
VWP07	706,143	7,710,261
VWP07A	706,143	7,710,224
VWP08	705,401	7,710,547
VWP08A	705,358	7,710,547

- NOTES:**
1. CONTOURS FROM CLIENT SUPPLIED "P24072\_WILDCAT\_Tabba\_Tabba\_A1\_LiDAR\_10m\_CLIP\_3DPT" AND AVAILABLE CMW GIS "RasterT\_1\_Sec\_FeatureTo3D\_adjusted"
  2. BACKGROUND PLAN PROVIDED BY CLIENT "Tabba Tabba - MBG Updated Layout\_100225\_B"
  3. COORDINATE SYSTEM: MGA ZONE 50, GDA94



CLIENT:	<b>WILDCAT RESOURCES</b>	DRAWN:	DE	PROJECT:	PER2024-0154
PROJECT:	<b>TABBA TABBA LITHIUM PROJECT</b>	CHECKED:	PA	DRAWING:	105
TITLE:	<b>INSTRUMENTATION PLAN</b>	REVISION:	A	SCALE:	1:10000
		DATE:	19.05.25	SHEET:	A3 L

# APPENDIX B

## Schedule of Quantities



Date	02.05.25
Job No	PER2024-0154
File	
Subject	Quantities
Revision	0

PROJECT TSF CELL 1 STAGE 1  
 CLIENT WILDCAT RESOURCES  
 LOCATION TABBA TABBA

Item	Description	Unit	Quantity	Rate	Amount
<b>1.00</b>	<b><u>Preliminaries</u></b>				
1.01	Site establishment and general cost (including mobilisation and demobilisation)	Item			
		10% of earthworks cost excluding liner and underdrainage			
<b>2.00</b>	<b><u>Preliminaries &amp; Site Preparation</u></b>				
2.01	Clear and Grub TSF area	ha	134	\$ 1,572.03	\$ 210,652
2.02	Topsail Stripping (0.2m ) and move to stockpile	m <sup>3</sup>	288,000	\$ 2.21	\$ 591,744
2.03	Site preparation in TSF basin	m <sup>2</sup>	1,060,000	\$ 2.02	\$ 2,145,440
<b>3.00</b>	<b><u>Perimeter Embankment</u></b>				
3.01	Prepare embankment foundation	m <sup>2</sup>	257,000	\$ 2.02	\$ 520,168
3.02	Excavate cut-off trench under upstream zone of embankment	m <sup>3</sup>	16,800	\$ 9.07	\$ 152,435
3.03	Backfill cut-off trench under upstream zone of embankment with roller compacted clayey mine waste	m <sup>3</sup>	16,800	\$ 11.40	\$ 191,461
3.04	Borrow, transport, place, moisture condition and roller compact clay mine waste material to upstream zone of embankment	m <sup>3</sup>	128,000	\$ 11.40	\$ 1,458,752
3.05	Borrow, transport, place, moisture condition and compact mine waste material to downstream zone of embankment (by Mining Fleet)	m <sup>3</sup>	1,042,000	\$ -	\$ -
3.06	Place selected mine waste to build windrows on both sides of embankment.	m <sup>3</sup>	4,300	\$ 12.75	\$ 54,840
3.07	Sheet perimeter embankment crest with 0.1 m base course	m <sup>3</sup>	11,000	\$ 18.39	\$ 202,274
<b>4.00</b>	<b><u>Decant</u></b>				
4.01	Borrow, transport, place, moisture condition and compact mine waste material to decant accessway	m <sup>3</sup>	50,500	\$ 4.05	\$ 204,424
4.02	Place selected mine waste to build windrows on both sides of the decant accessway	m <sup>3</sup>	500	\$ 12.75	\$ 6,377
4.03	Sheet perimeter embankment and decant accessway crests with 0.1 m base course	m <sup>3</sup>	350	\$ 18.39	\$ 6,436
4.04	Win, haul and place select filter rock to decant ring	m <sup>3</sup>	3,500	\$ 18.39	\$ 64,360
<b>5.00</b>	<b><u>Underdrainage</u></b>				
5.01	Supply and install Megafllo 450 underdrainage, including aggregate, geotextile	m	6,000	\$ 172.50	\$ 1,035,000
5.02	Supply and install 250 dia underdrainage outfall pipe	m	200	\$ 155.25	\$ 31,050
5.03	Install underdrainage sump	Item	2		
<b>6.00</b>	<b><u>Miscellaneous</u></b>				
6.01	QA/QC including engineer visits and QA/QC testing	Allow			\$ 264,500
6.02	Supply and install 14 no. VWP Piezometers				\$ 55,200
6.02	Raise and re-install tailings deposition pipeline		see item 3.08		
6.03	Raise and re-install decant return water pipeline		by others		
6.04	Raise and re-install decant pumps, underdrainage bore pump		by others		
6.05	Raise and re-install electrical equipment		by others		
	<b>SUB-TOTAL</b>				<b>\$ 7,195,112</b>
	No Contingency				\$ -
	<b>TOTAL COST (excl. GST)</b>				<b>\$ 7,195,112</b>

Notes:

PROJECT TSF CELL 1 STAGE 2

CLIENT WILDCAT RESOURCES

LOCATION TABBA TABBA

Item	Description	Unit	Quantity	Rate	Amount
<b>1.00</b>	<b><u>Preliminaries</u></b>				
1.01	Site establishment and general cost (including mobilisation and demobilisation)	Item			
			10% of earthworks cost excluding liner and underdrainage		
<b>2.00</b>	<b><u>Preliminaries &amp; Site Preparation</u></b>				
2.01	Clear and Grub TSF area	ha	12	\$ 1,572.03	\$ 18,864
2.02	Topsoil Stripping (0.2m ) and move to stockpile	m <sup>3</sup>	24,000	\$ 2.21	\$ 52,992
2.03	Site preparation in TSF basin	m <sup>2</sup>	0	\$ 2.02	\$ -
<b>3.00</b>	<b><u>Perimeter Embankment</u></b>				
3.01	Prepare embankment foundation	m <sup>2</sup>	115,300	\$ 2.02	\$ 233,367
3.02	Excavate cut-off trench under upstream zone of embankment	m <sup>3</sup>	0	\$ -	\$ -
3.03	Backfill cut-off trench under upstream zone of embankment with roller compacted clayey mine waste	m <sup>3</sup>	0	\$ -	\$ -
3.04	Borrow, transport, place, moisture condition and roller compact clay mine waste material to upstream zone of embankment	m <sup>3</sup>	97,100	\$ 11.40	\$ 1,106,600
3.05	Borrow, transport, place, moisture condition and compact mine waste material to downstream zone of embankment (by Mining Fleet)	m <sup>3</sup>	1,294,900	\$ -	\$ -
3.06	Place selected mine waste to build windrows on both sides of embankment.	m <sup>3</sup>	4,400	\$ 12.75	\$ 56,115
3.07	Sheet perimeter embankment crest with 0.1 m base course	m <sup>3</sup>	11,000	\$ 18.39	\$ 202,274
3.08	Remove pipework and replace after raising	m	4,420	\$ -	\$ -
<b>4.00</b>	<b><u>Decant</u></b>				
4.01	Borrow, transport, place, moisture condition and compact mine waste material to decant accessway	m <sup>3</sup>	37,500	\$ 4.05	\$ 151,800
4.02	Place selected mine waste to build windrows on both sides of the decant accessway	m <sup>3</sup>	520	\$ 12.75	\$ 6,632
4.03	Sheet perimeter embankment and decant accessway crests with 0.1 m base course	m <sup>3</sup>	360	\$ 18.39	\$ 6,620
4.04	Win, haul and place select filter rock to decant ring	m <sup>3</sup>	2,300	\$ 18.39	\$ 42,294
<b>5.00</b>	<b><u>Underdrainage</u></b>				
5.01	Supply and install Megafllo 450 underdrainage, including aggregate, geotextile	m	0	\$ -	\$ -
5.02	Supply and install 250 dia underdrainage outfall pipe	m	0	\$ -	\$ -
<b>6.00</b>	<b><u>Miscellaneous</u></b>				
6.01	QA/QC including enginer visits and QA/QC testing	Allow			\$ 132,250
6.02	Raise and re-install tailings deposition pipeline		see item 3.08		
6.03	Raise and re-install decant return water pipeline		by others		
6.04	Raise and re-install decant pumps, underdrainage bore pump		by others		
6.05	Raise and re-install electrical equipment		by others		
	<b>SUB-TOTAL</b>				<b>\$ 2,009,808</b>
	<b>No Contingency</b>				<b>\$ -</b>
	<b>TOTAL COST (excl. GST)</b>				<b>\$ 2,009,808</b>

Notes:

**PROJECT** TSF CELL 1 STAGE 3  
**CLIENT** WILDCAT RESOURCES  
**LOCATION** TABBA TABBA

Item	Description	Unit	Quantity	Rate	Amount
<b>1.00</b>	<b><u>Preliminaries</u></b>				
1.01	Site establishment and general cost (including mobilisation and demobilisation)	Item			\$ 247,589
			10% of earthworks cost excluding liner and underdrainage		
<b>2.00</b>	<b><u>Preliminaries &amp; Site Preparation</u></b>				
2.01	Clear and Grub TSF area	ha	15	\$ 1,572.03	\$ 23,580
2.02	Topsoil Stripping (0.2m ) and move to stockpile	m <sup>3</sup>	30,000	\$ 2.21	\$ 66,240
2.03	Site preparation in TSF basin	m <sup>2</sup>	0	\$ 2.02	\$ -
<b>3.00</b>	<b><u>Perimeter Embankment</u></b>				
3.01	Prepare embankment foundation	m <sup>2</sup>	159,200	\$ 2.02	\$ 322,221
3.02	Excavate cut-off trench under upstream zone of embankment	m <sup>3</sup>	0	\$ -	\$ -
3.03	Backfill cut-off trench under upstream zone of embankment with roller compacted clayey mine waste	m <sup>3</sup>	0	\$ -	\$ -
3.04	Borrow, transport, place, moisture condition and roller compact clay mine waste material to upstream zone of embankment	m <sup>3</sup>	131,400	\$ 11.40	\$ 1,497,500
3.05	Borrow, transport, place, moisture condition and compact mine waste material to downstream zone of embankment (by Mining Fleet)	m <sup>3</sup>	2,541,600	\$ -	\$ -
3.06	Place selected mine waste to build windrows on both sides of embankment.	m <sup>3</sup>	4,500	\$ 12.75	\$ 57,391
3.07	Sheet perimeter embankment crest with 0.1 m base course	m <sup>3</sup>	11,250	\$ 18.39	\$ 206,871
3.08	Remove pipework and replace after raising	m	4,500	\$ -	\$ -
<b>4.00</b>	<b><u>Decant</u></b>				
4.01	Borrow, transport, place, moisture condition and compact mine waste material to decant accessway	m <sup>3</sup>	55,800	\$ 4.05	\$ 225,878
4.02	Place selected mine waste to build windrows on both sides of the decant accessway	m <sup>3</sup>	540	\$ 12.75	\$ 6,887
4.03	Sheet perimeter embankment and decant accessway crests with 0.1 m base course	m <sup>3</sup>	370	\$ 18.39	\$ 6,804
4.04	Win, haul and place select filter rock to decant ring	m <sup>3</sup>	3,400	\$ 18.39	\$ 62,521
<b>5.00</b>	<b><u>Underdrainage</u></b>				
5.01	Supply and install Megafllo 450 underdrainage, including aggregate, geotextile	m	0	\$ -	\$ -
5.02	Supply and install 250 dia underdrainage outfall pipe	m	0	\$ -	\$ -
<b>6.00</b>	<b><u>Miscellaneous</u></b>				
6.01	QA/QC including enginer visits and QA/QC testing	Allow			\$ 132,250
6.02	Raise and re-install tailings deposition pipeline		see item 3.08		
6.03	Raise and re-install decant return water pipeline		by others		
6.04	Raise and re-install decant pumps, underdrainage bore pump		by others		
6.05	Raise and re-install electrical equipment		by others		
	<b>SUB-TOTAL</b>				<b>\$ 2,855,732</b>
	<b>No Contingency</b>				<b>\$ -</b>
	<b>TOTAL COST (excl. GST)</b>				<b>\$ 2,855,732</b>

**Notes:**

**PROJECT** TSF CELL 2  
**CLIENT** WILDCAT RESOURCES  
**LOCATION** TABBA TABBA

Item	Description	Unit	Quantity	Rate	Amount
<b>1.00</b>	<b><u>Preliminaries</u></b>				
1.01	Site establishment and general cost (including mobilisation and demobilisation)	Item			
			10% of earthworks cost excluding liner and underdrainage		
<b>2.00</b>	<b><u>Preliminaries &amp; Site Preparation</u></b>				
2.01	Clear and Grub TSF area	ha	180	\$ 1,572.03	\$ 282,965
2.02	Topsoil Stripping (0.2m ) and move to stockpile	m <sup>3</sup>	360,000	\$ 2.21	\$ 794,880
2.03	Site preparation in TSF basin	m <sup>2</sup>	1,340,000	\$ 2.02	\$ 2,712,160
<b>3.00</b>	<b><u>Perimeter Embankment</u></b>				
3.01	Prepare embankment foundation	m <sup>2</sup>	1,012,000	\$ 2.02	\$ 2,048,288
3.02	Excavate cut-off trench under upstream zone of embankment	m <sup>3</sup>	16,400	\$ 9.07	\$ 148,805
3.03	Backfill cut-off trench under upstream zone of embankment with roller compacted clayey mine waste	m <sup>3</sup>	16,400	\$ 11.40	\$ 186,903
3.04	Borrow, transport, place, moisture condition and roller compact clay mine waste material to upstream zone of embankment	m <sup>3</sup>	427,800	\$ 11.40	\$ 4,875,423
3.05	Borrow, transport, place, moisture condition and compact mine waste material to downstream zone of embankment ( <b>by Mining Fleet</b> )	m <sup>3</sup>	5,854,200	\$ -	\$ -
3.06	Place selected mine waste to build windrows on both sides of embankment.	m <sup>3</sup>	15,840	\$ 12.75	\$ 202,015
3.07	Sheet perimeter embankment crest with 0.1 m base course	m <sup>3</sup>	39,900	\$ 18.39	\$ 733,701
<b>4.00</b>	<b><u>Decant</u></b>				
4.01	Borrow, transport, place, moisture condition and compact mine waste material to decant accessway	m <sup>3</sup>	172,560	\$ 4.05	\$ 698,523
4.02	Place selected mine waste to build windrows on both sides of the decant accessway	m <sup>3</sup>	1,872	\$ 12.75	\$ 23,875
4.03	Sheet perimeter embankment and decant accessway crests with 0.1 m base course	m <sup>3</sup>	1,296	\$ 18.39	\$ 23,831
4.04	Win, haul and place select filter rock to decant ring	m <sup>3</sup>	11,040	\$ 18.39	\$ 203,009
<b>5.00</b>	<b><u>Underdrainage</u></b>				
5.01	Supply and install Megaflo 450 underdrainage, including aggregate, geotextile	m	7,200	\$ 172.50	\$ 1,242,000
5.02	Supply and install 250 dia underdrainage outfall pipe	m	240	\$ 155.25	\$ 37,260
5.03	Install underdrainage sump	item	2		
<b>6.00</b>	<b><u>Miscellaneous</u></b>				
6.01	QA/QC including engineer visits and QA/QC testing	Allow			
6.02	Supply and install 14 no. VWP Piezometers				
6.02	Raise and re-install tailings deposition pipeline		see item 3.08		
6.03	Raise and re-install decant return water pipeline		by others		
6.04	Raise and re-install decant pumps, underdrainage bore pump		by others		
6.05	Raise and re-install electrical equipment		by others		
	<b>SUB-TOTAL</b>				<b>\$ 14,213,638</b>
	<b>No Contingency</b>				<b>\$ -</b>
	<b>TOTAL COST (excl. GST)</b>				<b>\$ 14,213,638</b>

**Notes:**

**PROJECT** TSF CELL 3  
**CLIENT** WILDCAT RESOURCES  
**LOCATION** TABBA TABBA

Item	Description	Unit	Quantity	Rate	Amount
<b>1.00</b>	<b><u>Preliminaries</u></b>				
1.01	Site establishment and general cost (including mobilisation and demobilisation)	Item			
			10% of earthworks cost excluding liner and underdrainage		
<b>2.00</b>	<b><u>Preliminaries &amp; Site Preparation</u></b>				
2.01	Clear and Grub TSF area	ha	180	\$ 1,572.03	\$ 282,965
2.02	Topsoil Stripping (0.2m ) and move to stockpile	m <sup>3</sup>	360,000	\$ 2.21	\$ 794,880
2.03	Site preparation in TSF basin	m <sup>2</sup>	1,340,000	\$ 2.02	\$ 2,712,160
<b>3.00</b>	<b><u>Perimeter Embankment</u></b>				
3.01	Prepare embankment foundation	m <sup>2</sup>	1,012,000	\$ 2.02	\$ 2,048,288
3.02	Excavate cut-off trench under upstream zone of embankment	m <sup>3</sup>	16,400	\$ 9.07	\$ 148,805
3.03	Backfill cut-off trench under upstream zone of embankment with roller compacted clayey mine waste	m <sup>3</sup>	16,400	\$ 11.40	\$ 186,903
3.04	Borrow, transport, place, moisture condition and roller compact clay mine waste material to upstream zone of embankment	m <sup>3</sup>	427,800	\$ 11.40	\$ 4,875,423
3.05	Borrow, transport, place, moisture condition and compact mine waste material to downstream zone of embankment ( <b>by Mining Fleet</b> )	m <sup>3</sup>	5,854,200	\$ -	\$ -
3.06	Place selected mine waste to build windrows on both sides of embankment.	m <sup>3</sup>	15,840	\$ 12.75	\$ 202,015
3.07	Sheet perimeter embankment crest with 0.1 m base course	m <sup>3</sup>	39,900	\$ 18.39	\$ 733,701
<b>4.00</b>	<b><u>Decant</u></b>				
4.01	Borrow, transport, place, moisture condition and compact mine waste material to decant accessway	m <sup>3</sup>	172,560	\$ 4.05	\$ 698,523
4.02	Place selected mine waste to build windrows on both sides of the decant accessway	m <sup>3</sup>	1,872	\$ 12.75	\$ 23,875
4.03	Sheet perimeter embankment and decant accessway crests with 0.1 m base course	m <sup>3</sup>	1,296	\$ 18.39	\$ 23,831
4.04	Win, haul and place select filter rock to decant ring	m <sup>3</sup>	11,040	\$ 18.39	\$ 203,009
<b>5.00</b>	<b><u>Underdrainage</u></b>				
5.01	Supply and install Megaflo 450 underdrainage, including aggregate, geotextile	m	7,200	\$ 172.50	\$ 1,242,000
5.02	Supply and install 250 dia underdrainage outfall pipe	m	240	\$ 155.25	\$ 37,260
5.03	Install underdrainage sump	item	2		
<b>6.00</b>	<b><u>Miscellaneous</u></b>				
6.01	QA/QC including engineer visits and QA/QC testing	Allow			
6.02	Supply and install 14 no. VWP Piezometers				
6.02	Raise and re-install tailings deposition pipeline		see item 3.08		
6.03	Raise and re-install decant return water pipeline		by others		
6.04	Raise and re-install decant pumps, underdrainage bore pump		by others		
6.05	Raise and re-install electrical equipment		by others		
	<b>SUB-TOTAL</b>				<b>\$ 14,213,638</b>
	<b>No Contingency</b>				<b>\$ -</b>
	<b>TOTAL COST (excl. GST)</b>				<b>\$ 14,213,638</b>

**Notes:**

# APPENDIX C

## Tailings Lab Test Results

## C-1 Tailings Geochemical Results

# Tabba Tabba Project

## *Tailings Characterisation Report – DRAFT*

4 February 2025

J-AU0389-002-R-RevA



**Tabba Tabba Project**  
*Tailings Characterisation Report – DRAFT*

Document Number: J-AU0389-002-R-RevA

Document Date: 4 February 2025

Prepared for:

**WILDCAT RESOURCES LIMITED**

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Prepared by:

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REVISION	DATE	AUTHOR	RECORD OF REVIEW
A	4 February 2025	JW	JP

## EXECUTIVE SUMMARY

Mine Waste Management Pty Ltd (MWM) has developed this tailings geochemical characterisation report for Wildcat Resources Limited's (WRL) Tabba Tabba Lithium-Tantalum Project (Tabba Tabba). This report was completed in accordance with MWM proposal J-AU0389-002-P-Rev0 (11 January 2024).

The objectives of this scope of work were to complete a geochemical waste characterisation of the tailings sample provided and use the collected data to assess the potential for geoenvironmental hazards to exist within the provided Tabba Tabba tailings sample.

The scope of work completed included development of a sampling and analysis plan, coordination of the laboratory program, analysis and interpretation of the collected data, and reporting of the potential geoenvironmental hazards for the project.

The key findings are:

- The risk of generating neutral metalliferous drainage or saline drainage associated with neutralisation of oxidation products (derived from sulfide minerals) is unlikely from the tested tailings sample.
- Mineral fibres were not detected in the tailings sample submitted for fibrous mineral screening, suggesting a low hazard potential.
- The leachate generated from static leach testing was circum-neutral, fresh, and generally contained low levels of anions, cations, and trace elements, suggesting a low metal leaching potential.
- Based on the total uranium and thorium concentration of the tailings sample tested, combined head-of-chain activity concentrations for the natural U and Th decay series was 0.04 Bq/g. Therefore, the NORM hazard potential for the materials tested is low.
- The tailings samples tested has a low acid generating hazard potential due to containing very low total sulfur and sulfide concentrations.

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## 1 INTRODUCTION

Mine Waste Management Pty Ltd (MWM) has developed this geochemical tailing characterisation report for Wildcat Resources Limited's (WRL) Tabba Tabba Lithium-Tantalum Project (Tabba Tabba). This report was completed in accordance with MWM proposal J-AU0389-002-P-Rev0 (11 January 2024).

### 1.1 Objectives

The objectives of this scope of work were to:

- Complete a geochemical waste characterisation of the tailings sample provided.
- Use the collected data to assess the potential for geoenvironmental hazards to exist within the provided Tabba Tabba tailings sample.

### 1.2 Scope of Work

The following scope of works was completed:

- TASK 1 – Develop a sampling and analysis plan (SAP) and provide assistance to WRL in selecting appropriate proxy tailings samples.
- TASK 2 – Coordinate laboratory program. Liaise with the selected commercial laboratory during the analysis program.
- TASK 3 – Data analysis and interpretation. Collate, analyse, and interpret the dataset to identify the environmental geochemistry hazards for the project.
- TASK 4 – Report preparation. Develop a concise report that discusses the potential environmental geochemistry hazards for the project. Where required, provide further works recommendations including recommendations for the development of practicable management options for identified geochemical hazards.

## 2 **PROJECT SETTING**

The following section provides basic Tabba Tabba Project background and geology information.

### 2.1 **Background**

The Project tenements are located approximately 50 kilometres southeast of Port Hedland and have been the focus of historic alluvial tin and tantalum mining (early 20<sup>th</sup> century) as well as more recent mining and processing of tantalum ores by the Pilbara Minerals / Nagrom joint venture. Recent mining occurred during 2015, after which the process infrastructure was removed, and existing mine landforms were rehabilitated. The tenements are currently occupied by a shallow open pit and rehabilitated waste rock dump, tailings storage facility (TSF), and stockpiles (run of mine and low-grade ore).

The lithium resource is hosted across numerous pegmatite outcrops, and WRL are currently undertaking a drilling program to establish a maiden lithium resource estimate (current resource is defined for tantalum). WRL is planning an open pit lithium operation which, over a projected 13 year mine life, will likely consume the existing pit, rehabilitated waste rock dump, and low grade ore stockpile.

### 2.2 **Geology**

The main Tabba Tabba pegmatite intrusive outcrops as a southeast to north-westerly striking body at the surface. It dips to the northeast at 35-40° over a distance of approximately 500 m and has a maximum width of up to 70 m. It is thickest in its south-eastern portion and reduces to some 8-10 m width two-thirds of the way along its outcropping length until it disappears below the detritus (interpreted as granite/granodiorite basement) to the northwest. The pegmatite has intruded a narrow, southwest to northeast trending greenstone belt comprising a sheared metagabbro sill of amphibolite facies on the south-western boundary of the main pegmatite and mafic schists and amphibolite of the Warrawoona Group Sediments from the southeast to northwest of the pegmatite. The weathering profile at Tabba Tabba is very thin, and that negligible volumes of highly weathered waste rock ('oxide') are expected to be disturbed during mining.

### 2.3 **Predicted Material Volumes**

The Project has a proposed 11 years of mining with an additional 2 years of ore processing. Figure 1 and Table 1 present material quantities per type for the project and predicted schedule.<sup>1</sup> WRL has recently developed a sulfur block model for the deposit. Interrogation of the provided block model export for modelled sulfur content is provided in Table 2 and Figure 2.

---

<sup>1</sup>Quantities and schedule provided by Wildcat Resources (Matt Holmes) 22 October 2024.

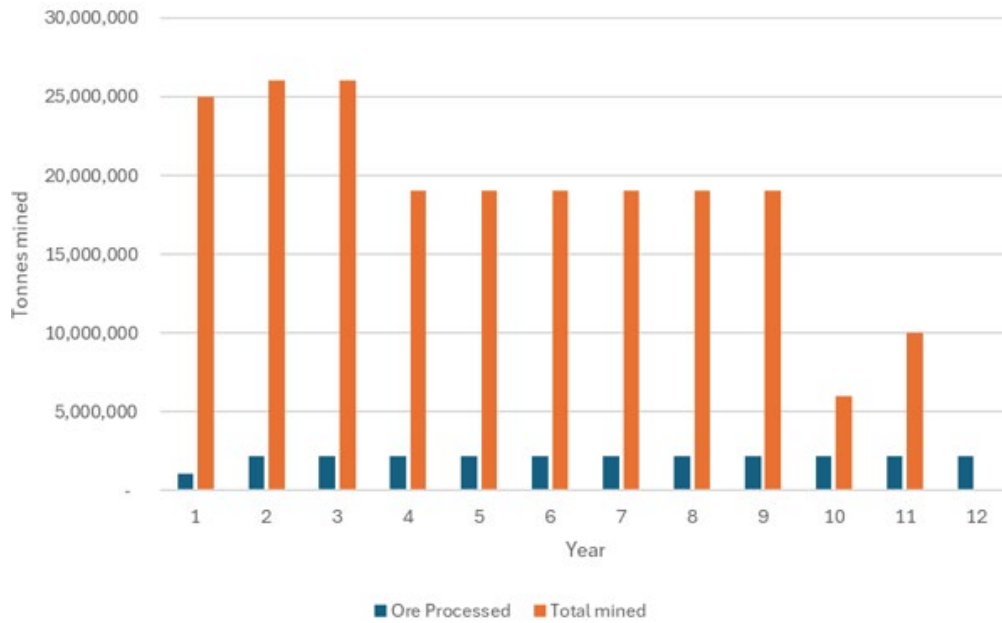


Figure 1: Materials schedule.

Table 1: Predicted material quantities to be mined over an 11-year period.

ROCK TYPE	ORE TONNES	WASTE TONNES	% OF TOTAL WASTE
<b>TRANSITION</b>			
Dolerite		8,100,000	4.3
Pegmatite		1,100,000	0.6
Proterozoic Dolerite		700,000	0.4
Cordierite-Biotite Schist		6,600,000	3.5
<b>FRESH</b>			
Dolerite		109,000,000	57.9
Pegmatite	24,000,000	13,400,000	7.1
Proterozoic Dolerite		9,700,000	5.1
Cordierite-Biotite Schist		39,800,000	21.1
<b>TOTAL</b>	<b>24,000,000</b>	<b>188,400,000<sup>1</sup></b>	

<sup>1</sup>Approximately equivalent to 65,000,000 m<sup>3</sup>.

Table 2: Block model results.

MATERIAL TYPE	VOLUME (m <sup>3</sup> )	MASS (t)	MASS (t) WITH S ≥0.2 wt%	% OF BLOCKS WITH S ≥0.2 wt%
1 (ore)	14,416,000	38,419,000	0	0.0%
2 (waste)	58,921,000	173,818,000	6,085,000	3.5%
<b>TOTAL</b>	<b>73,337,000</b>	<b>212,237,000</b>	<b>6,085,000</b>	<b>2.8%</b>

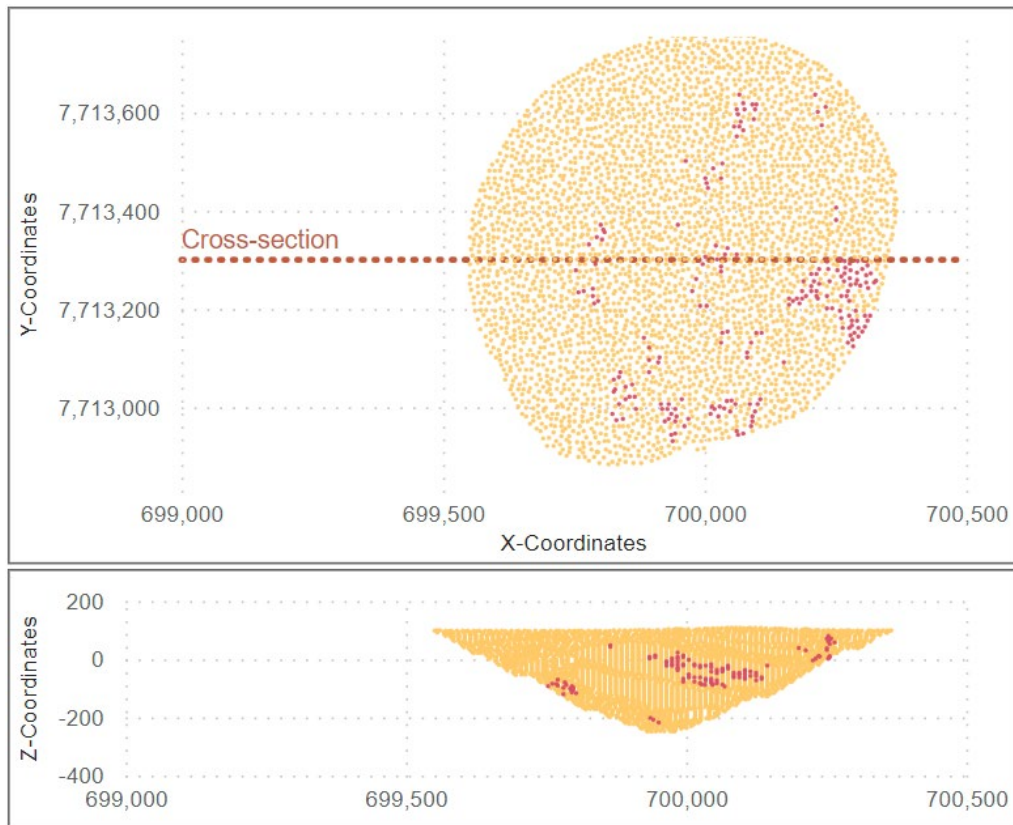


Figure 2: Block model export demonstrating approximate distribution of blocks with modelled sulfur greater than 0.2 wt% S (red circles).

### 3 MATERIALS CHARACTERISATION METHOD

The following section provides details for the sample selection method, analysis program development, and the geochemical tailings hazard assessment approach.

#### 3.1 Sample Selection and Sampling

MWM liaised with WRL and BHM Process Consultants to obtain representative tailings material for the program. Due to the stage of the project, only one tailings slurry sample could be provided to ALS Environmental for testing. This sample was to be split between geochemical and geotechnical testwork. Therefore, MWM coordinated the splitting of the slurry so that separate tailings samples were available for both programs without having to rely upon retesting of already tested material.



Figure 3: Slurry samples received by ALS Environmental.

ALS Environmental decanted the supernatant and dried the residue to recover approximately 7.5 kg of solids. ALS Environmental retained approximately 1.2 kg for the geochemical testing program and approximately 0.1 L of the supernatant for water quality analysis. The remaining material was provided to CMW Geosciences for geotechnical test work. Although initially retaining the supernatant for water quality analysis, the laboratory mistakenly discarded the supernatant. Therefore, leaching tests of the collected solids were added to the program to obtain data for potential leachable constituents.

#### 3.2 Analysis Program

Table 3 presents the laboratory analyses completed for the recovered tailings solids.

Table 3: Analysis program.

PARAMETER	SAMPLES
Paste pH/EC	1
Total sulfur (LECO – combustion furnace)	1
Acid neutralisation capacity (ANC)	1
Total carbon (TC)	1
Sulfide sulfur (chromium reducible sulfur)	1
Net acid generating (NAG) testing	1
Mineralogy (XRD)	1

PARAMETER	SAMPLES
Total elemental analysis	1
Short-term leach testing	
Exchangeable cations	1
Soil particle density	1
Soil classification	1
Asbestos presence/absence	1

### 3.3 Hazard Assessment

To facilitate the hazard assessment, the laboratory test results received have been subjected to quality assurance and quality control (QA/QC), tabulation, figure generation, and interpretation. The key interpretation components of the characterisation have and will include:

- Hazard classification of the materials for acidic seepage potential using best-practise acid base accounting (ABA) approaches (e.g., non-acid forming, potentially acid forming, acid forming).
- Screening of leachate testing results for indications that the materials tested may generate saline and/or neutral metalliferous drainage (acid base accounting results will also be considered in this hazard screening).
- Identification of elemental enrichment patterns versus typical levels in crustal rock.
- Screening for naturally occurring radioactive materials (NORM) related to natural uranium and thorium series radionuclides, as calculated from total uranium and thorium concentrations.
- Screening for potential presence of fibrous minerals, based on mineralogical test results

## 4 RESULTS AND DISCUSSION

Key results from laboratory testing are reported and discussed in this section with supporting information found in:

- Appendix B: Tabulated Results;
- Appendix C: Laboratory Method Details;
- Appendix D: Results Dashboard; and
- Appendix E: Laboratory Certificates.

### 4.1 Acid Generating Potential

This assessment is designed to identify specific potential acid generation or acid neutralisation characteristics associated with the tailings material. It was completed to highlight both acid generation hazards as acid neutralisation capacity.

The key data source interrogated was the environmental geochemical dataset for the single tailings sample. The environmental geochemical dataset was used to assess the geochemical properties of key materials via standard industry AMD<sup>2</sup> characterisation procedures (Appendix C). ABA was conducted to predict the acid generation characteristics tailings material through determination of the ANC, the maximum potential acidity (MPA), and the net acid production potential (NAPP). The environmental geochemical dataset provides detailed results regarding the potential acidity, neutralising potential, and elemental mobility under oxidising conditions.

Key results are:

- The tailings sample has very low total sulfur and sulfide concentrations (<0.01 wt%S and 0.009 wt%S respectively), generated circum-neutral to alkaline (pH<sub>1:2</sub> 8.8) and fresh (EC<sub>1:2</sub> 52 µS/cm) pastes, has a negative NAPP value (-2.4 kg H<sub>2</sub>SO<sub>4</sub>/t), generated a circum-neutral to slightly acidic NAG pH of 6.2, and is classified non-acid forming (NAF). Therefore, the tailings solids tested have a low acid generating hazard potential.
- ANC is low for the tailings samples (2.7 kg H<sub>2</sub>SO<sub>4</sub>/t), supported by ABCC testing. Therefore, there is little available buffering capacity within the tailings solids.

### 4.2 Saline and Neutral Metalliferous Drainage Potential

High sulfate is a characteristic of both neutral metalliferous drainage (NMD) and saline drainage (SD), therefore, in the absence of elevated sulfur, NMD and SD would be unlikely. Sulfur and ANC results were interrogated to identify high sulfur material (>1 wt%S) with accompanying high ANC so that the resulting NAPP is either negative or slightly positive.

The risk of generating NMD or SD associated with neutralisation of oxidation products is unlikely, when assessing the sample results presented in Appendix B. The tailings sample collected contained less than 0.1 wt%S.

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<sup>2</sup> Acid and metalliferous drainage

### 4.3 Elemental Enrichment

Concentrations of major and trace elements in the samples were used to calculate geochemical abundance index (GAI) values, which provide an indication of elemental enrichment relative to the average abundance of a specific element in rocks of the Earth's crust (see Appendix C for further detail). Full elemental composition results, as well as the corresponding GAI values, are presented in Tables B3 and B4 (Appendix B). A GAI of 0 indicates that the content of the element is less than, or similar to, the average crustal abundance, whereas a GAI of 3 corresponds to a 12-fold enrichment above the average crustal-abundance. Generally, a GAI of 3 or greater signifies enrichment that warrants further examination such as leachate testing. It is also important to note that elemental enrichment is not unexpected in samples from mineralised areas and that enrichment does not necessarily mean that specific elements will be environmentally mobile and bioavailable. Elements that were found to be enriched in the samples tested are presented in Table 4.

Table 4: Elements with GAI values  $\geq 3$  (enriched).

ELEMENT	GAI	CONCENTRATION (mg/kg)	AVERAGE CRUSTAL ABUNDANCE (mg/kg)
Cs	4	50	430
Li	5	1905	30
Mo	4	329	900
Te	4	22	70

NOTE: Tellurium (Te) was not measured above the limit of reporting. The exceedance noted is due to the application of half the LOR in the GAI calculation.

### 4.4 Metal Leaching Potential

The tailings solids sample was subjected to leach testing with deionised (DI) water at a 2:1 liquid to solid ratio. The leachate test results are presented in Table B5 (Appendix B), with the key findings being:

- The leachate generated was circum-neutral (pH = 7.5) and fresh (EC = 80  $\mu\text{S}/\text{cm}$ ).
- Aluminium (1.43 mg/L) was the only element measured above 1 mg/L.
- Iron (0.18 mg/L), lithium (0.237 mg/L), and manganese (0.15 mg/L) were identified at concentrations between 0.1 and 1 mg/L.

### 4.5 Naturally Occurring Radioactive Materials

Naturally occurring radioactive materials (NORMs) are typically geological materials enriched with respect to long-lived radioactive isotopes arising from the presence of elevated levels of uranium ( $^{238}\text{U}$  decay series) and thorium ( $^{232}\text{Th}$  decay series). The activity concentrations (level of radioactivity present at the source) of geological samples can be calculated based on elemental concentrations (U and Th), assuming secular equilibrium and using established specific activities. Note that the assumption of secular equilibrium is valid for the waste rock materials tested, given no chemical alteration of the materials is expected to occur.

Specific activities, which relate elemental concentration to activity concentration for naturally occurring proportions of the isotopes considered, were 12,500 Bq/g U ( $^{238}\text{U}$ ) and 4,090 Bq/g Th ( $^{232}\text{Th}$ ) (DMP, 2010; IAEA, 2006).

Based on the total uranium and thorium concentrations of the samples tested (Table B3, Appendix B), combined head-of-chain activity concentrations for the natural U and Th decay series was <0.04 Bq/g. A level of 1 Bq/g head of chain activity concentration is considered 'inherently safe' for uranium and thorium series radionuclides (IAEA, 2004; IAEA, 2006) and the materials tested would not be classifiable as radioactive wastes for the purposes of occupational safety management or in relation to restrictions on transporting the materials (ARPANSA, 2014).

#### **4.6 Fibrous Minerals Potential Screening**

The collected sample was submitted for fibrous minerals screening. Fibres were not detected in the sample suggesting a low hazard potential for the tailing material (Table B2, Appendix B).

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## **5 KEY FINDINGS AND RECOMMENDATIONS**

The following sections provide key preliminary findings and potential management implications.

### **5.1 Summary of Key Findings**

The key findings are:

- The risk of generating NMD or SD associated with neutralisation of oxidation products (derived from sulfide minerals) is unlikely from the tested tailings sample, presented in Appendix B.
- Mineral fibres were not detected in the tailings sample submitted for fibrous mineral screening, suggesting a low hazard.
- The leachate generated from static leach testing was circum-neutral, fresh, and generally contained low levels of anions, cations, and trace elements, suggesting a low metal leaching potential.
- Based on the total uranium and thorium concentration of the tailings sample tested, combined head-of-chain activity concentrations for the natural U and Th decay series was 0.04 Bq/g. Therefore, the NORM hazard potential for the materials tested is low.
- The tailings samples tested has a low acid generating hazard potential due to containing very low total sulfur and sulfide concentrations.

### **5.2 Implications for Management**

Based on the results, limited if any, management is required to manage the environmental geochemistry hazards assessed. However, this is based off one sample and therefore could require confirmatory testing throughout the project lifecycle.

### **5.3 Recommendations**

The key recommendation is to continue to test the low environmental geochemistry hazard assumption:

- Further testing should be completed once more material is available via pilot processing programs that covers the range of ore to be processed.
- Ongoing routine testing (weekly/monthly) throughout operations should be completed to continuously confirm key parameters and characteristics of the material with time.

## 6 REFERENCES

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## 7 LIMITATIONS

Attention is drawn to the document “Limitations”, which is included in Appendix F of this report. The statements presented in this document are intended to provide advice on what the realistic expectations of this report should be, and to present recommendations on how to minimise the risks associated with this project. The document is not intended to reduce the level of responsibility accepted by Mine Waste Management, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in doing so.

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**APPENDIX A ABBREVIATIONS AND DEFINITIONS**

ABBREVIATION	DEFINITION
ABA	Acid base accounting
ABCC	Acid buffering characteristic curve
AD	Acidic drainage
AMD	Acid and metalliferous drainage, which can also include low metal saline drainage
AMDMP	Acid and metalliferous drainage management plan
ANC	Acid neutralisation capacity
CSM	Conceptual site model
DWER	Department of Water and Environmental Regulation
DMIRS	Department of Mines, Industry Regulation and Safety
LOM	Life of mine
Mt	Million tonnes
MPA	Maximum potential acidity
MWM	Mine Waste Management Pty Ltd
NAF	Non-acid forming
NAPP	Net acid production potential
NP	Net percolation
PAF	Potentially acid forming
PSD	Particle size distribution
QA/QC	Quality assurance and quality control
ROM	Run of mine
SD	Saline drainage
TSF	Tailings storage facility
WRD	Waste rock dump

TERM	DEFINITION
Acid Base Accounting	Conducted to predict acid generation and neutralisation characteristics of a waste rock material.
Acid Neutralisation Capacity	This is a measure of the insitu neutralising potential of a sample. Expressed as kg H <sub>2</sub> SO <sub>4</sub> equivalent per tonne.
Acid and Metalliferous Drainage	Includes both acidic drainage typically caused from the oxidation of exposed sulfides, and metalliferous drainage resulting from elevated levels of toxic metals and salinity. Saline drainage can also occur. In all instances sulfate is high.
Acidic Drainage	A form of AMD, characterised by low pH, elevated toxic metal concentrations, high sulfate concentrations and high salinity.
Maximum Potential Acidity	Is a measure of the insitu acid production of a sample. Expressed as kg H <sub>2</sub> SO <sub>4</sub> equivalent per tonne.
Metalliferous Drainage	A form of AMD characterised by near-neutral pH, elevated heavy metal concentrations, and high sulfate salinity.
Net Acid Production Potential	Is a measure of the samples overall acid generating capacity and is calculated by subtracting the ANC from MPA. A negative NAPP indicates a net neutralising capacity and a positive NAPP indicates a net acid generating capacity. NAPP, MPA, and ANC are expressed in kg H <sub>2</sub> SO <sub>4</sub> per tonne equivalent.

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**APPENDIX B TABULATED RESULTS**

DATA TYPE			ACID-BASE ACCOUNTING										SINGLE ADDITION NAG			AMD CLASS.
PARAMETER			pH <sub>1,2</sub>	EC <sub>1,2</sub>	TS	CRS	MPA	ANC	ENC	NAPP	ANC/MPA	TC	NAG pH	NAG <sub>4,5</sub>	NAG <sub>7</sub>	
UNITS			pH unit	µS/cm	wt.%S	kg H <sub>2</sub> SO <sub>4</sub> /t				no unit	%	pH unit	kg H <sub>2</sub> SO <sub>4</sub> /t			
SAMPLE ID	MATERIAL	LOR	0.1	10	0.01	0.01		0.5	0.1	0.5		0.01	0.1	0.1	0.1	
Tails	TAILINGS		8.8	52	<0.01	0.009	0.3	2.7	1.2	-2.4	9.8	0.06	6.2		5.4	NAF

**KEY**

pH<sub>1,5</sub> = pH of 1:5 extract

EC<sub>1,5</sub> = Electrical Conductivity of 1:5 extract (µS/m)

TS = Total Sulfur

CRS = Sulfide Sulfur

MPA = Maximum Potential Acidity (kg H<sub>2</sub>SO<sub>4</sub>/t) = CRS x 30.6

ANC = Acid Neutralising Capacity (kg H<sub>2</sub>SO<sub>4</sub>/t)

Effective Neutralising Capacity (ENC) = ABCC @pH4.5

NAPP = Net Acid Producing Potential (kg H<sub>2</sub>SO<sub>4</sub>/t) = MPA - ANC

TC = Total Carbon

PARAMETER			XRD																	FIBRE SCREENING				
			Amphibole group	Boehmite	Chlorite group	Clinopyroxene subgroup	Epidote	Garnet group	Ilmenite	Mica group	Petalite	Potassium Feldspar	Plagioclase	Quartz	Serpentine subgroup	Smectite group	Sodium Plagioclase	Spodumene	Zeolite	Zirconium Titanate	Total	Asbestos Detected	Asbestos (Trace)	Synthetic Mineral Fibre
UNITS			wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%				
SAMPLE ID	MATERIAL	LOR	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
EP2412893	Tailings				<1				5	4	13	37	38				3	<1		100	NO	NO	NO	NO

PARAMETER		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe	Ga	Ge	Hf
UNITS		ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
SAMPLE ID	MATERIAL																	
EP2412893-001	Tailings	0.01	6.92	0.2	50	59.7	1.75	0.29	<0.02	0.9	4.6	252	114.5	16	0.33	36.3	0.05	0.4

PARAMETER		Hg	In	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb
UNITS		ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm
SAMPLE ID	MATERIAL																	
EP2412893-001	Tailings	<0.005	<0.005	2.5	<0.5	1905	0.03	329	53.1	2.98	43.8	232	140	4.3	1965	0.005	<0.01	0.12

PARAMETER		Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr		
UNITS		ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm		
SAMPLE ID	MATERIAL																	
EP2412893-001	Tailings	0.7	<1	36.4	27.9	29.5	<0.05	2.01	<0.005	16.15	2.1	3	1.2	1.2	22	2.3		



PARAMETER			pH	EC	TOT-ALK	SO4 as S	Cl	Ca	K	Mg	Na	Ag	Al	As	Ba	Be	Bi
UNITS			pH units	µS/cm	mg CaCO3 / L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SAMPLE ID	MAT.		0.1	10	1	1	1	1	1	1	1	0.001	0.01	0.001	0.001	0.001	0.001
EP2500512-001	Tailings		7.5	81	38	<1	8	8	1	1	15	<0.001	1.43	<0.001	0.321	0.002	<0.001

PARAMETER			Cd	Co	Cr	Cu	Fe	Hg	La	Li	Mn	Mo	Ni	Pb	Sb	Se	Sn
UNITS			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SAMPLE ID	MAT.		0.0001	0.001	0.001	0.001	0.05	0.00004	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.001
EP2500512-001	Tailings		<0.0001	<0.001	0.008	0.002	0.18	<0.00004	<0.001	0.237	0.15	0.027	0.003	<0.001	<0.001	<0.01	0.001

PARAMETER			Sr	Ta	Te	Th	Ti	Tl	U	V	W	Zn					
UNITS			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					
SAMPLE ID	MAT.	LOR	0.001	0.001	0.005	0.001	0.01	0.001	0.001	0.01	0.001	0.005					
EP2500512-001	Tailings		0.039	<0.001	<0.005	0.002	<0.01	<0.001	0.004	<0.01	<0.001	0.009					

DATA TYPE			EXCHANGEABLE-CATIONS									
PARAMETER			CEC	Ca	Mg	K	Na	Al	Ca	Mg	K	Na
UNITS			meq/100g	meq/100g	meq/100g	meq/100g	meq/100g	meq/100g	%	%	%	%
SAMPLE ID	MATERIAL	LOR	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
EP2412893-001	TAILINGS		0.7	0.6	<0.1	<0.1	0.1	<0.1	74.8	6.2	5.6	13.4

DATA TYPE			PHYSICAL-CLASSIFICATIONS					
PARAMETER			Clay	Silt	Fine Sand	Coarse Sand	Gravel	SPD
UNITS			%	%	%	%	%	g/cm3
SAMPLE ID	MATERIAL	LOR	1.0	1.0	11.0	1.0	1.0	
EP2412893-001	TAILINGS		6.0	14.0	59.0	21.0	<1	2.6

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**APPENDIX C LABORATORY METHODS**

## ACID BASE ACCOUNTING

Acid base accounting (ABA) is conducted to predict the acid generation characteristics of a waste rock material through determination of the acid neutralising capacity (ANC) and the maximum potential acidity (MPA). Although analysis of pH using distilled water is not a standard ABA test, it is often completed to aid in the interpretation of the ABA data as ancillary information.

The net acid production potential (NAPP) is a measure of the samples overall acid generating capacity and is calculated by subtracting the ANC of the sample from the MPA. A negative NAPP indicates that the sample has a net neutralising capacity and a positive NAPP indicates that the sample has a net acid generating capacity. NAPP, MPA, and ANC are expressed in kg H<sub>2</sub>SO<sub>4</sub>/tonne equivalent.

ANC is determined by acid digestion (using HCl) of the sample followed by back-titration (using NaOH) to determine the quantity of acid consumed by neutralising minerals within the rock sample. MPA is based on total wt% sulfur (or wt% sulfide sulfur if available) multiplied by the stoichiometric conversion factor 30.63. This conversion factor is determined from the stoichiometry of pyrite oxidation. NAPP is calculated from the below equation (all units are in kg H<sub>2</sub>SO<sub>4</sub>/tonne):

*Equation:*         $NAPP = MPA - ANC$

Thus potentially acid forming (PAF) rocks have a positive NAPP and non-acid forming (NAF) rocks have a negative NAPP.

ABA analysis typically includes determination of the following:

- Paste pH/EC: Pulverised sample (25 g) is equilibrated with deionised water at a 1:2 ratio and left for 12 hours (or overnight) before pH and EC measurements of the slurry are recorded (AMIRA, 2002).
- Total sulfur (TS): Measured by heating a pulverised sample (< 2 g) in a LECO furnace to ~1,650°C and measuring the sulfur dioxide production. Assay sulfur values measured by XRF analysis on pelletised samples can be used as a substitute for total sulfur measured by LECO.
- Total carbon (TC): Measured by heating a pulverised sample (< 2 g) in a LECO furnace to ~1,650°C and measuring the carbon dioxide production.
- Acid soluble sulfur (SHCl): Method uses hydrochloric acid to extract soluble and slightly soluble sulfate from a pulverised sample (< 2 g). Sulfides should not react and would normally be expelled; extracted sulfur is determined by ICP analysis of the digestion liquor.
- Chromium Reducible Sulfur (CRS): Method is based on the conversion of reduced inorganic sulfur to H<sub>2</sub>S by a hot acidic CrCl<sub>2</sub> solution. The evolved H<sub>2</sub>S is trapped in a zinc acetate solution as ZnS which is then quantified by iodometric titration (Ahern et al., 2004).
- Sulfide sulfur: Typically calculated if both total sulfur and sulfate sulfur (SSO<sub>4</sub>) have been measured.

*Equation:*         $Sulfide\ Sulfur = TS - SSO_4$

- Maximum potential acidity (MPA): A measure of the maximum potential of a sample to generate acidity. MPA can be calculated using TS or sulfide sulfur (all units are in kg H<sub>2</sub>SO<sub>4</sub>/tonne):

*Equation:*       $MPA = TS \times 30.63$

- Acid neutralising capacity (ANC): Measures the amount of hydrochloric acid (HCl) a pulped sample (2 g) can neutralise with gentle heating and the addition of hydrogen peroxide (2 drops of 30%) to dissolve any ferrous iron present (AMIRA, 2002).
- Net acid production potential (NAPP): The NAPP value is calculated as the difference between MPA and ANC as per Equation 1. A negative NAPP value indicates that a sample may have sufficient ANC to prevent acid generation and conversely, if MPA exceeds ANC, the material may be acid generating.
- Single Addition Net Acid Generation (NAG) Test: A pulverised sample (2.5 g) is digested with 250 mL of 15% hydrogen peroxide and allowed to react to completion before measuring the pH of the NAG liquor. The NAG liquor is then titrated with NaOH to pH 4.5 and pH 7. Acidity measured by the titration to pH 4.5 is due to free hydrogen ion as well as acidity from aluminium and iron (AMIRA, 2002). Additional acidity measured by the titration to pH 7 can be attributed to metal hydrolysis reactions such as copper and zinc (AMIRA, 2002).
- Sequential NAG Test: Involves conducting a series of single addition NAG tests to obtain the maximum NAG acidity value. This may be required for high sulfide bearing samples where complete oxidation may not occur. Incomplete oxidation can also be due to the catalytic decomposition of the hydrogen peroxide from high organic carbon contents (AMIRA, 2002).

## TOTAL ELEMENTAL ANALYSIS

The results from solid phase total or near-total analysis such as total elemental (TE) analysis or x-ray fluorescence (XRF) analysis can be used to make an inference regarding elements of potential environmental concern. Results can be assessed using tools such as the geochemical abundance index (GAI) to identify elements that may be enriched in respect to average values. However, an enrichment in a specific element does not imply mobility or bioavailability.

It is important to understand the strengths and weaknesses of each method, particularly the various digestions to ensure drainage predictions are not adversely affected (Price 2009).

Solid samples are digested to enable analysis with inductively coupled plasma mass spectrometry (ICP-MS) or ICP atomic emission spectrometry (ICP-AES). Various digestions can be utilised depending on the mineralogy of the sample or if specific elements are targeted, such as:

- Lithium borate fusion: Lithium borate flux is mixed with a pulped sample to lower the melting point and is then fused to produce a glass disc. The glass disc is either analysed directly by XRF or if a lower detection limit is required, the disc can be dissolved and analysed by ICP (Price, 2009).
- Sodium peroxide fusion: Sodium peroxide and sodium hydroxide is added to a pulped sample before being heated to 550°C. Diluted nitric acid is then used to dissolve the digested residue

before analysis with ICP. This flux is typically used to digest samples with sulfide contents greater than 5% or other refractory or resistant minerals (Price, 2009).

- Four acid digest: Hydrofluoric acid, perchloric acid and nitric acid are added to a pulped sample and taken to near dryness before leaching the nearly dry cake with hydrochloric acid (Price, 2009).
- Aqua regia digest: Samples digested in a heated water bath with a 3:1 mixture of hydrochloric acid and nitric acids (less complete digestion than the four acid digest).

## MINERALOGICAL ANALYSIS

Mineralogical analysis is an essential part of geochemical assessments because the mineralogical properties determine the physical and geochemical stability and relative weathering rates of waste rock under different weathering conditions (Price, 2009). Quantitative mineralogy assessment was undertaken utilising powder x-ray diffraction (XRD) technology using a PANalytical Cubix3 with copper radiation and graphite monochromator. Qualitative analysis was undertaken using Bruker Diffracplus Search/Match (ICDD PDF-2 (2011) database) and SIROQUANT Version 4 software was used for quantitative analysis.

## STATIC LEACH TESTING

Methods for static (or short-term) leach tests can vary widely, however, all tests generally measure readily soluble constituents of mine wastes and geologic materials. The short-term nature of static leach tests provides a snapshot in time of a material's environmental stability. Test results depend entirely on the present disposition of the sample (e.g., unoxidised vs. oxidised; oxidation products absent vs. oxidation products present). For reactive rocks (e.g., material that contains oxidisable sulfur), the transient processes that lead to changes in solution chemistry during water-rock interactions often develop over periods of time that are much greater than is stipulated in the testing protocols. Therefore, the results from short-term leach tests generally cannot be applied to develop reaction rates and predict long-term mine water quality, but should instead be used to get an initial indication of parameters of constituents of interest.

The method was completed on provided pulps. The sample (100 g) was leached with distilled water at a ratio of 20:1 (liquid to solid) for a period of 12 hours (bottle rolled). The leachate was then filtered through a 0.45 µm filter prior to analysis for a range of parameters.

## CARBON SPECIATION

Total carbon (TC) is measured in the sample by oxidising all carbon to carbon dioxide gas in a tube furnace using oxygen to aid the oxidation process. The evolved carbon dioxide is measure by an infra-red cell. The infra-red cell output is calibrated against the value of a known standard sample to provide the TC concentration of the sample.

Total organic carbon (TOC) is measured by pre-treating the sample with hydrochloric acid to remove any inorganic carbon (carbonate). The residual carbon in the sample, representing TOC, is then measured again using the tube furnace and infra-red method.

Total inorganic carbon (TIC) can then be calculated by subtracting TOC from TC:

*Equation:*         $TIC = TC - TOC$

## **ACID BUFFERING CHARACTERISTIC CURVES**

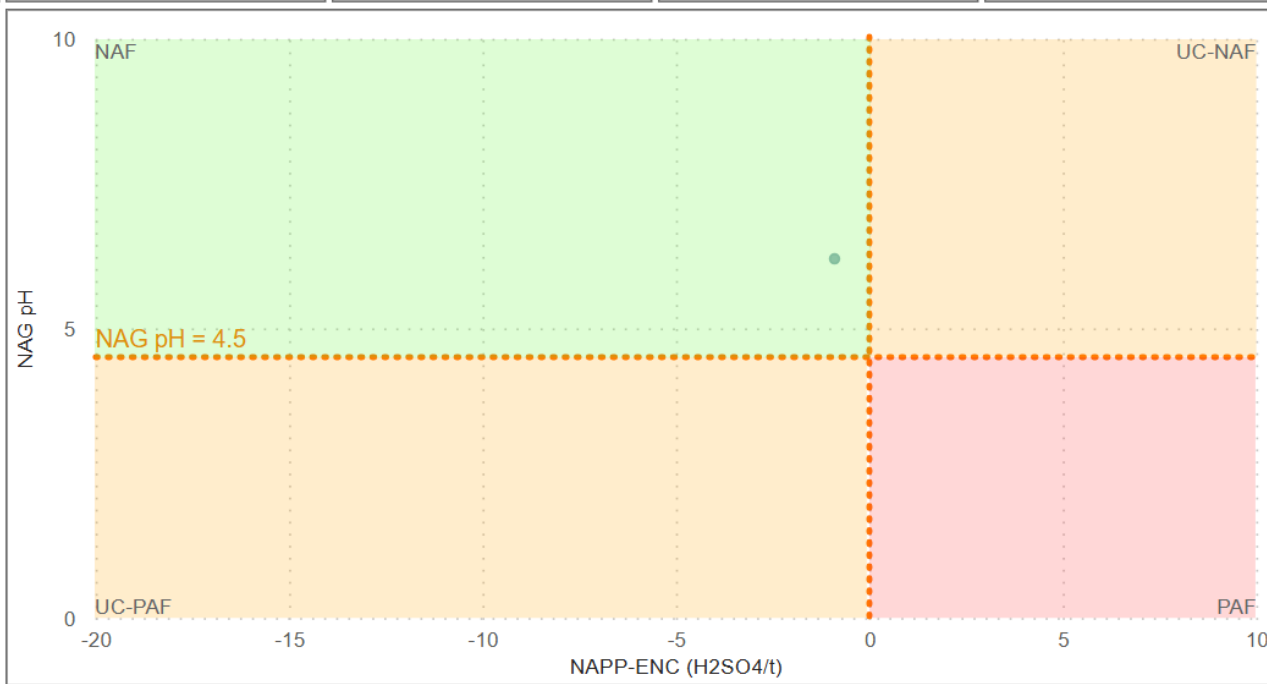
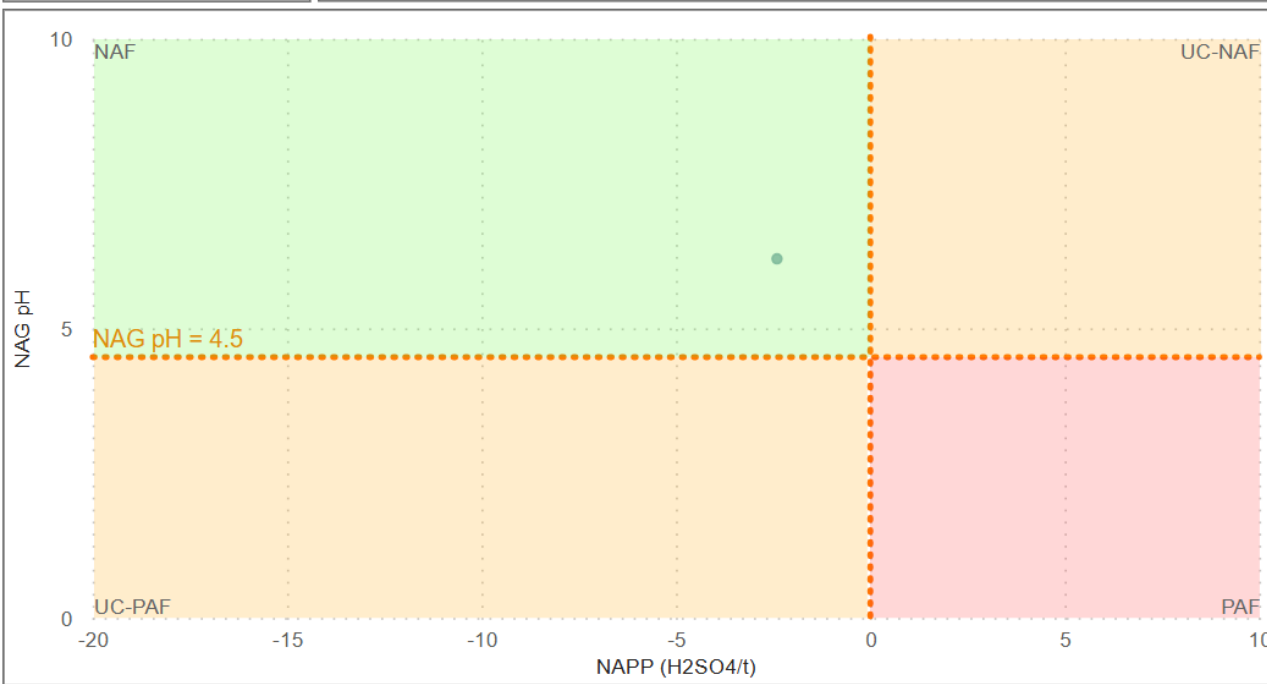
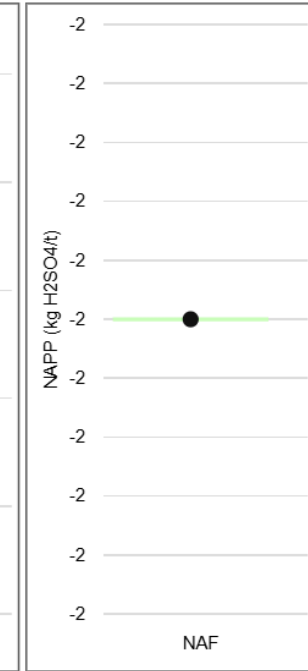
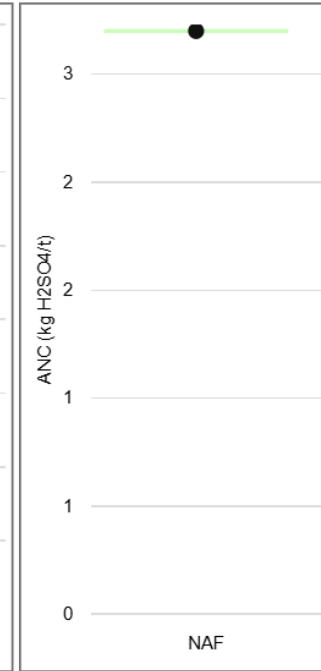
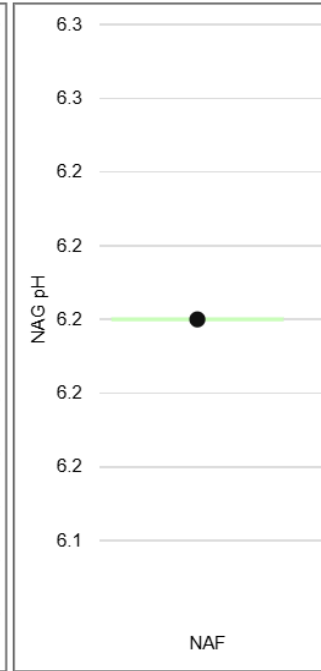
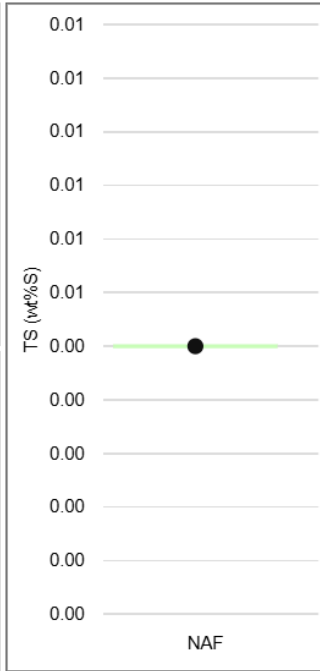
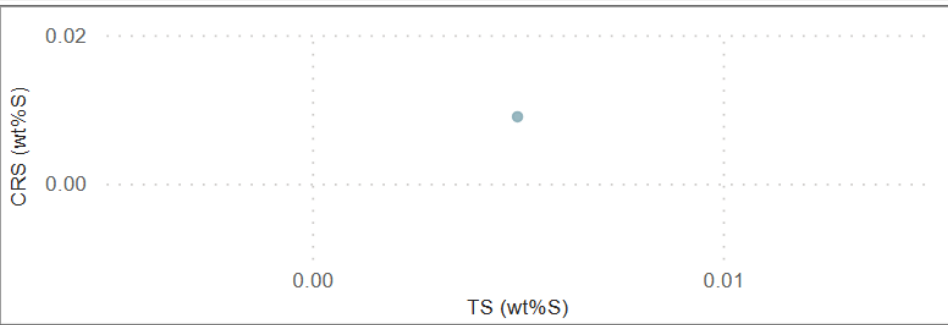
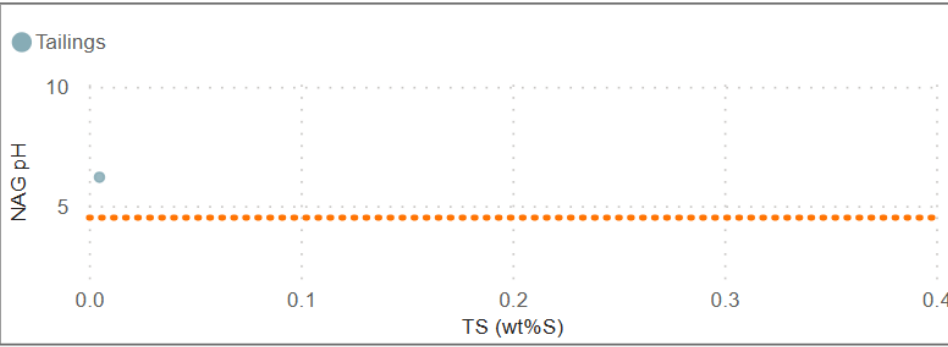
Acid buffering characteristic curve (ABCC) testing (AMIRA, 2002) were carried out to confirm the effective neutralising capacity (ENC) of specific samples. This should be used to provide some indication of reactive and available ANC and then be considered as part of the acid base accounting procedure. The ABCC test involves slow titration of a sample to pH 2.5 with acid while continuously monitoring pH. The ENC is equal to the amount of acid added to decrease the pH to 4.5. These data provide an indication of the portion of the ANC measured in a sample that is readily available for acid neutralisation.

DRAFT

DRAFT

**APPENDIX D RESULTS DASHBOARD**

- Basalt
- Dolerite
- Gabbro
- Interbedded sediments
- Pegmatite
- Phyllite
- Schist
- Siltstone
- Tailings



**APPENDIX E LABORATORY CERTIFICATES**  
*To be provided in final version*

DRAFT

**APPENDIX F LIMITATIONS**

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This Document has been prepared for the particular purpose outlined in MWM's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.

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# MINE WASTE MANAGEMENT

GREENROAD GROUP

## C-2 Tailings Geotechnical Results



SOIL | AGGREGATE | CONCRETE | CRUSHING

**TEST REPORT - AS 1289.3.5.1**

<b>Client:</b>	CMW Geosciences	<b>Ticket No.</b>	S14865
<b>Client Address:</b>	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	<b>Report No.</b>	WG24.16126_1_PD
<b>Project:</b>	IWL TSF, Tappa Tappa Lithium Project	<b>Sample No.</b>	WG24.16126
<b>Location:</b>	Not Specified	<b>Date Sampled:</b>	Not Specified
<b>Sample Identification:</b>	Representative Tailings into TSF	<b>Date Tested:</b>	1/11/2024

**TEST RESULTS - SOIL PARTICLE DENSITY**

**Sampling Method:**

**Sampled by Client, Tested as Received**

Particle Density - Fraction Passing 2.36mm	
<b>Temperature at test (°C)</b>	<b>23.0</b>
<b>Passing 2.36mm Soil apparent particle density (g/cm<sup>3</sup>)</b>	<b>2.62</b>

Particle Density - Fraction Retained 2.36mm	
<b>Retained 2.36mm Soil apparent particle density (g/cm<sup>3</sup>)</b>	<b>N/A</b>

Particle Density - Total Soil Sample	
<b>Total Sample Soil particle density (g/cm<sup>3</sup>)</b>	<b>N/A</b>

**Comments:**

**Approved Signatory:**

**Name:** Madhav Basnet

**Date:** 4/11/2024



**Accreditation No. 20599**  
**Accredited for compliance**  
**with ISO/IEC 17025 - Testing**

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SOIL | AGGREGATE | CONCRETE | CRUSHING

**TEST REPORT - AS 1289.3.8.1**

<b>Client:</b>	CMW Geosciences	<b>Ticket No.</b>	S14865
<b>Client Address:</b>	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	<b>Report No.</b>	WG24.16126_1_ECN
<b>Project:</b>	IWL TSF, Tabba Tabba Lithium Project	<b>Sample No.</b>	WG24.16126
<b>Location:</b>	Not Specified	<b>Date Sampled:</b>	Not Specified
<b>Sample Identification:</b>	Representative Tailings into TSF	<b>Date Tested:</b>	1/11/2024

**TEST RESULTS - Emerson Class Number**

**Sampling Method:** Sampled by Client, Tested as Received  
**Source of Material:** Not Specified  
**Soil Description:** Tailings  
**Water Used:** Distilled

**EMERSON CLASS  
 NUMBER**

**5**

**Comments:**

**Approved Signatory:**

**Name:** Cody O'Neill

**Date:** 04/November/2024



**Accreditation No. 20599**  
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SOIL | AGGREGATE | CONCRETE | CRUSHING

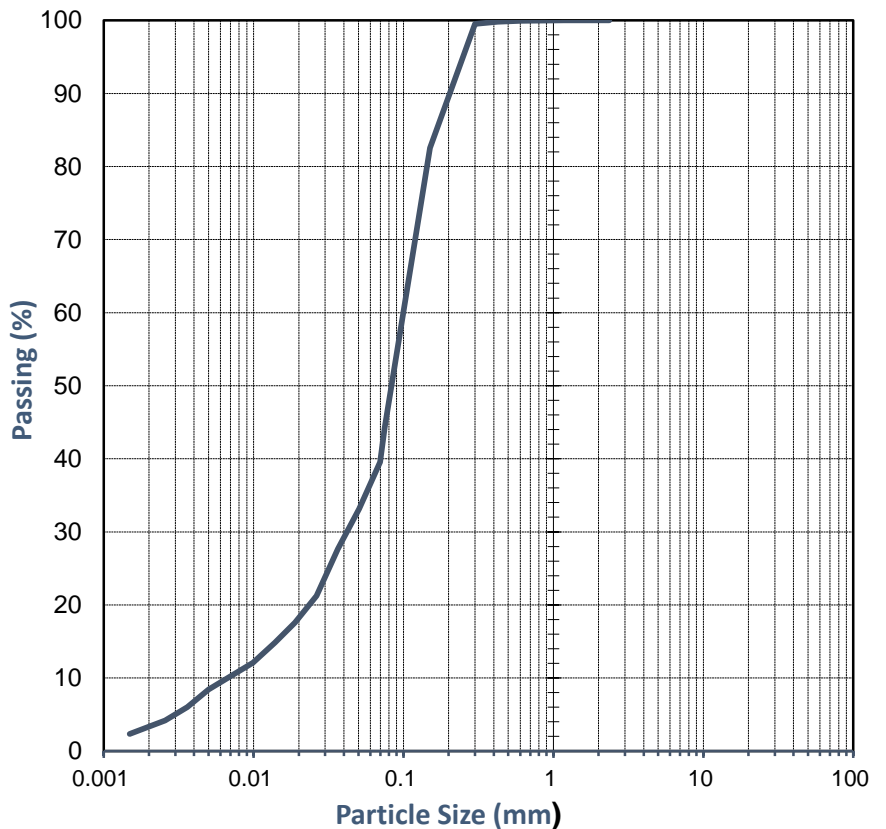
**TEST REPORT - AS 1289.3.6.1, 3.6.3, 3.5.1**

<b>Client:</b>	CMW Geosciences	<b>Ticket No.</b>	S14865
<b>Client Address:</b>	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	<b>Report No.</b>	WG24.16126_1_PSDHY
<b>Project:</b>	IWL TSF, Tabba Tabba Lithium Project	<b>Sample No.</b>	WG24.16126
<b>Location:</b>	Not Specified	<b>Date Sampled:</b>	Not Specified
<b>Sample Identification:</b>	Representative Tailings into TSF	<b>Date Tested:</b>	30/10 - 1/11/2024

**TEST RESULTS - Particle Size Distribution of Soil & Hydrometer Analysis**

<b>Sampling method:</b>	Sampled by Client, Tested as Received
<b>Sample description:</b>	Tailings
<b>Sample preparation:</b>	Oven Dried <50°C
<b>Loss in pre-treatment (%):</b>	N/A
<b>Type of hydrometer:</b>	g/L
<b>Method of dispersion:</b>	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	83
0.075	44
0.070	40
0.050	33
0.036	28
0.026	21
0.019	18
0.014	15
0.010	12
0.007	10
0.005	8
0.004	6
0.003	4
0.001	2



AS 1289.3.5.1 -2.36mm Particle Density (g/cm<sup>3</sup>)  
 2.62

**Comments:**

Approved Signatory:

Name: Madhav Basnet  
 Date: 04/November/2024

**NATA** Accreditation No. 20599  
 Accredited for compliance  
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SOIL | AGGREGATE | CONCRETE | CRUSHING

**TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1**

<b>Client:</b>	CMW Geosciences	<b>Ticket No.</b>	S14865
<b>Client Address:</b>	Suite 1, Level 3/29 Flynn Street, Wembley WA 6014	<b>Report No.</b>	WG24.16126_1_PI
<b>Project:</b>	IWL TSF, Tabba Tabba Lithium Project	<b>Sample No.</b>	WG24.16126
<b>Location:</b>	Not Specified	<b>Date Sampled:</b>	Not Specified
<b>Sample Identification:</b>	Representative Tailings into TSF	<b>Date Tested:</b>	1/11/2024

**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

<b>AS 1289.3.1.1</b>	<b>Liquid Limit (%)</b>	<b>Not Obtainable</b>
<b>AS 1289.3.2.1</b>	<b>Plastic Limit (%)</b>	<b>Non-Plastic</b>
<b>AS 1289.3.3.1</b>	<b>Plasticity Index (%)</b>	<b>Non-Plastic</b>
<b>AS 1289.3.4.1</b>	<b>Linear Shrinkage (%)</b>	<b>0.0</b>
<b>AS 1289.3.4.1</b>	<b>Length of Mould (mm)</b>	<b>250</b>
<b>AS 1289.3.4.1</b>	<b>Condition of Dry Specimen:</b>	<b>-</b>

**Comments:**

Approved Signatory:

Name: Cody O'Neill

Date: 04/November/2024



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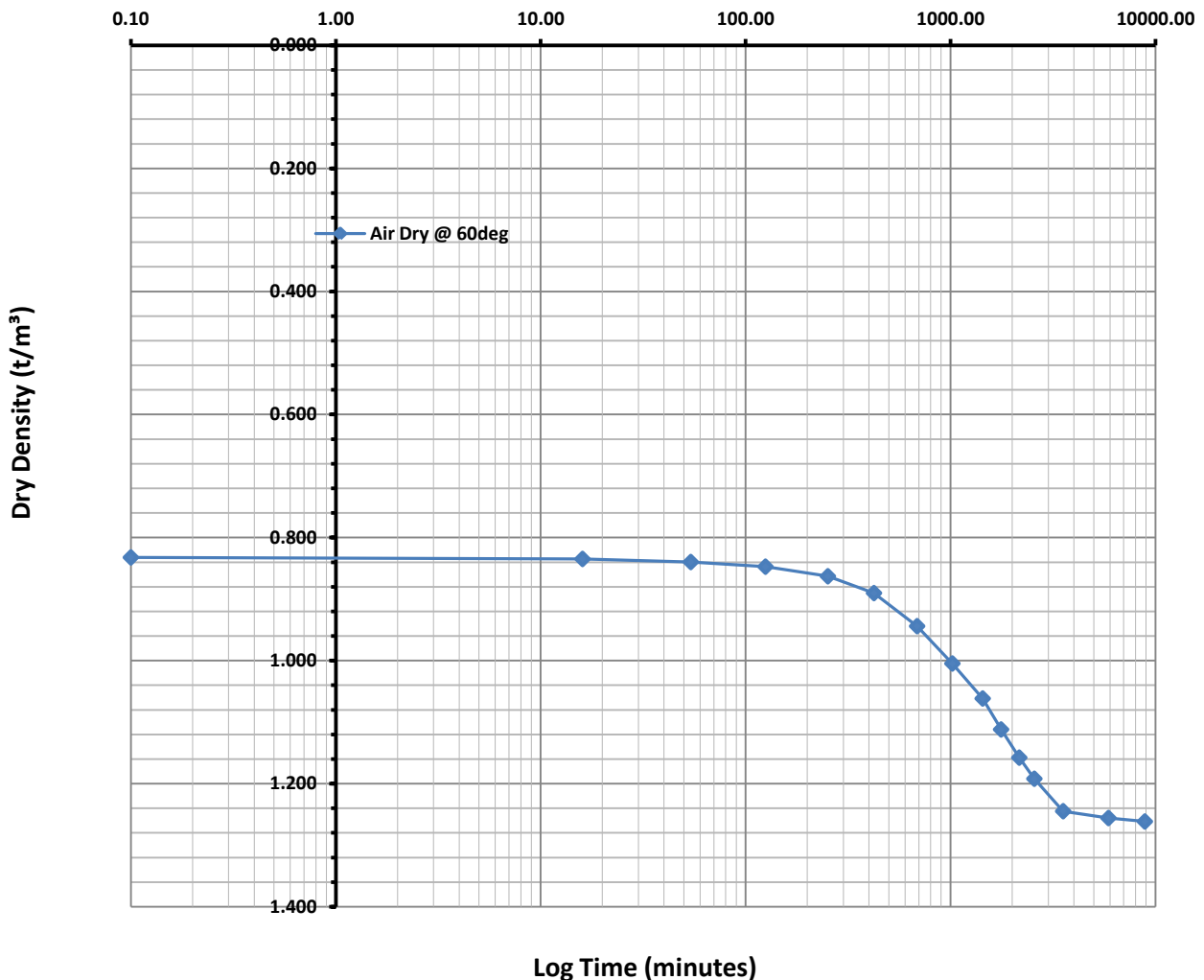
# AIR DRYING SETTLING TEST

**METHOD: Supplied by Client SRC-WF-100 / SRC-RF-100**

Client:	Western Geotechnical Lab Services	Date Tested:	07/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_AIR_DRY	Room Temperature at Test:	19°

<b>Tested by:</b> Phil	<b>Initial Bulk Density (t/m<sup>3</sup>):</b> 1.511
<b>Type of Test:</b> Air Dry Testing	<b>Particle Density (t/m<sup>3</sup>):</b> 2.62
<b>Sample Preparation:</b> 55% Solids	<b>Moisture Content Initial (%):</b> 81.593

## Dry Density (t/m<sup>3</sup>) Vs Time (minutes)



Comments:

**Authorised Signature (Geotechnical Engineer):**

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

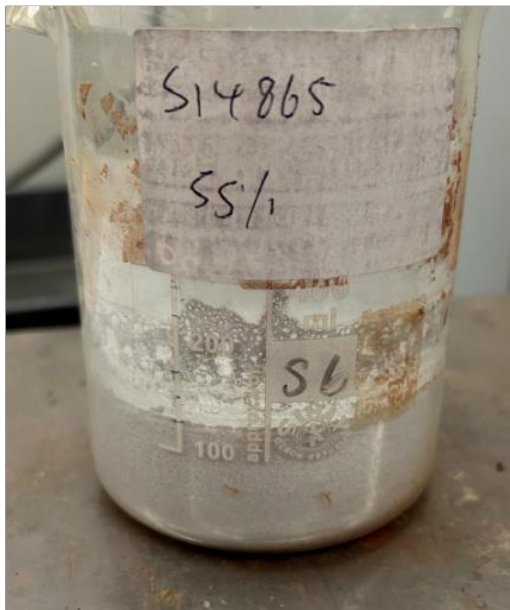


## AIR DRYING SETTLING TEST

METHOD: Supplied by Client SRC-WF-100 / SRC-RF-100

Client:	Western Geotechnical Lab Services	Date Tested:	07/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_AIR_DRY	Room Temperature at Test:	19°

### Photo of Samples after Testing



Oven dried @ 60deg

Comments:

Authorised Signature (Geotechnical Engineer):



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

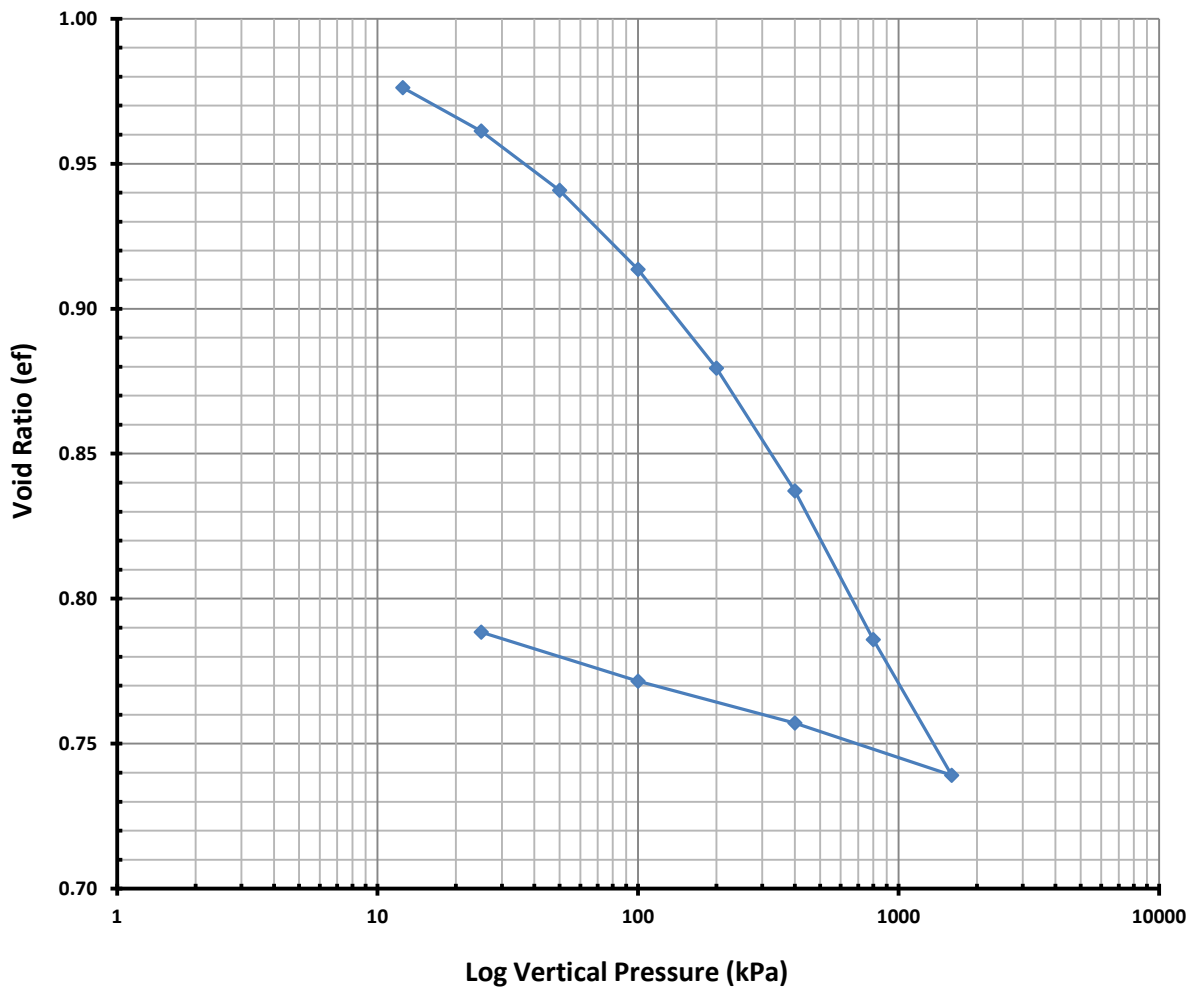


# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024		
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO		
Sample ID:	Representative Tailings into TSF				
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab		
Depth (m):	-	Room Temperature at Test:	~ 19°C		
Tested by:	Phil	Initial Moisture (%):	36.11	Test Condition:	Undrained
Height (mm):	38.92	Final Moisture Content (%):	35.29	Sample Condition:	Saturated
Diameter (mm):	61.80	Bulk Density (t/m <sup>3</sup> ):	1.79	Particle Density (t/m <sup>3</sup> ):	2.620
Direction:	Vertical	Dry Density (t/m <sup>3</sup> ):	1.32	Initial Void Ratio (e <sub>i</sub> ):	0.992

Void Ratio (e<sub>f</sub>) Vs Log of Vertical Pressure (kPa)

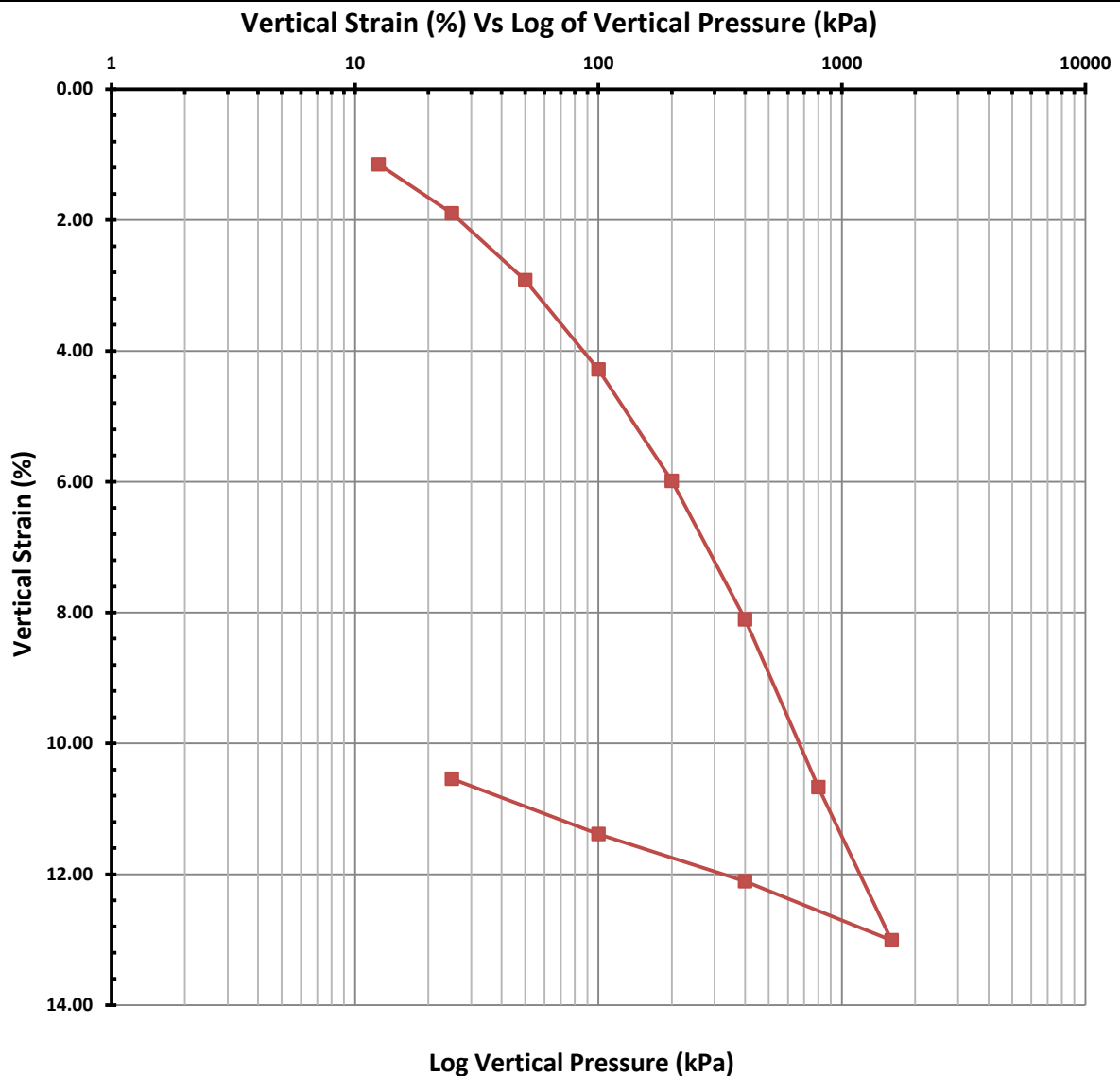




# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C





# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client: Western Geotechnical Lab Services Date Tested: 10/11/2024  
 Project: Tabba Tabba TSF EP Lab Job Number: WGEO  
 Sample ID: Representative Tailings into TSF  
 Lab ID: WG241\_16126\_55%\_OED Lab: EPLab  
 Depth (m): - Room Temperature at Test: ~ 19°C

## Test Results

\*

Stages	Vert Disp (mm)	Cv (m <sup>2</sup> /yr)		Compressibility Mv (m <sup>2</sup> /kN)	K (m/s)	Void Ratio (e <sub>f</sub> )	Vertical Strain (%)
		*t <sub>50</sub>	t <sub>90</sub>				
Stage 1 @ 12.5kPa	0.447	19.280	-	9.19E-04	5.5E-09	0.976	1.15
Stage 2 @ 25kPa	0.738	18.982	-	6.05E-04	3.6E-09	0.961	1.90
Stage 3 @ 50kPa	1.136	18.632	-	4.17E-04	2.4E-09	0.941	2.92
Stage 4 @ 100kPa	1.667	18.063	-	2.81E-04	1.6E-09	0.914	4.28
Stage 5 @ 200kPa	2.330	17.426	-	1.78E-04	9.6E-10	0.879	5.99
Stage 6 @ 400kPa	3.154	16.662	-	1.13E-04	5.8E-10	0.837	8.10
Stage 7 @ 800kPa	4.152	15.755	-	6.98E-05	3.4E-10	0.786	10.67
Stage 8 @ 1600kPa	5.063	14.961	-	3.28E-05	1.5E-10	0.739	13.01
Unload @ 400kPa	4.712						
Unload @ 100kPa	4.431						
Unload @ 25kPa	4.102						

\* 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):

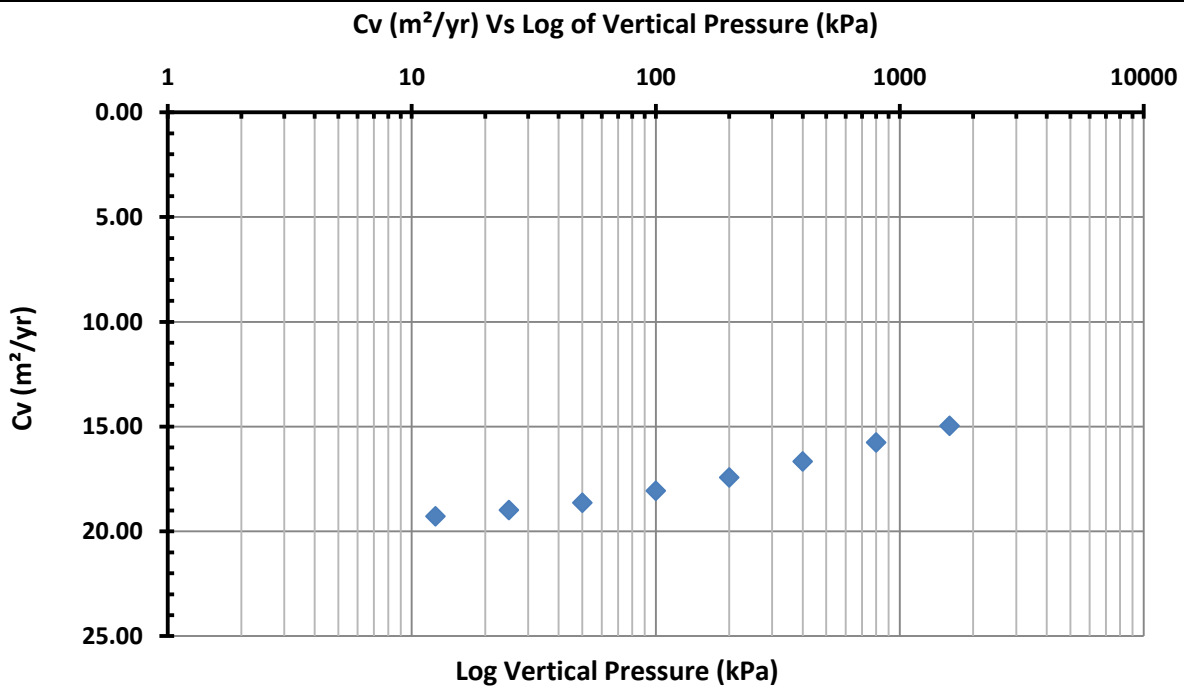
The results of tests performed apply only to the specific sample at time of test unless otherwise clearly stated. Reference should be made to E-Precision Laboratory's "Standard Terms and Conditions" E-Precision Laboratory ABN 431 559 578 87



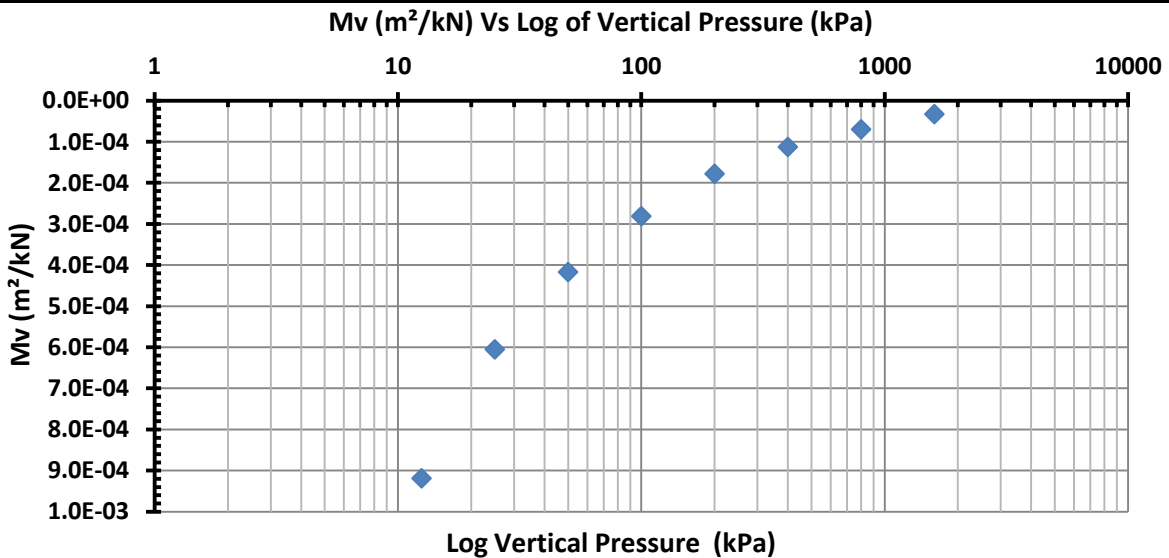
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C



\* Plot based on Log (time) data





## CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

**TEST RESULTS PLEASE SEE PAGES BELOW**



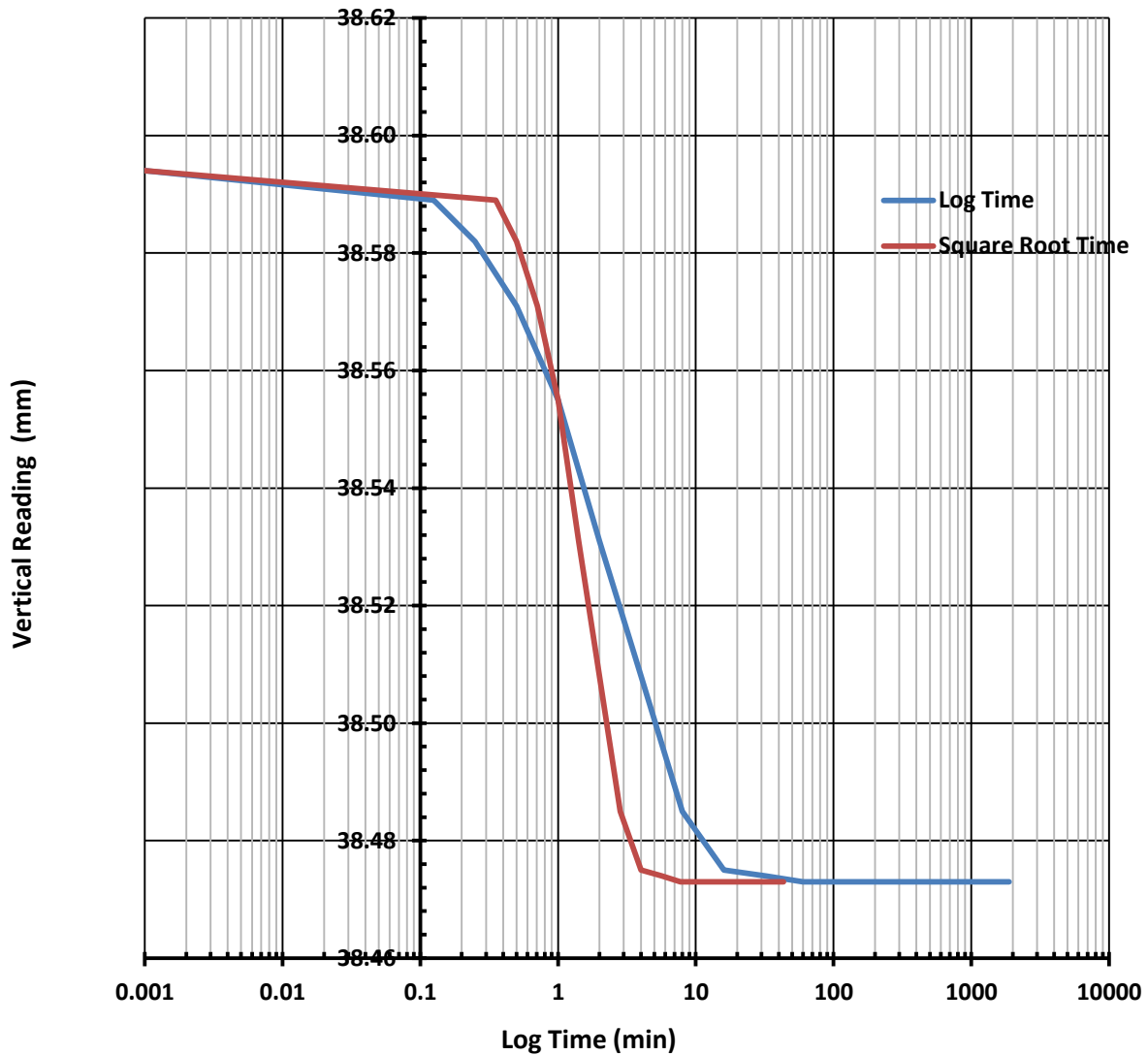
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 1 @ 12.5kPa

Square Root Time (min)





E-PRECISION LABORATORY

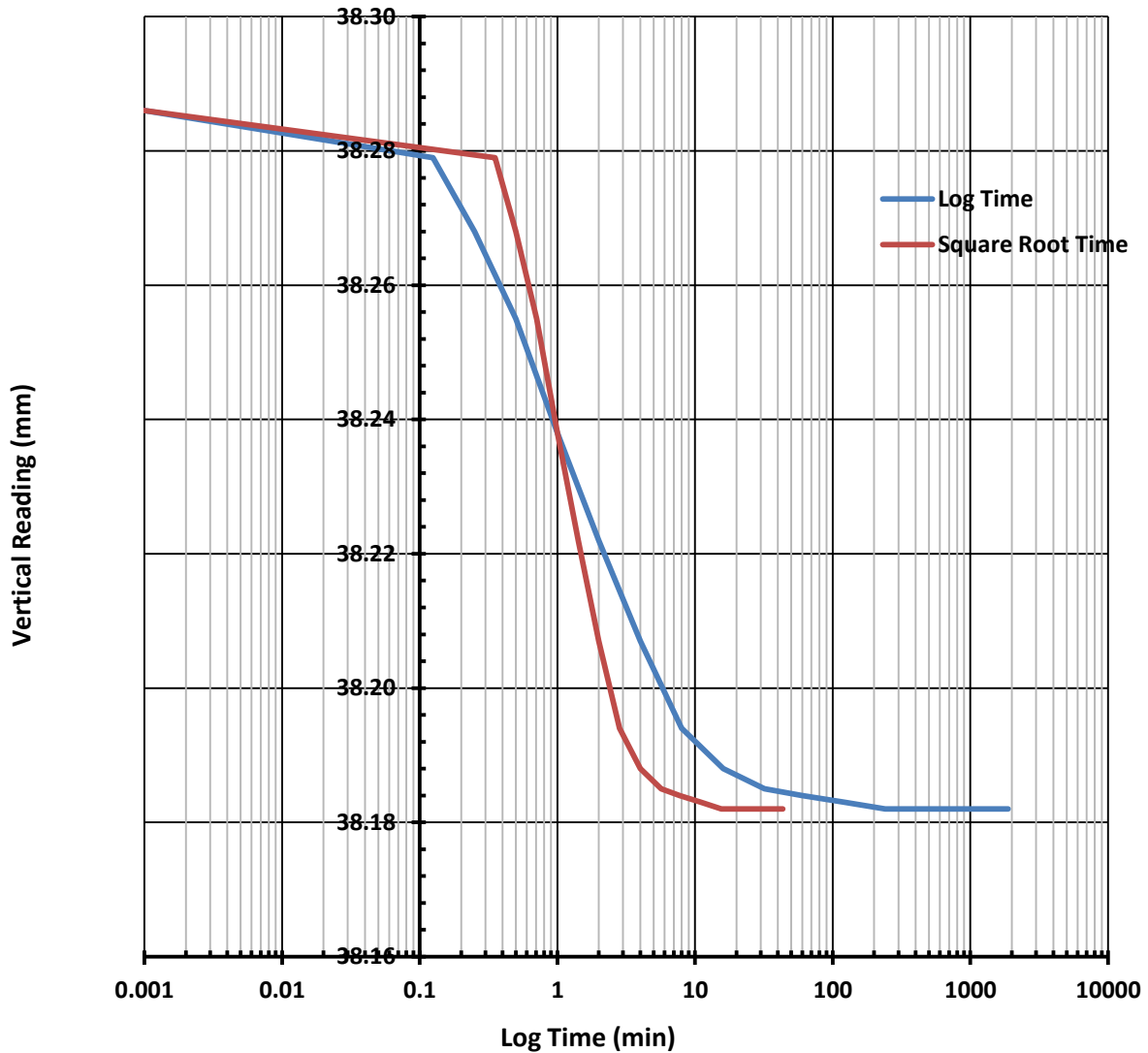
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 2 @ 25kPa

Square Root Time (min)





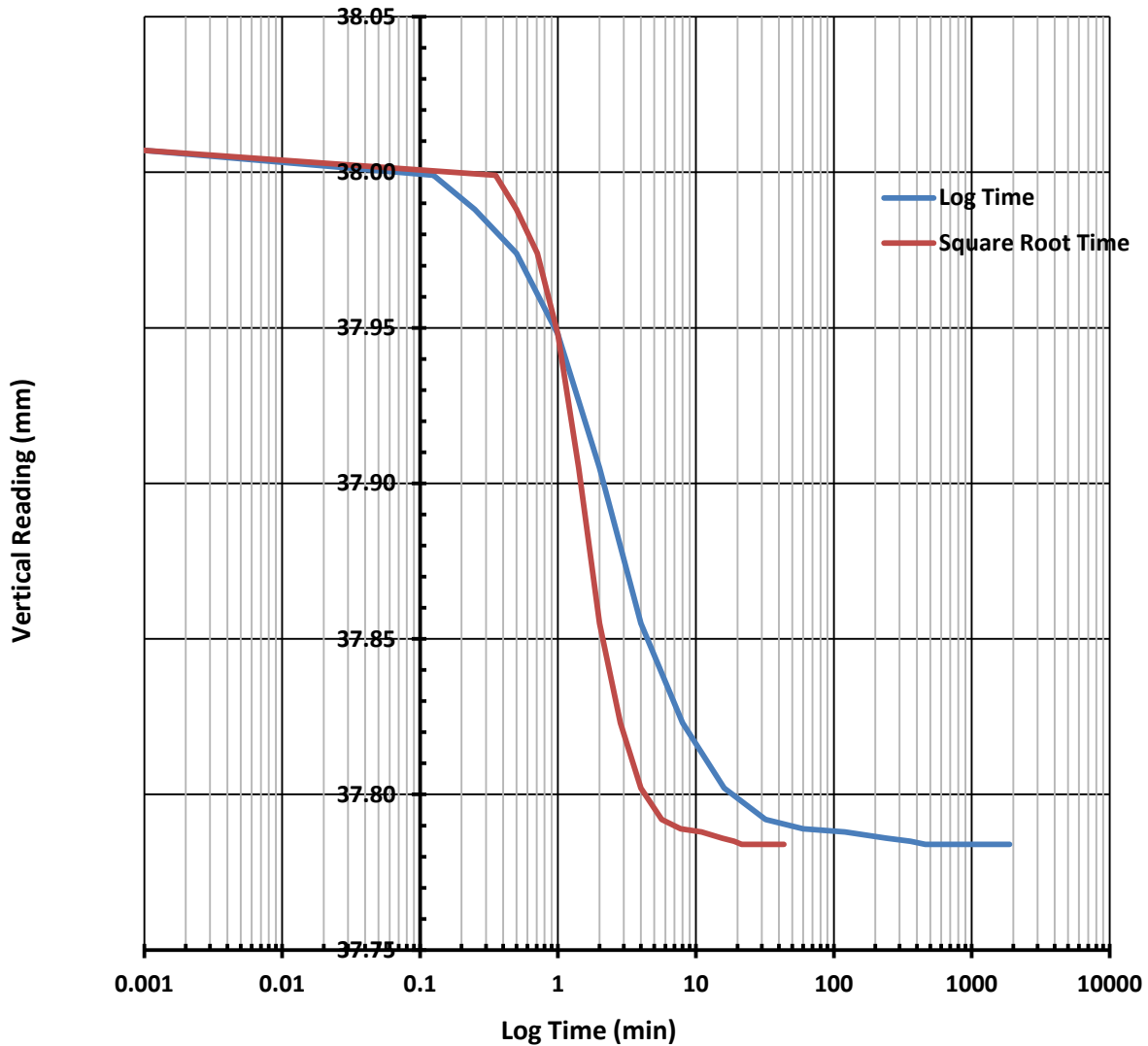
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 3 @ 50kPa

Square Root Time (min)





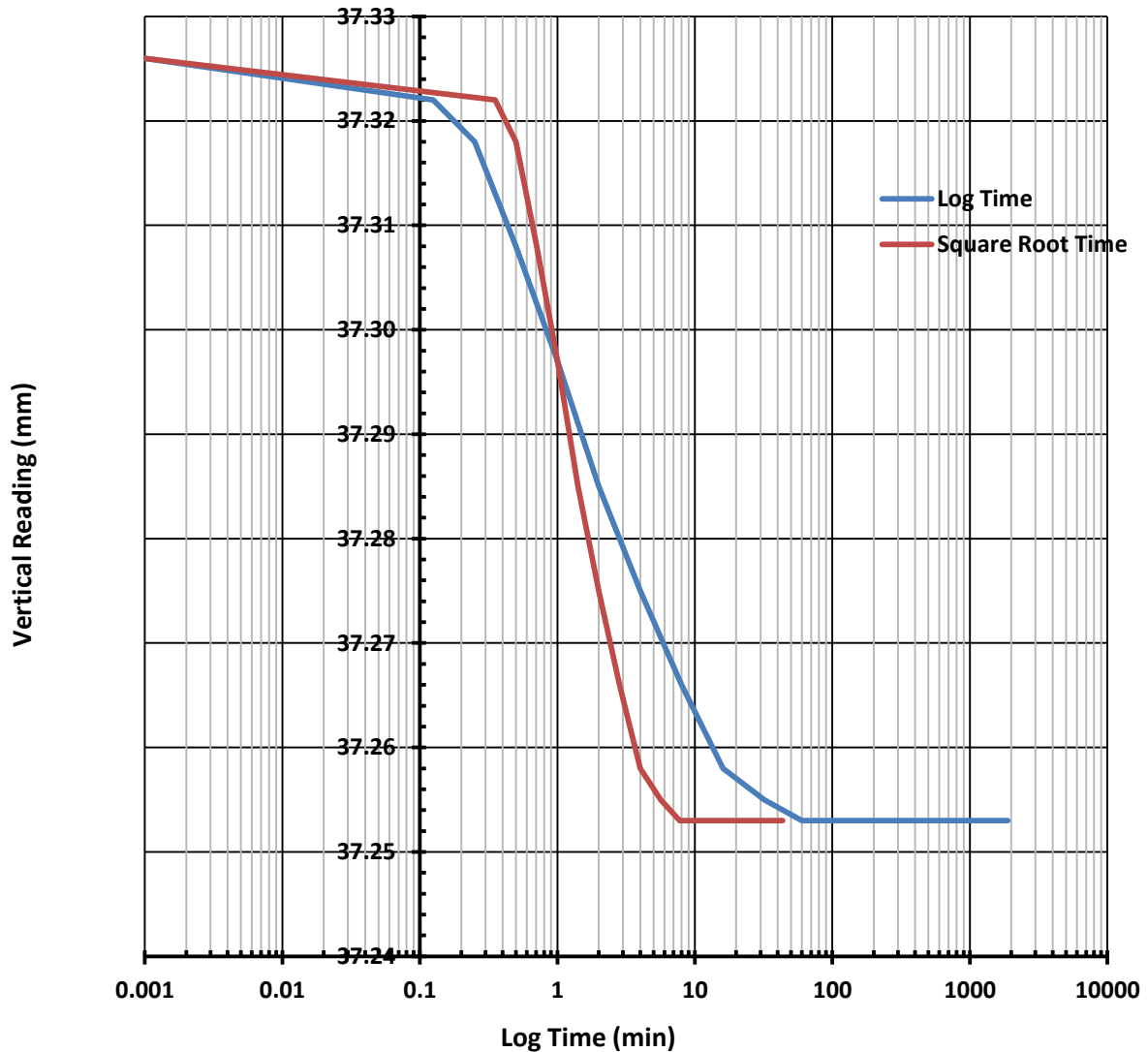
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 4 @ 100kPa

Square Root Time (min)





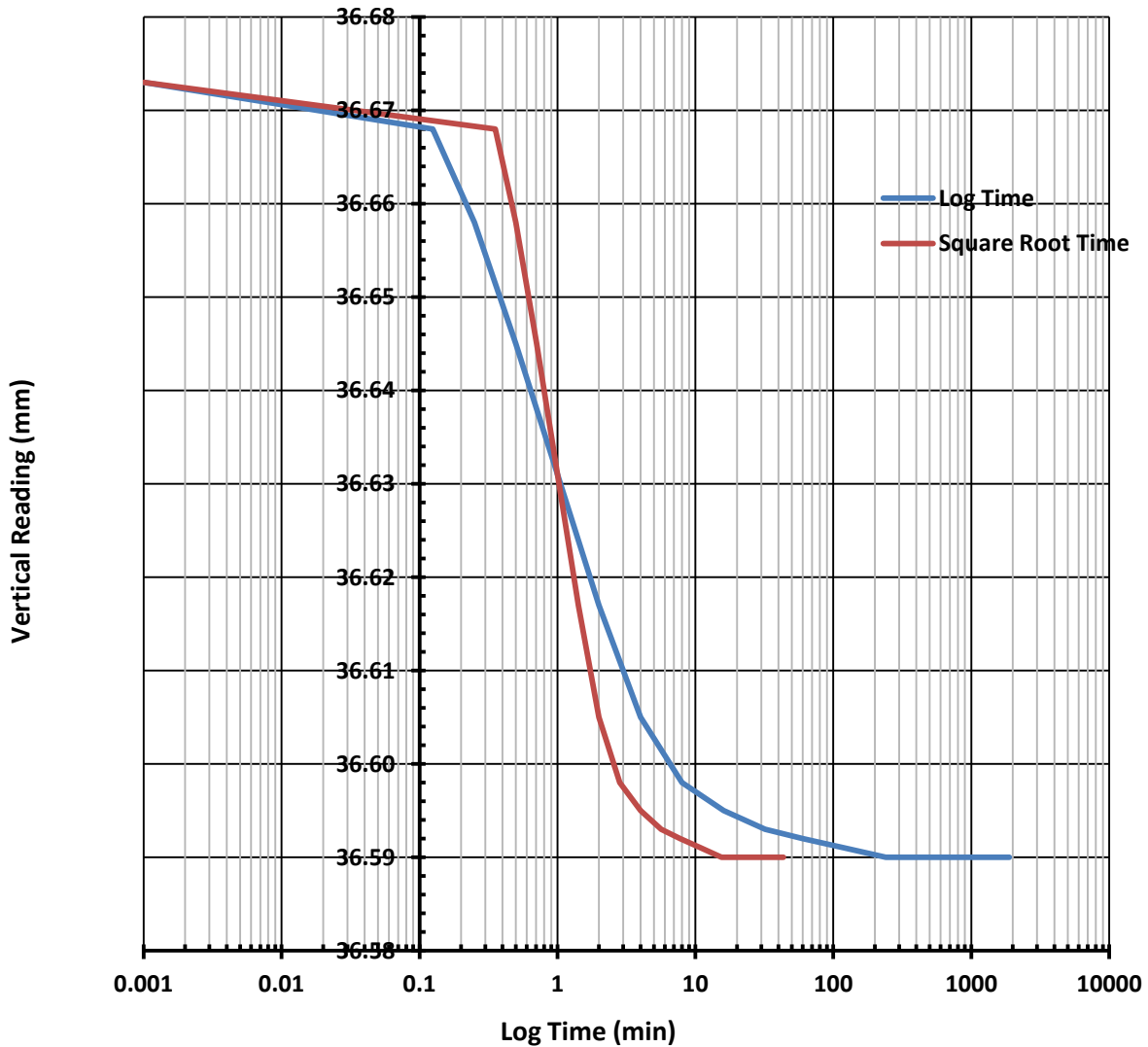
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 5 @ 200kPa

Square Root Time (min)





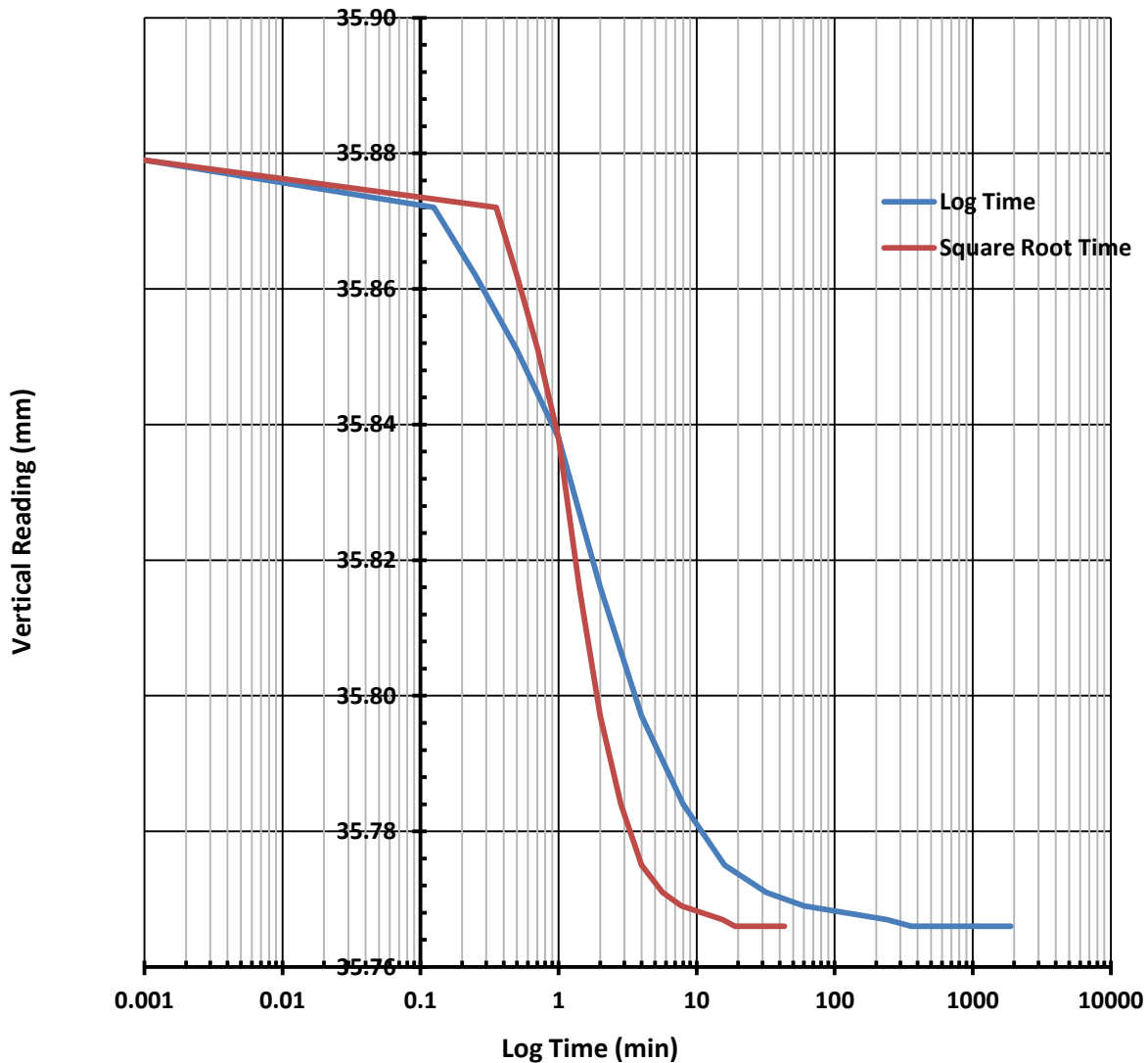
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 6 @ 400kPa

Square Root Time (min)





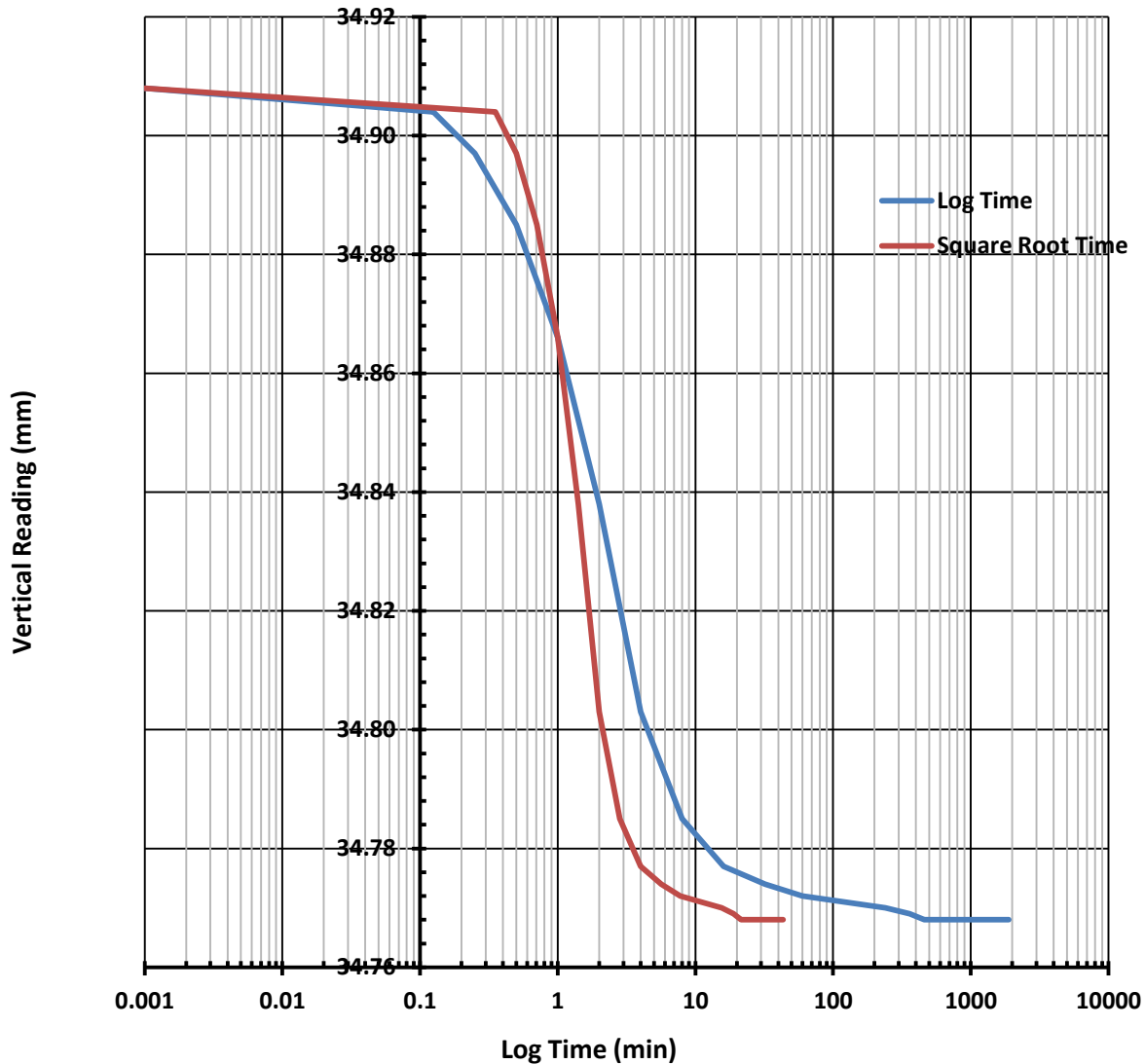
# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 7 @ 800kPa

Square Root Time (min)



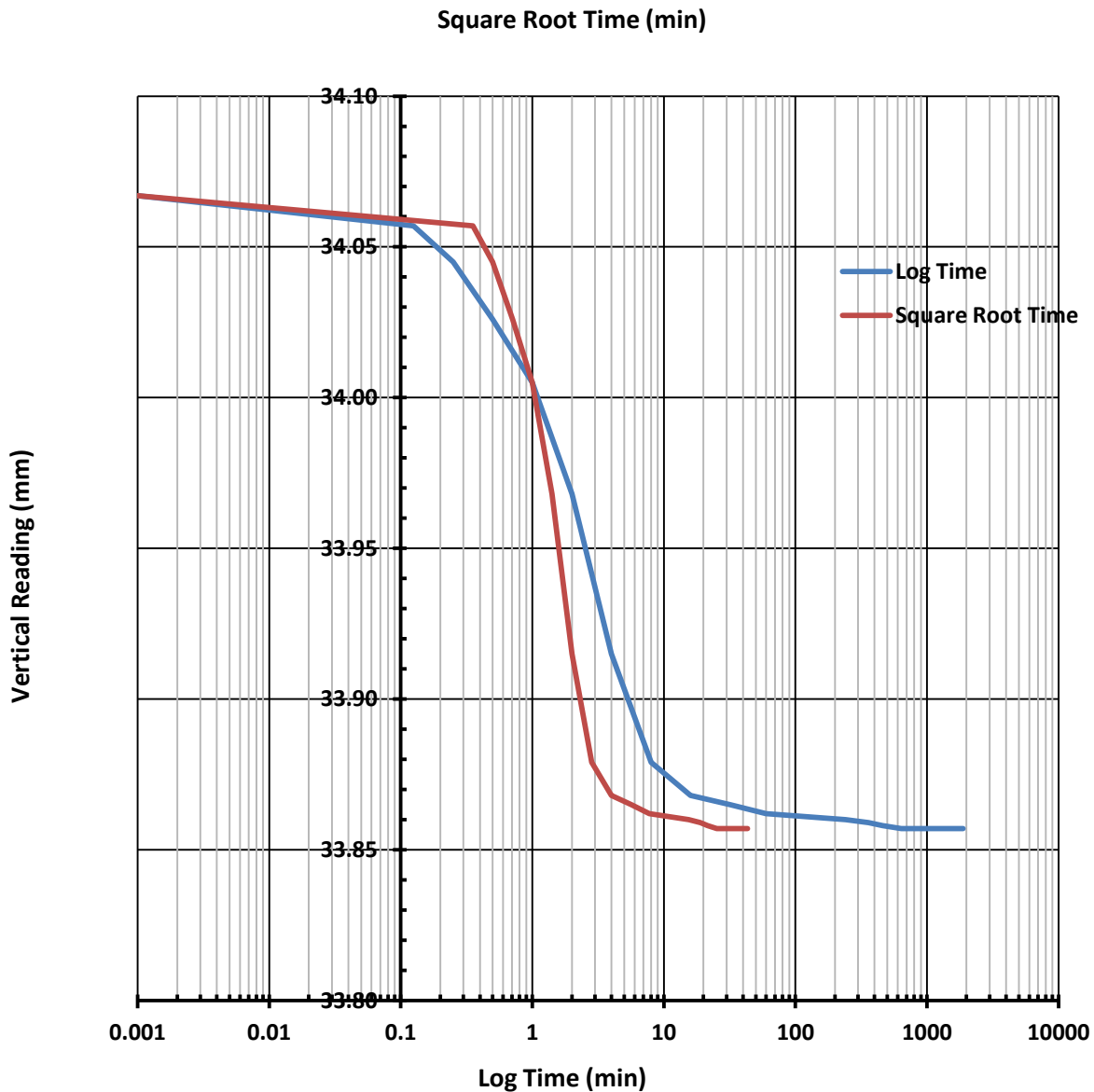


# CONSOLIDATION - ONE DIMENSION

Method: AS1289 6.6.1 / Inhouse Method

Client:	Western Geotechnical Lab Services	Date Tested:	10/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample ID:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_OED	Lab:	EPLab
Depth (m):	-	Room Temperature at Test:	~ 19°C

## Stage 8 @ 1600kPa





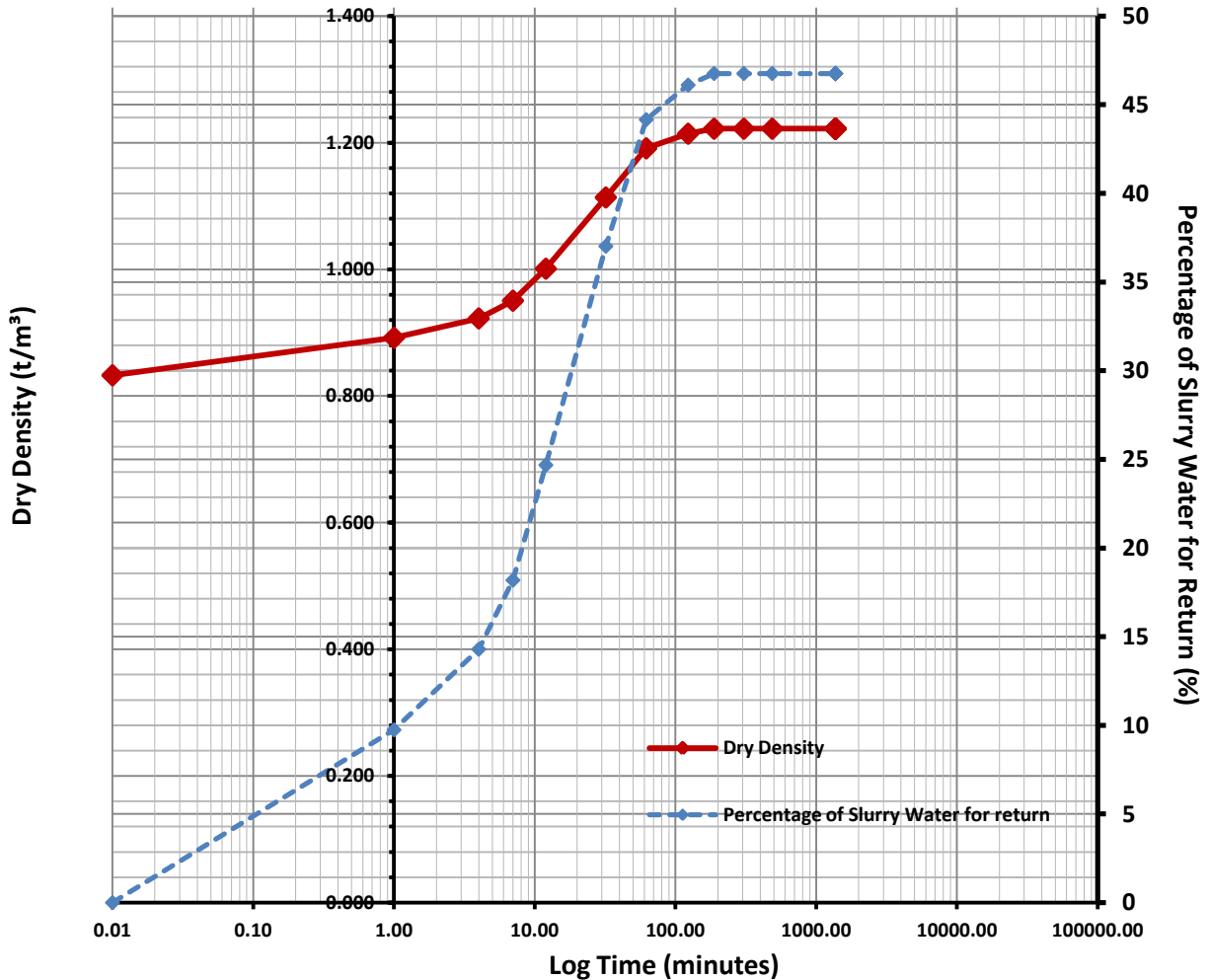
# SETTLEMENT TESTING TAILINGS

**METHOD: IN-HOUSE METHOD**

Client:	Western Geotechnical Lab Services	Date Tested:	08/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_SETTLEMENT	Room Temperature at Test:	19°

Tested by: Phil	Initial Dry Density (t/m <sup>3</sup> ): 0.833
Type of Test: Settlement Testing	Particle Density (t/m <sup>3</sup> ): 2.62
Sample Preparation: 55% Solids	Initial Bulk Density (t/m <sup>3</sup> ): 1.514

## Undrained Dry Density (t/m<sup>3</sup>) Vs Log Time (minutes)



Comments:

**Authorised Signature (Geotechnical Engineer):**

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



# SETTLEMENT TESTING TAILINGS

**METHOD: IN-HOUSE METHOD**

Client: Western Geotechnical Lab Services	Date Tested: 08/11/2024
Project: Tabba Tabba TSF	EP Lab Job Number: WGEO
Sample No: Representative Tailings into TSF	
Lab ID: WG241_16126_55%_SETTLEMENT	Room Temperature at Test: 19°

**Tested by:** Phil

**Initial Dry Density (t/m<sup>3</sup>):** 0.833

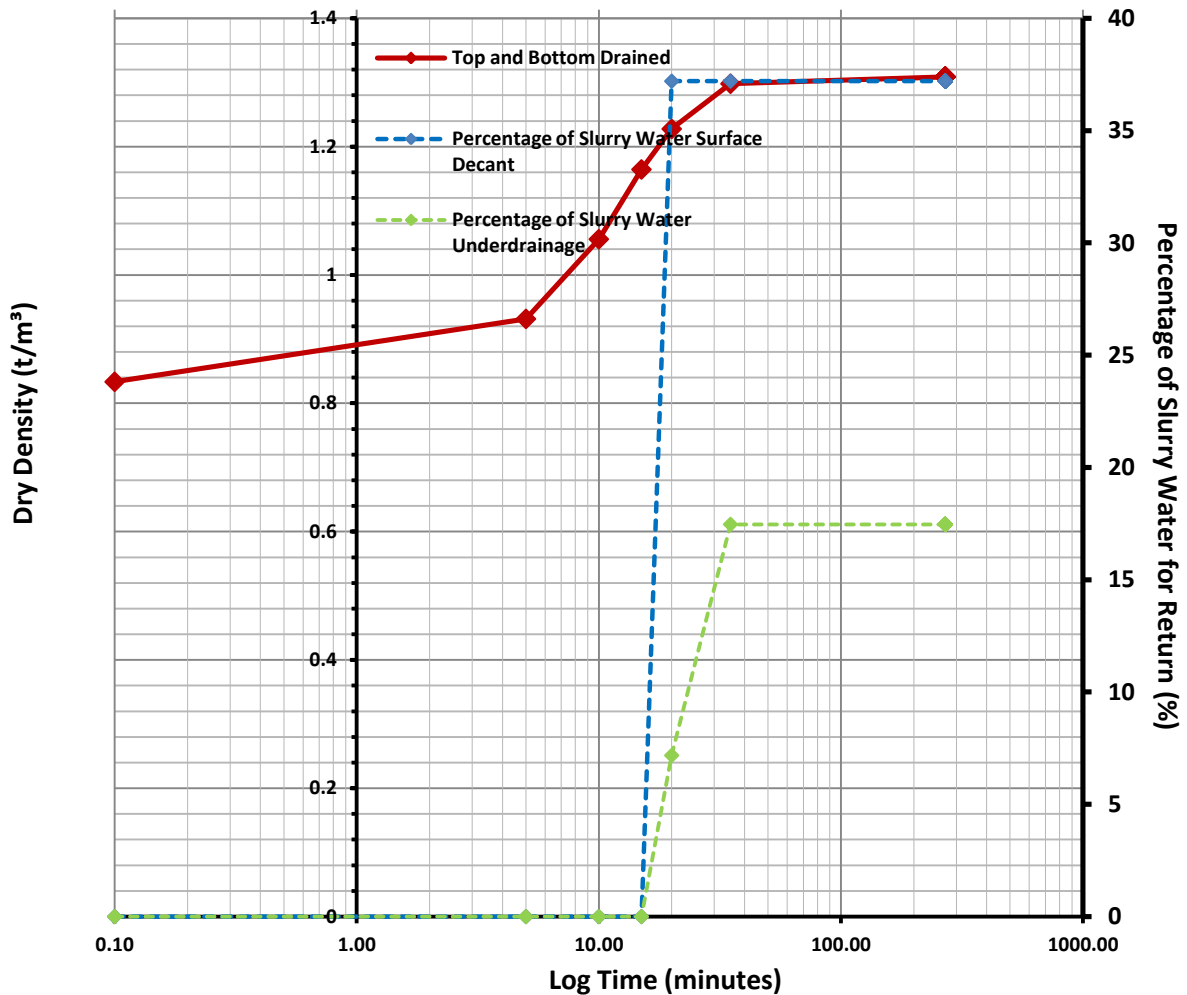
**Type of Test:** Settlement Testing

**Particle Density (t/m<sup>3</sup>):** 2.62

**Sample Preparation:** 55% Solids

**Initial Bulk Density (t/m<sup>3</sup>):** 1.515

## Top and Bottom Drained Dry Density (t/m<sup>3</sup>) Vs Log Time (minutes)



**Comments:**

**Authorised Signature (Geotechnical Engineer):**

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



# SETTLEMENT TESTING TAILINGS

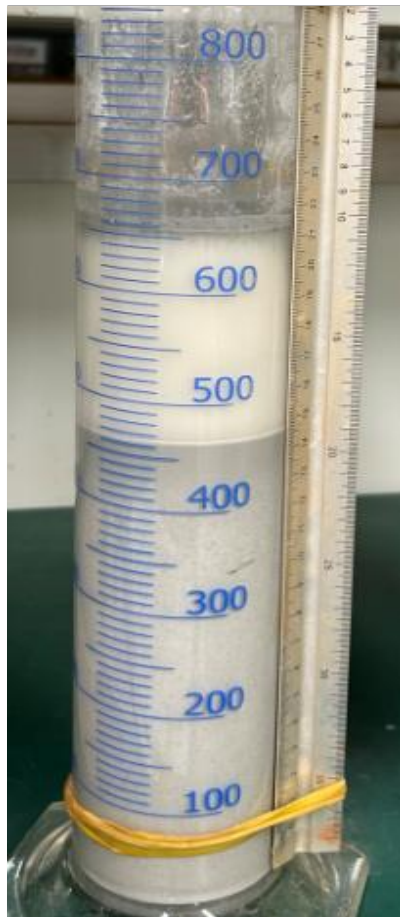
## METHOD: IN-HOUSE METHOD

Client:	Western Geotechnical Lab Services	Date Tested:	08/11/2024
Project:	Tabba Tabba TSF	EP Lab Job Number:	WGEO
Sample No:	Representative Tailings into TSF		
Lab ID:	WG241_16126_55%_SETTLEMENT	Room Temperature at Test:	19°

<b>Tested by:</b> Phil	<b>Initial Dry Density (t/m³):</b> -
<b>Type of Test:</b> Settlement Testing	<b>Particle Density (t/m³):</b> -
<b>Sample Preparation:</b> 55% Solids	<b>Initial Bulk Density (t/m³):</b> -

### Photo of Test Setup

**Undrained**



**Drained**



Comments:

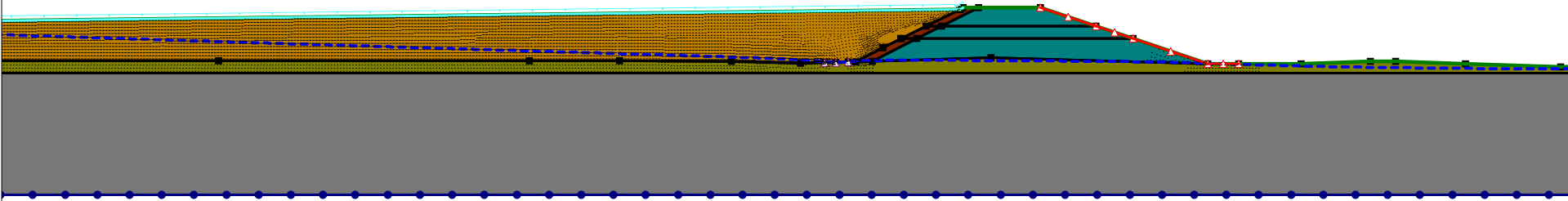
**Authorised Signature (Geotechnical Engineer):**

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

# APPENDIX D

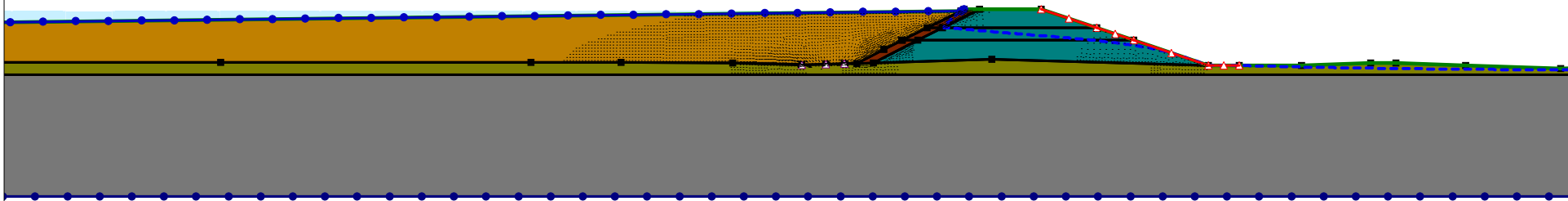
## Seepage Analysis

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx' Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant lined (200m), with 3 line of underdrainage immidate downstream  
 Prepare by: Pouyan Abbasi  
 Date: 13/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx' Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



Project Name: Tabba Tabba Lihium Project

Project Number: PER2024-0154AD

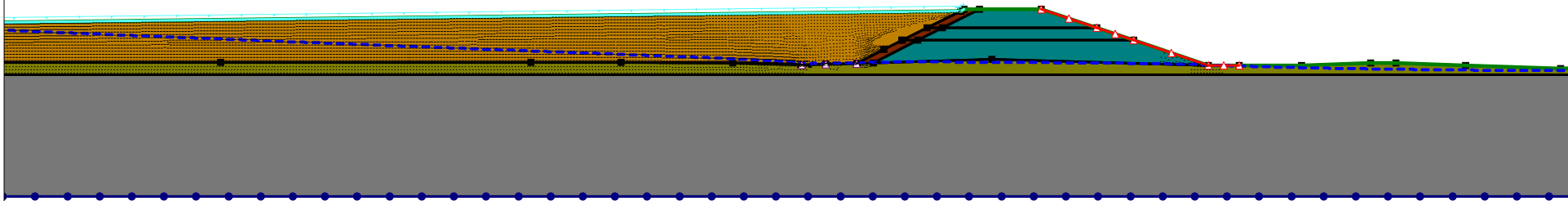
Scenario: Decant lined (200m), with 3 line of underdrainage immidate downstream, PMP

Prepare by: Pouyan Abbasi

Date: 13/05/2025

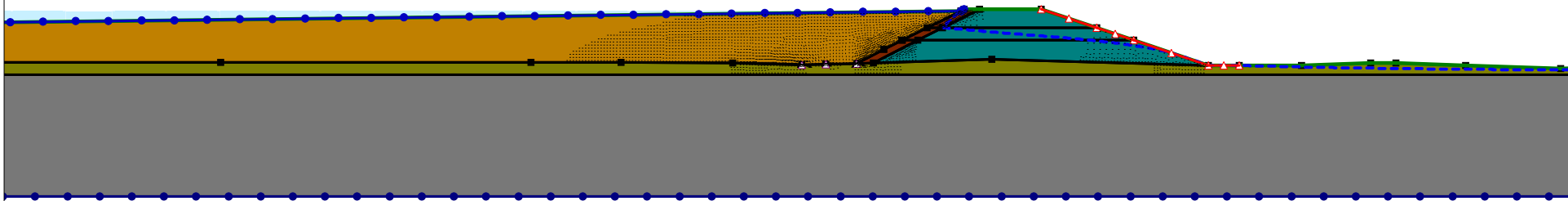
Revision: A

Color	Name	Hydraulic Material Model	Sat K <sub>x</sub> (m/d)	K <sub>y</sub> /K <sub>x</sub> Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



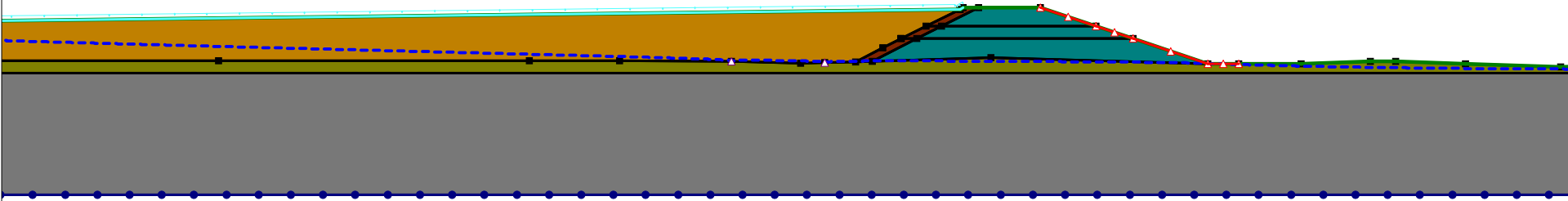
Project Name: Tappa Tappa Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant lined (200m), with 3 line of underdrainage downstream, normal  
 Prepare by: Pouyan Abbasi  
 Date: 13/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Tailic Compacted Mine Waste	Saturated Only	0.864	0.5



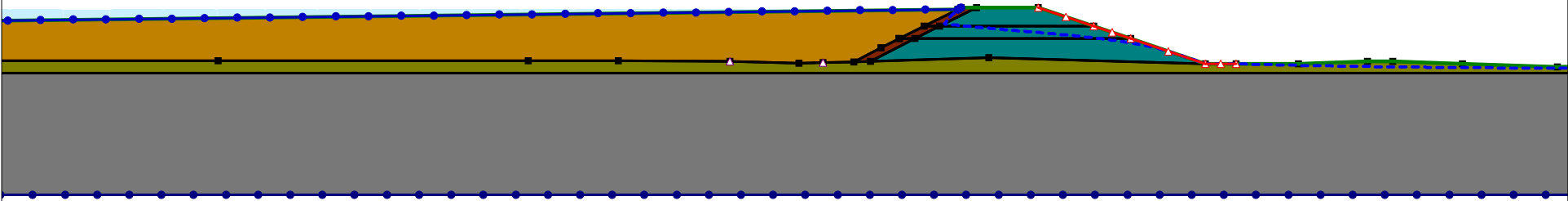
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant lined (200m), with 3 line of underdrainage downstream, PMP  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



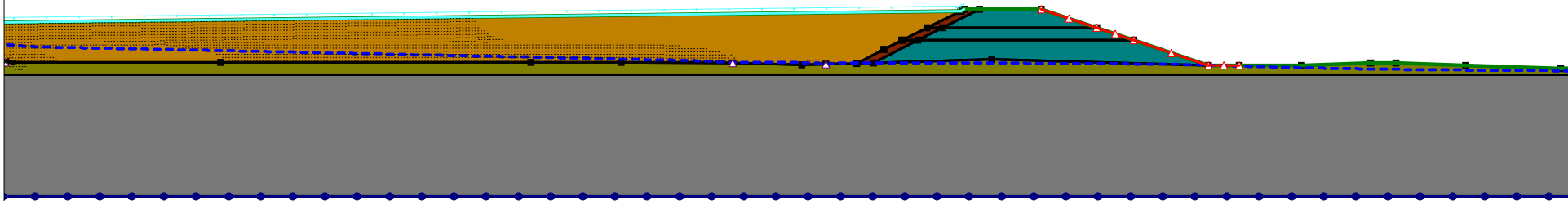
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant lined (200m), with 4 line of underdrainage located at downstream and decant, normal  
 Prepare by: Pouyan Abbasi  
 Date: 13/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



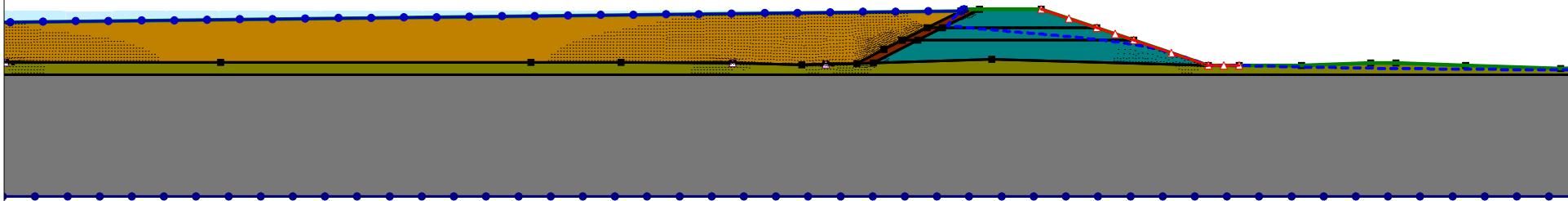
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant lined (200m), with 4 line of underdrainage located at downstream and decant, PMP  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx' Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5

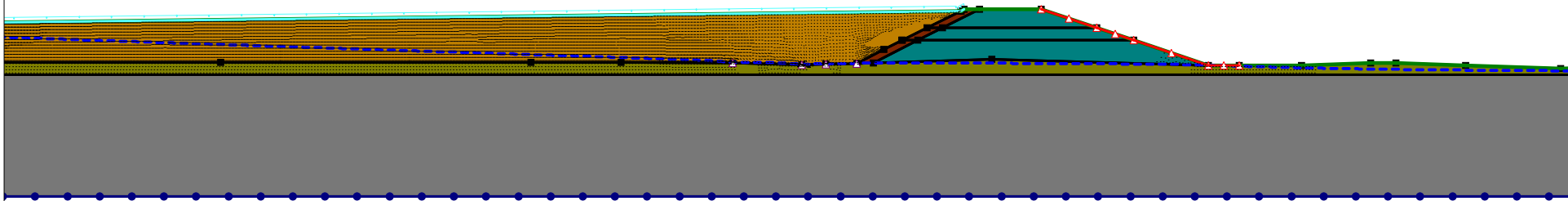


Project Name: Tabbatabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant lined (200m), with 3 line of underdrainage  
 located at downstream and after decant liner, normal  
 Prepare by: Pouyan Abbasi  
 Date: 13/05/2025  
 Revision: A

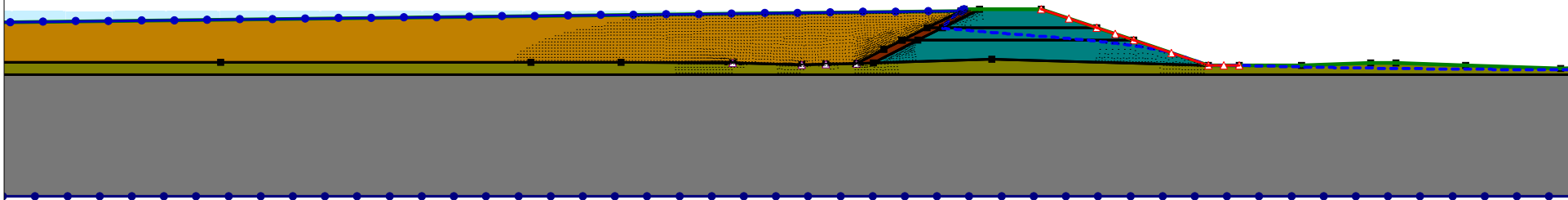
Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



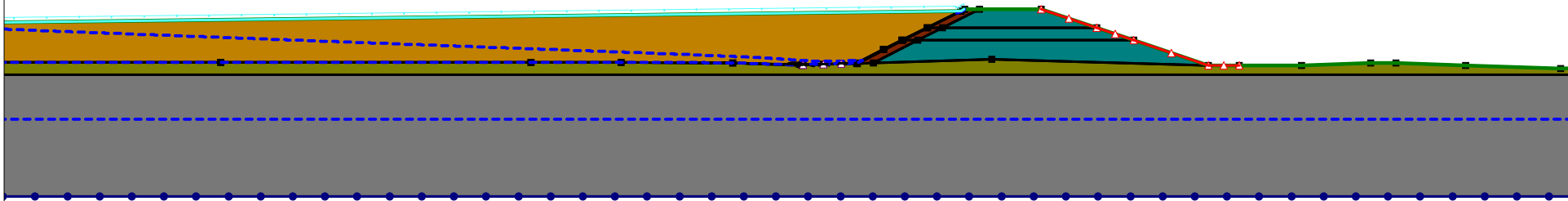
Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



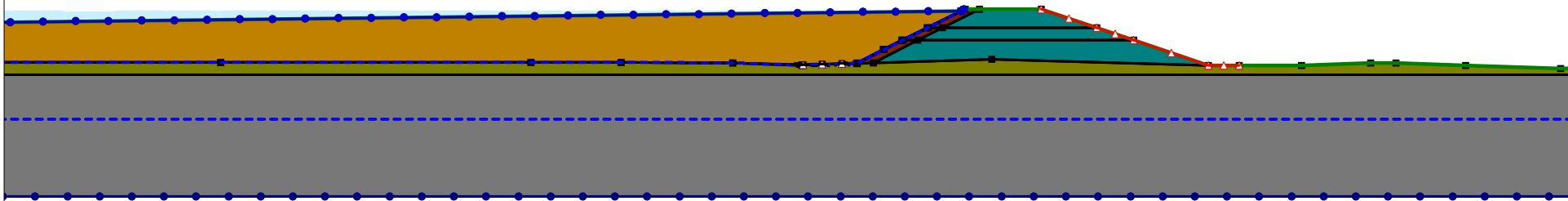
Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky'/Kx' Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



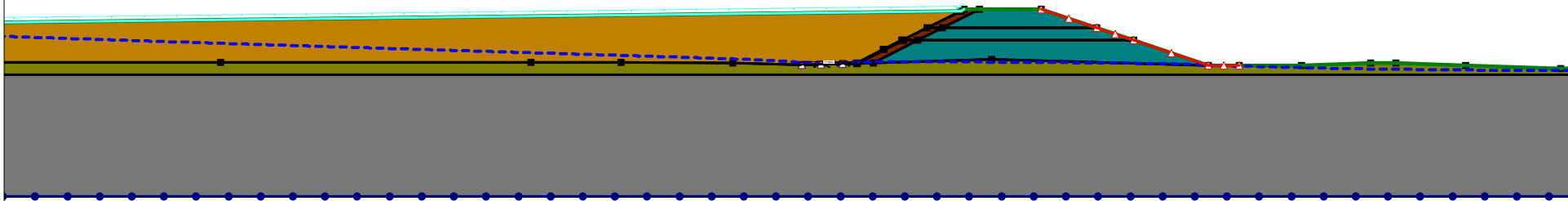
Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



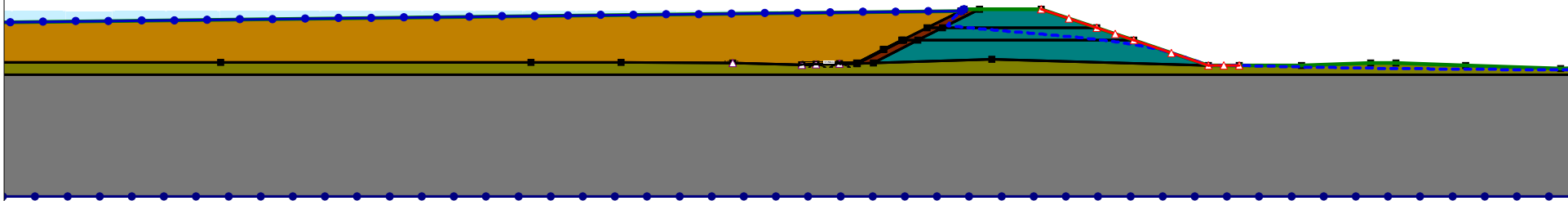
Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx' Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky//Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5

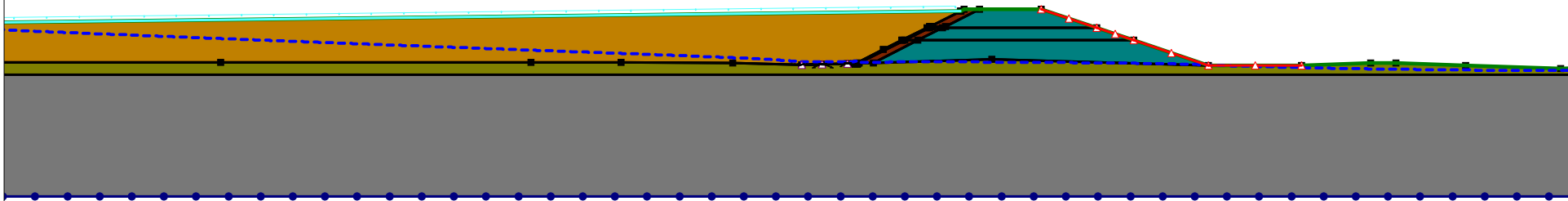


Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky'/Kx' Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



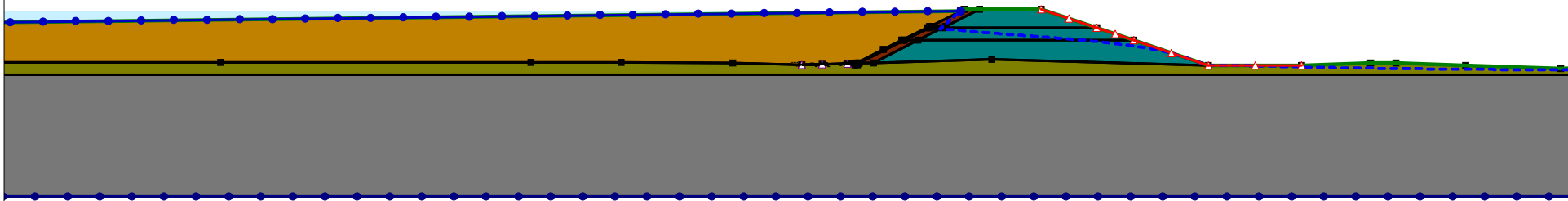
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant and upstream lined, with 3 line of underdrainage located at immediate downstream, PMP  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx' Ratio
	Compacted Mine Waste	Saturated Only	0.0864	0.5
	Compacted Transition Mine Waste	Saturated Only	0.000864	0.5
	HDPE Liner	Saturated Only	8.64e-16	1
	Subsurface / Granite	Saturated Only	0.00864	0.1
	Surface layer / Sandy	Saturated Only	0.432	0.5
	Tailings	Saturated Only	2.8512	0.1
	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant and upstream lined up to RL 115m, with 3 line of underdrainage located at immediate downstream, normal  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Hydraulic Material Model	Sat Kx (m/d)	Ky/Kx Ratio
■	Compacted Mine Waste	Saturated Only	0.0864	0.5
■	Compacted Transition Mine Waste	Saturated Only	0.000864	0.5
■	HDPE Liner	Saturated Only	8.64e-16	1
■	Subsurface / Granite	Saturated Only	0.00864	0.1
■	Surface layer / Sandy	Saturated Only	0.432	0.5
■	Tailings	Saturated Only	2.8512	0.1
■	Traffic Compacted Mine Waste	Saturated Only	0.864	0.5



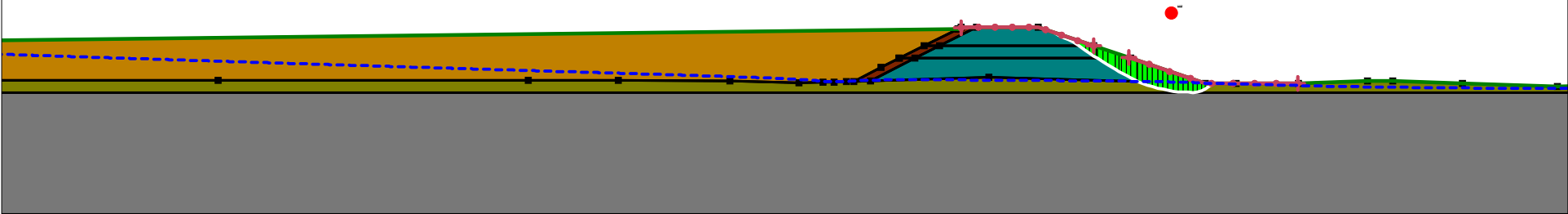
Project Name: Tappa Tappa Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Decant and upstream lined up to RL 115m, with 3 line of underdrainage located at immediate downstream, PMP

Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

# APPENDIX E

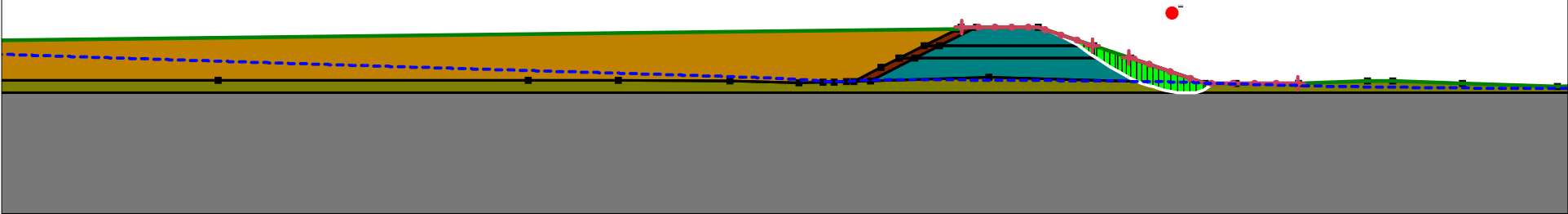
## Stability Analysis

Color	Name	Slope Stability Material Model	Unit Weight (kN/m <sup>3</sup> )	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
■	Compacted Transition Mine_Undrained	Mohr-Coulomb	20	0	34	0
■	Subsurface / Granite	Mohr-Coulomb	21	150	40	0
■	Surface layer / Sandy	Mohr-Coulomb	20	0	36	0
■	Tailings_Undrained	Mohr-Coulomb	18	0	33	0
■	Traffic Compacted Mine Waste_Undrained	Mohr-Coulomb	20	0	40	0



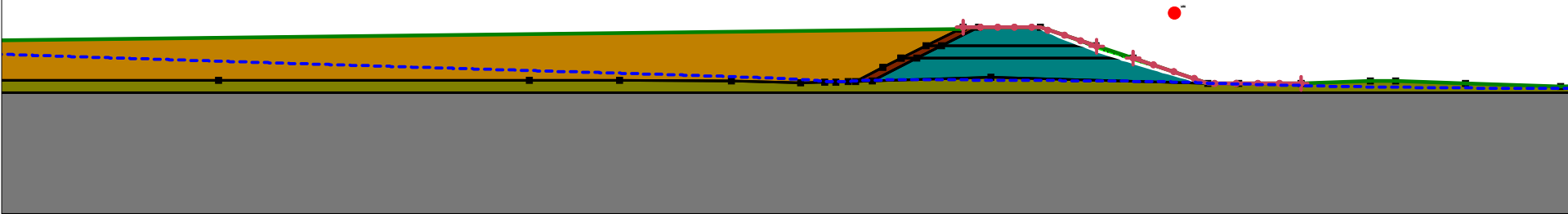
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Stage 3 - downstream failure at static condition, short term undrained  
 with normal operation pond size  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Slope Stability Material Model	Unit Weight (kN/m <sup>3</sup> )	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
■	Compacted Mine Waste	Mohr-Coulomb	20	0	34	0
■	Subsurface / Granite	Mohr-Coulomb	21	150	40	0
■	Surface layer / Sandy	Mohr-Coulomb	20	0	36	0
■	Tailings	Mohr-Coulomb	18	0	33	0
■	Traffic Compacted Mine Waste	Mohr-Coulomb	20	0	40	0



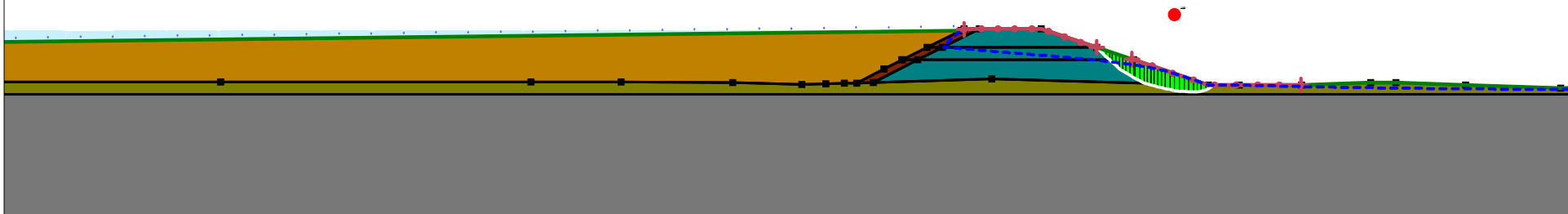
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Stage 3 - downstream failure at static condition, long term drained  
 with normal operating pond  
 Prepare by: Pouyan Abbasi  
 Date: 13/05/2025  
 Revision: A

Color	Name	Slope Stability Material Model	Unit Weight (kN/m <sup>3</sup> )	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
■	Compacted Transition Mine_Post seismic	Mohr-Coulomb	20		0	27.2	0
■	Subsurface / Granite	Mohr-Coulomb	21		150	40	0
■	Surface layer / Sandy	Mohr-Coulomb	20		0	36	0
■	Tailings_Post-seismic	SHANSEP	18	0.1			
■	Traffic Compacted Mine Waste_Post seismic	Mohr-Coulomb	20		0	32	0



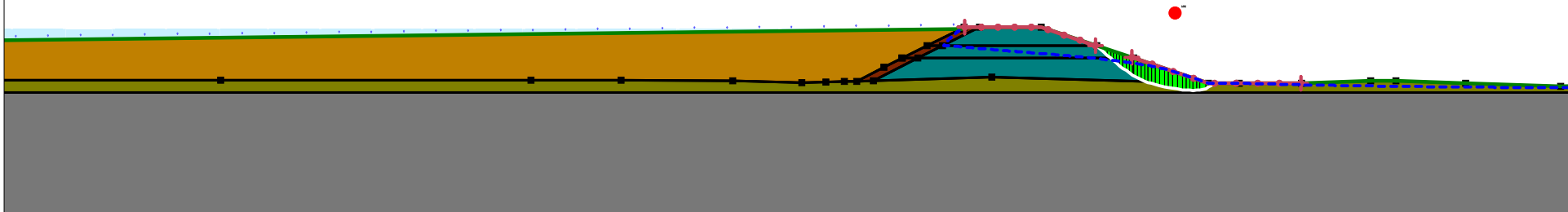
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Stage 3 - downstream failure at post seismic condition  
 with normal operating pond  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Slope Stability Material Model	Unit Weight (kN/m <sup>3</sup> )	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
■	Compacted Transition Mine_Undrained	Mohr-Coulomb	20	0	34	0
■	Subsurface / Granite	Mohr-Coulomb	21	150	40	0
■	Surface layer / Sandy	Mohr-Coulomb	20	0	36	0
■	Tailings_Undrained	Mohr-Coulomb	18	0	33	0
■	Traffic Compacted Mine Waste_Undrained	Mohr-Coulomb	20	0	40	0



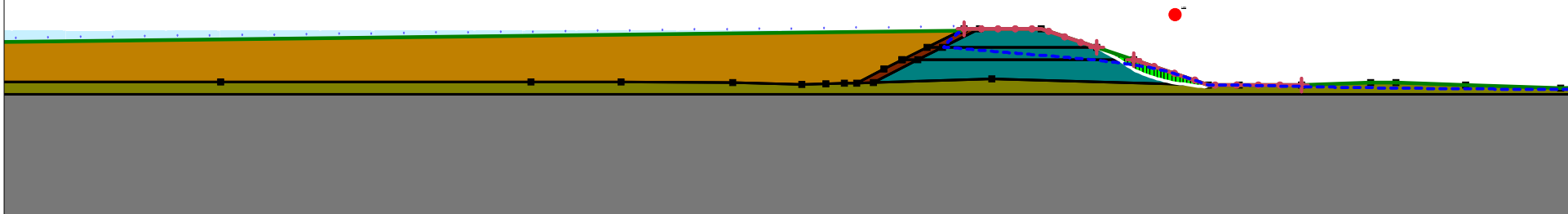
Project Name: Tabba Tabba Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Stage 3 - downstream failure at static condition, short term undrained  
 with PMP event  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

Color	Name	Slope Stability Material Model	Unit Weight (kN/m <sup>3</sup> )	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
■	Compacted Mine Waste	Mohr-Coulomb	20	0	34	0
■	Subsurface / Granite	Mohr-Coulomb	21	150	40	0
■	Surface layer / Sandy	Mohr-Coulomb	20	0	36	0
■	Tailings	Mohr-Coulomb	18	0	33	0
■	Traffic Compacted Mine Waste	Mohr-Coulomb	20	0	40	0



Project Name: Tappa Tappa Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Stage 3 - downstream failure at static condition, long term drained  
 with PMP event  
 Prepare by: Pouyan Abbasi  
 Date: 13/05/2025  
 Revision: A

Color	Name	Slope Stability Material Model	Unit Weight (kN/m <sup>3</sup> )	Tau/Sigma Ratio	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
■	Compacted Transition Mine_Post seismic	Mohr-Coulomb	20		0	27.2	0
■	Subsurface / Granite	Mohr-Coulomb	21		150	40	0
■	Surface layer / Sandy	Mohr-Coulomb	20		0	36	0
■	Tailings_Post-seismic	SHANSEP	18	0.1			
■	Traffic Compacted Mine Waste_Post seismic	Mohr-Coulomb	20		0	32	0



Project Name: Tappa Tappa Lihium Project  
 Project Number: PER2024-0154AD  
 Scenario: Stage 3 - downstream failure at post seismic condition  
 with PMP event  
 Prepare by: Pouyan Abbasi  
 Date: 14/05/2025  
 Revision: A

# APPENDIX F

## Deformation Analysis



CLIENT:	IWLTSF	DESIGNER:	HZ
PROJECT:	Wildcat Resources	CHECKED:	PA
TITLE:	Deformation - Simplified Approach - TTLP	REVISION:	A
		DAT	9/05/2025
		PROJECT:	PER2024-0154

Height	20.5	Mw	5.5	6	6.5	7	7.5	PGA	OBE	SEE
		Crest%	0.011795	0.015684	0.020856	0.027734	0.036879		0.07	0.12
	OBE	Crest settlement	2.4	3.2	4.3	5.7	7.6			
		Crest%	0.015977	0.021246	0.028252	0.037568	0.049957			
	SEE	Crest settlement	3.3	4.4	5.8	7.7	10.2			

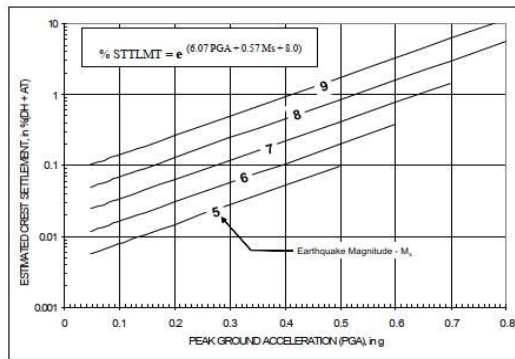
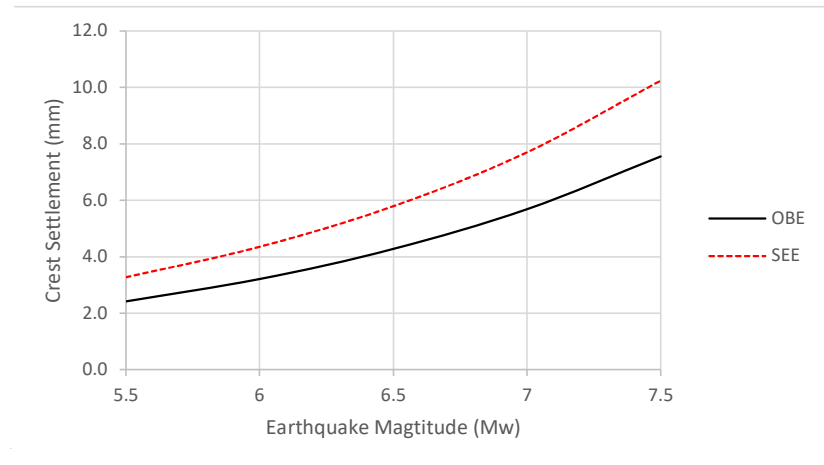


Figure 2. Chart for estimating crest settlement



#### 4 RESULTS OF REGRESSION ANALYSES

The regression analyses also provided a mathematical relationship between the crest settlement and the two factors, PGA and M. This relationship can be expressed as:

$$\% \text{ Settlement} = e^{(6.07 \text{ PGA} + 0.57 \text{ M} - 8.00)} \quad (1)$$

where % Settlement = the amount of settlement of the crest of the dam (in meters) divided by the height of the dam plus the thickness of the alluvium (in meters) times 100 (see. Fig 1); PGA = peak horizontal ground acceleration of the foundation rock (in g) recorded or estimated at the dam site; and M = earthquake magnitude (in surface-wave scale:  $M_s$ ).

This relationship is illustrated in Figure 2.

# APPENDIX G

## Water Balance









# APPENDIX H

## Dam Break Analysis



**PROJECT** : Tailings Storage Facility (TSF) Tabba Tabba Lithium  
**CLIENT** Wildcat Resources Ltd  
**LOCATION** : Tabba Tabba, WA  
**SUBJECT** : Dam Break Study - Cell A, Sunny Day  
**SCENARIO** : Sunny Day Conditions

Date	28-Apr-25
Job No	PER2024-0154
Rev	0

BREACH CHARACTERISTICS	Using Empirical Method	MacDonald and Langridge - Monopolis (1984)	
Input Parameters	Value	Unit	Comments
New Embankment Crest Level	120.5	mRL	From design
Approx. NGL	100.0	mRL	From design
Maximum Embankment Height (on Northern Side)	20.5	m	From design
Approximate Emb Length corresponding to Highest Section	1,000	m	assumed
Embankment Crest Width	25	m	From design
Upstream Embankment Slope	2	H to 1V	From design
Downstream Embankment Slope	3	H to 1V	From design
Embankment Cross Section Area	1,563.1	m <sup>2</sup>	Embankment cross section area at highest section
Total Tailings Tonnes stored in TSF	21.90	Mt	Estimated total storage capacity
Dry Density	1.40	t/m <sup>3</sup>	From design
Bulk Density	1.48	t/m <sup>3</sup>	From design
Tailings Volume stored in TSF (V <sub>T</sub> )	15,700,000	m <sup>3</sup>	Estimated total tailings volume
PMP Storm Volume over TSF Catchment	0	m <sup>3</sup>	Rainy Day Failure Scenario - PMP storm event adopted 6 hrs 1010 mm - Area - 1,213,310 m <sup>2</sup> (121.3 ha)
Total Released Tailings Volume from the TSF (V <sub>F</sub> )	5,181,000	m <sup>3</sup>	Allowed for released tailings ~ 33% of storage volume
	4,236	acre-feet	Converted from m <sup>3</sup> to acre-feet (1 acre-feet = 1233 m <sup>3</sup> )
Note: For conservative assessment, it was assumed that embankment breaches will be occurred through the whole embankment height. Tailings released from the embankment breaches were assumed to be liquefied.			
Output Parameters - Breach Characteristics	Value	Unit	Comments
Breach Shape - Trapezoidal Side Slopes	2	V to 1H	Adopted approximate trapezoidal breach shape (T MacDonald and J Langridge - Monopolis, 1984)
Breach Height (H <sub>b</sub> )	20.5	m	Adopted the bottom of the breach is at the base of the embankment
	67.2	feet	Converted from meter to feet
Breach Formation Factor (V <sub>F</sub> x H <sub>b</sub> )	106,210,500	m <sup>3</sup> x m	Used this figure to predict the volume of embankment material removed during a breach
	2.8E+05	acre-ft x ft	Converted from m <sup>3</sup> x m to acre-feet x feet
Embankment Volume Eroded during Breach (V <sub>M</sub> )	4.2E+04	yrd <sup>3</sup>	Embankment volume removed during a breach (determined from Figure 1, T MacDonald and J Langridge - Monopolis, 1984)
	31,904	m <sup>3</sup>	Converted from cubic yard to cubic meter (1 cubic yard = 0.765 cubic meter)
Average Breach Width (W <sub>ave</sub> )	20	m	Calculated based on the removed embankment volume during a breach and embankment geometry
Base Breach Width (W <sub>b</sub> )	10	m	Calculated based on the removed embankment volume during a breach and embankment geometry
Top Breach Width (W <sub>t</sub> )	31	m	Calculated based on the removed embankment volume during a breach and embankment geometry
Breach Shape Area (A <sub>F</sub> )	418	m <sup>2</sup>	Breach shape area at highest embankment section
Equivalent Released Tailings Volume behind Breach Area	158,851	m <sup>3</sup>	Used this figure to estimate the equivalent tailings failed length behind breach area
Equivalent Tailings Failed Length behind Breach Area (x <sub>e</sub> )	380	m	Calculated based on the released tailings volume (behind breach area) and breach shape
Adopted Breach Development Time (t <sub>F</sub> )	6.0	hour	Determined from Figure 2, T MacDonald and J Langridge - Monopolis, 1984
Released Tailings Run-out Flow (Q <sub>F</sub> ) - average flow	240	m <sup>3</sup> /s	Calculated based on released tailings volume and breach development time
Peak Tailings Run-out Flow (Q <sub>P</sub> )	480	m <sup>3</sup> /s	Assuming a triangular hydrograph
Peak Tailings Run-out Flow (Q <sub>P</sub> )	2,306	m <sup>3</sup> /s	Based on Rico M, Beniti G, Diez-Herrero G 2008
			Run-out distance (D <sub>max</sub> ) 35 km



**PROJECT** : Tailings Storage Facility (TSF) Tabba Tabba Lithium  
**CLIENT** Wildcat Resources Ltd  
**LOCATION** : Tabba Tabba, WA  
**SUBJECT** : Dam Break Study - TSF, Worst Case  
**SCENARIO** : Worst Case (PMP Rainy Day Failure Conditions)

Date	28-Apr-25
Job No	PER2024-0154
Rev	0

BREACH CHARACTERISTICS	Using Empirical Method		MacDonald and Langridge - Monopolis (1984)
Input Parameters	Value	Unit	Comments
New Embankment Crest Level	120.5	mRL	From design
Approx. NGL	100.0	mRL	From design
Maximum Embankment Height (on Northern Side)	20.5	m	From design
Approximate Emb Length corresponding to Highest Section	1,000	m	assumed
Embankment Crest Width	25.0	m	From design
Upstream Embankment Slope	2.0	H to 1V	From design
Downstream Embankment Slope	3.0	H to 1V	From design
Embankment Cross Section Area	1,563.1	m <sup>2</sup>	Embankment cross section area at highest section
Total Tailings Tonnes stored in TSF	21.90	Mt	Estimated total storage capacity
Dry Density	1.40	t/m <sup>3</sup>	From design
Bulk Density	1.48	t/m <sup>3</sup>	From tailings testwork
Tailings Volume stored in TSF (V <sub>T</sub> )	15,700,000	m <sup>3</sup>	Estimated total tailings volume
PMP Storm Volume over TSF Catchment	1,225,443	m <sup>3</sup>	Rainy Day Failure Scenario - PMP storm event adopted 6 hrs 1010 mm - Area - 1,213,310 m <sup>2</sup> (121.3 ha)
Total Released Tailings Volume from the TSF (V <sub>F</sub> )	6,406,443	m <sup>3</sup>	Allowed for released tailings ~ 33% of storage volume
	5,238	acre-feet	Converted from m <sup>3</sup> to acre-feet (1 acre-feet = 1233 m <sup>3</sup> )
Note: For conservative assessment, it was assumed that embankment breaches will be occurred through the whole embankment height. Tailings released from the embankment breaches were assumed to be liquefied.			
Output Parameters - Breach Characteristics	Value	Unit	Comments
Breach Shape - Trapezoidal Side Slopes	2	V to 1H	Adopted approximate trapezoidal breach shape (T MacDonald and J Langridge - Monopolis, 1984)
Breach Height (H <sub>b</sub> )	20.5	m	Adopted the bottom of the breach is at the base of the embankment
	67.2	feet	Converted from meter to feet
Breach Formation Factor (V <sub>F</sub> x H <sub>b</sub> )	131,332,084	m <sup>3</sup> x m	Used this figure to predict the volume of embankment material removed during a breach
	3.5E+05	acre-ft x ft	Converted from m <sup>3</sup> x m to acre-feet x feet
Embankment Volume Eroded during Breach (V <sub>M</sub> )	4.9E+04	yrd <sup>3</sup>	Embankment volume removed during a breach (determined from Figure 1, T MacDonald and J Langridge - Monopolis, 1984)
	37,820	m <sup>3</sup>	Converted from cubic yard to cubic meter (1 cubic yard = 0.765 cubic meter)
Average Breach Width (W <sub>ave</sub> )	24	m	Calculated based on the removed embankment volume during a breach and embankment geometry
Base Breach Width (W <sub>b</sub> )	14	m	Calculated based on the removed embankment volume during a breach and embankment geometry
Top Breach Width (W <sub>t</sub> )	34	m	Calculated based on the removed embankment volume during a breach and embankment geometry
Breach Shape Area (A <sub>F</sub> )	496	m <sup>2</sup>	Breach shape area at highest embankment section
Equivalent Released Tailings Volume behind Breach Area	220,672	m <sup>3</sup>	Used this figure to estimate the equivalent tailings failed length behind breach area
Equivalent Tailings Failed Length behind Breach Area (x <sub>e</sub> )	440	m	Calculated based on the released tailings volume (behind breach area) and breach shape
Adopted Breach Development Time (t <sub>F</sub> )	6.0	hour	Determined from Figure 2, T MacDonald and J Langridge - Monopolis, 1984
Released Tailings Run-out Flow (Q <sub>F</sub> ) - average flow	297	m <sup>3</sup> /s	Calculated based on released tailings volume and breach development time
Peak Tailings Run-out Flow (Q <sub>P</sub> )	593	m <sup>3</sup> /s	Assuming a triangular hydrograph
Peak Tailings Run-out Flow (Q <sub>P</sub> )	2,521	m <sup>3</sup> /s	Based on Rico M, Beniti G, Diez-Herrero G 2008
			Run-out distance (D <sub>max</sub> ) 40 km



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