

Macraes Phase Four (MP4) Project

Hydraulic Mining Pre-Feasibility Study of SP11, SP10 and MTI Tailings Storage Facilities

Prepared for OceanaGold (New Zealand) Ltd

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Please note that in this version of the report, commercially sensitive information has been REDACTED and whole pages from Appendix F have been removed.



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Executive Summary

The **Hydraulic Mining Pre-Feasibility Study (PFS)** for **SP10, SP11** and the **Mixed Tailings Impoundment (MTI)** has been undertaken as a critical component of OceanaGold (New Zealand) Limited's (OGNZL's) **Macraes Phase Four (MP4)** project located in the East Otago region, New Zealand. MP4 is an initiative aimed at extending the operational life of the **Macraes Operation** until at least 2039. MP4 is being advanced under the **Fast-track Approvals Act 2024 (FTAA)** as a project of national significance, enabling a streamlined environmental consent pathway to accelerate delivery of key infrastructure and resource developments.

A central requirement of MP4 is the removal of legacy tailings from **SP10, SP11** and, where required, **MTI**, to unlock the full mining extent of the **IM11 to IM13** pit sequence. The combined **27.77 Mt** of tailings currently stored within SP10 and SP11 must be reclaimed to allow excavation of **IM13**, one of the major ore sources in the MP4 mine plan. All tailings will be hydraulically mined and transferred as slurry to the proposed **Frasers TSF (FTSF) Stage 3**, which will provide additional capacity for approximately **153 Mt of tailings**, including both hydraulically reclaimed and future operational tailings.

Hydraulic mining has been selected as the preferred removal method due to its ability to recover tailings safely and efficiently across the MTI and within the constrained SP10 and SP11 pit geometries, minimise heavy equipment exposure, and integrate effectively into the Macraes Mine Water Management System (MWMS). High pressure water monitors will be used to disaggregate the tailings, which will then be transported via launders and mining sumps into the slurry pipeline network for deposition at FTSF Stage 3.

This PFS builds upon the recent **Agilitus peer review of the SP10/11 hydraulic mining PFS prepared by others**, which identified key design improvements, clarified technical risks, and aligned assumptions with international best practice. The peer review now forms the technical foundation for the SP10/11 and MTI PFS, ensuring that design parameters, production envelopes, hydraulic mining requirements, and geotechnical constraints are robust and appropriate for use in the FTAA approval process.

The study evaluates the technical, operational, economic feasibility of implementing hydraulic mining at SP10/11 and MTI. This includes the Basis of Design (BoD), conceptual mining methodology, water and slurry management, geotechnical envelopes, surface water controls, production planning, and PFS level cost estimation of selected items. The outcomes of this PFS will directly support the fast-track approval pathway and inform the scope and level of engineering required for progression to the **Feasibility Study (FS)**.

- The total quantity of tailings to be reclaimed from the SP11/SP10 TSF is estimated at 27.77 Mt, the MTI tailings between RL 548 and RL 512 is estimated at 38.44 Mt. This results in a combined total of approximately 66.21 Mt of tailings to be removed using hydraulic mining. Based on an overall project availability of 82%, the duration of the reclamation program is estimated at approximately 109.1 months. The production schedule assumes that steady state production is achieved from 15 January 2028.
- The production schedule assumes that SP11 will be commissioned first and operated in an alternating sequence with SP10. SP11 is estimated to be fully reclaimed by January 2032. Thereafter, SP10 and the MTI will operate in an alternating sequence, with reclaim activities prioritised in SP10. SP10 is estimated to be fully reclaimed by October 2032, followed by reclamation of the MTI tailings to RL 512 by January 2037.

- The project production schedule assumes differential and staged production rates throughout the operation for SP11 and SP10. Initial production at SP11 is planned at 1,200 t/h, reducing to 750 t/h as reclamation progresses, with further reductions to 450 t/h at the lower RL elevations. SP10 is planned to operate at production rates of 750 t/h and 450 t/h, respectively.
- Production rates, equipment selection, and resourcing levels are based on the available tailings surface area, which decreases significantly at lower RL elevations. Reclamation of the MTI tailings is planned to operate at a constant production rate of 1,200 t/h for the full duration of the hydraulic mining programme and is not affected by the reduction in surface area.
- The project workforce plan is based on a combination of continuous shift operations and day-shift support. Shift personnel are rostered on a 7-days-on / 7-days-off cycle to provide full operational coverage, while day-shift and project management roles operate on staggered day shift roster to ensure continuous leadership and decision-making support across the week. The total workforce requirement for the project is estimated at 43 personnel. This estimate excludes potential opportunities for technical services resource sharing with other areas of the Macraes Operation, which will be evaluated during the Feasibility Study stage.
- Capital expenditure (CAPEX) is estimated at approximately NZ\$ [REDACTED] and covers the hydraulic mining equipment and supporting infrastructure directly associated with the operation, including remote operating mining units, control room and control systems, supply water pipelines, and mobile plant. This estimate is consistent with comparable hydraulic mining operations. Under a contract services delivery model, these capital costs may be included within the contractor's scope of supply.
- Operating expenditure (OPEX) for the hydraulic mining project is estimated at NZ\$ [REDACTED], equating to an average unit cost of approximately NZ\$ [REDACTED] per tonne based on a total reclaimed tailings quantity of 66.2 Mt. The OPEX estimate includes labour, maintenance of hydraulic mining equipment, diesel consumption for mobile equipment, and minor spares.

Key Assumptions

- Review of the mechanical system designed by IMEC identified that no provision had been made for a standby or secondary pontoon system. To optimise the mine design and improve operational resilience, agreement was reached with OGNZL to include a second pontoon installation. This assumption has subsequently been incorporated into the Agilitus mine design. The inclusion of a secondary operating pontoon is consistent with findings from the Agilitus peer review of the Boya Resources Feasibility Study completed in mid-2025.
- Key integration points between the hydraulic mining system and third-party designers were undertaken at a high level. While this level of integration is considered sufficient to support development of the Hydraulic Mining PFS, significantly more detailed and comprehensive integration with third-party designers will be required at the Feasibility Study (FS) stage.
- Material characterisation data has been sourced from historical reports and supplemented with recent data from the active Top Tippery TSF. This data is not considered to be representative of ground conditions in SP10, SP11 and MTI facilities. Further work is recommended to characterise the tailings across all areas to mitigate slope instability risks and optimise reclaim performance.
- Single in-situ material parameters have been assumed across the full hydraulic mining cycle e.g. tailings density. These assumptions may not be representative of material behaviour at depth, where differential settling, consolidation, and moisture redistribution are likely to occur. This represents a key uncertainty that should be addressed through targeted investigations at the FS stage.
- Access to the pontoons has been assumed to be via existing mining ramps. Detailed access planning, constructability assessments, and cost implications have not been completed at the PFS level. These aspects will require further evaluation to ensure representative capital and construction costs are captured during the FS phase.
- Dewatering activities and early-stage capping removal are excluded from the hydraulic mining scope. Infrastructure requirements, sequencing, timing, and the final location of transferred capping material and recovered pond water remain undefined. These elements will need to be integrated into the overall project schedule and cost framework at the FS level.
- Project availability has been conservatively assumed at 82%, in line with guidance provided by OGNZL. This results in an extended overall project duration, particularly with the inclusion of the MTI reclaim volumes, which were not previously considered in earlier scope definitions.
- The MP4 scoping brief does not explicitly define the sequencing or prioritisation of tailings reclamation activities required to meet the broader mining schedule. This PFS assumes, based on direction from OGNZL, that SP11 is prioritised ahead of the MTI. However, the MTI reclaim volumes defined in the MP4 brief materially extend the overall project duration and increase total project cost.
- Specialist hydraulic mining equipment is assumed to be OEM-supplied and is not readily available within New Zealand. Equipment cost and technical specifications have been benchmarked against a known vendor; however, no formal trade-off studies have been completed against alternative suppliers.
- The PFS has been developed on the basis of an owner-operated model. It is unlikely that this would represent the ultimate operating strategy, as hydraulic mining is a niche capability typically better executed by specialist mining service providers. The PFS does not consider contractor mining costs, equipment logistics, or contractor management overheads, as these were outside the defined scope of work.
- The preliminary execution schedule indicates that early site works, and equipment procurement may commence up to 12 months prior to commissioning. This schedule does not incorporate

third-party design dependencies or detailed integration requirements, which will need to be developed at the FS stage to align with broader engineering interfaces and lifecycle dependencies.

Relied Upon Information

Reports

Description	Source
MAC-205-MAN-001 6961 – Macraes MTI OMS Manual (RL548 August 2025)	EGL
MAC-205-MAN-002 6793 – Macraes SP11A OMS (RL544 August 2025)	EGL
OGC Macraes_Hydro Mining Draft FS 20230608	Boya Resources
OGC Macraes TSF FS_Opex Capex_20230608	Boya Resources
9430 – SP11A Mechanical Remining Technical Report	EGL
8923 – MTI TSF 2023 Geotechnical Investigation Factual Report	EGL
5956 – MTI Tailings and SP11A Geotechnical Investigation Factual Report	EGL
2105-FD-01_A – Functional Description	IMEC
2105-PDC-01 – Project Design Criteria	IMEC
2105-REP-01_A Options Study	IMEC
2105-REP-01_B Options Study	IMEC
250944 M01-rev 1	ATC Williams (Water Balance Memo)
5.0 IM11 Hydromining Power Supply Concept Design Report	GHD
OGC Macraes_Hydro Mining FS Review with IM Extension_20250707v2	Boya Resources
OGC Macraes Tailings Reclaim Study Review_IM Extension Study Summary_20250717	Boya Resources
OGC Macraes TSF FS_Opex Capex_20250707	Boya Resources
25174-GT-REP-0001_A	Agilitus

Data

Data Type	Area and Year	Description	PFS Relevance	Source
CPT	MTI, 2023	CPT campaign for MTI tailings characterisation	Primary dataset	EGL
	MTI, 2020	CPT and CPT-sampling completed at MTI for closure design of MTI TSF, referred to as CPT 200 series	Supporting dataset	EGL
	SP10/11, 2019	CPT investigations at SP10/11 and MTI completed following periods of tailings rest to establish post-rest baseline	Primary dataset	EGL
	MTI, 2019	CPT and SCPT completed at MTI for closure design of MTI TSF, referred to as CPT 100 series	Supporting dataset	EGL
	SP10/11 and MTI, 2005	CPT campaign for MTI / SP10-11 expansion works. Raw digital data not available.	Historical reference only	EGL
	MTI, 2002	CPTs undertaken during early upstream construction phases at MTI	Historical reference only	EGL

List of Acronyms

Acronym	Meaning
AGIL	Agilitus
BOD	Basis of Design
CAD	Computer-Aided Design
CAPEX	Capital Expenditure
CID	Isotropically Consolidated Drained Triaxial
CPT	Electric Friction Cone Penetration Test
Cu	Coefficient of Uniformity
Cv	Solids by volume
Cw	Solids by weight
d/t	Dry tonnes
Dt/h	Dry tonnes per hour
EGL	Engineering Geology Ltd
FS	Feasibility Study
FoS	Factor of Safety
FTAA	Fast-track Approvals Act (2024)
FTSF	Frasers Tailings Storage Facility
GHD	Gutteridge Haskins & Davey
HP	High Pressure
ID	Internal Diameter
IM11	Innes Mills Stage 11
IM12	Innes Mills Stage 12
IM13	Innes Mills Stage 13
IMEC	International Mining Engineering Consultants
LDV	Light-Duty Vehicle
L/s	Litres Per Second
m/d	Metres per day
ML	Million Litres
MP4	Macraes Phase 4 Project
RL	Metres Reduced Level
MTI	Mixed Tailings Impoundment
MT	Million Tonnes
MWMS	Mine Water Management System
NZSOLD	New Zealand Society on Large Dams
OCR	Over Consolidation Ratio
OEM	Original Equipment Manufacturer
OGC	Oceana Gold Corporation
OGNZL	Oceana Gold (New Zealand) Limited
OPEX	Operational Expenditure

Acronym	Meaning
P80	Passing eighty per cent
PFD	Process Flow Diagram
PFS	Pre-Feasibility Study
PLC	Programmable Logic Controller
PMP	Probable Maximum Precipitation
PSD	Particle Size Distribution
RCM	Reliability-centre Management
RL	Reduced level
ROMU	Remote Operated Mining Unit
SC77	Victaulic Coupling
SCADA	Supervisory Control and Data Acquisition
SHANSEP	Stress History and Normalized Soil Engineering Properties
SP10	Southern Pit 10 Tailings Storage Facility
SP11 or SP11A (used interchangeably)	Southern Pit 11 (or 11A) Tailings Storage Facility
t/h	Tonnes Per Hour
TSF	Tailings Storage Facility
SSL	Skid Steer Loader
TTTSF	Top Tipperary Tailings Storage Facility
µm	Micrometre
UTV	Utility Task Vehicle

1. Introduction

1.1 Project Background

The Macraes Phase Four (MP4) project is a major development initiative designed to extend the life of gold mining operations at the Macraes Operation until at least 2039. The MP4 project is identified as a Listed Project in Schedule 2 of the Fast-track Approvals Act 2024 (“**FTAA**”) as a project providing significant national or regional benefits.

A central component of MP4 is the construction of Frasers Tailings Storage Facility (FTSF) Stage 3, which will provide additional capacity for approximately 153 Mt of tailings. This includes not only future operational tailings but also relocated tailings from the Southern Pit TSFs (SP10 and SP11), and the Mixed Tailings Impoundment (MTI) that must be moved to enable the next phase of mining.

MP4 also includes a series of enabling works required to facilitate full extraction of ore from the IM11, IM12 and IM13 pit areas. These activities include but are not limited to:

- Realignment of Macraes Road in two stages
- Relocation of SP10, SP11 tailings and MTI tailings
- Rerouting of powerlines, pipelines (water and tailings), and pump stations
- Relocation of the Open Pit Mining Workshop.

These activities are essential to maintain operational continuity and ensure safe access to down dip and stockwork ore zones planned for extraction.

1.2 Objective of PFS and Strategic Importance

The MP4 project proposes a further pit expansion to the north, east, and west into the Southern Pit area, from IM11 through to IM12, while mining of IM13 will be constrained by the presence of legacy tailings facilities.

The SP10 and SP11 TSFs contain approximately 27.77 Mt of tailings. Complete removal of these tailings is required to enable the full mining extent of IM13. While all tailings within SP10 and SP11 must be reclaimed, part of the SP11 embankment will remain in place unless future design work determines that its full removal is required.

Hydraulic mining has been identified as the preferred method for tailings reclamation because it:

- Enables safe material removal within constrained pit geometries
- Reduces heavy equipment interaction risks
- Provides continuous flow of slurry to FTSF
- Integrates effectively with the Macraes Mine Water Management System (MWMS).

Under MP4, hydraulic mining will be used to remove tailings from SP10, SP11 and MTI, with all reclaimed material transported as slurry to FTSF Stage 3 for permanent storage.

This Pre-Feasibility Study (PFS) focusses on the key elements of hydraulic mining as applicable to the SP10, SP11 and MTI sites. Specific elements of the study are covered by third parties and are not addressed in this report, including:

- Mechanical sump construction
- Mechanical systems

- Electrical systems
- Major civil earthworks
- Slurry transport
- Dam Safety and global TSF stability

1.3 Hydraulic Mining and Water Supply

Tailings removal will be undertaken using hydraulic mining techniques, employing high pressure water monitors to repulp tailings and transport the material via launders (channels) and sumps into the pumping network.

The hydraulic mining system will source water from the Macraes Mine Water Management System (MWMS), which provides controlled storage, transfer, and reuse of mine-affected water across the site.

1.4 Link to the Current PFS Scope

This PFS is directly tied to the MP4 strategic development pathway. The PFS provides:

- The design basis required to support fast track consenting under the FTAA
- Confirmation of technical and operational feasibility for hydraulic mining
- Evaluation of water, staging, geotechnical, and economic requirements
- Layout details for others to identify the pumping and electrical requirements for water supply and pumping of tailings to FTSF Stage 3
- Definition of the engineering and operational timeframes required to unlock IM11–IM13 mining.

Additionally, this study builds on, and is aligned with, the recent Agilitus peer review of the SP10/11 Hydraulic Mining PFS undertaken by Boya Resources. Findings from that peer review have been incorporated to ensure compliance with industry best practice and to strengthen the risk mitigation framework applied to this PFS and subsequent feasibility-level work.

The scope of this PFS is limited to the hydraulic mining of tailings within SP11, SP10, and the partial hydraulic mining of the MTI facility. For this study phase, IMEC will be responsible for all mechanical design, supply and install of the hydraulic mining system. GHD will undertake the electrical design, supply, and control systems, including the development of the control philosophy. OGNZL will be responsible for removing the capping layers and waste rock cover on SP11 and the MTI, as well as the mechanical removal of the upstream embankments of SP11 and the MTI, and the downstream embankments of SP11.

1.5 Limitations, assumptions and data confidence

The PFS has been completed to an accuracy of 25–30% and relies on available datasets, peer-reviewed assumptions, and the MP4 development framework. The estimation accuracy is considered to be averaged over all cost components and individual cost components may exceed or be less than the average accuracy.

Elements requiring further work to refine the cost uncertainties such as geotechnical parameters, detailed mining plans, and final production sequencing will be progressed in the Feasibility Study phase.

2. Project Setting

2.1 Site Location

The Macraes Operation is situated on New Zealand's South Island in the East Otago region, approximately 60 km north of Dunedin. The mine comprises a combination of large open pit operations and underground mining.

The site contains several tailings storage facilities (TSFs), including the Top Tipperary TSF (TTTSF), the MTI, SP10 and SP11. Currently, all operational tailings are pumped to the FTSF for final deposition. A Mine Site Plan of the site and location of the TSFs is presented in Figure 2-1.

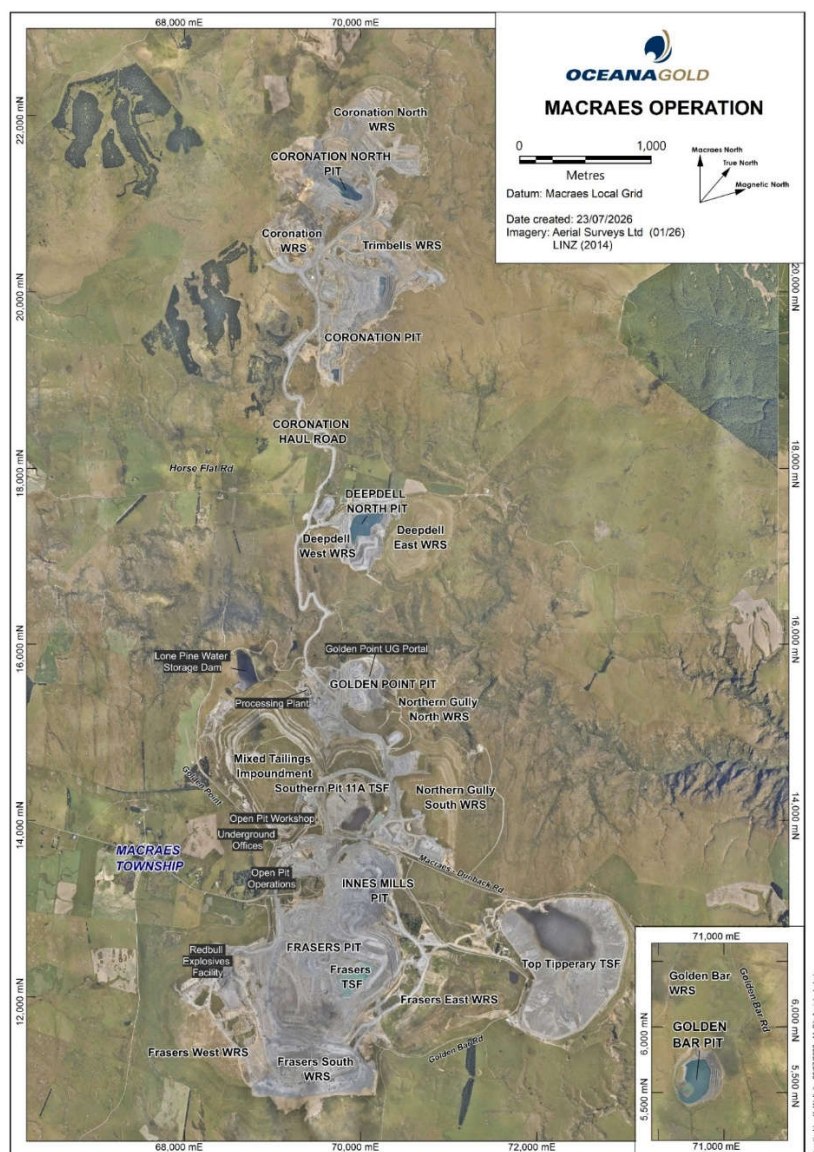


Figure 2-1 Existing site layout at Macraes Operation (as of July 2026)

2.2 Macraes Operational Overview

The Macraes Operation, located in the Otago region of New Zealand's South Island, is the country's largest gold mine and the foundation asset of OceanaGold. It has been in continuous operation since 1990, producing more than six million ounces of gold.

Macraes is a large-scale operation consisting of:

- Numerous open pits (both operational and non-operational);
- Two underground mines (Frasers, now closed, and Golden Point, which is actively mined);
- Waste rock stacks at various stages of operation and rehabilitation;
- A network of haul roads and general mine service tracks;
- A Processing Plant;
- Five tailings storage facilities (three inactive, one active but nearing capacity, and one under construction and currently receiving tailings);
- An extensive network of water management infrastructure, including diversion drains, silt ponds, sumps, pit lakes, and freshwater storage reservoirs;
- Two consented but not yet constructed water storage reservoirs (Camp Creek Dam and Coal Creek Dam); and
- Associated infrastructure supporting ongoing operations, including district roads, powerlines, workshops, offices, and associated water and amenity facilities.

2.3 Overview of SP10, SP11 and MTI TSFs

According to the site Operating, Maintenance and Surveillance reports and records, there have been no noted issues regarding the performance of the TSFs.

2.3.1 SP10 and SP11

The SP11 TSF lies immediately east of the MTI. Tailings deposition into SP11 began in March 2006. The facility is formed by a zoned earth and rockfill embankment constructed from mine waste rock. SP11 holds Resource Consent to RL551 and Building Consent to RL544, which is the current embankment crest level.

The MTI, located west of SP11, was the first tailings facility built at Macraes, with construction commencing in 1990. It received continuous tailings deposition until 2002, when a second TSF, SP10, was commissioned. After approximately 16 months of deposition into SP10, tailings discharge cycled back to MTI.

From 2003 to 2004, deposition alternated between MTI and SP10 to support staged embankment lifts, including raising the SP10 embankment to RL525.

Construction of the SP11 Embankment commenced in 2005, reaching RL525 in early 2006 and RL530 later that year. Tailings deposition into SP11 progressed from March 2006 to December 2007, during which time SP11 reached its design capacity and fully covered the underlying SP10 TSF (crest RL525). Thereafter, SP10 no longer functioned as a dam.

Following the filling of SP11, deposition reverted to MTI while the first upstream lift of SP11 to RL537 was constructed. Tailings were again discharged to SP11 between May 2009 and February 2010, after which the second upstream lift to RL544 was completed. SP11 then received a final period of tailings deposition between May 2011 and January 2012. No further tailings have been placed in SP11

since January 2012. Note that SP11 is also known as SP11A and these names are used interchangeably.

This sequence reflects the alternating deposition strategy used across MTI, SP10 and SP11 to manage embankment construction, storage capacity, and operational needs over time.

2.3.2 MTI

Construction of the MTI began in 1990, forming a zoned earth and rockfill embankment within Māori Tommy Gully. The structure was originally designed to a crest elevation of RL490, but was later redesigned to increase storage capacity, with the crest raised to RL515 by September 2001.

In late 2002, consents were granted to raise the embankment further to RL526 using a combination of downstream and upstream construction, followed by approval in May 2005 to extend the crest to RL527. The staged lifts above RL515 were completed between 2002 and 2005, including the placement of the rockfill mattress for this section of upstream construction.

Additional resource consents obtained in November 2006 allowed the crest to be progressively raised to RL551. Subsequent lifts were completed as follows:

- RL533 in 2007
- RL539 in 2010
- RL545 in 2012
- Final lift to RL548 in 2013, the current crest level.

Embankment construction followed strict technical specifications, including routine testing of fill properties (density, permeability, grading, moisture). Embankment performance has been monitored through piezometers, survey prisms, seepage measurements, and regular visual inspections.

Tailings deposition into MTI commenced on 10 February 1991. Initially, only flotation tailings were discharged, with concentrate tailings placed in a separate upstream impoundment. A mixed tailings strategy began in 1993, consolidating all tailings deposition into the MTI facility. Tailings were briefly separated again in 1998–1999 during a process plant upgrade but returned to mixed deposition thereafter, with tailings also directed to SP10/11) as required. Additional deposition capacity was added with the commissioning of the Top Tipperary TSF in October 2013.

Throughout its life, tailings have been predominantly discharged sub-aerially from the embankment crest, forming extensive beaches and a decant pond to the south. MTI has also experienced several resting periods to support construction of embankment lifts and to optimise tailings consolidation before further upstream development.

The general layout of SP11 and MTI is presented in Figure 2-2.

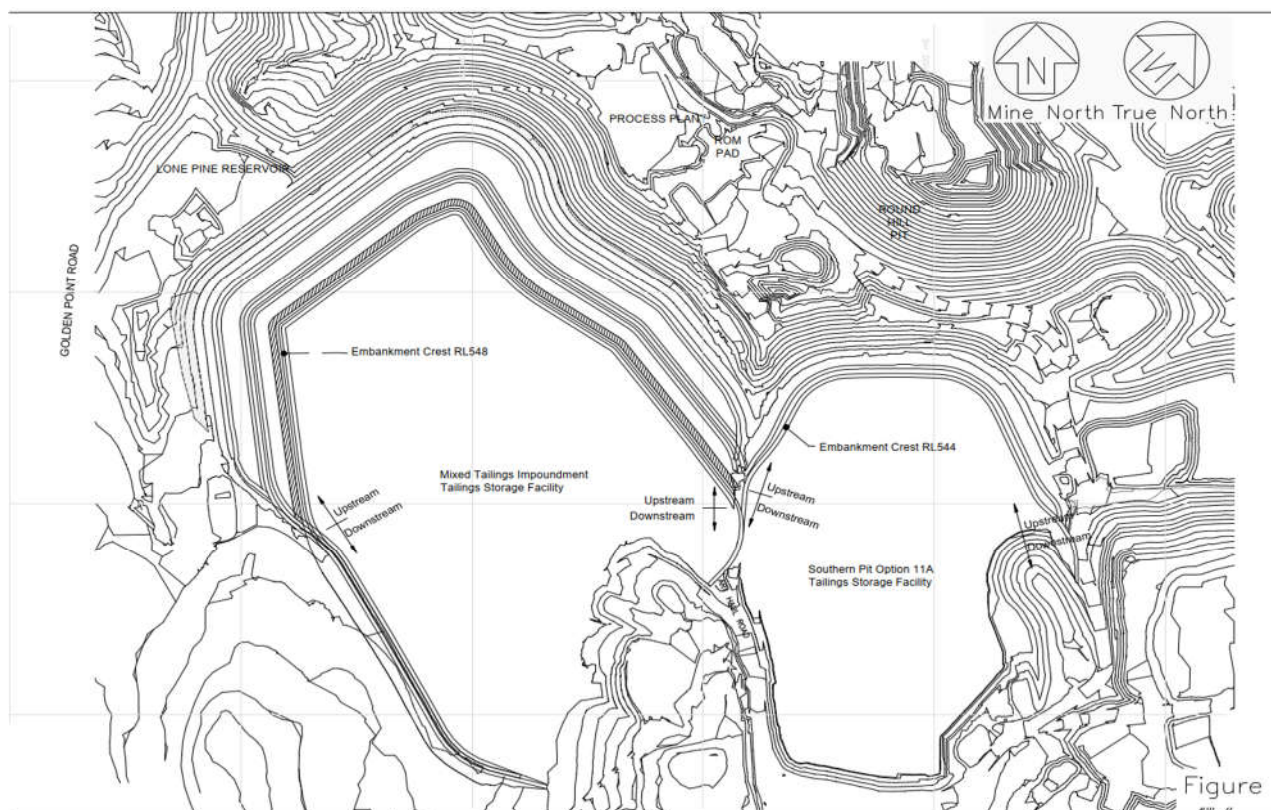


Figure 2-2 SP11 and MTI General Layout

2.4 Regulatory Context

The SP10, SP11 and MTI tailings storage facilities operate within New Zealand's dam safety and environmental regulatory framework, which includes compliance with resource management Consents or Permits, and Building Consents governing tailings discharge, water management, and embankment construction, as demonstrated in similar consent frameworks used for the Frasers TSF. These facilities have been designed and operated in alignment with the New Zealand Society on Large Dams (NZSOLD) dam safety guidelines, which form the national good practice benchmark for TSF design, monitoring, construction and performance management.

Tailings were deposited in SP10 from 2002 – 2006 following construction of the SP11 embankment, tailings deposition covered SP10 from RL 525 and SP10 thereafter ceased to function as a dam. Dam safety legislation was enacted in 2022 (the Building (Dam Safety) Regulations 2022). The regulations provide a minimum level of acceptance for dam safety whereas the NZSOLD guidelines reflect recommended industry practice.

3. Basis of Design

3.1 Purpose Of the Basis of Design

This Basis of Design defines the technical, operational and planning assumptions that underpin the PFS. It establishes the design criteria, production parameters, geotechnical considerations, and engineering inputs required to evaluate the technical and economic viability of hydraulic mining at Macraes.

All parameters presented in Table 3-1 are derived from site data, historical operating information, Agilitus benchmarking, and previous Macraes studies. Key source documents include the Macraes Phase Four Project Description – Fast-track Approvals Act 2024 and supporting analyses completed by Agilitus.

Table 3-1 Hydraulic Mining Site Data and BOD

Site Data		SP11	SP10	MTI	Metric
Resource		Gold tailings	Gold tailings	Gold tailings	Au
Scope of Hydro mining		Remove all tailings	Remove all tailings	Remove tailings from RL548 - RL512	
Tailings Volume		27.77		38.44	Mt
Planned Production	Phase 1	1200			dt/hr
	Phase 2 – Phase 3	900 - 450	900		
	Phase 4 – Phase 5		450	1200	
Production hours per year		7,211	7,211	7,211	hr/year
Specific Gravity		2.7	2.7	2.7 to 2.8	
Dry Density		1.38			t/m ³
Required Slurry Density		35-45			%avg.
Moisture content		20	20	20	%avg.
PSD (P80)		110	110	100	µm
Deposition point		FTSF	FTSF	FTSF	m ³ /hr
Average Annual Rainfall		620			mm/year
Embankment Removal (Upstream)		Yes	N/A	Yes	Required

BOD		SP11	SP10	MTI	Metric
Pressure required at Remote Operated Mining Unit (ROMU)		25-30			bar
Water quality		6.5			pH
ROMU					
Unit Size		150			mmInce
Unit Capability		450			t/hr
ROMU required	1200 t/h	3		3	Unit
	900 t/h	2	2	N/A	
	450 t/h	1	1	N/A	
Water required	1200 t/h	500			L/s
Water required	900 t/h	370			
Water required	450 t/h	185			
Orifice size		53-55	53-55	53-55	mm
Advance Rate (Mining)	1200 t/h	63		56	m/day
	900 t/h	66	66	N/A	
	450 t/h	81	81	N/A	
Cv (solids volume)		20.59	20.59	20.59	%
Cw (solids weight)		41.18	41.18	41.18	
MINE DESIGN					
Mining depth		6-8	6-8	9	m
Launder gradient		150-200H-1V	150-200H-1V	150-200H-1V	m
Mining Block size	Phase 1	8m(d)x12m (W)	8m(d)x12m (W)	9m(d)x12m(W)	m
	Phase 2	8m(d)x13m (W)	8m(d)x13m (W)	N/A	
	Phase 3	6m(d)x14m (W)	6m(d)x14m (W)	N/A	
Pontoon sump		1(v):2.5(h)	1(v):2.6(h)	1(v):2.5(h))	ratio
Batter (Mining face)		27	27	38	degrees
Launder width		5	5	5	m

4. Tailings Quantity Evaluation

The tailings quantity evaluation for the proposed hydraulic mining operation has been developed using site survey, solids inventory, and historical deposition datasets provided by OGNZL. These datasets collectively define the spatial extent, volumetric inventory, and solids distribution of tailings within the SP10, SP11, and MTI areas targeted for re-mining. The data sources represent the most recent consolidated tailings information available at the time of this PFS and form the basis for the tailings inventory estimates presented herein.

The evaluation has focused on establishing a geometrically and volumetrically consistent tailings resource, suitable for hydraulic mining method selection and production rate development.

4.1 Data Sources and Tailings Inventory

The following primary data sources were used in the preparation of the tailings inventory:

- **Site_As-Built_260201.msr**

This dataset represents an as-built surface model derived from site survey information. It provides the reference topography of the tailing's storage areas prior to re-mining activities. The surface model is used as the upper bounding surface for tailings volume calculations and spatial reconciliation between different tailings domains.

- **SP10 SP11 tails to be remined Aug 2020.dxf**

This CAD dataset delineates the lateral extents of tailings within the SP10 and SP11 facilities identified for re-mining as of August 2020. The file defines the plan-view boundaries of the re-minable tailings footprint and is used to constrain volumetric calculations to areas approved for hydraulic mining under the current project scope.

- **SP11A_Total_tailings solid.dxf**

This dataset defines the three-dimensional solids model for the SP11 tailings area. It represents the interpreted solids envelope of deposited tailings and provides a direct basis for estimating in situ tailings volumes within SP11. The model is used to differentiate tailings solids from underlying foundation materials and containment structures.

- **MTI Total tailings.msr**

This solids resource model provides the total tailings inventory associated with the MTI area. The dataset includes volumetric solids interpretation and supports cross-checking of tailings quantities against site deposition records and survey surfaces.

All datasets were supplied by OGNZL and are assumed to have been generated in accordance with site survey standards and internal quality control procedures.

- **Volume Estimation**

Tailings volumes were calculated by comparing the as-mined surface (Site_As-mined_260201.msr) against the interpreted base of tailings defined in the solids models (SP11A_Total_tailings solid.dxf and MTI Total tailings.msr). Volumes represent in situ tailings solids and exclude containment embankments and foundation materials.

Total tailings to be reclaimed under the MP4 project reported in Table 4-1

Table 4-1 Reported tailings for each TSF to be reclaimed

Location	Volume (m³)	Area (m²)	Dry Density (t/m³)	Tonnes (t)
SP10/11	20,123,110	2,933,893	1.38	27,769,891
MTI	27,856,275	3,625,199	1.38	38,441,659
All Tailings	47,979,385	6,559,092	1.38	66,211,551

4.2 Data Confidence and Gaps

The tailings inventory is considered appropriate for a PFS level assessment. However, the following limitations are noted:

- The solids models are based on interpreted surfaces and may not fully capture local variability in tailings thickness or consolidation state.
- No additional independent survey validation or drilling-based confirmation was undertaken as part of this PFS.
- Moisture content, density, and fines segregation are not explicitly defined in the geometric models and are treated as global assumptions for hydraulic mining purposes.

Notwithstanding these limitations, the datasets provide a coherent and internally consistent representation of the tailings resource suitable for evaluating hydraulic mining viability, equipment selection, and production scheduling at PFS accuracy.

5. Hydraulic Mining Methodology

5.1 Overview of Hydraulic Mining Method

Hydraulic mining is a water-based reclamation method used to recover tailings by directing a high-pressure water jet onto a material face to break down, mobilise, and transport the material as slurry. It is widely used in tailings reclamation because it enables remote, continuous, and low-impact material recovery compared with mechanical methods.

Hydraulic mining relies on three key mechanisms described below and illustrated in Figure 5-1.

5.1.1 Hydraulic Erosion and Fracturing

A Remote Operated Mining Unit (water cannon) projects a high-pressure jet typically 25-30 bar in tailings applications onto the tailings surface. The jet:

- Fractures the material
- Liquefies it
- Creates a flow path that transports the slurry to a sump or collection point.

5.1.2 Hydraulic Transport

The repulped tailings form a slurry that flows by gravity towards a collection sump or trench. Accurate floor gradients and mining geometry are critical to ensure controlled flow and to prevent dead zones or uncontrolled run-off.

5.1.3 Slurry Collection and Pumping

At the sump, high-density slurry pumps (typically 30–45% solids by weight in tailings applications) lift the material through pipelines for tailings deposition into the FTSF.

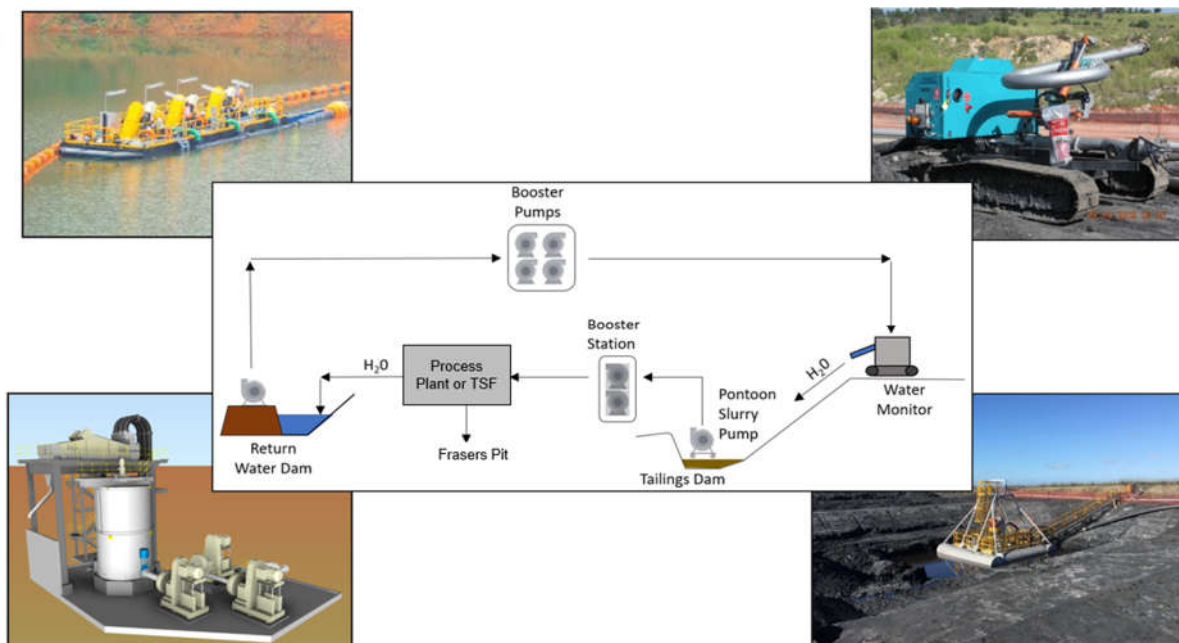


Figure 5-1 Hydraulic Mining Process Flow Diagram

5.2 Pre-Mining Enabling Works

5.2.1 SP11

The SP11 tailings are contained by a series of upstream constructed embankments and primary downstream embankment. The upstream embankments were progressively raised over the tailings beach. These embankments comprise zoned earth fill and rockfill sourced from mine waste rock. As hydraulic mining advances, both the upstream embankments and the main downstream embankment will need to be progressively reclaimed using conventional excavator and truck methods. The locations of the upstream and downstream embankments are illustrated in Figure 5-2 with the cross section and geometry illustrated in Figure 5-3.

The SP11 haul road runs east–west across the SP11 TSF and was constructed using mine waste rock. This haul road, along with the capping layer on the SP11 tailings surface, will need to be removed ahead of hydraulic mining activities. The works will also include the dewatering of the

existing water pond located on the southern side of the TSF. Dewatering is outside the scope of this study so associated timing and costs have not been considered further.

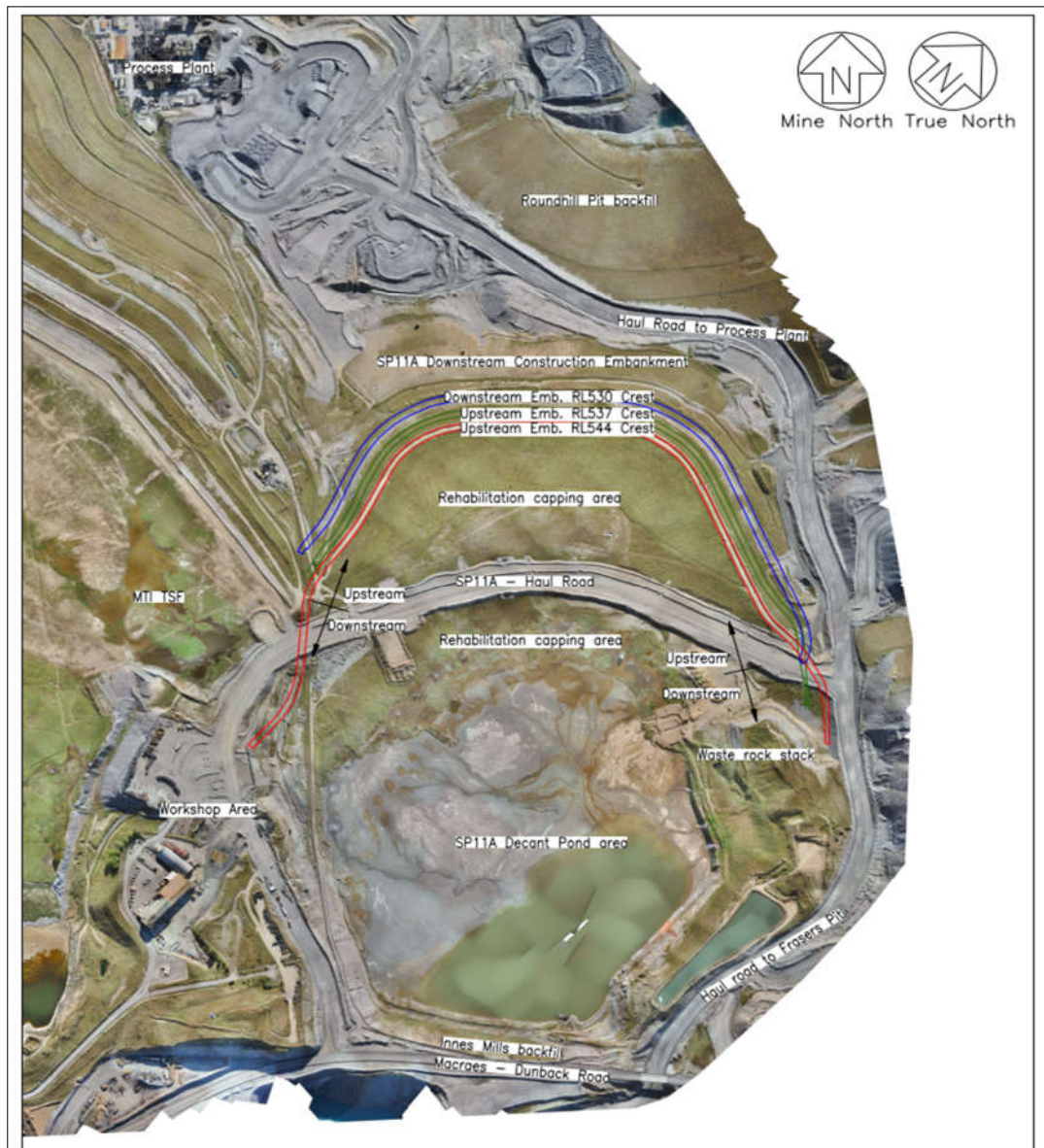


Figure 5-2 SP11 Aerial view with embankment RLs

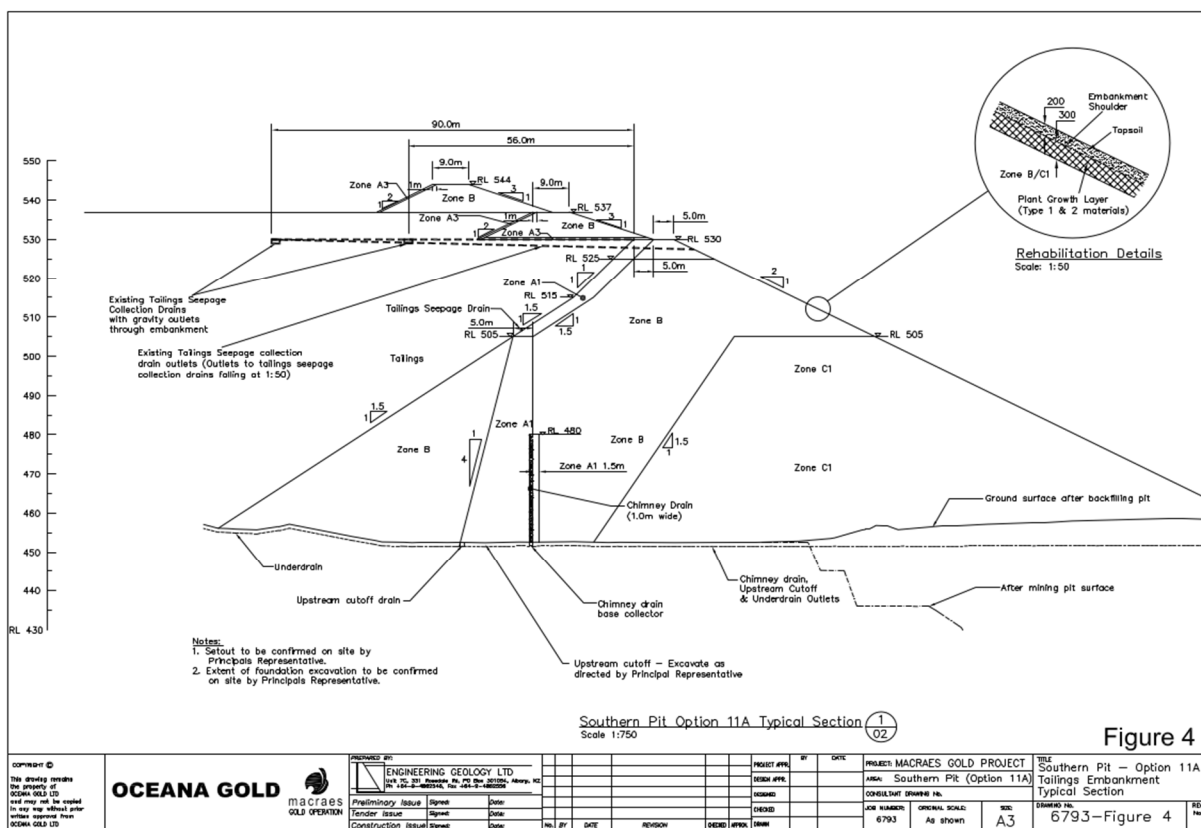


Figure 5-3 SP11 Typical Embankment Section

5.2.2 MTI

The upper MTI tailings are contained by a series of upstream-constructed embankments that were progressively raised over the tailings beach. These embankments consist of zoned earth fill and rockfill derived from mined waste. As hydraulic mining progresses, all upstream embankment lifts between RL548 and RL515 (a height difference of about 33 m) will need to be reclaimed mechanically using conventional excavator and truck methods. A cross-section of the MTI upstream and downstream embankments is shown in Figure 5-4.

Hydraulic mining will terminate at a tailings elevation of RL512, providing a 3 m freeboard below the remaining downstream embankment crest level at RL515 shown in Figure 5-5. The remainder of the downstream embankment will remain in place, together with the residual tailings located below RL512.

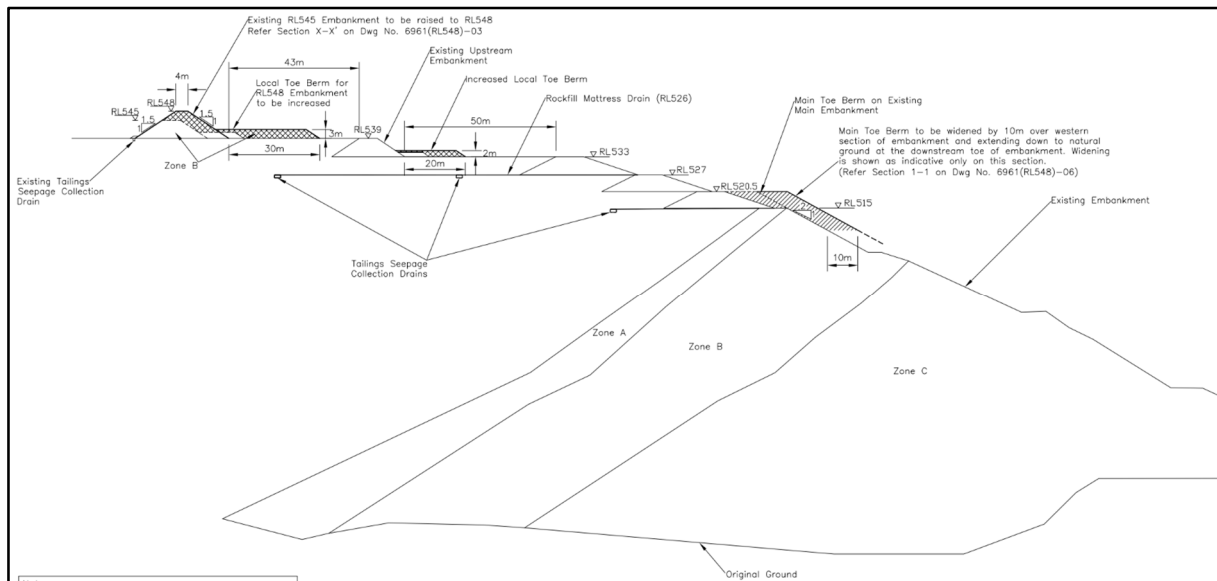


Figure 5-4 MTI Embankment typical section

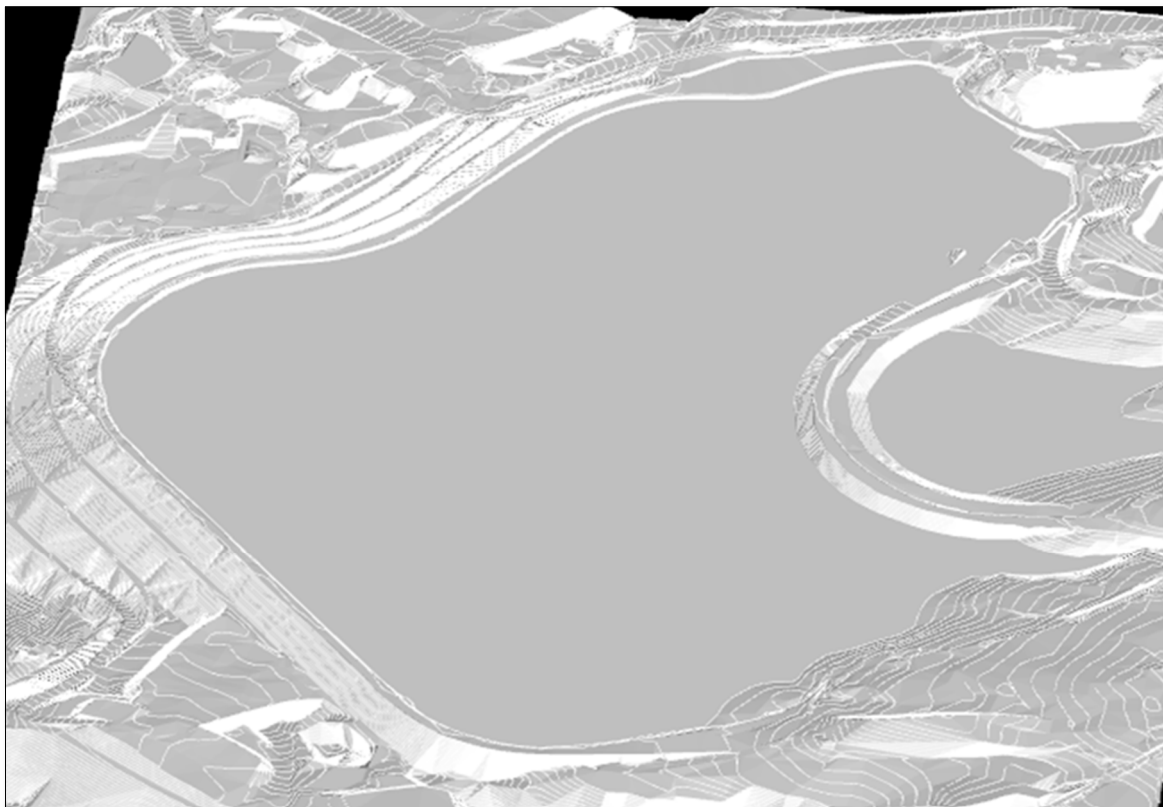


Figure 5-5 MTI Tails at RL512 and Embankment at RL515

The MTI facility currently has some waste rock cover shown in Figure 5-6, and Agilitus has been informed that this waste rock will be removed in the near future and prior to the commencement of hydraulic mining using an excavator and trucks. This removal scope also includes dewatering the water pond located on the southern section of the MTI TSF. Dewatering is outside the scope of this study so associated timing and costs have not been considered further.

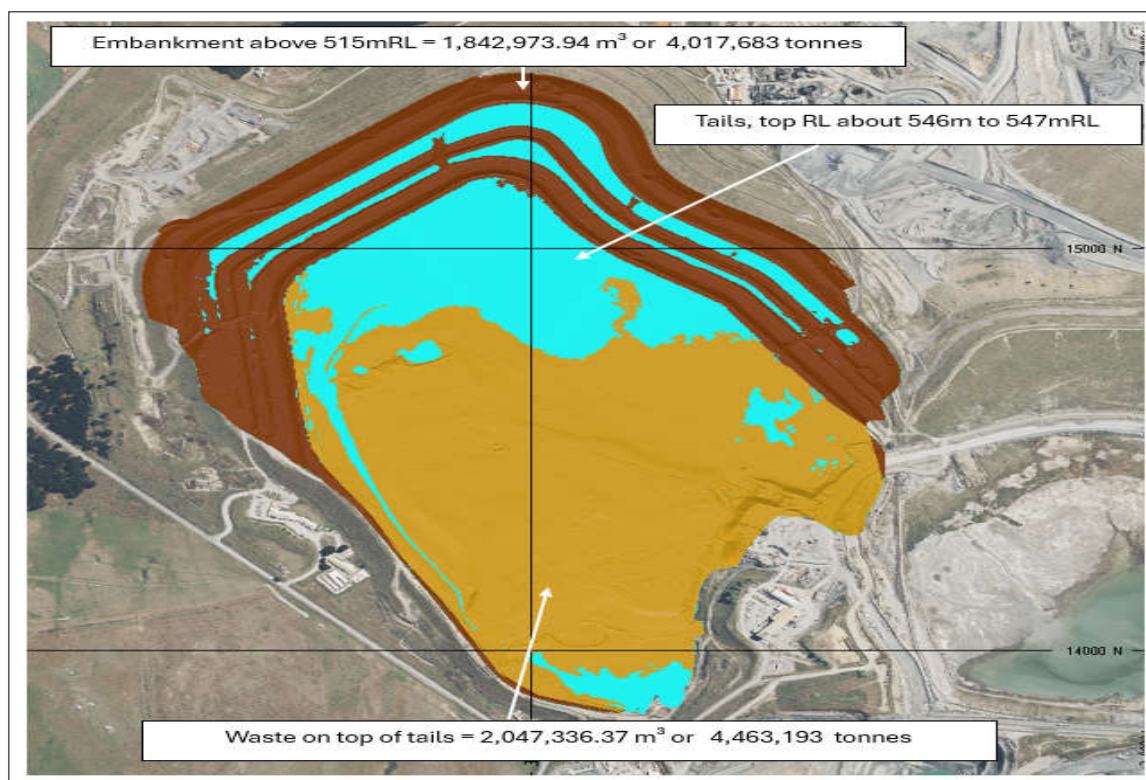


Figure 5-6 MTI Waste rock cover

5.3 Commissioning and Ramp-up

5.3.1 Dry Commissioning

Dry commissioning involves verifying that all mechanical, electrical, and control systems function correctly before introducing water or slurry. This includes equipment installation checks, power-up tests, rotation checks, valve actuation, instrumentation calibration, control logic testing, and communication/SCADA (supervisory control and data acquisition) verification. Dry commissioning ensures that the system is mechanically complete and ready for safe wet operation.

5.3.2 Wet Commissioning

Wet commissioning introduces water and slurry into the system for the first time. This stage validates hydraulic performance, including pump operation under load, monitoring of pressure and flow requirements, sump performance, slurry line velocity, and instrumentation under operating conditions. Wet commissioning ensures that the system performs as designed and can support initial mining operations.

5.3.3 Ramp-Up

Following successful wet commissioning, hydraulic mining begins at reduced throughput and progressively increases as operational stability is achieved. Ramp-up allows the mining, pumping, and water supply systems and the operating team to reach full, steady-state production under controlled conditions.

The entire ramp-up period has not been incorporated into the production schedule and is shown separately in Section 0.

5.4 Pontoon Sump

Before hydraulic mining can commence, a sump must be excavated within the tailings to allow for installation of the pontoon-mounted slurry pumping system for slurry collection during hydraulic mining. This sump is an engineered excavation with defined slope and bench requirements as presented in Figure 5-7 to accommodate return slurry piping, electrical connections, and access walkways for maintenance. The design criteria for these sumps are outlined in Section 6 under the Geotechnical Assessment.

After completion of mining for each installed flitch, the pontoons must be relocated to the next bench level.

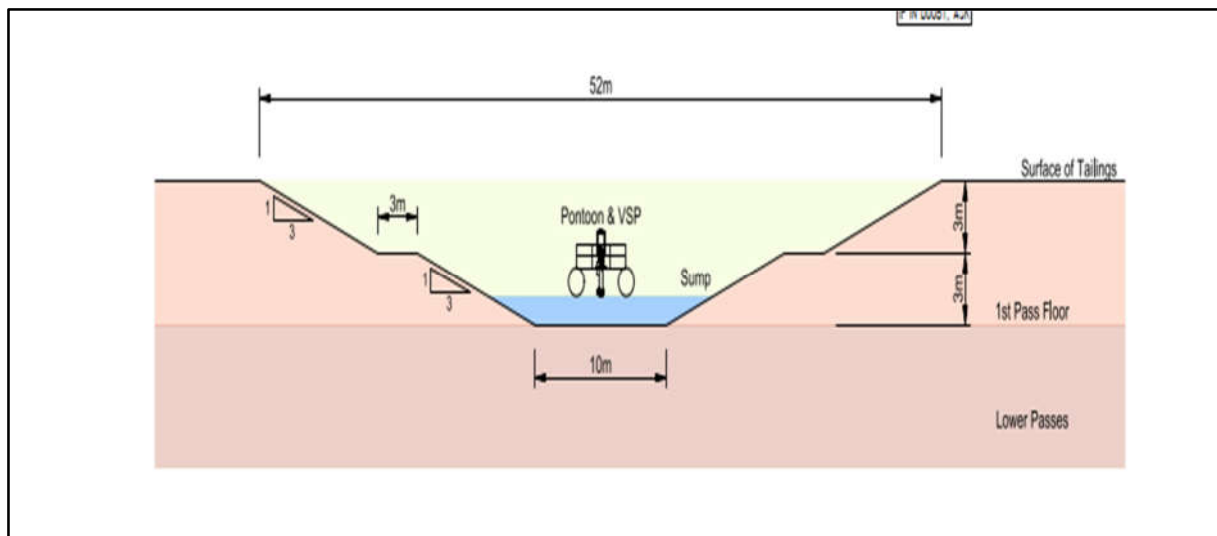


Figure 5-7 Pontoon Sump - Concept Design at 6m depth

5.5 Launder and Bench Development

The main launder and trenches will be hydraulically mined at an approximate side slope of 27° (1V:2H) with a maximum crest width of 45 m and a maximum bench height of 6-9 m. An overall floor grade (tailings beach angle) of 0.6% (H150:V1) is assumed, based on the current TSF beach angle, draining toward the slurry collection sump. The main launder must be developed first to establish the initial void required for subsequent mining blocks to drain into.

Example of conventional launder development is depicted in Figure 5-8.

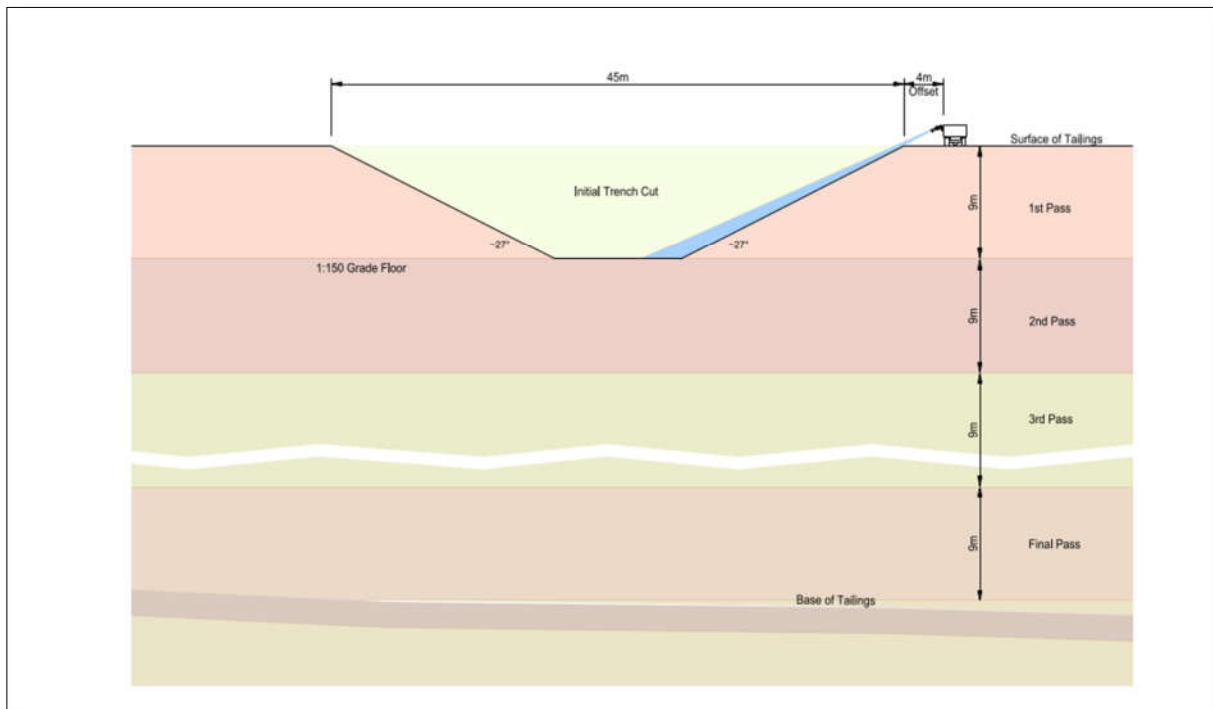


Figure 5-8 Hydraulic Mining Launder typical cross section example at 9m flitches

Bench development is a critical component of the hydraulic mining process. Trenches mined from the main launder create defined mining blocks, as illustrated in Figure 5-9, Figure 5-10 and Figure 5-11. These trenches assist in dissipating pore pressures within the mining slope, thereby improving bench stability. Trenches also provide operational flexibility, allowing movement between mining blocks particularly important when a mining zone is more saturated and surface cracking begins to appear. Such cracking is an early indicator of potential instability and is typically observed in areas that have experienced prolonged saturation, such as former water storage pond locations on the TSF.



Figure 5-9 Launder development during Hydraulic Mining

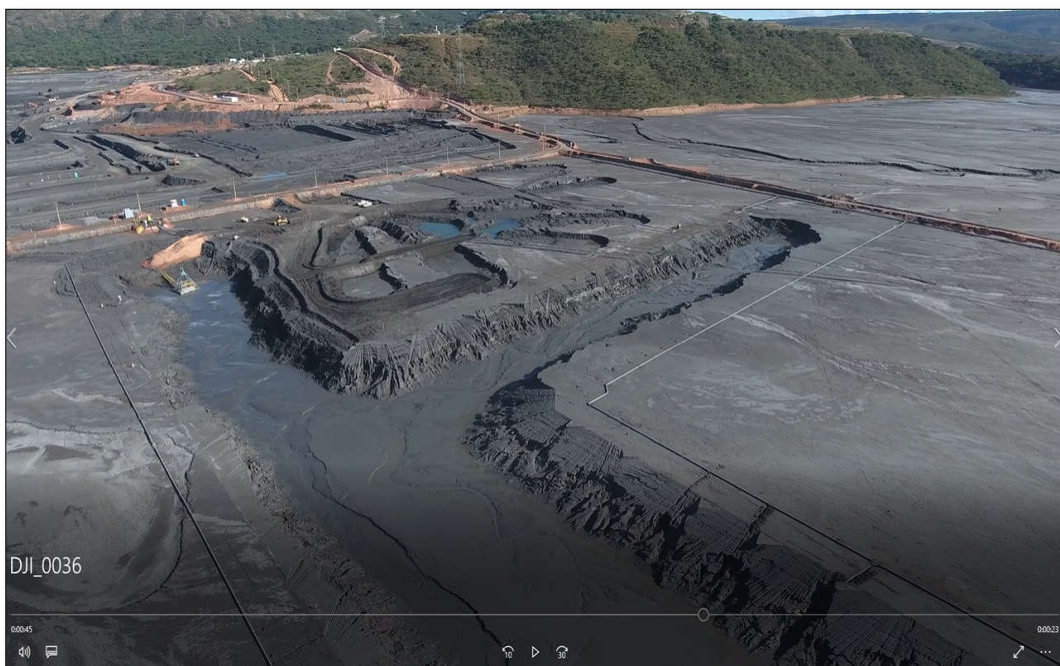


Figure 5-10 Trench Development during Hydraulic Mining



Figure 5-11 Bench and Mining Block Development during Hydraulic Mining

5.6 Pontoon Locations

Pontoon locations have been defined for each mining phase throughout the hydraulic mining development for SP11, SP10, and MTI. The pontoons are strategically positioned on either side of the common abutment separating the SP11 and MTI tailings facilities. The abutment comprises competent in-situ rock.

This configuration enables the following activities to be conducted progressively during hydraulic mining:

- Progressive deconstruction of the SP11 and MTI embankments: These materials are unsuitable for hydraulic mining and must be removed mechanically as mining advances.
- Safe installation of pontoon services: Power, pipelines, and associated services are placed on the abutment between the two embankments, keeping them clear of deconstruction works.
- Stable foundation for pontoon installation: The rock abutment provides a secure platform for lifting equipment to position the pontoons.
- Maximised tailings reclamation near the pit wall: Hydraulic mining recovers tailings as close as practical to the old Southern Pit highwall. After each bench drop, an estimated 2 m tailings skin will remain; this can be scraped by excavator and placed onto the next bench for recovery in the subsequent flitch.
- Exposure of historical access ramps: As mining progresses toward the pit wall, old in pit ramps become exposed, enabling support equipment to access the mining area and service hydraulic mining operations.

The strategic positioning of the pontoons also helps manage geotechnical risks associated with potential wetting or seepage into the embankments resulting from slurry collection during hydraulic mining. The initial pontoon locations is offset by approximately 168 m from the constructed embankments. As the pontoons advance down the pit or along the southern highwall, this separation distance increases due to the expanding footprint created by the deconstruction of upstream raises. This process exposes additional tailings surface area that was previously covered by construction fill, thereby providing a substantial buffer that minimises hydraulic loading, reduces seepage risk, and maintains embankment stability.

The old Southern Pit highwalls that will be re-exposed by tailings removal are assumed to be stable for the purposes of this PFS. Agilitus recommend that pit wall geotechnical stability be assessed as part of the future FS or detailed design in the context of the proposed hydraulic mining plan and associated operational activities. Particular consideration should be given to potential changes in groundwater conditions and seepage regimes resulting from hydraulic mining, which may influence pit wall stability.

5.6.1 SP11 Pontoon Locations

The SP11 pontoon locations are presented in Figure 5-12 and Figure 5-13.

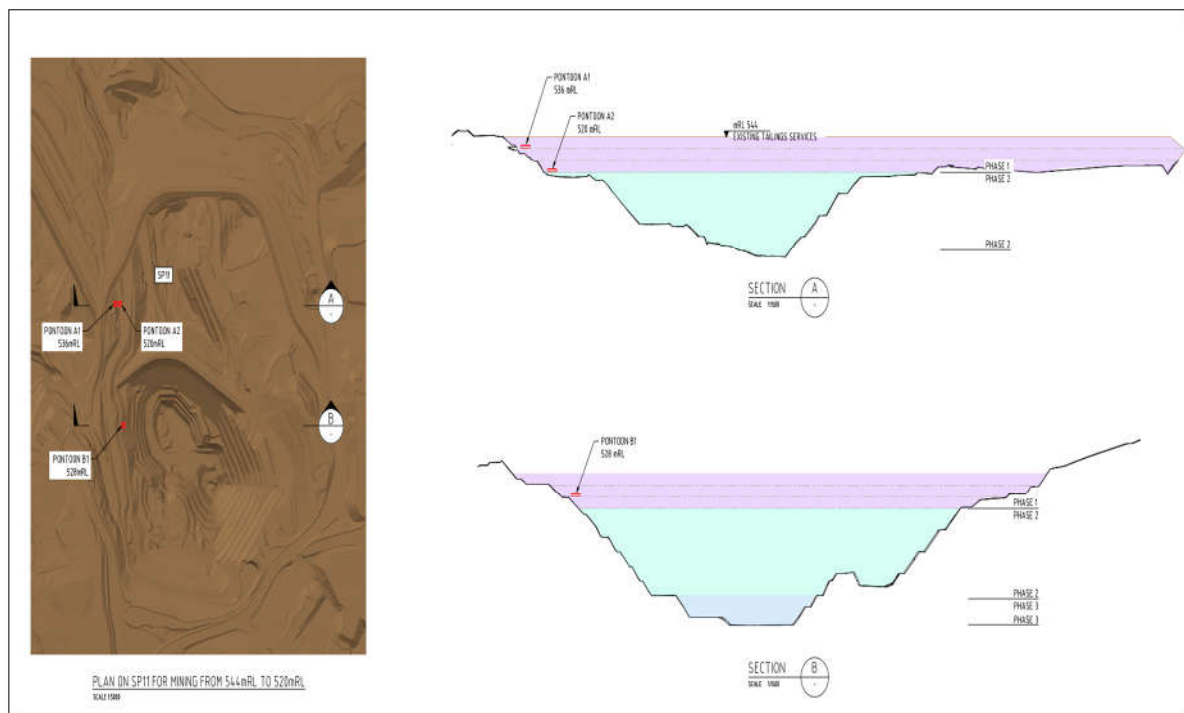


Figure 5-12 SP11 Pontoon locations from RL544 to RL520 (SP11 – Total Tailings Across surface)

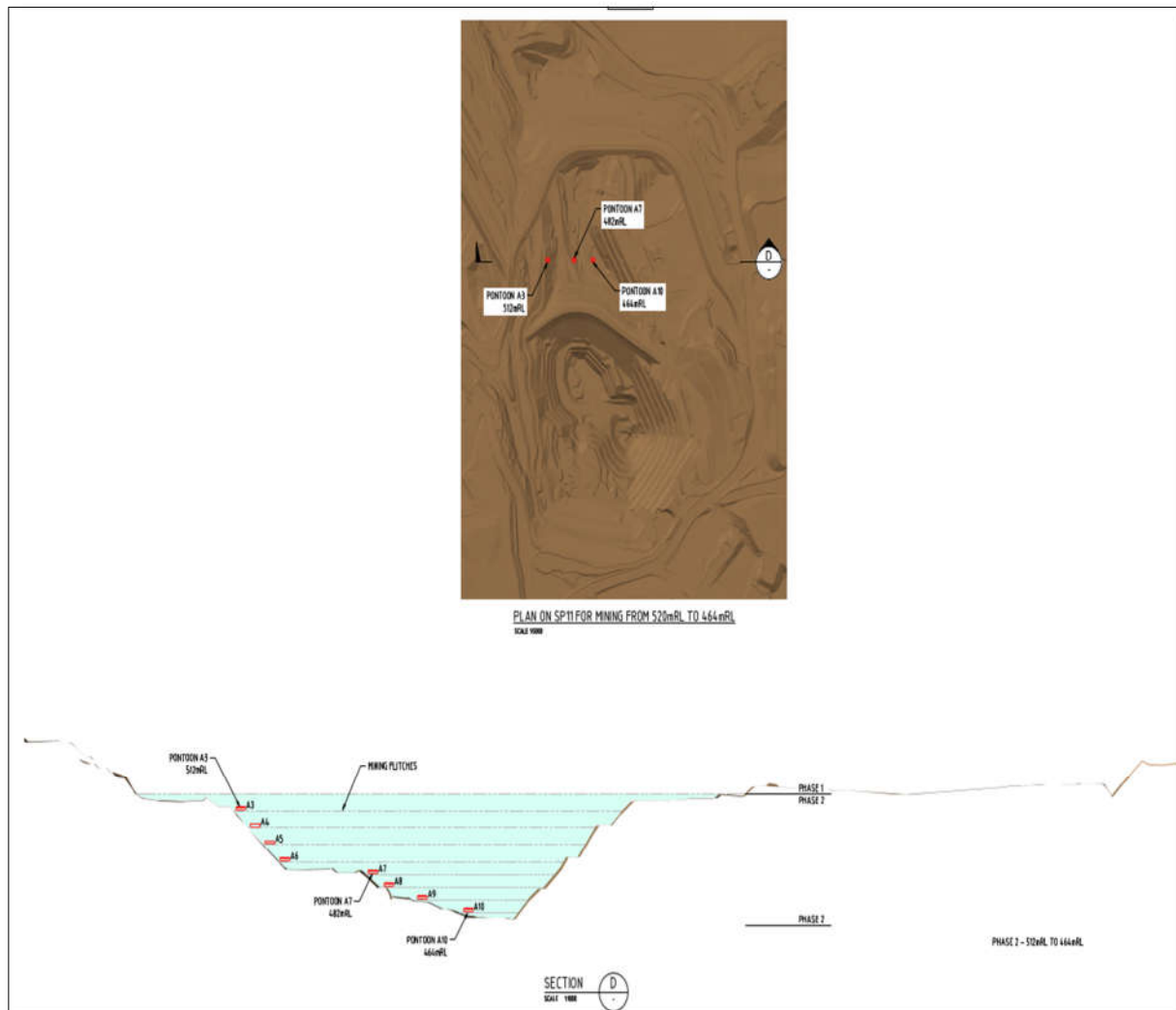


Figure 5-13 SP11 Pontoon locations from RL520 to RL464 (SP11 Post SP10 Embankment exposure)

5.6.2 SP10 Pontoon Locations

The SP10 pontoon locations are presented in Figure 5-14.

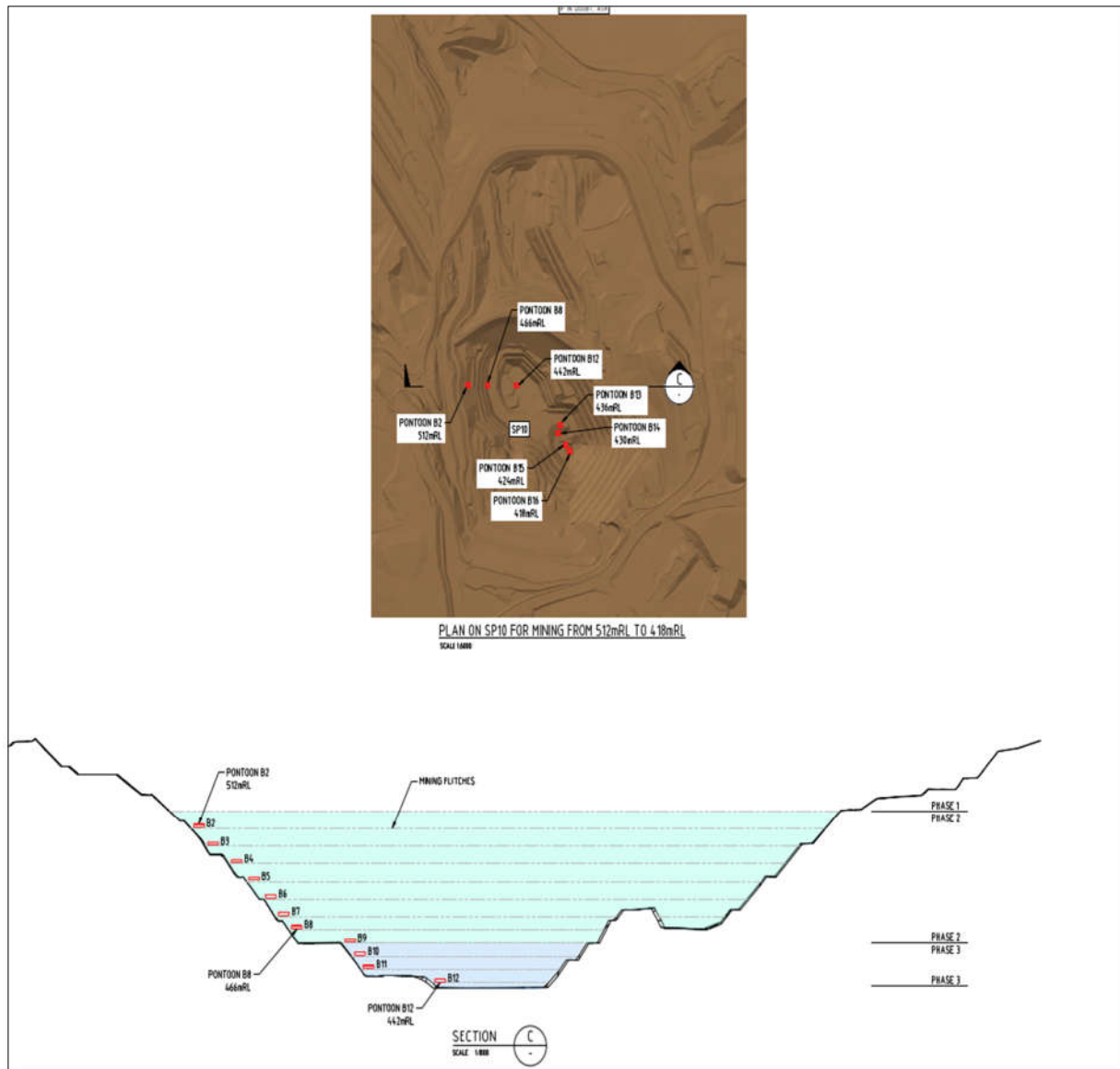


Figure 5-14 SP10 Pontoon locations from RL512 to RL418 (SP10 Post embankment exposure)

5.6.3 MTI Pontoon Locations

The MTI pontoon locations are presented in Figure 5-15.

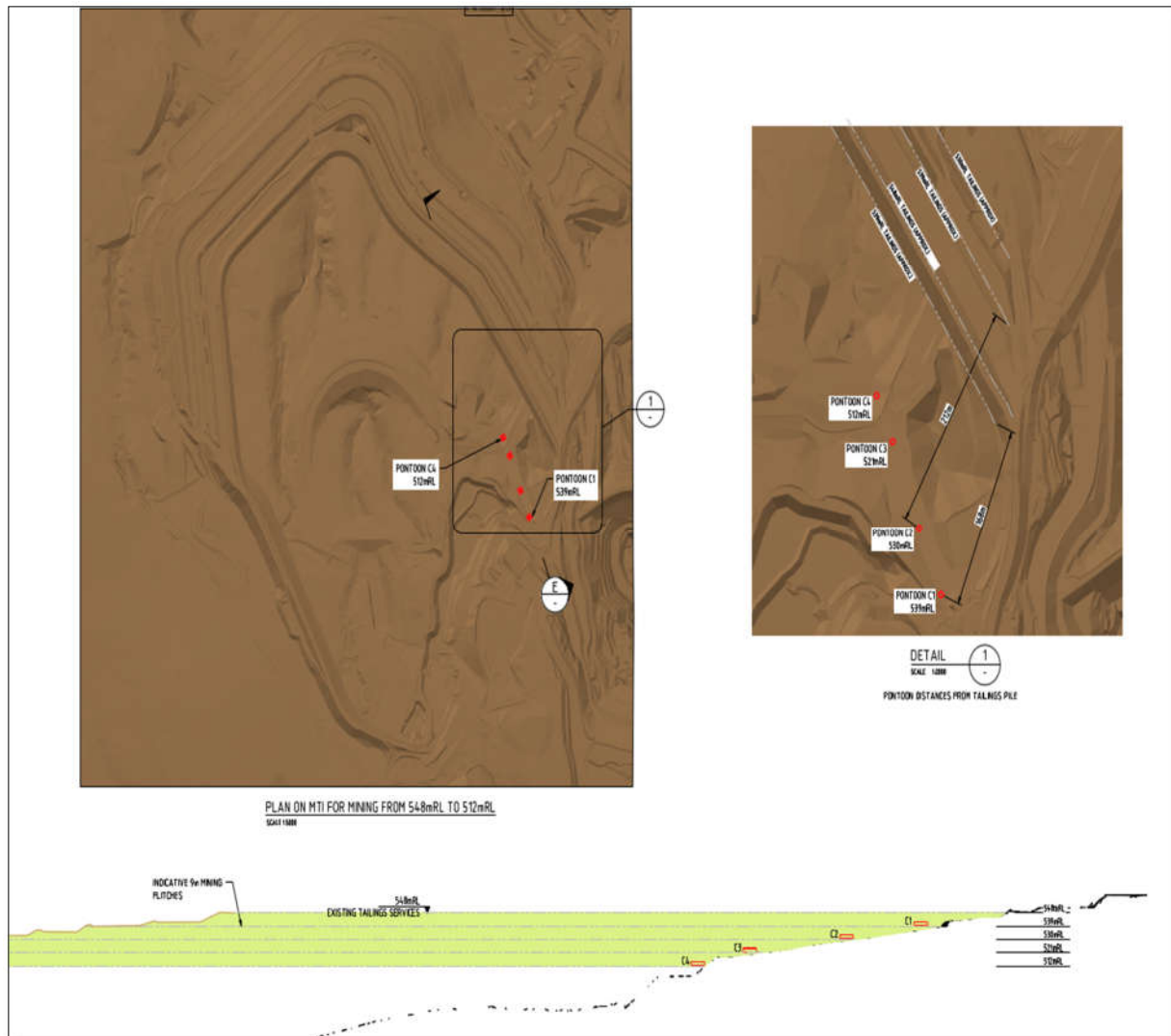


Figure 5-15 MTI Pontoon locations from RL548 to RL512

5.7 Mining Phases, SP11, SP10 and MTI

The MP4 hydraulic mining plan and staged development are inherently complex due to a combination of topographical and operational constraints. Key constraints include the central embankment separating the SP10 and SP11 facilities and the progressive narrowing of the pit at depth. These constraints directly influence mining sequence, achievable production rates, and the timing and coordination of hydraulic mining infrastructure relocation.

To address these constraints, the mining plan has been developed around a phased operating strategy, whereby hydraulic mining is undertaken within discrete operating areas, SP11, SP10, or MTI throughout the life of the project. Each operating period is defined as a mining phase. The approach is based on maintaining production in one TSF while preparation works, including pontoon relocation and infrastructure setup, are undertaken in an alternate TSF.

The conceptual sequence involves mining in SP11 while SP10 is prepared for pontoon relocation, followed by a changeover to SP10 once the active flitch in SP11 has been fully reclaimed. This alternating sequence continues between SP11 and SP10 until SP11 is fully depleted. As SP10 extends to significantly greater depths than SP11, hydraulic mining equipment is subsequently relocated to MTI following completion of SP11, after which an alternating operational sequence is adopted between SP10 and MTI. The individual mining phases are described below and presented in Table 5-1.

Table 5-1 Mining Phases between SP11, SP10 and MTI

Phase	TSF	Range (RL)	Nominal Production (t/h)	ROMU Configuration	Notes
1	SP11	544 - 520	1,200	3 operating ROMUs + 2 standby	Sufficient surface area to support full ROMU deployment; initial high-productivity phase. Alternating between Pontoon A and Pontoon B
2A	SP11	512 - 504	900	2 operating ROMUs + 1 standby	Reduced surface area with depth and internal SP10 embankment wall daylight; production adjusted accordingly. Alternating with SP10 – Pontoon B
2B	SP11	496 - 464	450	1 operating ROMU	Reduced surface area with depth and internal SP10 embankment wall daylight; production adjusted accordingly. Alternating with SP10 – Pontoon B
3 - 4	SP10	512 - 464	900	2 operating ROMUs + 1 standby	Reduced surface area with depth and internal SP10 embankment wall daylight; production adjusted accordingly. Alternating with SP11 – Pontoon A
4 - 5	SP10	458 - 418	450	1 operating ROMU	Reduced surface area with depth; production adjusted accordingly. Alternating with MTI – Pontoon A
5	MTI	548 - 512	1200	3 operating ROMUs + 2 standby	Sufficient surface area to support full ROMU deployment; initial high-productivity phase. Alternating with SP10 – Pontoon B

SP11 – Phase 1 and Phase 2

Phase 1 mining is initiated in SP11 at a nominal production rate of 1,200 tonnes per hour. At this stage, the available surface area is sufficient to accommodate three operating ROMUs, with provision for two additional ROMUs on standby. This production rate is maintained from elevation RL544 down to RL520.

Phase 2 continues in SP11 as the available operating area reduces with depth. Production rates are reduced in line with decreasing surface area and pit geometry. Mining is undertaken at:

- 900 tonnes per hour between elevations RL512 and RL504, using two operating ROMUs with one ROMU on standby, and
- 450 tonnes per hour between elevations RL496 and RL464, using a single operating ROMU.

The slurry pontoon is installed at the lowest practicable elevation in SP11, at RL464, which is estimated to be 1–2 m above the in-situ rock surface, representing the finite base of the SP11 tailings. Residual tailings below this elevation are not recoverable by hydraulic means and will require mechanical reclamation, or alternatively mechanical excavation and stockpiling for subsequent hydraulic reclamation where practicable.

Upon completion of hydraulic mining in SP11, the hydraulic mining equipment and associated slurry pontoon infrastructure are relocated to the MTI.

SP10 – Phase 3 and Phase 4

Phase 3 mining in SP10 is undertaken between elevations RL512 and RL464 at a nominal production rate of 900 tonnes per hour, reflecting the available operating area and flitch geometry.

Phase 4 continues in SP10 from elevation RL458 down to RL418, with production reduced to 450 tonnes per hour due to the significantly reduced pit diameter and constrained surface area at depth. Tailings below RL418, estimated to be 1–2 m in thickness, cannot be reclaimed hydraulically due to limitations in slurry pickup at the pontoon pump intake and will therefore require mechanical reclamation.

MTI – Phase 5

Phase 5 mining commences in MTI between elevations RL548 and RL512. Mining in MTI is undertaken in an alternating sequence with SP10 Phase 4 (RL458 to RL418), allowing for ongoing pontoon relocation and preparation works while maintaining continuous production.

This alternating operational approach between SP10 and MTI enables the progressive relocation of slurry pontoon structures to successive lift depths while maintaining continuous production. The strategy minimises downtime associated with infrastructure relocation and ensures hydraulic mining can continue in parallel with pontoon relocation activities until all tailings within the relevant sections have been recovered. Overview of the development of the hydraulic mining methodology is detailed in Section 5.7.1

Production Rate Assumptions and Limitations

The stated production rates are derived from the ROMU design capacity, available surface area per flitch, and assumed mining advance rates. Production has been modelled as constant, based on an assumed in-situ bulk density of 1.38 t/m³.

These assumptions do not explicitly account for potential variability associated with consolidation effects, differential settlement, moisture content variations, or particle size distribution, as these material characteristics are currently not fully defined. As such, variability in actual production performance may occur as mining progresses, particularly with depth.

The use of a single representative material parameter is considered appropriate to support confidence at the PFS level. However, it is expected that these assumptions will require refinement during the Feasibility Study (FS) phase, informed by a more complete suite of material characterisation data and supporting geotechnical testing.

Operating Strategy and Pontoon Sequencing

The alternating operational approach between SP10 and MTI enables the progressive relocation of slurry pontoon infrastructure to successive lift depths while minimising production downtime. This strategy allows hydraulic mining to continue in one operating area while pontoon relocation and preparation activities are completed in the alternate area, thereby maintaining production continuity until all tailings within the respective sections have been reclaimed.

The operating strategy described in Section 5.7 should be read in conjunction with the pontoon location and layout drawings presented in Section 5.6. These drawings illustrate the planned installation locations and sequential movements of the slurry pontoons throughout the life of the hydraulic mining operation.

Two primary slurry pontoons are used under the operating strategy:

- Pontoon A, which is initially installed in SP11 and is sequentially relocated within SP11 as mining progresses through successive flitches. Individual pontoon positions within SP11 are designated A1, A2, A3, etc., corresponding to each flitch or operating elevation. Upon completion of hydraulic mining in SP11, Pontoon A is relocated to MTI, where the same sequential positioning approach is applied.
- Pontoon B, which is installed in SP10 and is sequentially relocated within SP10 only. Pontoon B positions are designated B1, B2, B3, etc., corresponding to successive SP10 flitches. Pontoon B remains within SP10 for the duration of SP10 hydraulic mining and is not relocated to other TSFs.

The mining sequence alternates between pontoon positions in accordance with the phased operating strategy, typically progressing in the order A1, B1, A2, B2, etc. This alternating sequence enables hydraulic mining to continue in one TSF while pontoon relocation, infrastructure setup, and preparation works are undertaken in the alternate TSF, thereby minimising production downtime and maintaining operational continuity.

The pontoon layout drawings in Section 5.6 provide a spatial representation of this sequencing logic and should be used as the primary reference for understanding pontoon movements, flitch transitions, and the relationship between mining phases and infrastructure relocation.

Relationship Between Mining Phases and Production Scheduling

The mining phases defined in Section 5.7 are aligned with the production scheduling framework and reflect changes in achievable production rates associated with operating area, pit geometry, and elevation. Phase boundaries are therefore primarily driven by variations in available surface area and

resulting ROMU deployment and throughput, rather than by the physical sequencing of mining between slurry pontoons.

Accordingly, while the phases are used to structure the production schedule and to define changes in nominal production rates at different elevations, they do not represent the detailed mining sequence or order of pontoon operation. The actual mining sequence is governed by the alternating pontoon operating strategy described above and illustrated in the pontoon layout drawings in Section 5.6, whereby operations alternate between Pontoon A and Pontoon B positions (e.g. A1, B1, A2, B2) to maintain continuous production during pontoon relocation and preparation activities.

This distinction ensures that production scheduling reflects realistic operating constraints and throughput changes, while allowing flexibility in the day-to-day sequencing of pontoon movements within and between TSFs

An overview of the development of the hydraulic mining methodology and phased operating strategy is provided in Section 5.7.1.

5.7.1 Hydraulic Mining Methodology – Initial SP11 Operations

Hydraulic mining will commence at Pontoon A1 within SP11 at the initial slurry pump installation elevation. Operations will be conducted between the current tailings surface at RL544 and the initial pontoon installation depth of RL536, corresponding to an eight-metre operating depth.

Mining will initially be undertaken using two ROMU units positioned at the pontoon, with reclamation progressing away from the sump to establish the main launder. Once the main launder has been developed, a secondary launder will be constructed to enable full production. At this stage, all three ROMU units will be deployed.

The establishment of secondary launders provides operational flexibility by allowing three active mining blocks and two standby blocks, each equipped with dedicated pipework and a ROMU. This configuration enables standby units to be brought into service immediately during pipework reconfiguration, routine servicing, or refuelling of operating ROMUs, thereby minimising production interruptions.

The initial pontoon location at A1 (RL536), as illustrated in Figure 5-16, allows for reclamation of tailings across the full extent of the TSF down to this elevation. Mining Block 2 will be prioritised to facilitate preparation works on the RL536 tailings surface, including excavation of the subsequent pontoon sump (B1) down to RL528, following completion of Block 2 reclamation.

Upon completion of hydraulic mining of the active flitch down to the RL536 level, operations will transition directly to Pontoon B1, enabling continued production without extended downtime while preparation works are completed at the alternate operating location.

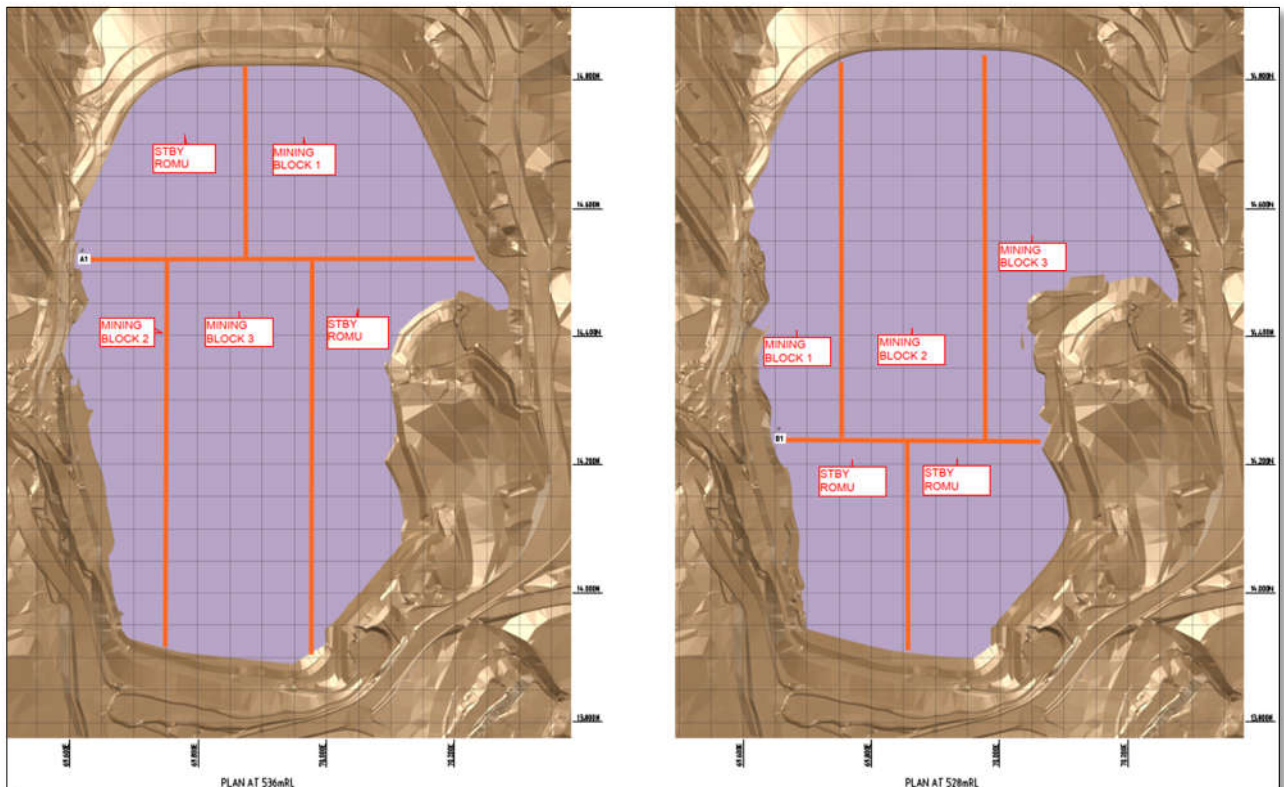


Figure 5-16 RL536 - RL528 Mine Plan Layout SP11

Hydraulic mining at Pontoon B1 follows the same methodology applied at Pontoon A1. Mining Block 1 will be prioritised to enable excavation, and preparation works for installation of Pontoon A at its subsequent location (A2) at RL520. As illustrated in Figure 5-17, continued mining progressively exposes the central embankment separating the SP10 and SP11 tailings facilities at RL525. The embankment may be managed under one of two potential approaches. The embankment could be progressively reclaimed using conventional excavator and truck methods, or alternatively, it could be left in place for the duration of hydraulic mining operations.

Once Pontoon A2 is installed at RL520, the adjacent tailings surface lies approximately five metres below the crest of the central embankment. To facilitate gravity flow of tailings from the SP10 area toward the SP11 area and into the A2 pontoon sump, two mechanically excavated trenches will be constructed through the embankment using an excavator. These trenches provide controlled flow paths, enabling effective hydraulic reclamation across the embankment interface while maintaining operational continuity.

The SP10 embankment is currently assumed to remain in place for the duration of the hydraulic mining reclamation of the SP11 and SP10 tailings. At this stage, the ultimate treatment requirements for the embankment have not been defined. Potential options include progressive deconstruction as tailings flitches are reclaimed, or retention of the embankment for potential future use.

This PFS does not include the method of embankment deconstruction, nor the associated costs or scheduling implications. Definition of the preferred treatment strategy, together with constructability, sequencing, and cost impacts, will be required during the Feasibility Study (FS) phase.

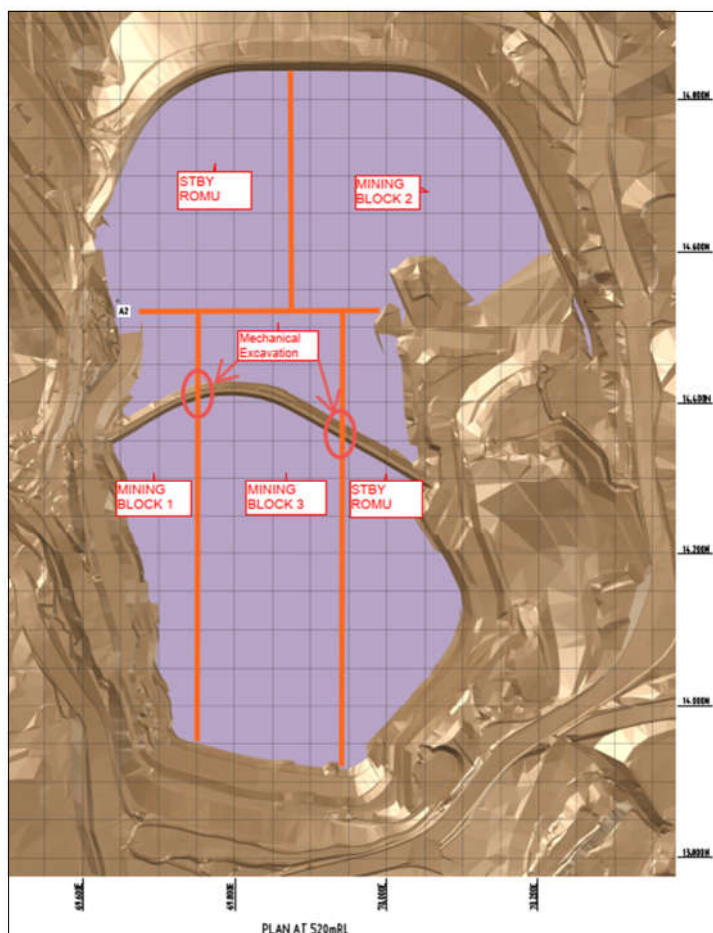


Figure 5-17 RL520 (A2) Layout and exposure of SP10 Embankment at RL525

5.7.2 Transition to alternating SP10 and SP11 operation post embankment exposure

Upon completion of the A2 mining flitch, hydraulic mining operations transition into two defined operating zones serviced by separate slurry pontoons: Pontoon A, servicing SP11, and Pontoon B, servicing SP10.

Under this arrangement, only one pontoon operates at any given time, while the alternate pontoon is lowered to its next operating elevation through excavation of the subsequent sump location. This sequencing allows hydraulic mining to continue uninterrupted in one TSF while pontoon installation, sump excavation, and associated preparation works are undertaken in the alternate TSF.

The alternating sequence between pontoon operation and pontoon installation is maintained throughout the remainder of the mining plan presented in Figure 5-18 and underpins the phased production schedule described in this report. This approach minimises non-operating time between flitches, improves operational flexibility, and enables efficient progression of hydraulic mining across SP11, SP10, and subsequently MTI, in accordance with the pontoon layout drawings presented in Section 5.6 and the production scheduling framework outlined in Section 5.7.

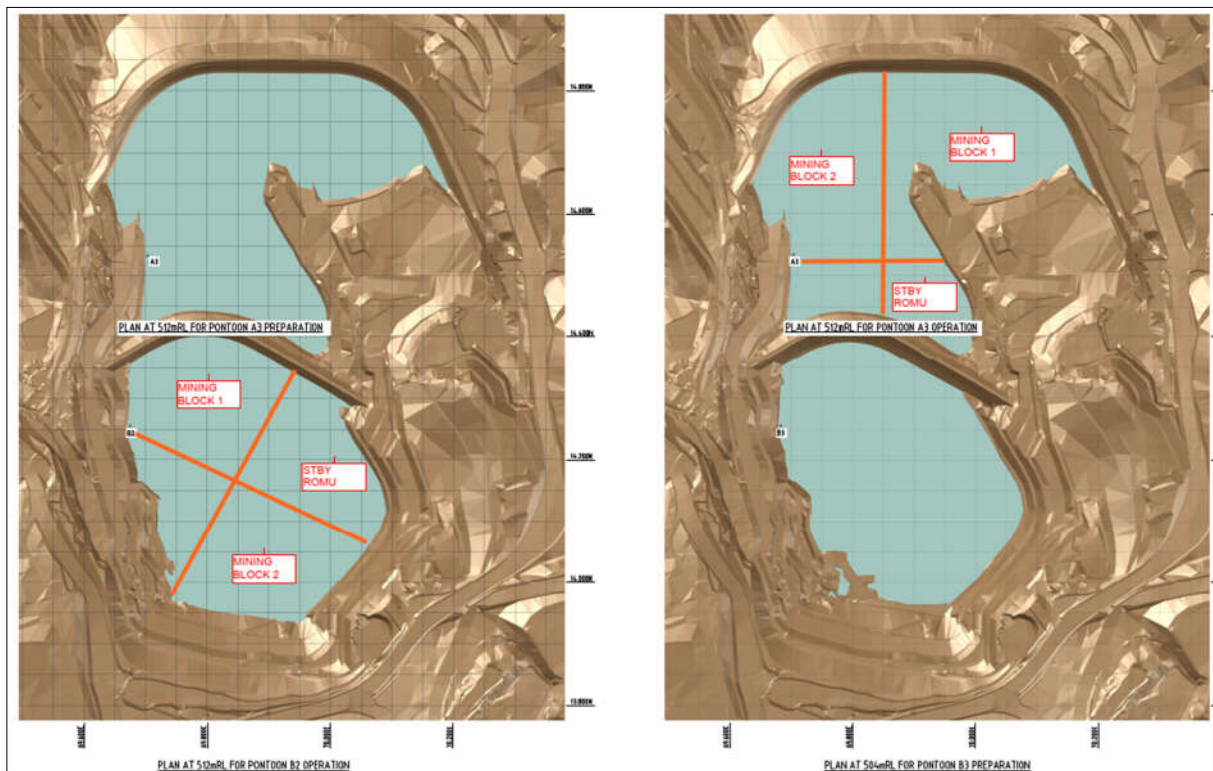


Figure 5-18 SP11 and SP10 Operating Methodology and Pontoon Scheduling

5.7.3 Transition to Alternating Pontoon Operations SP10 and MTI

Operations will transition between SP10 and the MTI once tailings have been fully reclaimed from the SP11 footprint as presented in Figure 5-19. At that time, the equipment that operated within SP11 (Pontoon A) will be relocated to the MTI, while hydraulic mining operations in SP10 continue.

During this period, SP10 is expected to operate at reduced production rates of 400–450 tonnes per hour, as the operational footprint progressively narrows with the reclamation of the final ~20 m of material, whilst the MTI will operate at nominal production of 1200 tonnes per hour.

Following installation of the MTI equipment, MTI operations will be commissioned, enabling the relocation of Pontoon B from SP10 to the next lower flitch elevation. Based on the current schedule, approximately 21 days of preparation works and pontoon relocation are required per relocation event. A total of four pontoon relocations is anticipated during SP10 operations. During each relocation period, hydraulic mining will continue in the MTI, after which operations will immediately return to SP10 to recommence mining activities.

Hydraulic mining in the MTI will be paused during SP10 flitch reclamation, and this operating sequence will be repeated. SP10 is prioritised over the MTI to enable completion of all tailing's reclamation in SP10 by the end of Q3 2032.

At that stage, OGNZL will be required to determine whether the remaining tailings in SP10 are better recovered using conventional excavator and truck methods and end tipped on MTI, or whether operations should continue in an alternating hydraulic mining sequence. This approach provides

operational flexibility and allows for continuous production, while avoiding delays associated with the construction of a new sump.

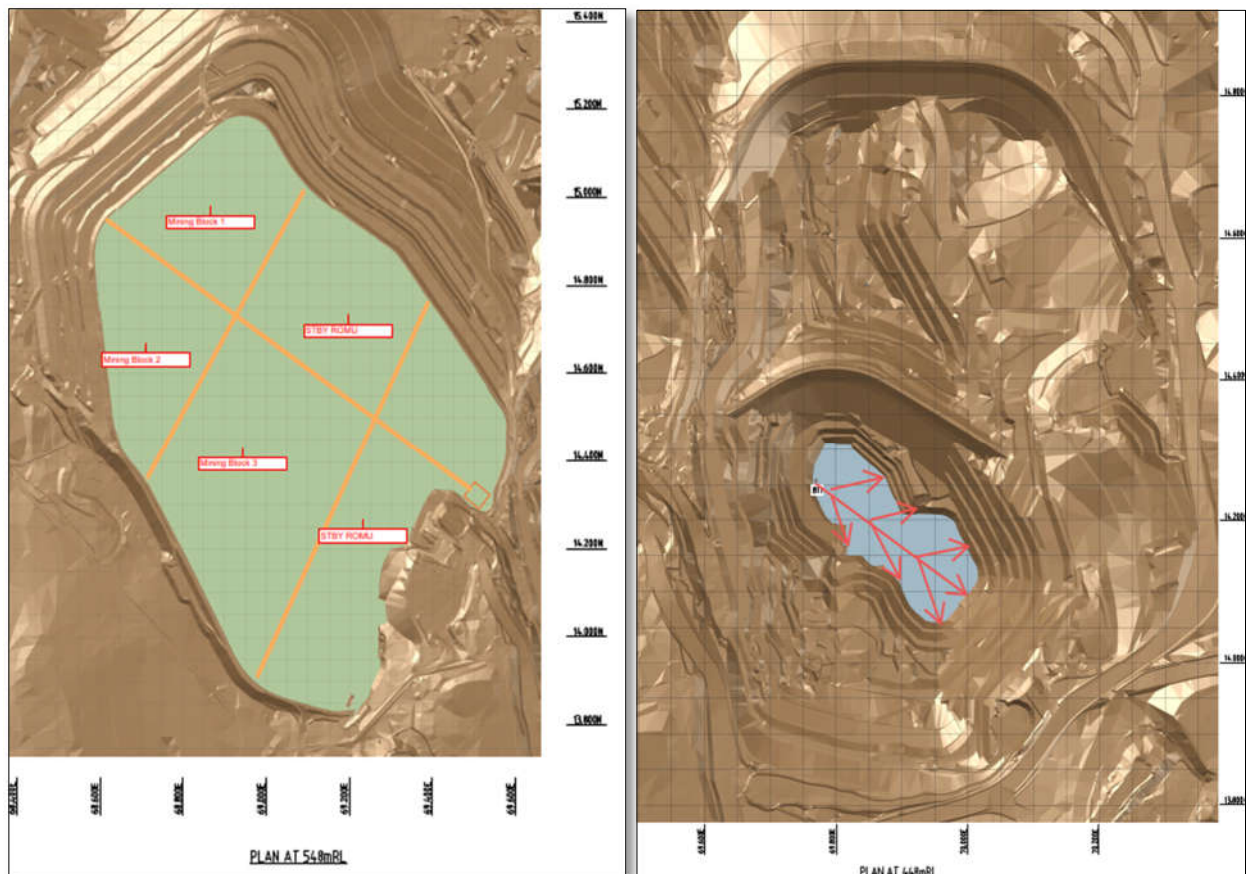


Figure 5-19 Transition between SP10 and MTI

5.8 ROMU Operation and Control Philosophy

The ROMUs are state-of-the-art mining systems designed to be operated remotely from a centralised command centre, as illustrated in Figure 5-20, by a trained control room operator. This remote operating capability significantly improves both operational efficiency and safety by reducing the need for personnel to work near active mining areas or be exposed to the challenging environmental conditions experienced at the Macraes Operation. The ROMUs are directed by the operator in accordance with the mine plan requirements and the operational controls established by site operations.

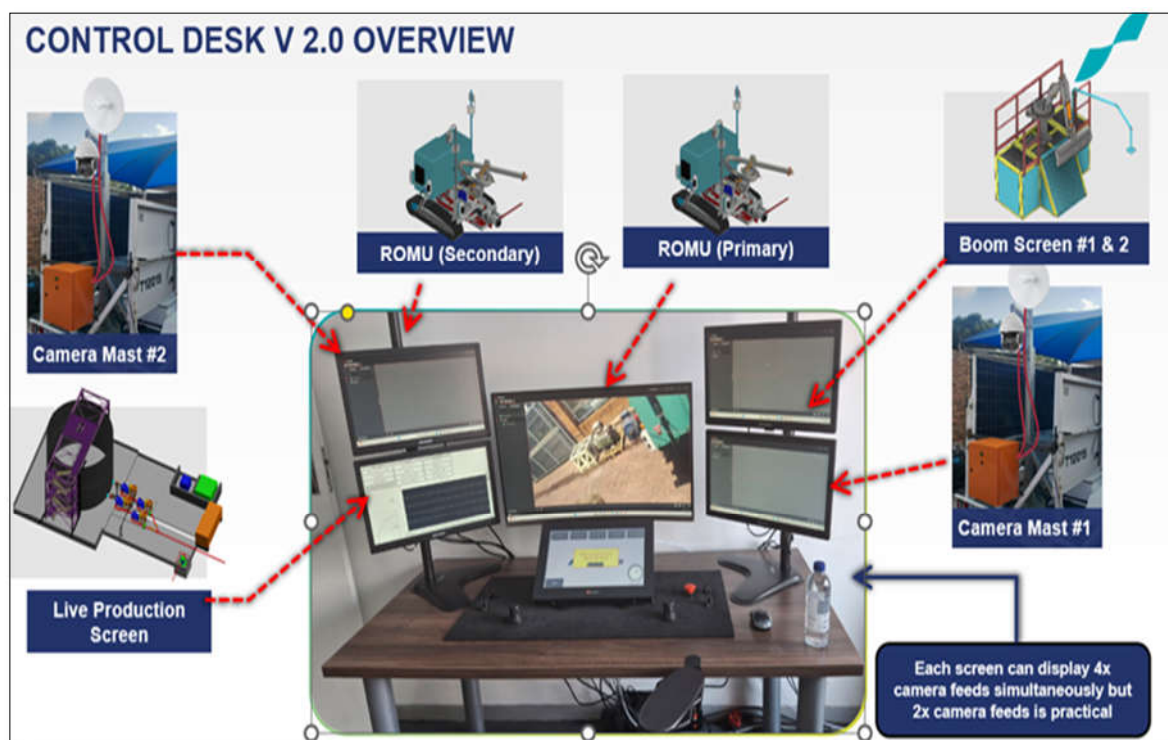


Figure 5-20 Remote Mining Unit Command Centre

Each ROMU is equipped with self-cleaning camera systems and dedicated lighting stations, ensuring continuous visual clarity for the operator and allowing the equipment to be operated with minimal physical intervention in the field. This configuration supports high availability and reduces downtime associated with manual cleaning or inspection activities.

The ROMU are also fitted with an integrated Programmable Logic Controller (PLC) system that continuously monitors critical operational parameters, including water pressure and flow rates. These parameters are essential for effective control of the mining process and maintaining stable, predictable operating conditions. Any deviations or changes in water pressure or flow are automatically communicated to the command centre, where the control room operator can log the data in real time and take appropriate corrective action to ensure safe and efficient system performance.

The command centre is equipped with control desks capable of operating up to two ROMUs simultaneously as illustrated in Figure 5-21. For the Macraes Operation, during peak production rates of approximately 1,200 tonnes per hour, two control desk operators are required to manage the three active ROMUs. The ability to switch seamlessly between operating units and standby units is fully

integrated into the PLC control system, providing operational flexibility and ensuring continuity of production in the event of equipment changeovers or maintenance requirements.



Figure 5-21 ROMU Control Desk Operation



Figure 5-22 Mobile Repeater Station for Alternative ROMU view

5.9 Monitoring and Operational Controls

Monitoring and operational controls for the project will apply across the entire site and are not limited solely to the operation of the ROMUs. The ROMUs will occupy and traverse the surface of tailings deposits and active mining areas, requiring a coordinated approach to site inspections, access control, and operational oversight to ensure safe interaction between equipment, personnel, and ground conditions.

At the PFS stage, the monitoring and control measures described below establish the overarching framework and performance intent. Detailed procedures, inspection checklists, and roles and responsibilities will be developed and formalised during subsequent study phases and prior to commencement of operations.

5.9.1 Mining Areas and Tailings Surface

Routine inspection of tailings surfaces and mining areas will be a fundamental control measure prior to and during ROMU operations. Inspections will be undertaken to confirm that ground conditions are suitable for equipment access and occupation and that no adverse conditions are present that could compromise operational safety or productivity.

Inspection activities will include, but not be limited to:

- Assessment of tailings surface condition, including trafficability, ponding, soft or saturated areas, cracking, erosion, or instability
- Identification of changes in surface geometry or drainage patterns that may affect ROMU access or operation
- Confirmation that exclusion zones, bunding, and demarcated access routes are clearly defined and maintained
- Verification that mining areas are free from obstructions, uncontrolled water accumulation, or geotechnical hazards

Inspection frequency and responsibility will be defined through site procedures, with additional inspections triggered following significant rainfall events, changes in deposition or mining methodology, or observed changes in ground conditions.

5.10 Operational Monitoring and Control

Operational control of site activities will be maintained through a combination of remote system monitoring, field inspections, and structured communication between the command centre and site personnel. ROMU operations will be coordinated in accordance with the mine plan and site operational controls to ensure interaction with other site activities is effectively managed.

Monitoring will include:

- Real-time oversight of ROMU operating parameters via the control system
- Coordination of ROMU movements and operating areas to avoid conflicts with other site activities
- Ongoing review of site conditions that may influence ROMU performance or access, including weather conditions and water management

Where site or operating conditions fall outside acceptable limits, ROMU operations may be modified, suspended, or restricted until conditions are reassessed and controls are confirmed to be effective.

5.10.1 Shift Handover and Site Walkdowns

A structured shift handover process will be implemented to ensure continuity of operations and effective transfer of information between operating crews. Shift handovers will capture ROMU operating status, site conditions, inspection findings, and any identified hazards or abnormal conditions.

In addition to control room handovers, physical site walkdowns will form part of the monitoring and control strategy. These walkdowns will focus on confirming tailings surface conditions, active mining areas, water management features, and ROMU access routes. Findings from site inspections will be communicated back to the command centre, and recorded to support ongoing risk management.

5.10.2 Development of Procedures

As the project advances beyond the PFS stage, detailed operational procedures will be developed to support the monitoring and control framework outlined above.

These procedures should include:

- Pre-start and periodic inspection requirements
- Defined acceptance criteria for tailings surface access
- Weather and rainfall based operating triggers
- Formalised shift handover and site inspection protocols
- Clear roles, responsibilities, and escalation pathways

The development and implementation of these procedures will ensure that ROMU operations are integrated into the broader site operating model and that risks associated with operating on tailings surfaces and within active mining areas are effectively managed.

6. Geotechnical Assessment

This section presents the geotechnical assessment undertaken to support the hydraulic mining PFS for the SP10/11 and MTI areas at the Macraes Operation. The assessment has been undertaken at PFS level using simplified analytical methods appropriate for study stage design, including two-dimensional limit equilibrium slope stability analyses and bearing capacity assessments.

The assessment includes interpretation of tailings material behaviour, derivation of representative drained and undrained shear strength parameters, and evaluation of slope stability and bearing capacity for the proposed hydraulic mining operations based on available geotechnical investigation data. Key data limitations and uncertainties relevant to the PFS stage are identified.

The suitability of the proposed hydraulic mining operations has been evaluated with consideration of the temporary nature of hydraulic mining slopes, the anticipated behaviour of exposed tailings during progressive mining, and the application of performance-based operational controls. Key geotechnical hazards and appropriate mitigation measures relevant to the proposed operations are identified.

Slope stability analyses have been carried out based on preliminary geometries to meet the hydraulic mining requirements and to confirm that target factors of safety can be achieved. Further optimisations of slope geometries will be required once further information is available.

6.1 Material Behaviour (SP10/11 and MTI)

The geomechanical material behaviour of tailings within SP10/11 and MTI facilities has been interpreted using available investigation data, and information on deposition history and operational performance. Primary data sets relied upon include EGL (2019) for SP10/11 and EGL (2023) for MTI.

6.1.1 Tailings Deposition and History

The deposition history of the SP10/11 and MTI facilities influences tailings fabric, consolidation state, and drainage behaviour relevant to hydraulic mining.

Early deposition into the SP10/11 system occurred under downstream embankment construction with total product discharge, resulting in uncontrolled placement and spatial variability in density and consolidation. Subsequent upstream embankment raises utilised spigot discharge, enabling improved control of tailings placement, segregation, and beach development. As a result, the current tailings profile exhibits spatial variation in density, consolidation, and moisture condition.

Areas that have experienced prolonged rest periods are relatively drier, while zones associated with later or less controlled deposition may exhibit higher moisture contents. Both the MTI and SP10/11 facilities have been inactive since approximately 2012/2013 and have therefore undergone extended rest periods of similar duration. Any difference in tailings consolidation state, moisture condition, or phreatic surface levels between facilities are attributed to differences in deposition methodology, staging, geometry and drainage conditions rather than variations in the timing or recency of deposition.

6.1.2 Geotechnical Uncertainties

The analyses and interpretations of the tailings characteristics are based on several phases of investigation and testing on SP11 and MTI, along with ongoing piezometric monitoring. For this assessment there are some key limitations to the dataset, including:

- Limited spatial coverage of geotechnical testing for the tailings deposits. Existing investigations are largely limited to the edges of the pits (upstream embankment zones), with little to no direct coverage of central tailings areas. This limits confidence in representing lateral and vertical variability in tailings composition and strength.
- Limited definition of piezometric pressures across the full tailings profile depth. This leads to uncertainty with regards to the effective stress conditions and available shear strength in the cut slopes.
- Limited understanding of spatial grading variability in the tailings materials. This directly affects the shear strength, excavation and transportation characteristics and ROMU achievable production rates.
- Reliance on historical datasets. The primary investigations relied upon include EGL (2019) for SP10/11 and EGL (2023) for MTI. These may not fully reflect current conditions given the ongoing consolidation, drainage, or phreatic surface drawdown that may have occurred since data collection.

- Limited laboratory testing of in-situ tailings materials. While advanced laboratory testing (consolidated drained and undrained triaxial testing) was completed on reconstituted samples collected from tailings near the upstream embankment zones, there remains limited statistical confidence in strength and stiffness parameters across full tailings mass.

The uncertainties associated with limitations of the available dataset have been managed through conservative interpretation and are considered appropriate for a PFS-level assessment. Additional CPTu investigations and updated phreatic surface monitoring, specifically targeting central tailings within hydraulic mining depths, are recommended to refine geotechnical understanding during subsequent project phases.

6.1.3 Material Characteristics

The tailings material characteristics relevant to hydraulic mining are summarised as follows:

- Predominantly low to medium plasticity sandy silts to silty sands with variable fines content, consistent with hydraulically deposited tailings.
- Stratified fabric with interbedded horizons exhibiting contractive (looser, finer) and dilative (denser) behaviour. CPT data from locations within or near upstream embankments indicate that dilative behaviour is predominant, with contractive horizons typically limited in thickness (generally < 1 m). Hydraulic segregation may result in more contractive tailings within lower-energy interior zones in limited CPT data available from the central tailings (MTI CPT 401 and 403).
- Near surface tailings that are locally unsaturated (or desiccated), tending to moist to near-saturated conditions at depth. Previous CPT and piezometer data recorded slightly negative dynamic pore pressures in the upper tailings, with dissipation tests equilibrating around 0 kPa, indicating unsaturated conditions above the phreatic surface.
- Rapid pore pressure dissipation is expected within upstream embankment tailings based on low estimated time to 90% pore pressure dissipation (under 300 seconds) from SP10/11 dissipation tests below phreatic surface.
- Low to moderate permeability; impacts development of drained or undrained conditions, noting uncertainty associated with lack of characterisation data.

6.1.4 Phreatic Levels

Groundwater and phreatic surface conditions adopted in the stability analyses are consistent with available monitoring data, together with conservative sensitivity envelopes:

Key observations include:

- Spatially variable phreatic surface across the SP10/11 and MTI, with evidence of drawdown in dormant areas and lowered groundwater levels
- Historical groundwater levels at SP10/11 indicate a reduction from approximately RL533 – 515 m (2016) to RL522 – 496 m (2020)
- Vibrating wire piezometer data from MTI (2023) indicate a pseudo-hydrostatic groundwater profile, with groundwater levels RL535 – 500 m and generally decreasing towards the embankment

It is noted that the groundwater and CPT data used in this assessment were collected approximately three years prior to this study. Given the largely dormant status of the SP10/11 and MTI facilities,

ongoing drainage is likely to have occurred since that time, particularly within the upper tailings. As such actual current groundwater levels may be lower than the phreatic surfaces noted above.

6.1.5 Key Behaviours for Hydraulic Mining

The following behavioural implications are relevant to the proposed hydraulic mining operations:

- Drained behaviour is expected to prevail during typical operations, due to incremental excavation, slope exposure, drainage, and desiccation of tailings slopes. This interpretation is based on a limited number of test locations, most of which are located within the upstream embankments, and may not be fully representative of central or deeper tailings domains.
- Undrained behaviour and associated strength loss may develop locally under rapid excavation, incomplete drainage, or within contractive tailings layers. These conditions have been assessed as sensitivity cases rather than base-cases.
- Contractive tailings layers may be susceptible to liquefaction or strain softening under strong monotonic or cyclic loading; laboratory triaxial testing indicates moderate post-peak strain softening rather than abrupt brittle strength loss; appropriate operational and observational controls are therefore recommended.
- Periods of sustained rainfall or localised ponding during hydraulic mining may result in temporary elevation of pore pressures.

6.2 Shear Strength Parameters (Drained / Undrained)

Given the progressive nature of hydraulic mining method and the anticipated drainage and desiccation of exposed tailing slopes, drained behaviour is considered the most representative condition for typical operations.

Drained stability analyses were undertaken using a Mohr-Coulomb soil model, with the effective friction angle governing stability. Undrained scenarios were evaluated as sensitivity cases using undrained strength ratios (S_u/σ'_v).

Shear strength parameters were interpreted from CPT data (EGL 2019 for SP11; EGL 2023 for MTI) using industry standard CPT based correlations appropriate for tailings (Plewes, 1991) and supported by laboratory triaxial testing (WSP, 2024), including isotopically consolidated drained (CID) and anisotropically consolidated undrained (CKoU) on tailings samples prepared using loose moist tamped and dense moist tamped / vibration methods in general accordance with procedures recommended by Jefferies and Been (2015). The laboratory testing was undertaken on limited samples that were more easily accessible from the edge of pit and may not include all representative tailings samples due to the limited spatial coverage of historical investigations.

Key considerations include:

- Dense triaxial specimens exhibited dilative behaviour and did not reach critical state, with peak friction angles of approximately 35 degrees
- Loose reconstituted specimens exhibited contractive behaviour and reached critical state, providing conservative lower bound friction angles of approximately 33 degrees
- Laboratory triaxial testing indicates moderate post-peak strain softening rather than abrupt brittle strength loss
- Undrained strength ratios were derived from triaxial stress conditions and CPT based correlations.

Table 6-1 Geotechnical Design Parameters

Soil Property	Unit	Adopted value	Comments
Material description	-	Tailings, typically comprising low to medium plasticity sandy silts to silty sands with variable fines content	-
Unit weight, γ	kN/m ³	18.6	-
Friction angle, Φ'	degrees	33	Critical state line (lower bound)
		35	Peak strength (typical of in-situ drained behaviour)
Cohesion, c'	kPa	0	-
Undrained Strength Ratio, S_u/σ'_v	-	0.26	Undrained case (intact), with minimum shear strength (residual) 20 kPa
		0.13	Undrained (liquefied)
Permeability, k	m/s	10^{-7} to 10^{-6} within upper tailings near embankments, and 10^{-9} to 10^{-8} at depth	-

6.3 Slope Stability Analysis

6.3.1 Assessment Approach

Slope stability assessment was undertaken to evaluate the global stability of temporary tailings slopes associated with hydraulic mining operations at the SP10/11 and MTI areas.

Analyses were performed using Rocscience Slide2, employing 2D limit equilibrium methods based on Morgenstern-Price with non-circular slip surface searches. Representative cross-sections were developed to assess stability under anticipated mining conditions.

Hydraulic mining produces temporary, sacrificial cut faces that are actively eroded by high-pressure water jetting. Localised instability of the hydraulic mining face is inherent to the process and is therefore excluded from the definition of global stability for the purposes of this assessment.

Both drained (base-case) and undrained (sensitivity) behaviours were assessed to capture the range of potential tailings responses.

6.3.2 Analysis Assumption and Limitations

The following assumptions and limitations apply to the slope stability assessment:

- Groundwater and CPT data informing the analyses were collected approximately three years prior to this study. Given the largely dormant status of the SP10/11 and MTI facilities, continued drainage and consolidation are likely to have occurred since data collection, particularly within the upper tailings.
- The stability analyses do not explicitly model infiltration from surface water, short-duration rainfall events, or extreme rainfall scenarios, and no transient seepage modelling has been undertaken at PFS level.

- Ongoing groundwater and pore pressure monitoring during hydraulic mining operations is assumed to form part of the operational control framework to verify phreatic conditions and to provide early warning of adverse groundwater response.
- Simplified pseudo-static seismic sensitivity analyses were undertaken for representative drained design cases and are intended as a screening-level evaluation only. Given the continuous operational control inherent in hydraulic mining, including active management of bench geometry and exposure duration, the pseudo-static method is considered appropriate, and a full dynamic or displacement-based seismic assessment is not warranted at this stage of the study.
- Assessment of in-situ pit wall or rock slope stability is outside the scope of this study, which is limited to the stability of temporary tailings slopes associated with hydraulic mining operations.
- The slope stability analysis are localised to the hydraulic mining bench, global dam stability and upstream embankment slope stability risk were not assessed as part of this assessment and is recommended to be undertaken to identify and mitigate stability risk at a holistic level.

6.3.3 Acceptance Criteria

Slope stability acceptance criteria were defined using a risk-based framework, supplemented by performance based operational controls appropriate for temporary mining slopes.

For static and pseudo-static temporary conditions:

- Global FoS values of 1.10 – 1.30 are considered acceptable for the retained slope mass (typical industry practice for temporary slopes subject to controlled operational activities)
- Lower FoS values may be tolerated locally within the operational zone where supported by performance based controls.

Stability results are therefore interpreted in two zones:

Operational Zone (near excavated face, within ROMU stand-off distance)

- Stability managed operationally
- FoS values may be below global targets, depending on case
- Results are not considered governing, but are provided for awareness

Retained Slope Zone (beyond ROMU stand-off)

- Global stability criteria apply
- FoS values must satisfy the acceptance criteria
- These FoS values are reported as governing results (provided in Table 6-2).

The above acceptance criteria are intended to be interpreted in conjunction with the performance-based operational controls described in Section 6.6. These controls include staged production, management of bench geometry and exposure duration, minimum stand-off distances, groundwater monitoring, routine inspections and defined trigger action response plans, which are considered appropriate for the temporary nature of the hydraulic mining benches.

6.3.4 Stability Assessment Inputs

The stability analyses were based on the following inputs:

- Slope and bench geometry as per the Basis of Design (Section 3)

- ROMU operational loading represented by an equivalent ground pressure of 45 kPa, including dynamic allowance (typical of a small skid steer loader)
- Geotechnical design parameters defined in Table 6 1
- Groundwater and phreatic surface interpretations from Section 6.1.4, with tailings below the interpreted phreatic surface assumed to be fully saturated ($H_u = 1.0$) for conservatism
- Horizontal seismic coefficients (k_h) of 0.05 and 0.08 were adopted to represent reduced return period earthquake loading appropriate for temporary hydraulic mining benches, consistent with the intent of NZS 1170.5. The adopted coefficients are based on a typical seismic hazard factor (Z) of approximately 0.2 to 0.3 for the Macraes area, a reduced return period factor appropriate for temporary works, and a site factor of 1.0 for screening purposes. The adopted loading therefore represents a low-probability seismic event over the operational life of an individual hydraulic mining bench.

Shallow slip surfaces representative of surficial slumping or ravelling (local instability) were excluded through constraining the slip surface searches such that entry and exit points are set-back 1.5 m of the crest and toe and minimum slip depth of 2.0 m is required.

6.3.5 Stability Assessment Results

The analyses indicate that global stability of the proposed hydraulic mining geometries provide are within the acceptance criteria (beyond the ROMU stand-off) under base case (drained) conditions.

Localised stability responses (FoS values of 1.0 - 1.2) occur close to the active excavation face within the ROMU stand-off distance and are considered shallow sacrificial instabilities inherent to hydraulic mining. These mechanisms are assumed to be managed operationally rather than through design geometry and are not considered to control the assessment outcome. As such, the results reported in Table 6-2 correspond to the global stability of the retained tailings slope mass located behind the ROMU stand-off distance. Figure 6-1 illustrates the typical distribution and geometry of localised and global slip mechanisms, with detailed stability plots provided in Appendix C.

Sensitivity analyses show reduced stability under elevated phreatic surface conditions and under undrained or liquefied response in contractive tailings. However, these mechanisms are not considered typical of the proposed hydraulic mining operations provided mining progresses in a staged and controlled manner. Additionally, although the pseudo-static analyses indicate reduced factors of safety relative to the static cases, they represent a low-probability loading condition, and the associated risk is mitigated through the temporary nature of the benches and operational controls.

Table 6-2 Stability Assessment Results

Purpose	Behaviour	Phreatic Surface	Comments	FOS MTI (H = 9 m, with slope angle 38°)	FOS SP11 (H = 8 m, with slope angle 27°)
Normal operation	Drained	Below depth of influence (> 3 m below toe)	Primary design case representing progressive hydraulic mining with effective drainage and observed drawdown	> 1.2 below and beyond ROMU	≥ 1.50
Sensitivity	Drained	Phreatic surface at toe level	Conservative drained case representing wet toe conditions	> 1.2 below and beyond ROMU	≥ 1.47

Purpose	Behaviour	Phreatic Surface	Comments	FOS MTI (H = 9 m, with slope angle 38°)	FOS SP11 (H = 8 m, with slope angle 27°)
Sensitivity	Drained	Elevated phreatic surface within slope (including short-term ponding)	Bounding drained groundwater condition	> 1.2 beyond ROMU	≥ 1.30
Seismic Sensitivity	Drained	Same as normal operation	Screening-level pseudo-static assessment ($k_h = 0.05 - 0.08$)	> 1.0 beyond ROMU	> 1.0 beyond ROMU
Sensitivity	Drained slope over undrained foundation (non-liquefied)	Phreatic surface at toe level	Short-term undrained response in contractive tailings at foundation/toe level beneath a drained hydraulically mined slope due to rapid loading; not groundwater-driven	< 1.00	> 1.13
Sensitivity	Undrained (intact)	None	Rate controlled undrained response due to contractive behaviour (short-term)	< 1.00	< 1.00
Extreme sensitivity	Drained over Undrained (liquefied)	Phreatic surface at toe level	Static liquefaction triggered by elevated phreatic surface (post-trigger condition, non-design)	< 1.0 (extreme case)	< 1.0 (extreme case)
Notes: - Slip surfaces reported in this table exclude shallow mechanisms by applying a minimum slip depth of 2.0 m and crest/toe exclusion zones of 1.5 m. - Lower factors of safety occurring within the operational zone near the hydraulic mining face are assumed managed through stand-off distances, mining rate controls, and observational triggers, and are therefore considered non-governing. - Detailed stability plots are provided to illustrate the distribution of localised versus global slip mechanisms and confirm that governing instability lies only within excluded or managed zones.					

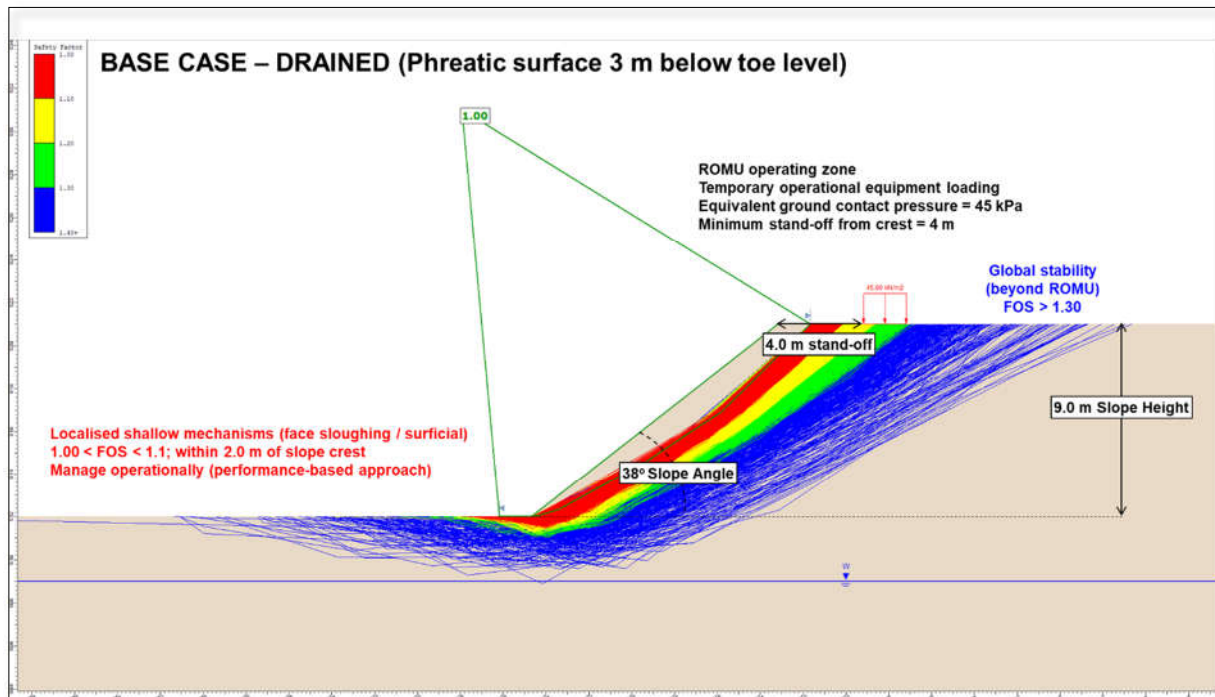


Figure 6-1 MTI Hydraulic Mining Slope Stability Base Case (Drained, 9.0 m Slope Height, 38°)

6.4 Bench Geometry Verification

Bench geometries adopted in the stability analyses are consistent with the Basis of Design and provide adequate separation between active excavation faces and retained slope sections. Bench configuration is therefore considered suitable for PFS-level assessment.

6.5 Bearing Capacity

The mobile equipment required for hydraulic mining operations on the tailings surface include ROMU, lighting towers, skid steer loaders, and UTV support vehicles. Only the ROMU has been considered critical for bearing assessment, given its higher load intensity and proximity to retained slopes.

Bearing capacity of tailings beneath hydraulic mining equipment was assessed considering the ROMU as the governing load case. An equivalent ground pressure of 45 kPa was adopted, typical of a small skid-steer loader with a 2.0 m wheelbase.

For drained tailings conditions, allowable bearing pressures for temporary equipment are estimated to be on the order of 130 kPa, providing adequate support. Bearing capacity effects associated with distance from the slope crest are considered negligible under the defined operating configuration (The ROMU will operate with a minimum 4 m stand-off from the retained slope crest).

6.6 Geotechnical Hazards and Controls

Key geotechnical hazards associated with slope instability during hydraulic mining include:

- Localised slumping or cracking of near-surface tailings, particularly within the upper desiccated crust and exposed hydraulic mining faces.
- Softening of exposed tailings due to saturation arising from rainfall, seepage, or hydraulic mining activities.
- Progressive retreat and unintentional over-steepening of the hydraulic mining face or benches beyond intended spatial or geometric limits due to operational variability or loss of control of the mining advance.
- Elevation of the phreatic surface within the retaining slope mass, resulting in reduced effective stress and stability.
- Rapid loading conditions, where excavation progresses too quickly for adequate drainage to occur, potentially resulting in undrained or strain-softening response in contractive tailings layers.
- Insufficient drainage or localised ponding, which may occur through wet patches, surface seepage, cracking of the surface crust, or water spouting from the face, indicating elevated pore pressures and potential instability.
- Inadvertent movement of vehicles or mobile equipment too close to retained slope crests, resulting in increased local loading and reduced stability.
- Sensitivity analyses indicate full height undrained behaviour may result in severe consequences including potential loss of plant and equipment.

The above hazards may be managed through implementation of the baseline hazard controls. The following baseline controls are recommended as standard practice throughout hydraulic mining operations to maintain stability under anticipated drained conditions.

- Full ground investigation and characterisation of tailings and piezometric conditions to identify areas where contractive, undrained behaviour may be more representative of ground response to excavation than drained conditions.
- Minimum ROMU setback distances from retained slope crests
- Staged and controlled hydraulic mining advance, limiting the rate and extent of excavation to promote drainage and avoid rapid loading
- Routine visual inspection of exposed slopes and faces, focusing on cracking, excessive deformation, wet patches, seepage, or surface instability.
- Groundwater and pore pressure monitoring, including pre-mining baseline confirmation and ongoing monitoring during operations.
- Operational management of sacrificial mining faces, recognising that localised face sloughing is expected and managed as part of normal operations.

Where undrained or adverse conditions are observed, defined stop-work triggers / triggers-based response / escalation responses should be activated. Key triggers and recommended responses include:

Observable triggers may include:

- Persistent wet patches or localised ponding indicating insufficient slope drainage.
- Development or opening of surface cracks within the retained slope zone.
- Water spouting or boiling from the mining face.
- Accelerated face deformation beyond expected operational sloughing.

Response actions may include:

- Reduction or temporary cessation of hydraulic mining rates to allow dissipation of excess pore pressures.
- Temporary pause in mining to re-establish drained conditions.
- Operational flattening of slope geometry to reduce driving forces and restore target stability levels ($FoS \geq 1.3$) beneath operating equipment; and
- Enhanced monitoring and reassessment of slope performance prior to resuming operations.

7. Hydraulic Mining Equipment Specifications

7.1 ROMU Equipment Specifications

The ROMU equipment specifications are summarised in Table 7-1. The ROMUs are original equipment manufacturer (OEM) units owned and operated by Fraser Alexander, which currently re-mines approximately 55 tailings facilities across Africa and South America. The equipment selected for the project is considered fit for purpose based on the prevailing site conditions.

Table 7-1 ROMU Equipment Specifications

Category	Parameter	Specification/Description
General	Equipment Type	Remote Operating Mining Unit (ROMU)
	Manufacturer (OEM)	Fraser Alexander
	Owner/Operator	Fraser Alexander (Established 1912)
	Number of Units	Unknown
	Deployment History	Deployed across ~ 55 active tailings reclamation sites across Africa and South America
Production Capacity	Nominal Production Rate	100 - 450 t/h (150 mm pipe diameter)
	Maximum Production Rate	450 t/h
	Operating Availability	95% assumed
	Typical Operating Hours	22 h/day
Mechanical System	Mining Method	High pressure water supply, orifice
	Drive System	Diesel
	Movement	Hydraulic
	Mobility	Tracked
Water Management	Operating Pressure	25-35 bar
	Quality	Can manage turbidity
	pH	4-7.5 (stainless steel for more acidic water, otherwise mild steel)
Environmental	Dust Suppression	Capable
	Noise	85 decibels

	Safety Systems	Emergency stop, guards, and interlocks
Site Suitability	Ground conditions	Suitable for site-specific conditions
	Climate Suitability	Proven performance in comparable environments
	Overall assessment	Deemed fit-for-purpose for Macrae's



Figure 7-1 ROMU in operation

7.2 ROMU Pressure and Orifice Sizing

The ROMU operating pressure is assumed to be in the range of 25–30 bar per unit. Based on the assessed and degree of tailings consolidation in both SP11 and MTI, this pressure is considered sufficient to effectively cut through the tailings. The assumed operating pressure falls within the maximum rated capacity of each ROMU and provides adequate jet reach to promote rapid breakdown of the tailings and subsequent fluidisation, thereby maintaining a consistent slurry density at the working face.

Orifice sizes have been calculated based on the required flow rates and the estimated hourly production tonnage and are presented in Table 7-2 below.

Table 7-2 ROMU Orifice Size

ROMU #	t/h	bar	Nozzle ID (mm)	Notes
3	1200	25-30	55	Each unit
2	900	25-31	50	Each unit
1	450	25-32	52	Unit

It is strongly recommended that the service provider maintain a nozzle size range of 30 mm to 60 mm to accommodate adjustments during the commissioning phase and transition to full operations.

7.3 ROMU Mining Advance Rate

Advance rates for the ROMU are calculated based on the assumed production rate (dry tonnes per unit), operating hours per day, in-situ tailings density (tonnes per cubic metre), and the assumed bench depth and width. Advance rates are sensitive to these input parameters and will be further refined during subsequent phases of the project as additional site-specific information becomes available.

Preliminary advance rates for the project are presented in Table 7-3. Block size conceptual layout in Figure 7-2 below.

Table 7-3 ROMU Preliminary Advance Rates

Description	Metric	Criteria			
Production	t/h	1200	900	450	1200
TSF	Section	SP11	SP10/11	SP10/11	MTI
Operating hours	h/day	22	22	22	22
Dry density of material	m ³	1.38	1.38	1.38	1.38
Bench depth	m	8	8	6	9
Bench width	m	12	13	14	12
Advance rate	m/day	62	64	79	55

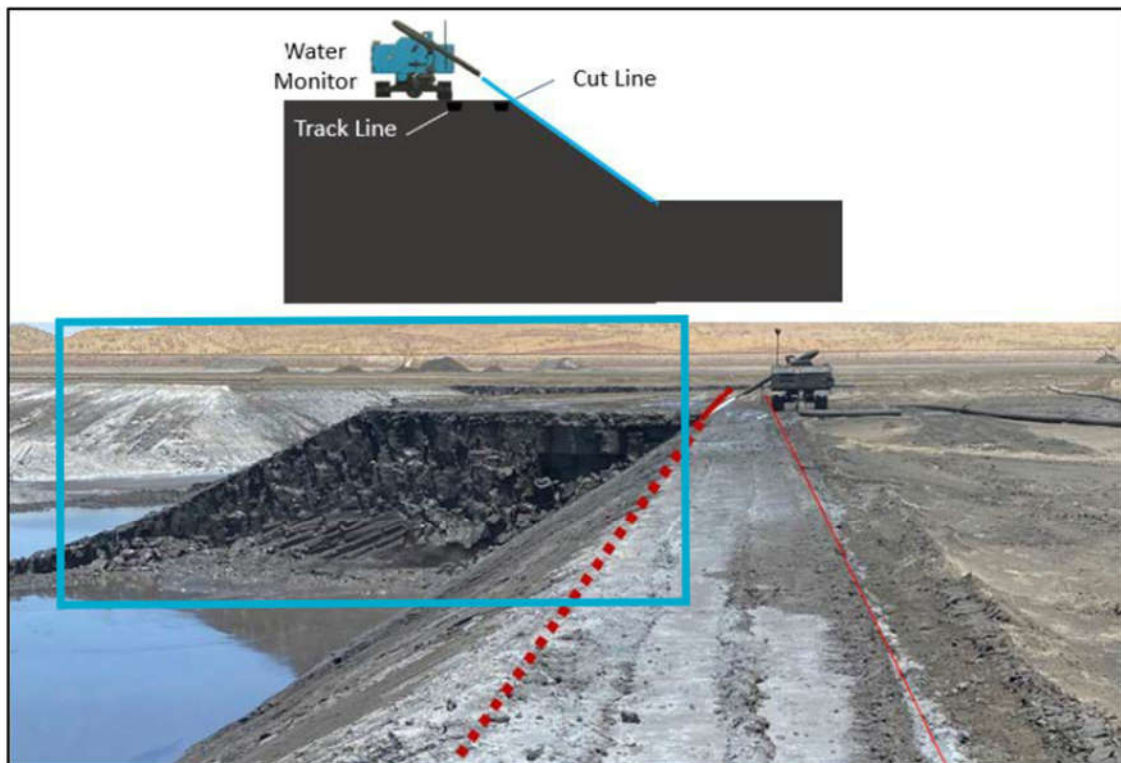


Figure 7-2 ROMU Mining Block Size illustration

7.4 ROMU High Pressure Pipeline Sizing

Two different pipe materials are required to supply water to each ROMU. Connection points for both supply lines are taken directly from the main high-pressure water supply pipeline, which will be installed, sized, and managed by OGNZL, as illustrated in Figure 7-3.



Figure 7-3 Preliminary High Pressure Supply Steel Pipeline

For handling and flow-rate requirements, 200 mm Victaulic galvanised steel pipes will be reticulated from the main high-pressure supply line and progressively advanced down the TSF pit wall as hydraulic mining reclaims each flitch. These pipes are connected using SC77 shouldered Victaulic couplings, which allow for rapid coupling and uncoupling during mining advance and when transitioning ROMUs between operating and standby locations. It is important to note that these pipes should not be installed over uneven ground, across mined trenches, or suspended above ground, as such configurations may result in coupling displacement during pipeline pressurisation.

The second supply line extends directly from the Victaulic steel pipeline to the ROMU and consists of specialised double-jacketed layflat hoses. These hoses are designed to operate at pressures up to 40 bar and have a burst rating of 80 bar. Hose lengths of up to 100 m can be installed between the Victaulic take-off point and the ROMU as presented in Figure 7-4 . The flexible hoses are sized to match the ROMU inlet requirements (150 mm internal diameter) and provide sufficient flexibility to accommodate mining advance while maintaining operational continuity. This configuration allows the ROMU to operate over distances of up to approximately 180 m without requiring additional Victaulic pipe extensions during operation.



Figure 7-4 Flexible ROMU supply mining hose

Once the full length of the flexible hose has been used, the Victaulic pipeline will be extended to re-establish the connection point at the previous hose limit, after which mining can continue. Pipeline specifications are summarised in Table 7-4.

Table 7-4 ROMU HP Supply Pipework

Description	Qty	Total (m)
Waterlord Extra HP Hose 152mm Black x 100.0m	8	800
Shouldered Pipe-Galvanised 200mm x 3.2mm x 6.00m	450	3000

7.5 Process Water Demand

At peak operating conditions, with three ROMUs operating at a combined production rate of approximately 1,200 t/h, the estimated process water demand is 500 L/s. At mid-range operating conditions, with two ROMUs operating at a combined production rate of approximately 900 t/h, the estimated process water demand reduces to approximately 370 L/s. At the lower operating range, with one ROMU in operation, the estimated process water demand is approximately 185 L/s. These estimated demands are summarised in Table 7-5 below.

Table 7-5 Estimated Water Demand by ROMU Operating Scenario

Operating Scenario	# ROMUs	Total Production Rate (t/h)	Estimated Water Demand (l/s)	Notes
Phase 1 and 5	3	1200	500	Total demand for all 3 ROMU
Phase 2 and 3	2	900	370	Total demand for both ROMU

Operating Scenario	# ROMUs	Total Production Rate (t/h)	Estimated Water Demand (l/s)	Notes
Phase 2 and 4	1	450	185	Total demand for a single ROMU

It is important to note that the process water demand estimates exclude gland water, flushing water, and make-up water requirements. In addition, the calculations do not account for the inherent moisture content of the in-situ tailings material and are therefore considered conservative and intended to serve as a contingency allowance only. No allowance has been made for free-draining or entrained water within the tailings, as such contributions are inherently variable and not expected to be consistent across different tailings layers.

The estimates also exclude evaporation losses and institutional losses associated with mining operations. These factors will be quantified and incorporated into the overall water balance during the subsequent phase of the study.

7.6 Skid Steer Loader for TSF Pipe Handling and Ancillary Works

Equipment Description and Application

A rubber-tracked Skid Steer Loader (SSL) is proposed for use on the TSF to support pipe installation activities and general light civil works. The unit is fitted with a pipe grab attachment, which allows secure handling, lifting, and manoeuvring of Victaulic pipe sections that are placed within the pipe grab bucket. This configuration enables efficient installation and relocation of pipework over long distances across the TSF footprint, significantly reducing manual handling and installation time.

The skid steer loader has an operating weight of approximately 4,400 kg and a rated engine power of 55.4 kW, providing sufficient power and traction for TSF operations while maintaining a low ground pressure profile. The rubber-tracked configuration is particularly suited to tailings environments, offering improved flotation, reduced rutting, and enhanced stability when operating on variable surface conditions commonly encountered on active and inactive TSF surfaces.

Suitability for TSF Operations

The proposed skid steer loader is well suited for work in and around the TSF due to its compact size, low mass, and high manoeuvrability. These characteristics allow the machine to operate safely within constrained areas, including between pipe corridors, around embankment crests, and on prepared tailings surfaces.

The relatively low operating weight reduces the risk of excessive bearing pressure on the tailings surface, making the unit appropriate for use in areas where larger earthmoving equipment may be restricted due to geotechnical or operability constraints. This is particularly advantageous during pipe installation campaigns where frequent repositioning and alignment of pipe strings is required.

Pipe Installation and Handling

The primary attachment for the skid steer loader is a pipe grab, purpose-designed to securely grip pipe sections and facilitate controlled placement. When used in conjunction with Victaulic piping systems, the pipe grab enables:

- Rapid alignment and installation of pipe sections
- Safe handling of pipes over extended distances
- Reduced reliance on manual labour and temporary lifting aids
- Improved installation productivity and consistency.

This method supports a faster pipe installation rate compared to manual or crane-assisted methods, particularly for smaller-diameter pipelines and frequent reconfigurations typical of TSF operations.

Additional Attachments and Functional Versatility

In addition to the pipe grab, the skid steer loader is supplied with up to eight interchangeable attachments, enhancing its versatility and overall value to TSF operations. Key attachments relevant to TSF activities include:

- **Trencher (or Delver):**
 - Suitable for excavating small trenches for pipe placement, drainage lines, or minor service installations.
- **Auger Attachment:**
 - Can be used to assist with on-site testing activities such as Vane Shear Testing (VST), as well as for small-diameter drilling applications.
- **4-in-1 Multipurpose Bucket:**
 - Enables loading and transport of small material volumes, trimming and contouring of uneven TSF surfaces, and preparation of pipe corridors prior to installation.

These attachments allow the skid steer loader to perform a wide range of ancillary tasks, reducing the need for additional specialised equipment and improving overall operational efficiency on the TSF. A Skid Steer Loader with a pipe grab attachment is illustrated in Figure 7-5



Figure 7-5 Skid Steer Loader with pipe grab attachment

7.7 Utility Task Vehicle (UTV) for TSF Inspections and Logistics Support

Equipment Description and Application

A four-wheel drive Utility Task Vehicle (UTV) is proposed for use on the TSF to support personnel transport, inspections, shift handovers, and light coordination activities. The UTV will be used to move operational and technical staff efficiently between key points across the TSF and associated infrastructure, enabling timely inspections and effective shift transitions.

In addition to personnel transport, the UTV is configured to carry tools and small equipment required for routine servicing and inspection of the ROMU, as well as associated infrastructure such as refuelling pods and SC77 pipe clamps. The vehicle provides a practical and flexible transport solution for day-to-day TSF operational support.

Load Capacity and Performance

The proposed UTV has a tray load capacity of approximately 300 kg, allowing it to safely transport tools, consumables, small spares, and inspection equipment alongside personnel. When fully loaded, the UTV has an operating weight of approximately 1 tonne, which is significantly lower than that of a light-duty vehicle (LDV) offering similar transport functionality.

The reduced operating weight results in lower ground pressures, making the UTV particularly suitable for TSF environments where surface conditions may be variable and where minimising disturbance to tailings surfaces is desirable.

The UTV is 4x4 driven, providing enhanced traction and mobility across unsealed roads, tailings beaches, embankment crests, and prepared TSF surfaces. This capability ensures reliable access to inspection locations under a range of operating and weather conditions.

Suitability for TSF Operations

The UTV is well suited for use on the TSF due to its compact footprint, low mass, and off-road capability. Compared to conventional LDVs, the UTV offers:

- Improved manoeuvrability in confined or uneven areas
- Reduced risk of bogging or surface damage on tailings
- Easier access to pipe corridors, perimeter roads, and inspection points.

These attributes make the UTV an effective platform for routine inspections, operational supervision, and rapid response activities across the TSF.

Personnel Transport and Operational Support

The UTV enables efficient transport of staff between operational areas, supporting:

- Routine TSF inspections
- Shift handovers and supervision activities
- Rapid access to maintenance or operational issues
- Transport of small tools and inspection equipment.

By consolidating personnel and equipment transport into a single platform, the UTV reduces reliance on multiple vehicles and improves operational efficiency. Visual illustration of proposed model presented in Figure 7-6



Figure 7-6 Utility Task Vehicle

8. Operational Strategy

8.1 Staffing Plan and Shift Structure

The proposed hydraulic mining operation will operate on a continuous 2 hours per day, 7 days per week basis to maximise ROMU utilisation and support stable water and tailings management. A 7-days-on / 7-days-off (7/7) roster has been adopted as the base operating model, reflecting customary practice for continuous mining and tailings operations and providing a balance between operational continuity, workforce fatigue management, and personnel retention.

At the Prefeasibility Study (PFS) stage, the staffing plan defines the indicative roles, functional coverage, and shift structure required to support operations safely and reliably. Detailed role descriptions, competency matrices, and final headcount optimisation will be developed during subsequent study phases.

8.1.1 Shift Structure

Operations are assumed to be organised into two 12-hour shifts per day, comprising a day shift and a night shift, with full operational capability maintained across both shifts.

- Shift length: 12 hours
- Roster: 7 days on / 7 days off
- Coverage: Continuous 24/7 operations
- Shift rotation: Day and night shifts alternated on successive rosters (subject to site fatigue management policy).

This structure allows for consistent operational handover, sufficient overlap for critical communications, and predictable workforce scheduling.

8.1.2 Staffing Philosophy

The PFS staffing philosophy is based on the following principles:

- Lean, competency-based staffing appropriate for remote-operated equipment
- Clear separation of operational, maintenance, and supervisory functions
- Sufficient redundancy in critical roles to manage fatigue, leave, and short-term absences.
- Day-to-day operational control maintained on shift, with specialist and strategic support provided on a day-work basis.

Automation and remote operation of ROMUs are assumed to reduce the need for large field-based operating crews relative to conventional hydraulic mining operations.

8.1.3 Day-Shift Coverage

- **Contract Manager (Day Shift)**

A Contract Manager is assumed to be present on-site during each day shift on a 4-days-on / 3-days-off (4/3) roster.

- This arrangement provides management and commercial oversight coverage across seven days per week, while avoiding the requirement for 24-hour coverage.

Responsibilities include contract administration, performance management, interface with OGNZL, and escalation support to operational supervisors.

- **Planner (Day Shift)**

A dedicated Planner is assumed to be present on-site during day shift on a five-days-per-week (5/2) basis.

The Planner is responsible for short-term and medium-term operational and maintenance planning, including:

- Development and coordination of ROMU operating schedules
- Maintenance planning and work prioritisation in alignment with the ROMU maintenance strategy
- Coordination of planned maintenance windows with operational requirements
- Integration of operational, maintenance, and water management activities

The Planner role provides continuity, improves schedule adherence, and reduces the risk of reactive maintenance and unplanned downtime.

8.1.4 Shift-Based Operational Roles (24/7)

Each operational shift (day and night) is assumed to include the following roles:

- **Shift Supervisor (1 per shift)**

Overall responsibility for safe execution of operations on shift, including coordination of ROMU activities, water management, maintenance response, and compliance with site procedures.

- **ROMU Control Room Operators (2 per shift)**

Responsible for the remote operation and monitoring of the hydraulic mining units, including production control, response to alarms, and coordination with field and maintenance personnel.

- **Mechanical Technician (1 per shift)**

Trade-qualified mechanical support providing first-line maintenance, inspections, and fault response for ROMUs, pumping systems, pipelines, and associated mechanical infrastructure.

- **Electrical Technician (1 per shift)**

Trade-qualified electrical and control systems support responsible for fault finding, diagnostics, and maintenance of electrical, instrumentation, and control systems associated with ROMUs and plant.

- **Mechanical System (Pumping) Control Room Operators (2 per shift)**

Responsible for monitoring and controlling mechanical systems from the control room, including pumps, pipelines, water distribution and return systems, and supporting infrastructure.

Electrical and mechanical technicians may be shared with processing plant resources, presenting an opportunity for operational efficiencies and cost savings by minimising duplicated staffing. Detailed

role definitions, cost benefits, and resource-sharing arrangements will be assessed during the FS stage.

- **Pipe Moving Crew (3 per shift)**

Field-based personnel responsible for pipeline and hose relocation, alignment, inspection, and general pipe handling activities required to support hydraulic mining progression.

The crew includes a trained and licensed SSL operator and a UTV operator, enabling:

- Safe mechanical handling and movement of pipelines and hoses
- ROMU refuelling activities in the field.
- Transport of personnel between ROMU locations, pumping stations, and work fronts, subject to access and safety constraints.

This capability reduces manual handling risk, improves task efficiency, and supports timely response to operational and maintenance requirements across the hydraulic mining operations.

8.1.5 Staffing Basis and Assumptions

The indicative roles above are defined on the basis that:

- Two full crews are required to support the 7-days-on / 7-days-off roster.
- Each shift is 12 hours in duration.
- Maintenance capability on shift is limited to first-line response, with specialist and planned maintenance support provided by day-work personnel.
- Final headcounts may be adjusted based on ROMU fleet size, automation level, and final operating philosophy.

Detailed staffing numbers, competency requirements, and relief factors will be confirmed during the FS following completion of task analysis, maintenance strategy development, and operational risk assessment. Preliminary structure presented in Figure 8-1.

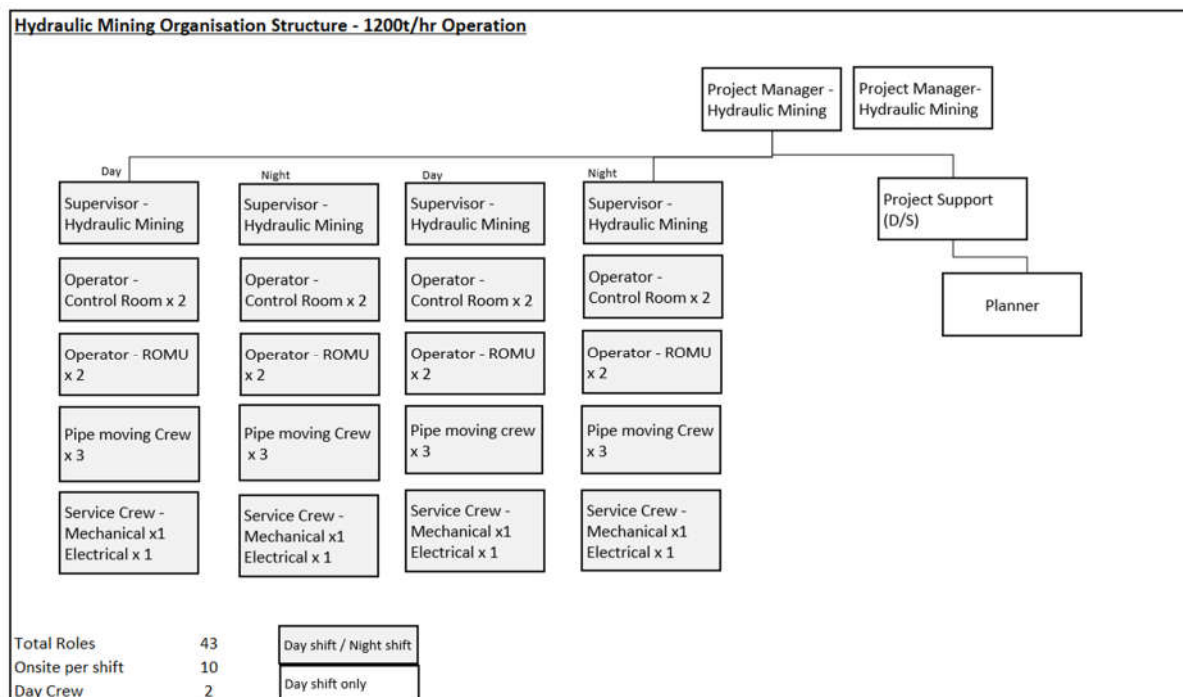


Figure 8-1 Preliminary Organisation Structure for Hydraulic Mining

8.2 ROMU Maintenance Strategy

The ROMUs are critical production assets for the proposed hydraulic mining operation. ROMU availability, reliability, and maintainability directly influence production continuity, water management performance, and overall operational safety. Accordingly, a structured maintenance strategy is required to support a controlled transition from commissioning into sustained operations.

At the PFS stage, the ROMU maintenance strategy defines the overarching maintenance philosophy, identifies key maintenance risks, and establishes the framework within which detailed maintenance plans will be developed during subsequent study phases.

Maintenance Philosophy

The ROMU maintenance strategy is based on a risk-based, reliability-centred maintenance (RCM) philosophy, with emphasis on preventing unplanned failures, managing wear in abrasive tailings environments, and ensuring safe maintenance execution within a TSF setting.

The strategy prioritises:

- Planned and condition-based maintenance over reactive maintenance.
- Early identification of degradation through monitoring and diagnostics
- Maintainability and modular replacement of high-wear components
- Alignment of maintenance activities with operational sequencing and TSF constraints
- This approach recognises the limited tolerance for extended ROMU downtime, and the operational complexity associated with remote-operated equipment.

Planned and Condition-Based Maintenance

Planned maintenance is assumed to be the primary maintenance mechanism for ROMUs and will be based on OEM recommendations, operating hours, and comparable hydraulic mining experience. This includes scheduled inspections, servicing, and replacement of consumable and wear components.

Condition-based maintenance is expected to progressively supplement planned maintenance through the monitoring of key operating parameters such as hydraulic pressures, pump performance, temperatures, vibration, and control system diagnostics. These data will be used to inform maintenance timing, reduce secondary damage, and optimise component life.

The level of instrumentation and data analytics will be confirmed and refined during later study phases.

- Corrective maintenance and breakdown response
- Corrective maintenance capability is required to address unplanned failures that cannot be prevented through planned or condition-based approaches.

The maintenance strategy assumes:

- Rapid fault identification supported by ROMU diagnostics and control systems.
- Defined isolation, lock-out, and access procedures compatible with remote operations
- Adequate on-site spares and tooling to address credible failure scenarios.

Breakdown response planning explicitly considers access limitations, tailings trafficability, and interaction with live water systems.

Spares and Logistics

A risk-based spares strategy underpins the ROMU maintenance approach, with particular focus on high-wear and long-lead components whose failure would result in extended downtime. At PFS level, allowance is made for on-site holding of critical consumables and strategic spares, with detailed spares lists and inventory levels to be developed during FS.

Coordination planning considers site access constraints, weather impacts, and integration with broader TSF operations.

8.3 Operational Readiness Strategy

Operational readiness for the proposed hydraulic mining operation is critical to achieving a safe, efficient, and reliable transition from construction and commissioning into sustained production. Given the interaction between remote-operated equipment, tailings surface conditions, water management systems, and site-wide operational controls, readiness must be addressed holistically across people, processes, and systems.

At the PFS stage, this strategy defines the readiness framework and key focus areas. Detailed readiness plans, procedures, and resourcing requirements will need to be developed by OGNZL and implemented during subsequent study phases and prior to commencement of operations.

8.3.1 Readiness Objectives

The primary objectives of the operational readiness strategy are to:

- Ensure personnel, systems, and infrastructure are prepared to support safe ROMU operations on the TSF.
- Minimise ramp-up risk and unplanned downtime during early operations.
- Confirm that monitoring, control, and water management systems perform as intended under expected operating and climatic conditions.
- Establish clear governance, accountability, and communication pathways between the command centre and site operation.

8.3.2 People and Capability Readiness

Operational readiness will require the development of appropriately skilled personnel capable of managing both remote and field-based activities. This includes control room operators, field inspection personnel, maintenance teams, and supervisory staff.

Key people-related readiness actions include:

- Definition of ROMU operator competency requirements and training pathways
- Development of site-specific training focused on TSF access, tailings surface conditions, and climate-driven operational risks.
- Simulation-based training for control room operators prior to live operation
- Establishment of clear roles and responsibilities across control room, field, and management functions.

8.3.3 Systems and Infrastructure Readiness

Critical systems supporting ROMU operations must be available, tested, and integrated prior to start-up. This includes control systems, communications, water supply and dewatering infrastructure, and monitoring equipment.

Readiness considerations include:

- Verification of PLC, control, and communication system integration with the central command centre
- Testing of ROMU monitoring systems, alarms, and data logging functionality
- Commissioning and performance testing of water supply, stormwater diversion, and dewatering systems
- Confirmation that existing TSF drainage and water management infrastructure can support planned operating scenarios.

8.3.4 Progressive Commissioning and Ramp-Up

Operational readiness will be supported through a staged commissioning and ramp-up approach. This will allow systems, personnel, and procedures to be validated progressively under controlled conditions before full production rates are achieved.

This approach will include:

- Initial low-intensity operating trials to validate ROMU performance and control systems.
- Progressive increase in operating hours and production rates
- Validation of water management and dewatering performance during early wet-weather events

- Ongoing refinement of operating parameters and procedures based on observed performance.

8.3.5 Risk-Based Readiness Assurance

Readiness activities will be aligned with key operational risks identified during the PFS, including climate-driven downtime, tailings surface trafficability, water management capacity, and system reliability. Readiness assurance will focus on ensuring that controls are in place and effective prior to commencement of sustained operations.

This will be achieved through:

- Readiness reviews at defined project milestones
- Verification that critical controls are implemented and understood by operations personnel.
- Early identification of gaps requiring further design development or procedural definition.

8.3.6 Transition to Operations

The transition from project execution into steady-state operations will be managed through a structured handover process. This will ensure that ownership of systems, documentation, and operational responsibilities is clearly transferred to site operations.

As the project advances beyond the PFS stage, this operational readiness strategy will be refined into a detailed readiness and commissioning plan, aligned with the final mine design, operating philosophy, and site management systems.

8.4 Stormwater Management

One of the primary risks to achieving a consistent hydraulic mining production rate is the occurrence of heavy rainfall events. As part of this study, mine design concepts have been evaluated, each incorporating alternative rainfall and stormwater management strategies aimed at mitigating this risk. Intense rainfall can result in the inundation of mining launders and sumps, requiring dewatering activities that may extend over several days and temporarily disrupt operations.

The Macraes Operation is located east of the Southern Alps and is characterised by a relatively dry climate, with extended periods of low rainfall. Historical data from monitoring stations in the vicinity of Macraes indicate an average annual rainfall of approximately 634 mm. Monthly rainfall totals are generally highest during the summer months but typically do not exceed 50–60 mm per month. Rainfall during the period from May to September is relatively consistent, averaging approximately 30–40 mm per month.

In addition, the mean annual pan evaporation at the Macraes Operation is estimated to be approximately 952 mm. As a result, the site generally experiences a net annual water loss, with evaporation exceeding rainfall over a typical year.

Under extreme rainfall conditions associated with a Probable Maximum Precipitation (PMP) event defined as the greatest depth of precipitation meteorologically possible for a given duration rainfall of approximately 700 mm over a 48-hour period has been estimated for the site (Macraes Operation, Southern Pit Option 11A TSF – RL544, Operations, Maintenance and Surveillance Manual, EGL, 16 October 2017) this corresponds to 308 ML of accumulated water. Under such exceptional conditions, dewatering of the TSF is expected to require approximately one week, including the deployment of additional mobile dewatering pumps. Dewatering performance is further enhanced when existing TSF

water management infrastructure is considered, including dewatering pontoon pumps, diversion drains, underdrains, and seepage collection systems.

Given the relatively dry climatic conditions at Macraes, the influence of rainfall on operations has been conservatively estimated to result in up to 480 hours of lost operating time per annum (approximately 20 days). This allowance includes both rainfall-related downtime and an appropriate drying period to allow safe re-access to the TSF.

9. Production Scheduling

9.1 Basis of Schedule

The hydraulic mining production schedule has been developed to reflect the anticipated operational sequencing, equipment deployment, and practical mining constraints associated with flitch-based tailings reclamation. The base case schedule assumes a total availability of 82%, equivalent to 7,211 operational hours per annum.

Indicative hydraulic mining channels were established at the locations of the planned flitch sumps. These channels represent the logical starting points for flitch reclaim and were used to guide the progression of reclamation within each Tailings Storage Facility (TSF). The channels do not represent detailed hydraulic designs but serve as scheduling control points to ensure realistic advancement of the reclaim faces.

Production rates were applied on a flitch-by-flitch basis, with deployment of one (1), two (2), or three (3) ROMUs depending on:

- The available flitch area,
- The geometry and continuity of the flitch,
- The assessed mining ability of the tailings within that flitch

Reclaim sequencing commences on 1 January 2028 in SP11 and covers the total tailings footprint across SP11 and SP10 presented in the base case schedule presented in Figure 9-1, reflecting project development strategy and operational considerations. Upon completion of SP11 Phase 1, reclaim activities alternate between SP10 and MTI, allowing flexibility in ROMU deployment and sump preparation.

Block volumes were converted to tonnes using this density, forming the basis for:

- Annual production forecasts
- ROMU utilisation modelling
- Schedule duration estimates.

No differentiation in density between TSFs or flitches has been applied at this stage, with refinement expected at later study phases if additional geotechnical or material characterisation data become available.

Flitch plan development during hydraulic mining presented in Figure 9-2 - Figure 9-5

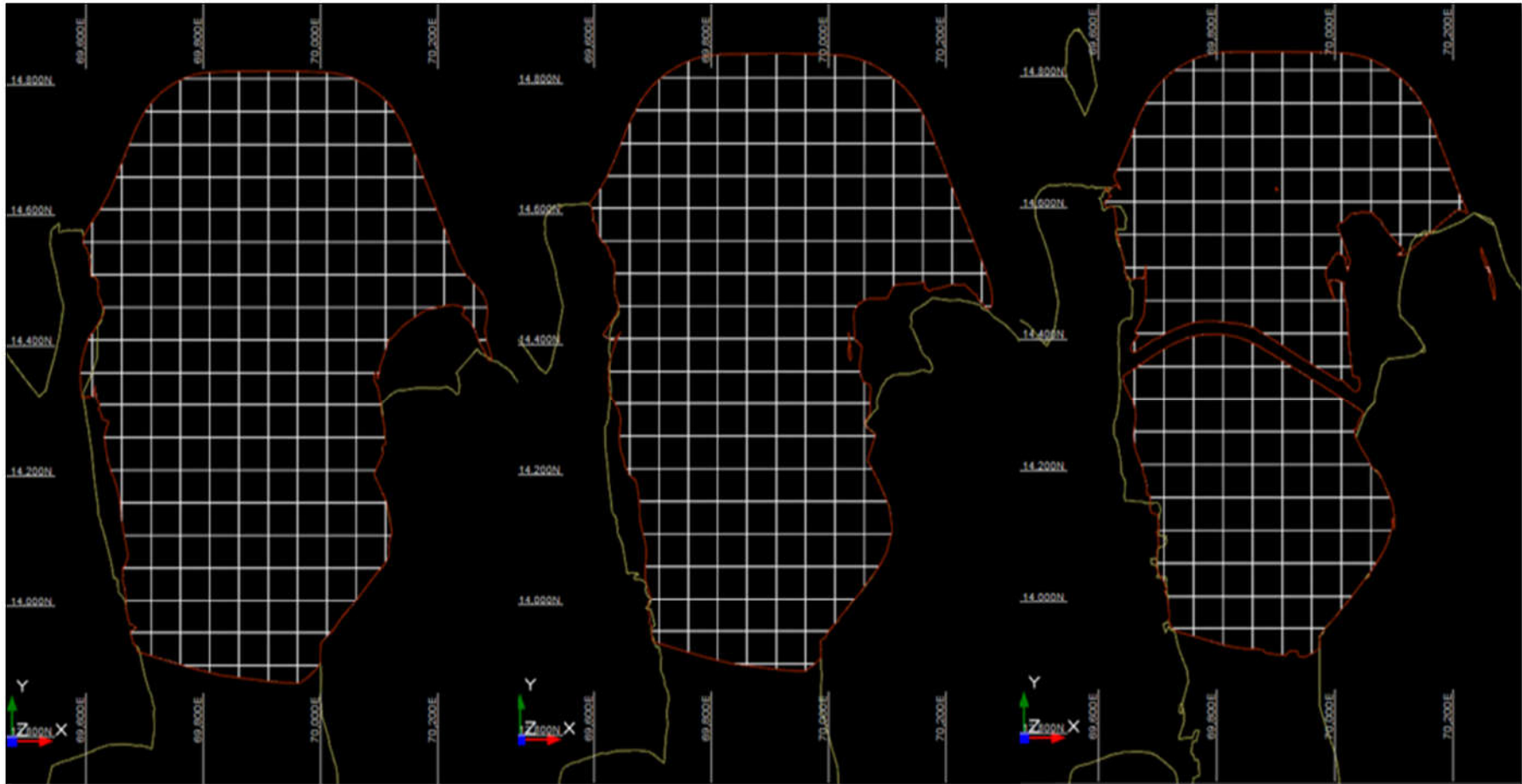


Figure 9-2 SP11 RL540 - RL520

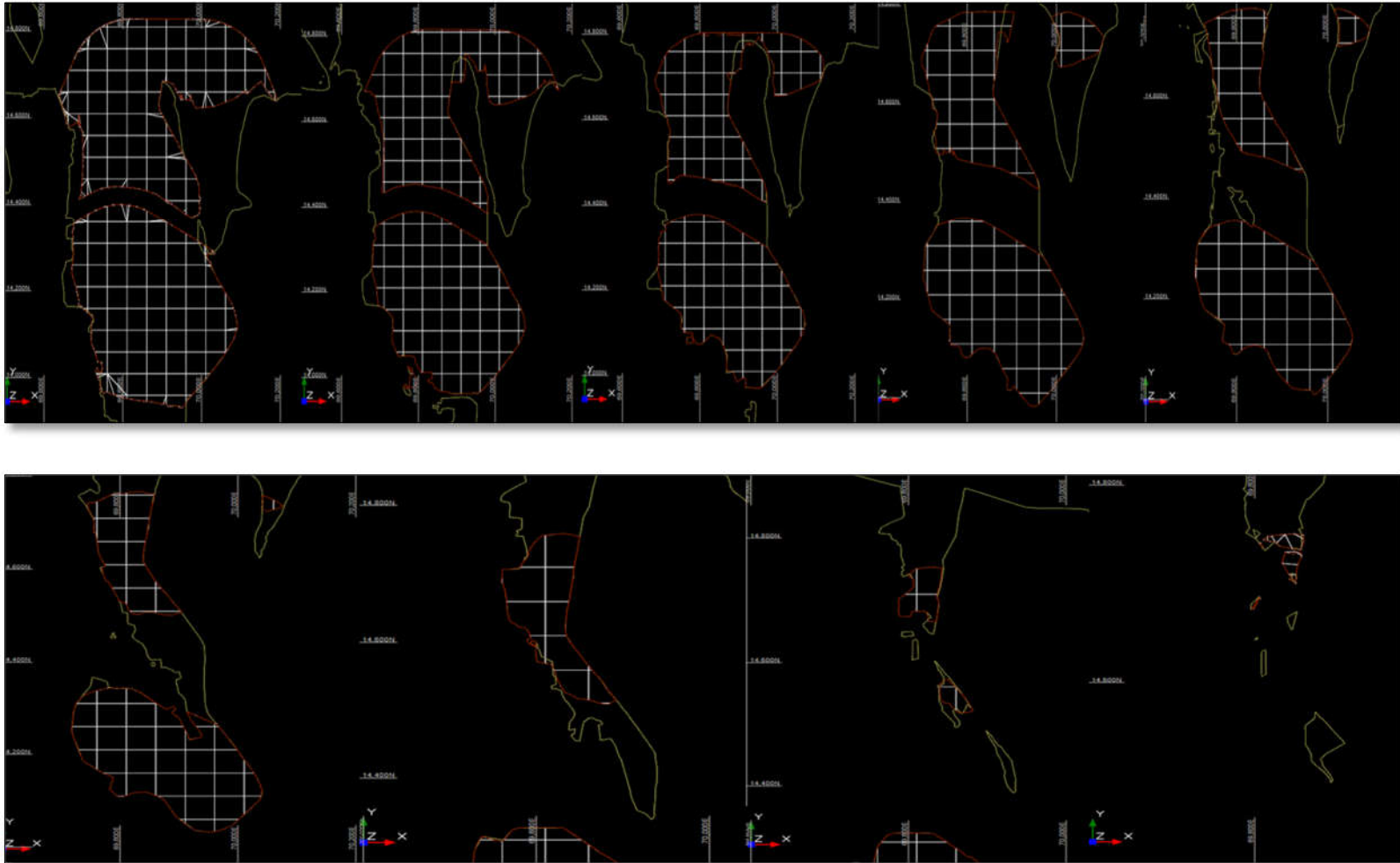


Figure 9-3 SP10 and SP11 RL512 - RL460

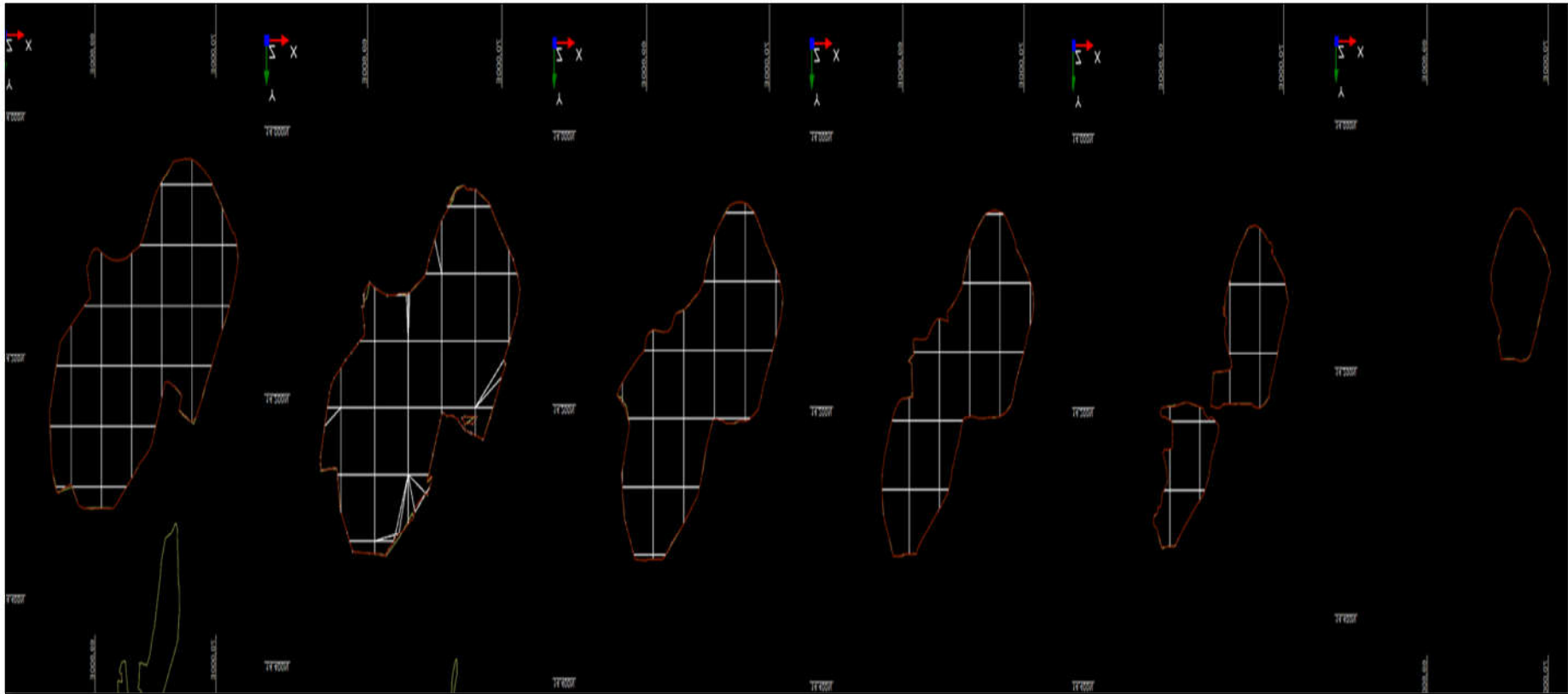


Figure 9-4 SP10 RL466 - RL438

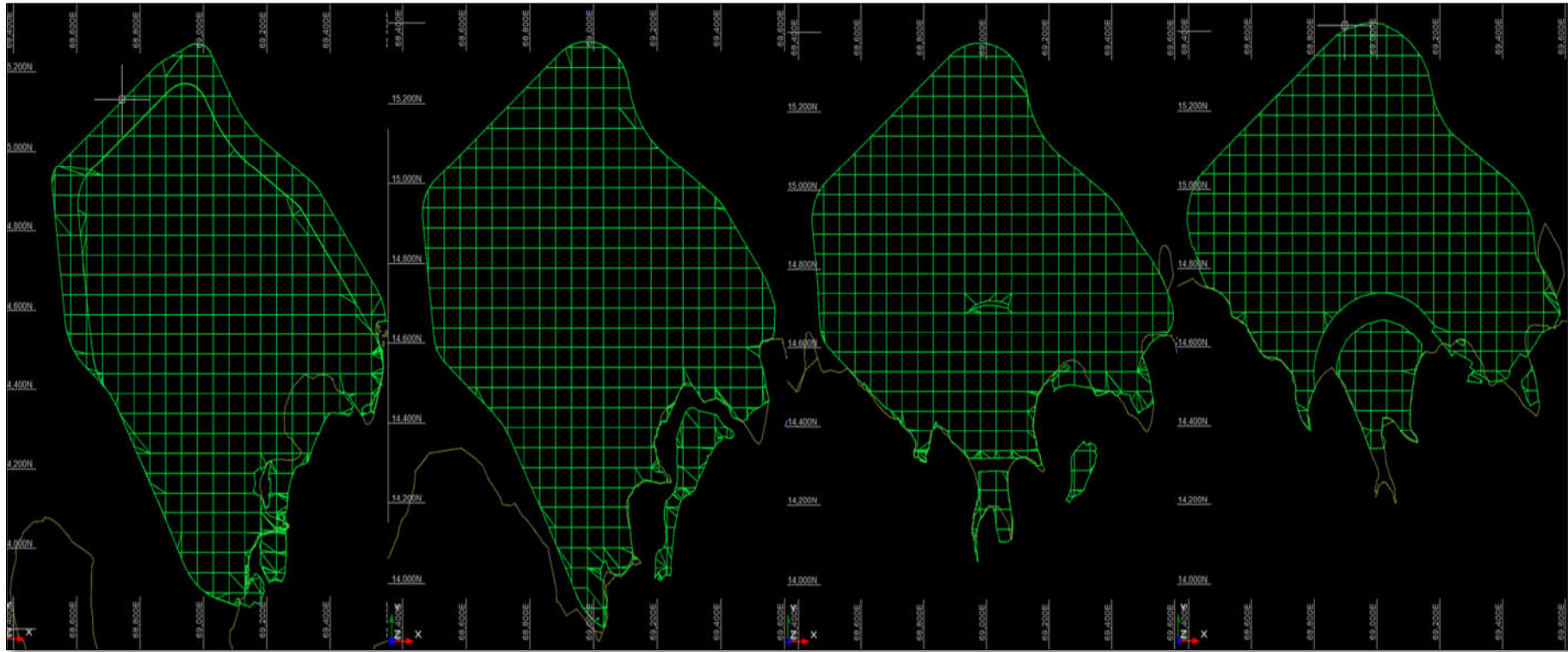


Figure 9-5 MTI RL548 - RL512

9.4 Sensitivity Cases

Sensitivity cases were developed to assess the impact of improved operational availability on the overall reclaim schedule duration. The base case schedule assumes a total availability of 82%, equivalent to 7,211 operational hours per annum.

Two higher-availability scenarios were evaluated:

- 85% availability presented in Figure 9-6
- 90% availability presented in Figure 9-7

All other assumptions, including ROMU production rates, reclaim sequencing, and block model inventory, were held constant across the sensitivity cases.

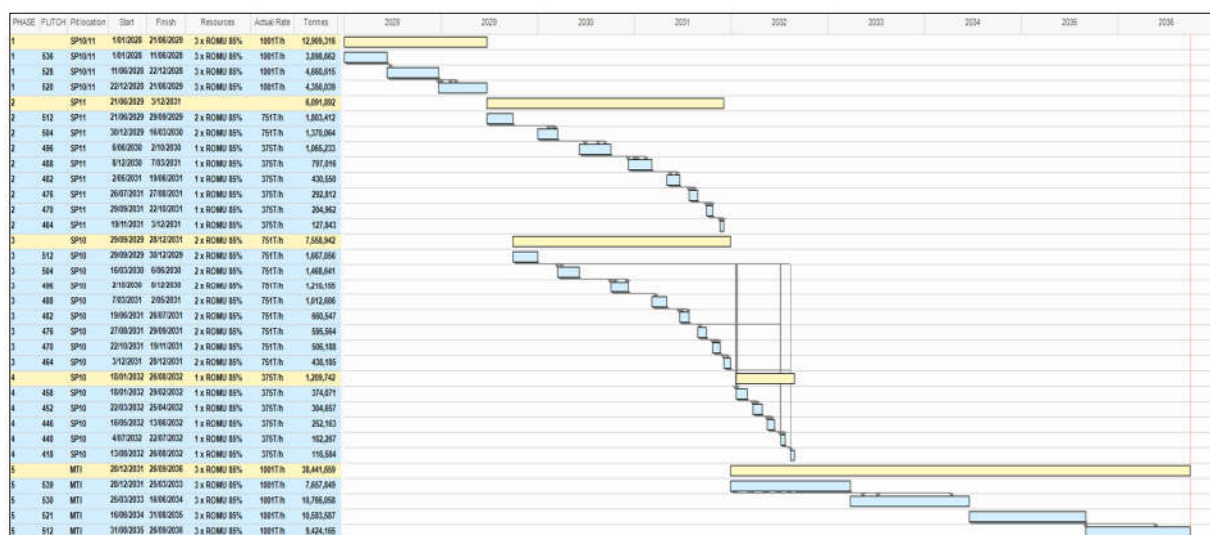


Figure 9-6 85% Availability Scenario

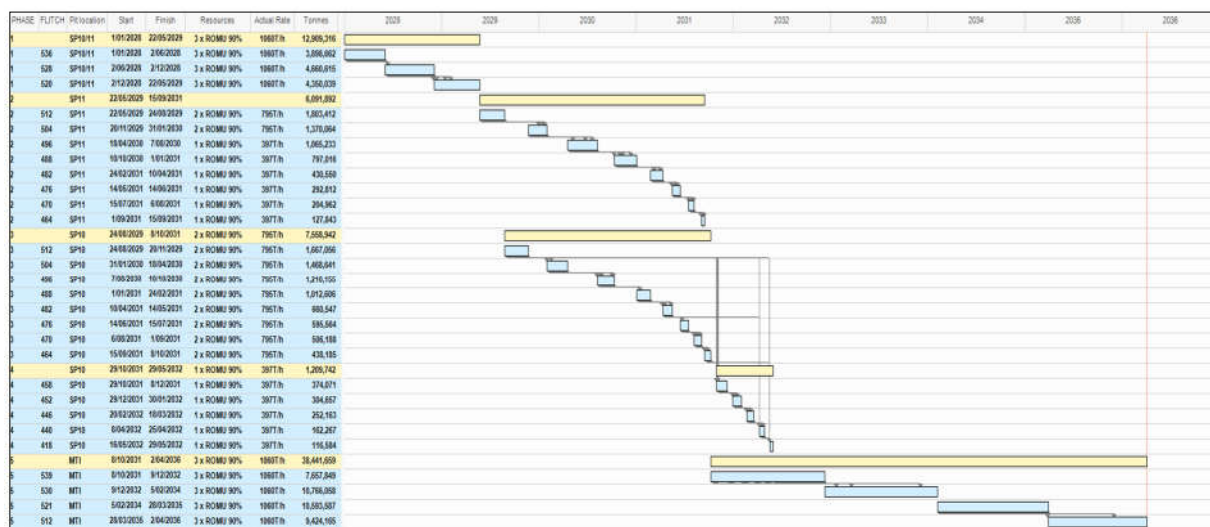


Figure 9-7 90% Availability Scenario

9.5 Sensitivity Results

The results of the availability sensitivity analysis demonstrate a material reduction in total schedule duration as availability increases:

- **Base Case** (82% availability):
 - 109 months (9 years, 1 month)
 - 1,200 t/h planned and 969 t/h based on availability.
 - 900 t/h planned and 727 t/h based on availability.
 - 450 t/h and 363 based on availability.
- 85% availability:
 - Overall schedule reduced by approximately 6 months
 - 1200 t/h planned and 1,001 t/h based on availability.
 - 900 t/h planned and 751 t/h based on availability.
 - 450 t/h and 375 based on availability.
- 90% availability:
 - Overall schedule reduced by approximately 9 months, resulting in a total duration of 100 months (8 years, 4 months)
 - 1200 t/h planned and 1,060 t/h based on availability.
 - 900 t/h planned and 795 t/h based on availability.
 - 450 t/h and 397 based on availability.

These results highlight the strong leverage of operational availability on project duration and underscore the importance of maintenance strategy, redundancy, and operational discipline in achieving schedule optimisation.

9.6 Schedule Optimisation

As indicated by the sensitivity cases for the 82% base availability and the 85% and 90% availability scenarios, the production schedule and associated delivery dates for completion of reclamation of the SP11, SP10, and MTI tailings can be optimised to achieve earlier project completion relative to the base case duration of 109.1 months.

Four alternative opportunities have been identified that could materially improve schedule outcomes at the subsequent FS stage; however, these remain untested at the PFS level.

Key potential optimisation measures include:

- Comprehensive hydrology assessment to support the higher availability scenarios (85% and 90%). The current PFS base case is primarily constrained by wet weather impacts and unfavourable climatic conditions.
- Installation of temporary dewatering infrastructure within the hydraulic mining catchment areas, including cut-off drains and perimeter diversion trenches, to minimise water ingress into the TSF.
- Reduction in pontoon installation durations at SP10, currently assumed to be 21 days per event at the lower RL elevations after SP11 have been fully reclaimed. Rather than reinstalling pontoon structures at successive flitch levels, a fixed-elevation booster pump installation on a skid at

approximately RL 458 is considered more suitable. At this elevation, the working area reduces significantly, resulting in flitch durations of only weeks, a smaller more fit for purpose sump could reduce construction between 2-3 days.

10. Capital Cost Estimates (CAPEX)

Capital cost estimates for the hydraulic mining operation have been developed at a PFS level and are intended to support project option evaluation and development planning. The CAPEX estimate is specific to the hydraulic mining scope and includes only those assets required to establish and sustain ROMU operations. Costs are presented in both historical (2025) and real terms, escalation of 7.5% have been applied on historical rates.

10.1 ROMU units and Control Systems

Capital costs associated with the ROMU units include the supply of the hydraulic mining units and associated control and monitoring systems. This includes the ROMU mechanical assemblies, hydraulic jetting systems, local control panels, instrumentation, and integration with the central control room systems.

The CAPEX estimate assumes proven, OEM-supplied ROMU units with an established operating history in comparable tailings re-mining applications. Control systems are assumed to provide sufficient automation, monitoring, and safety interlocks to support continuous operation and remote monitoring. No allowance has been made for bespoke system development or advanced automation beyond standard OEM configurations at the PFS stage.

Commissioning support and minor ancillary items required to place the ROMUs into service are excluded. Major upgrades, future expansions, and replacement units are excluded from the initial CAPEX estimate.

10.2 Flexible Hose and Victaulic Pipelines

Capital costs for water reticulation include the supply of Victaulic steel pipelines and specialised high-pressure flexible hoses required to deliver process water from the main high-pressure supply line to each ROMU.

The estimate includes:

- Victaulic galvanised steel pipework, couplings, fittings, and valves
- Flexible double-jacketed layflat hoses rated for high-pressure operation.
- Pipe take-off points, manifolds, and connection hardware.

Pipeline lengths and configurations have been estimated based on the hydraulic mining layout and anticipated ROMU advance distances. The CAPEX estimate reflects reasonable allowance for pipeline extension during early mining stages but does not include long-term replacement of consumables, which is treated as operating cost.

10.3 Skid Steer Loader, UTV and LDVs

Mobile equipment capital costs include the supply of SSL units, UTVs, and light-duty vehicles (LDVs) required to support hydraulic mining operations.

These vehicles are intended to provide:

- ROMU and pipeline support during mining advance
- Personnel transport within the TSF operating area
- Light maintenance and inspection capability
- General operational coordination support

The CAPEX estimate assumes standard, commercially available equipment suitable for tailings storage facility conditions. No allowance has been made for specialised or heavy earthmoving equipment, which is outside the hydraulic mining scope.

10.4 Contingency

A contingency allowance of 15% has been applied to the hydraulic mining CAPEX estimate to account for PFS-level uncertainty in quantities, pricing, and scope definition. The contingency reflects the current level of design maturity and the inherent variability associated with tailings re-mining projects.

Contingency has been applied at an overall project level rather than on individual line items and is intended to cover:

- Quantity growth due to layout refinement
- Vendor pricing variability
- Minor scope changes identified during detailed design.

The contingency allowance will be reviewed and refined during subsequent project phases as design definition improves.

10.5 CAPEX Risk

The capital cost estimate is subject to the following key risks typical of PFS-level studies. Primary CAPEX risk drivers include:

- Final ROMU specification and OEM pricing
- Pipeline routing, lengths, and installation methodology.
- Availability and lead times for specialised high-pressure components
- Site access constraints and TSF operating conditions
- Market variability for equipment and materials
- Australian cost basis and specifications.

The CAPEX estimate has been prepared to PFS (Class 4) accuracy, with an expected accuracy range of 25–30%. These risks will be progressively mitigated through further engineering definition, vendor engagement, and constructability reviews in subsequent study phases.

10.6 CAPEX Cost Summary

The Hydraulic Mining ROMU CAPEX summary is shown in Table 10-1. The equipment included within the estimate and its associated cost breakdown are detailed in RN25070-GT-BOE-0001_A, attached to this report.

Table 10-1 Hydraulic Mining ROMU CAPEX Summary

Hydraulic Mining CAPEX		
#	Description	Total
1	ROMU	\$ [REDACTED]
2	HP VALVES	\$ [REDACTED]
3	IN-DAM WATER RETICULATION (3000m)	\$ [REDACTED]
4	ROMU TRAIL PIPE (800m)	\$ [REDACTED]
5	MOBILE EQUIPMENT	\$ [REDACTED]
	SUB-TOTAL	\$ [REDACTED]
	15% contingency	\$ [REDACTED]
	TOTALESTIMATED CAPEX	\$ [REDACTED]

11. Operating Cost Estimate (OPEX)

11.1 Methodology Overview

Operating cost estimates for the hydraulic mining operation have been developed using a bottom-up, activity-based approach, with costs calculated on an annualised basis and normalised to unit production where applicable. The OPEX estimate is specific to the hydraulic mining (ROMU) operation only and does not include downstream processing, tailings handling beyond the ROMU operating area, or site-wide general and administrative costs unless explicitly stated.

Labour, consumables, diesel burn rates, maintenance, and operational support requirements have been defined based on the proposed operating philosophy, production rates, and equipment configuration outlined elsewhere in this PFS.

11.2 Labour Cost Basis

Labour costs represent the dominant component of the hydraulic mining OPEX and have been estimated using labour rates sourced from the Boya Resources PFS completed in mid-2025. These rates are considered appropriate for PFS-level estimating and reflect prevailing industry conditions at the time of that study.

The following assumptions apply:

- Labour rates are from the Boya Resources 2025 PFS and have been escalated by 3.5%.
- A 7-day on / 7-day off (7/7) roster has been assumed for all hydraulic mining personnel.
- Manning levels are based on continuous operations, inclusive of operational coverage, leave, and rostered relief.
- Labour costs include base rates, roster uplifts, allowances, and statutory on-costs consistent with the Boya Resources PFS assumptions.

Labour costs included in the OPEX are limited to personnel directly supporting the hydraulic mining operation, such as ROMU operators, supervisors, maintenance technicians, and field support staff.

11.3 Operating Scope and Cost Inclusions

The hydraulic mining OPEX includes the following cost components:

- Operating labour associated with ROMU deployment and control.
- Routine mechanical and hydraulic maintenance of ROMUs and associated equipment
- Wear parts and consumables (e.g. nozzles, hoses, couplings, minor spares)
- Power and fuel associated with hydraulic mining equipment (where applicable)
- Operational support directly attributable to ROMU activities.

Costs are expressed in real terms and represent steady-state operations under the defined operating scenarios.

11.4 Cost Exclusions

The following items are explicitly excluded from the hydraulic mining OPEX estimate:

- Water supply, treatment, pumping, or storage infrastructure OPEX outside the ROMU boundary
- Gland water, flushing water, or make-up water costs.
- Tailings transport or deposition beyond the ROMU operating area
- Evaporation losses or institutional water losses
- Owner's corporate overheads and site-wide G&A
- Sustaining capital and major equipment overhauls.

These exclusions are consistent with the defined scope of this PFS and will be addressed separately where required.

11.5 Accuracy and Level of Confidence

OPEX estimate has been prepared in accordance with PFS-level accuracy expectations and is considered to have an accuracy range of approximately 25–30%. The estimate is suitable for comparative evaluation of operating scenarios and for informing project development decisions but should not be considered a definitive operating cost.

Further refinement of labour rates, manning levels, consumable usage, and maintenance strategies will be undertaken during subsequent project phases.

11.6 Limitations and Future Refinement

The OPEX estimate is sensitive to:

- Labour rates and roster structure
- ROMU utilisation and availability
- Production rates and operating hours
- Consumable wear rates and maintenance strategies

These parameters will be validated and optimised during the next phase of the project, at which point the OPEX estimate will be updated to a higher level of confidence.

11.7 Labour Cost Summary

Labour operating costs for the hydraulic mining operation have been estimated based on the previously defined organisation structure and manning levels for the 1,200 t/h, 900 t/h and 450 t/h operating cases. The labour cost estimate is specific to the hydraulic mining scope only and has been developed to PFS-level accuracy.

Labour rates have been adopted directly from the Boya Resources PFS completed in mid-2025 and are considered representative of prevailing industry conditions for comparable hydraulic mining operations. Escalation, market adjustment, or contingency uplift have been applied to these rates.

All labour costs assume a 7-day on / 7-day off (7/7) roster, with continuous operations requiring day and night shift coverage. The adopted labour rates are assumed to include base pay, roster uplifts, allowances, and statutory on-costs consistent with the Boya Resources PFS assumptions. Accommodation, mobilisation / demobilisation, subsistence, transportation and other associated costs are not included in the rates.

The labour cost estimate includes personnel directly supporting the hydraulic mining operation, including operations, supervision, maintenance presented in Table 11-1 , and dedicated planning and support functions. Costs have been annualised and represent steady-state operations under normal operating conditions.

Labour costs explicitly exclude processing plant personnel, site-wide general and administrative staff, corporate overheads, construction and commissioning labour, and any owner's representative roles not directly attributable to the hydraulic mining scope.

The labour cost estimate has been prepared to PFS (Class 4) accuracy, with an expected accuracy range of 25–30%. Labour costs are sensitive to production rate, ROMU utilisation, roster structure, and labour market conditions, and will be reviewed and refined during subsequent phases of the project.

Table 11-1 Hydraulic Mining Labour Cost Summary

Hydraulic Mining Labour Cost						
#	Description	Months	Tonnes (Mt)	Monthly Cost	Total (Incl. 3.5% escalation) \$M	NZ\$/t
1	Phase 1 – SP11	19	12,90	\$ [REDACTED]	\$ [REDACTED]	\$ [REDACTED]
2	Phase 2(SP11) and 3(SP10)	31.1	13,65	\$ [REDACTED]	\$ [REDACTED]	\$ [REDACTED]
3	Phase 4(SP10) and 5 - MTI	59.0	39,65	\$ [REDACTED]	\$ [REDACTED]	\$ [REDACTED]
	TOTAL	109.1	66,21		\$ [REDACTED]	\$ [REDACTED]

11.8 ROMU Operational Cost and Maintenance

Operating and maintenance (O&M) costs for the ROMU fleet have been estimated at a PFS level of accuracy and are based on steady-state hydraulic mining operations at the defined production rates. The O&M cost estimate is specific to the ROMU hydraulic mining scope only and excludes downstream processing, water supply infrastructure beyond the ROMU boundary, and site-wide services unless otherwise stated.

ROMU operating costs have been developed using a component-based approach, with costs grouped into routine operations, planned maintenance, and consumables and wear items. Cost assumptions reflect OEM guidance, operating experience from comparable hydraulic mining operations, and production profiles defined elsewhere in this PFS.

11.8.1 Operating Cost Basis

ROMU operating costs include energy consumption (electric or diesel, as applicable), routine inspections, lubrication, minor servicing, and operational support directly attributable to ROMU deployment. Energy demand is a function of operating pressure, flow rate, and utilisation, and has been estimated based on the defined operating scenarios (one, two, and three ROMUs in operation).

ROMU utilisation is assumed to reflect steady-state operations, inclusive of routine stoppages for inspections and minor maintenance. No allowance has been made for extended breakdowns or major component replacement within the operating cost estimate, as these are treated separately.

11.8.2 Maintenance Cost Basis

Maintenance costs have been estimated using a planned preventative maintenance philosophy, consistent with OEM recommendations and industry practice for high-pressure hydraulic mining equipment. Maintenance activities are assumed to be undertaken primarily during scheduled maintenance windows and shift changeovers, supported by on-site mechanical and electrical personnel.

Maintenance costs include:

- Routine mechanical and electrical servicing
- Replacement of minor components subject to wear
- Planned maintenance consumables
- Maintenance labour directly attributable to ROMU upkeep (where not already captured in labour OPEX)

Major overhauls, structural refurbishment, and replacement of primary ROMU components are considered sustaining capital and are excluded from operating costs at the PFS level.

11.8.3 Consumables and Wear Items

Consumables and wear items represent a material component of ROMU O&M costs and include, but are not limited to:

- High-pressure nozzles and orifice inserts
- Flexible hoses and couplings
- Victaulic fittings and gaskets
- Seals, liners, and sacrificial wear components

Wear rates are assumed to be a function of operating pressure, tailings abrasivity, and ROMU utilisation. At the PFS stage, consumable usage has been estimated on an average basis and does not differentiate between individual tailings domains.

11.8.4 Cost Exclusions

The following items are explicitly excluded from the ROMU operational and maintenance cost estimate:

- Major equipment overhauls and rebuilds.
- Replacement of primary ROMU units
- Water abstraction, storage, and pumping OPEX outside the ROMU boundary
- Gland water, flushing water, and make-up water costs.
- Evaporation and institutional water losses
- Site-wide general and administrative costs
- Construction and commissioning costs.

These exclusions are consistent with the defined scope and level of confidence of this PFS. A summary of operational costs by operating scenario is provided in Table 11-2

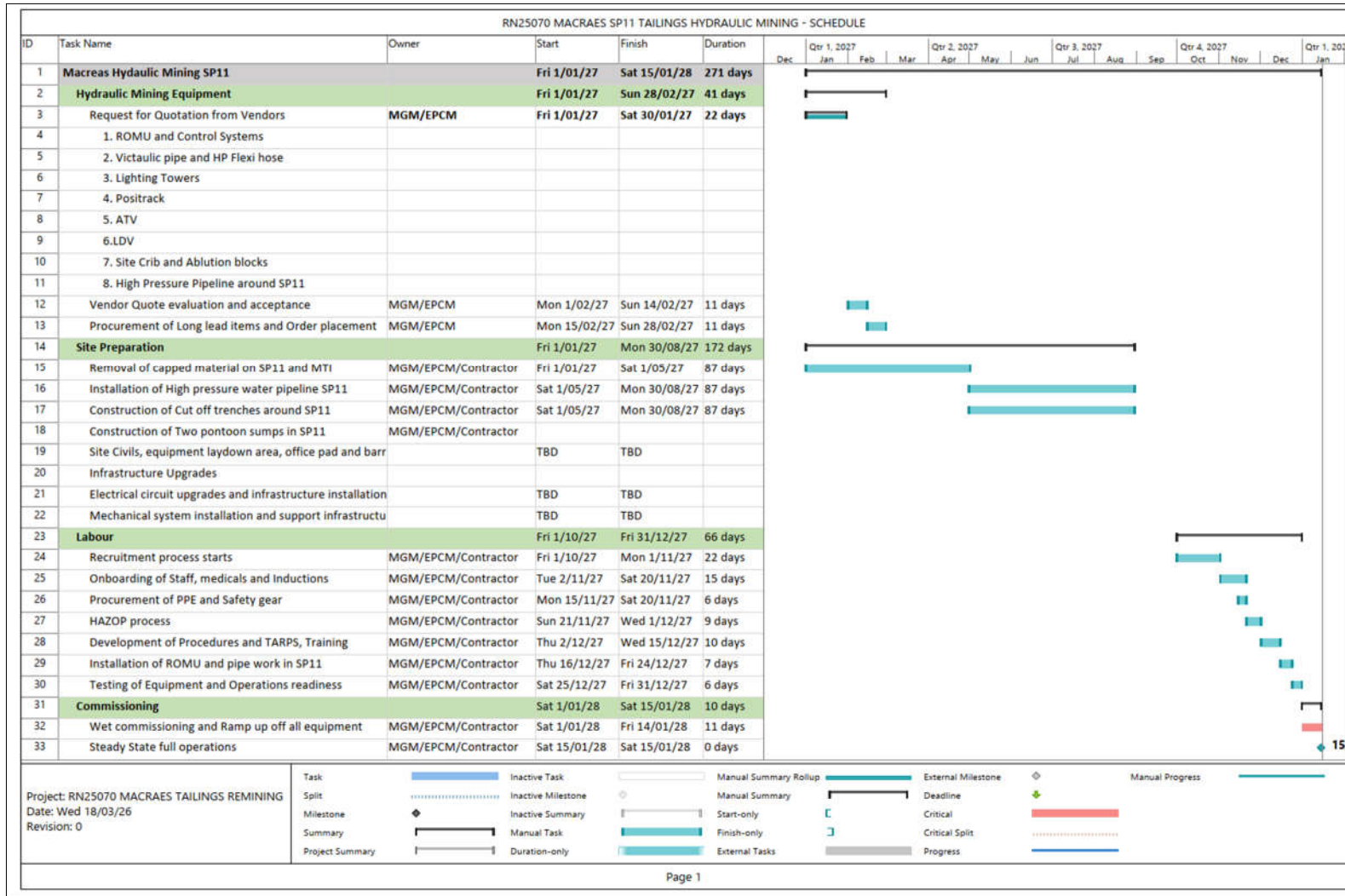
Table 11-2 Hydraulic Mining Operating and Maintenance OPEX Summary

Hydraulic Mining OPEX						
#	Description	Months	Tonnes (Mt)	Monthly Cost	Total (Incl. 15% contingency) \$M	NZ\$/t
1	Phase 1 – SP11	19	12,90	\$ [REDACTED]	\$ [REDACTED]	\$ [REDACTED]
2	Phase 2(SP11) and 3(SP10)	31.10	13,65	\$ [REDACTED]	\$ [REDACTED]	\$ [REDACTED]
3	Phase 4(SP10) and 5 - MTI	59.00	39,65	\$ [REDACTED]	\$ [REDACTED]	\$ [REDACTED]
	TOTAL	109.1	66,21		\$ [REDACTED]	\$ [REDACTED]

12. Hydraulic Mining Implementation Schedule

The hydraulic mining implementation for SP11 has been developed as a staged, logical programme progressing from early vendor engagement through procurement, site preparation, construction, commissioning, and steady-state operations. The schedule has been structured to de-risk long-lead items, align construction activities with procurement delivery, and allow sufficient time for workforce mobilisation, testing, and commissioning prior to full operational ramp-up.

The overall implementation period from project commencement to steady-state hydraulic mining operations is approximately 12 months, consistent with a PFS-level execution strategy for a modular hydraulic mining system.



12.1 Phase 1 – Project Initiation and Vendor Engagement

The programme commences with early project initiation activities, including engagement with hydraulic mining equipment vendors and system suppliers. This phase focuses on:

- Confirmation of system configuration and performance requirements
- Finalisation of vendor technical submissions
- Identification of long-lead equipment items.

Key equipment packages assessed during this phase include the ROMU and control systems, Victaulic pipework and high-pressure flexible hoses, lighting towers, skid steer loader or equivalent support equipment, UTVs and LDVs, site crib and ablution facilities, and high-pressure pipelines associated with SP11.

Early vendor engagement is critical to inform procurement decisions and to ensure that delivery timelines are aligned with site preparation and construction activities.

12.2 Phase 2 – Procurement and Long-Lead Items

Following vendor evaluation and acceptance, procurement of long-lead items is undertaken. This phase runs in parallel with early site preparation activities to minimise schedule risk.

Procurement activities include:

- Placement of purchase orders for major equipment and pipework
- Expediting and inspection of vendor deliverables
- Coordination of delivery logistics to site.

This phase is managed by the owner with engineering, procurement and construction management (EPCM) support and forms part of the project critical path due to the dependence of construction and installation activities on timely equipment delivery.

12.3 Phase 3 – Site Preparation and Infrastructure Works

Site preparation activities are undertaken to enable safe and efficient installation of the hydraulic mining system. These works include:

- Removal of cover rock and rehabilitation materials within SP11 and the MTI footprint
- Installation of high-pressure water pipelines to SP11
- Construction of the cut-off trench surrounding SP11
- Construction of two pontoon sumps within SP11.

These activities are scheduled to overlap with procurement to optimise the overall programme. The scope is deliberately staged to allow progressive handover of work fronts as equipment becomes available.

Supporting infrastructure works, including site crib facilities, laydown areas, offices, and temporary barriers, are identified within the schedule, with final durations to be confirmed during subsequent project phases.

12.4 Phase 4 – Labour Mobilisation and Systems Installation

Labour mobilisation activities commence ahead of major equipment installation and include recruitment, onboarding, medical assessments, and site inductions. In parallel, procurement of PPE and safety equipment is completed, and project-specific HAZOP, risk assessments and preparation of standard operating procedures are undertaken.

Installation activities during this phase include:

- Installation of the ROMU and associated piping within SP11
- Mechanical installation of hydraulic mining support infrastructure
- Electrical and control system upgrades required to support operations.

This phase represents a key transition from construction to operational readiness and is sequenced to ensure that installation progresses in a controlled and safe manner.

12.5 Phase 5 – Testing and Commissioning

Once installation activities are complete, a structured testing and commissioning programme is implemented. This includes:

- Mechanical completion checks
- Functional testing of hydraulic mining equipment
- Verification of control systems and operational interlocks
- Wet commissioning of all equipment

Commissioning activities are supported by vendor representatives, EPCM personnel, and operations staff to ensure knowledge transfer and operational readiness. A short ramp-up period is included to allow progressive increase in operating hours and throughput.

12.6 Phase 6 – Ramp-Up and Steady-State Operations

Following successful commissioning, the operation transitions into steady-state hydraulic mining.

During this phase:

- All equipment operates under normal production conditions.
- Performance metrics are monitored and optimised.
- Operational procedures are fully implemented.

At the conclusion of this phase, the hydraulic mining operation is considered fully implemented and operating at planned production rates.

12.7 Schedule Philosophy and PFS Confidence Level

The hydraulic mining implementation schedule has been developed at a Pre-Feasibility Study (PFS) level, with a focus on defining the logical sequencing, interfaces, and critical path activities associated with the hydraulic mining system at Macraes. The schedule reflects the scope of work defined for this study and has been prepared to support cost estimation, execution planning, and risk assessment at this stage of project development.

12.7.1 Scope Inclusions

The schedule includes the following primary work streams:

- Benchmark from previous studies, evaluation, and procurement of hydraulic mining equipment within study scope
- Site preparation activities related to SP11 hydraulic mining readiness.
- Labour mobilisation, onboarding, and HSEQ readiness
- Installation of ROMU and associated hydraulic mining infrastructure within the defined scope.
- Testing, commissioning, ramp-up, and transition to steady-state operations.

Durations have been developed based on comparable hydraulic mining projects and prior operational experience, with allowances appropriate to PFS-level definition.

12.7.2 Scope Exclusions and Interface Assumptions

The following work streams and associated costs have been explicitly excluded from the implementation schedule as they fall outside the scope of this study:

- **Mechanical equipment supply and installation to be delivered by IMEC**, including pumping systems, major mechanical infrastructure, and associated high-pressure piping. Based on previous project experience, this work stream is anticipated to require approximately 6 to 8 months, depending on equipment lead times, fabrication schedules, and site installation sequencing.
- **Electrical and control systems upgrade to be delivered by GHD**, including substation installations, power supply upgrades, electrical reticulation, and control system integration. These activities are similarly excluded from the schedule and are expected to represent a multi-month work stream that may overlap or extend beyond the hydraulic mining implementation programme.
- **Site civil works**, including bulk earthworks, permanent access roads, and major civil infrastructure. Ownership, scope definition, and execution responsibility for this work stream have not been defined at the time of this study and are therefore excluded from the schedule.
- **Mechanical excavation and deconstruction of upstream earth embankments** at SP11 and the MTI, as well as any works associated with the downstream embankment of SP11 or the SP10 embankment wall. These activities are considered outside the hydraulic mining scope and have not been scheduled.
- **Duration of the pontoon sump construction** during the implementation phase, as final sump design, excavation volumes, and construction methodology have not yet been confirmed. As a result, construction durations for these activities remain undefined and are excluded from the schedule.
- **Onboarding and mobilisation of the ROMU supply contractor**, noting that no service provider is currently available within New Zealand. It is anticipated that the ROMU contractor will be sourced from the international market, introducing uncertainty around lead times, mobilisation logistics, immigration requirements, and availability. Accordingly, contractor onboarding durations have not been defined or included in the schedule.

The hydraulic mining implementation schedule assumes that the above excluded work streams will be planned, executed, and integrated under separate project controls, with appropriate interface management to ensure that their delivery does not adversely impact hydraulic mining commissioning and ramp up.

13. Project Risk and Opportunities Register

[REDACTED]

[REDACTED]

14. Study Closure and Recommendations

14.1 Study Closure

This PFS has evaluated the technical and economic viability of the proposed Hydraulic Mining ROMU as the selected reclaim method for the Project. The assessment has been completed to a level of definition consistent with a PFS / AACE Class 4 estimate, incorporating preliminary engineering, production scheduling, capital and operating cost estimates, and key risk considerations. Some key capex and opex exclusions will require separate cost estimation to develop representative project costs, including:

- Energy costs
- Slurry transport dewatering
- Pipeline and other wear items
- Mechanical sump construction
- IMEC mechanical systems
- GHD electrical systems
- Major civil earthworks including internal pit access roads and crane platforms.

The study demonstrates that hydraulic mining is a technically feasible and operationally appropriate reclaim method, offering the potential for:

- Controlled and selective ROMU Mining
- Reduced reliance on conventional excavator and truck operations
- Competitive unit operating costs at the defined production rates.

Capital expenditure estimates have been developed based on preliminary equipment selection, conceptual layouts, and benchmarked cost data, with appropriate contingencies applied to reflect the level of project definition. Operating cost estimates reflect assumed operating philosophies, availability, and maintenance strategies consistent with comparable hydraulic mining operations.

The PFS confirms that, subject to the assumptions and limitations outlined in this report, the Hydraulic Mining ROMU represents a credible development option capable of supporting the Project's production objectives.

Based on the outcomes of this PFS, the Hydraulic Mining ROMU option is considered technically viable and suitable for advancement to the FS phase, subject to further design development, risk reduction, and confirmation of cost and schedule assumptions.

14.2 Recommendations for the Feasibility Study

The following activities are recommended to progress the Project from PFS to FS and to reduce technical, cost, and execution risk.

Engineering and Design Development

Advance the Hydraulic Mining ROMU design from conceptual to FS-level engineering, including:

- Detailed hydraulic mining layouts
- Defined mining blocks, benches, and sequencing

- Final ROMU location(s) and relocation strategy
- Develop detailed piping, pump station, and slurry transport designs, including surge management and redundancy
- Confirm ROMU interfaces with downstream embankment deconstruction activities

Geotechnical and Hydrogeological Investigations

Complete targeted geotechnical investigation and assessments to confirm:

- In situ strength parameters and the extent of spatial variability (lateral and depth)
- Erosion and liquefaction susceptibility
- Stability of hydraulic mining faces and benches
- Confirm design groundwater levels across the whole mining operation
- Stability of re-exposed highwalls in SP10/11 and risk management requirements

Undertake hydrogeological studies to:

- Refine groundwater inflow assumptions
- Confirm water recovery and seepage behaviour
- Support detailed water balance modelling

Capital and Operating Cost Refinement

Update CAPEX estimates to AACE Class 3 accuracy, including:

- Vendor budget or firm quotations for major equipment
- Detailed quantity take-offs for civils, piping, and electrical works
- Refined construction and installation costs

Refine OPEX estimates based on:

- Confirmed power and water consumption
- Maintenance strategies and spares philosophies
- Labour models and shift configurations, including other site dependencies related to system control, and mechanical systems

Risk Assessment and Mitigation

Update the project risk register with FS-level detail, with specific focus on:

- Hydraulic mining performance variability
- Water availability and water quality constraints
- Equipment reliability and maintenance access
- Weather-related operability risks

Implementation and Execution Planning

Develop a FS-level execution plan, including:

- Procurement strategy for long-lead equipment
- Construction and commissioning sequencing
- Owner vs contractor execution models

- Full integration and alignment with other disciplines outside of hydraulic mining for example, civil, electrical, and mechanical design.

Prepare a preliminary Project Schedule (Level 2/3) aligned with FS outcomes.

Appendices



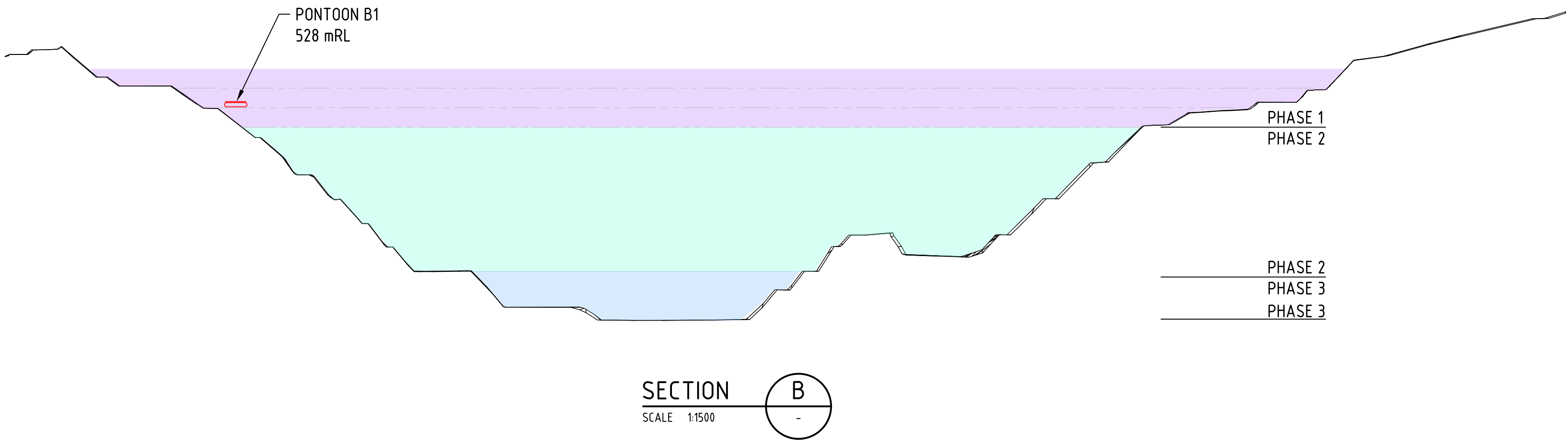
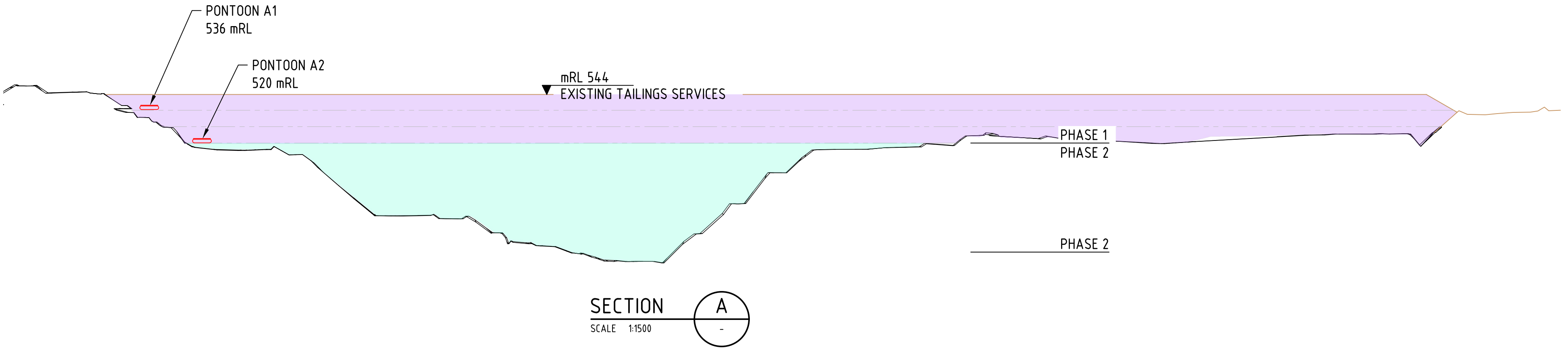
Appendix A - Basis of Design (Extended)

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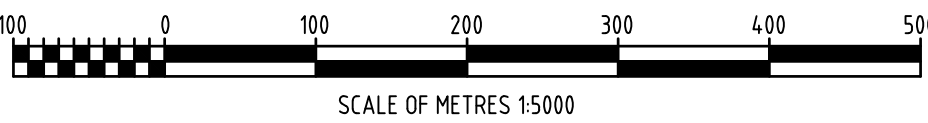
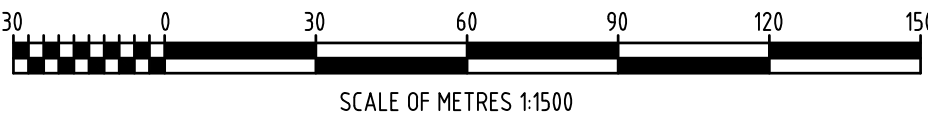
Appendix B - Pontoon Layout GAs



PLAN ON SP11 FOR MINING FROM 544mRL TO 520mRL
SCALE 1:5000

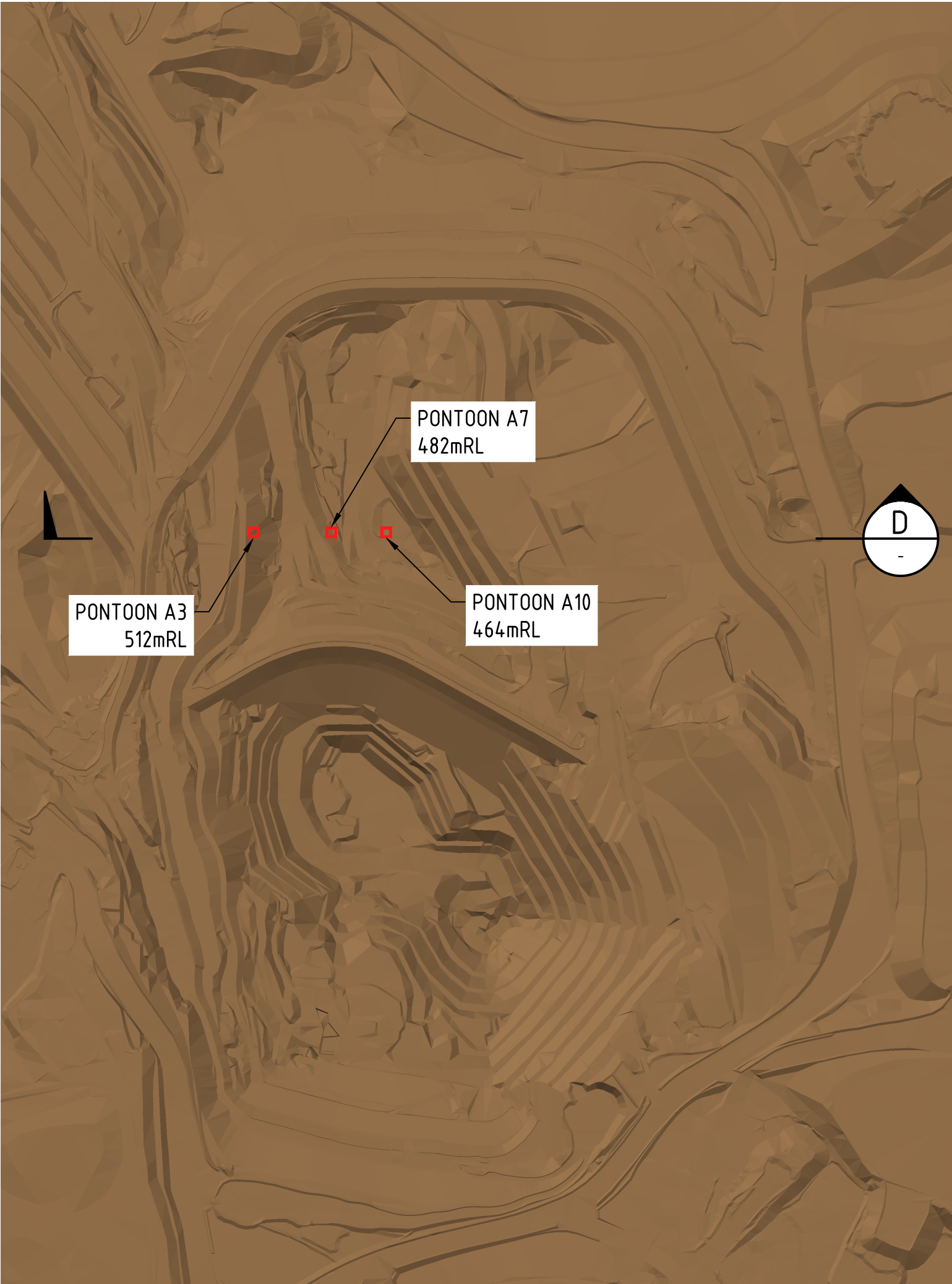


- PHASE 1 - 544mRL TO 520mRL - 8m FLITCHES
- PONTON A1 @ 544mRL TO 536mRL
- PONTON B1 @ 536mRL TO 528mRL
- PONTON A2 @ 528mRL TO 520mRL

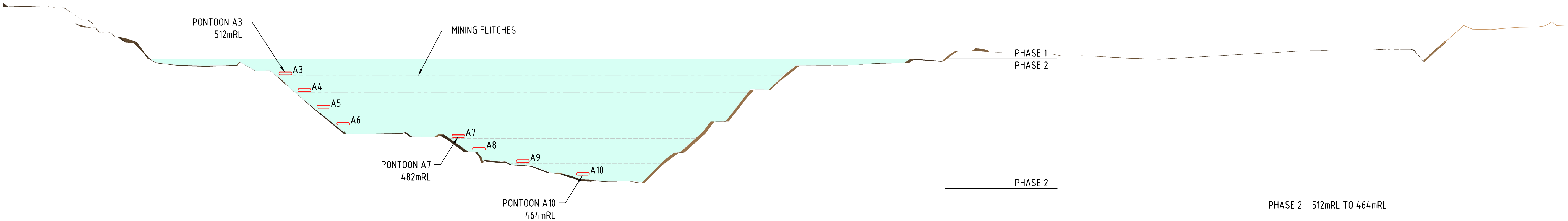


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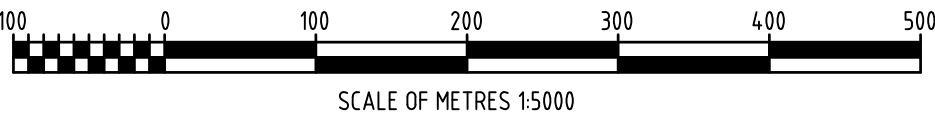
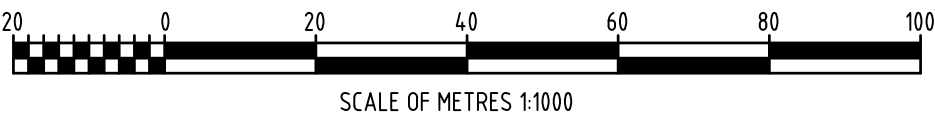
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PLAN ON SP11 FOR MINING FROM 520mRL TO 464mRL
SCALE 1:5000

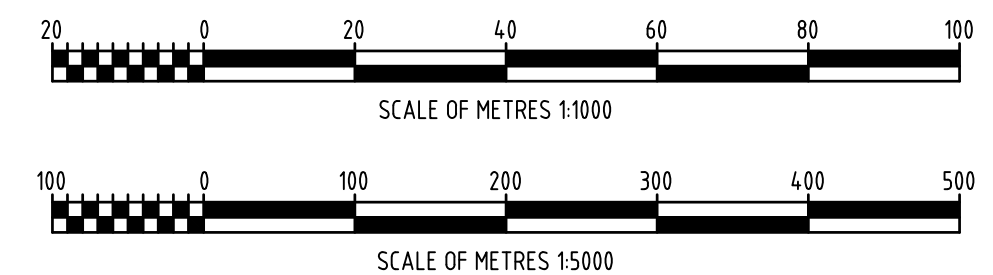


SECTION D
SCALE 1:1000

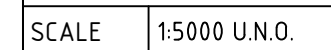


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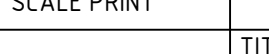
DRG No	RN25070-000-GE-1003
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PROJECT MANAGER
M. BROWN

REV C

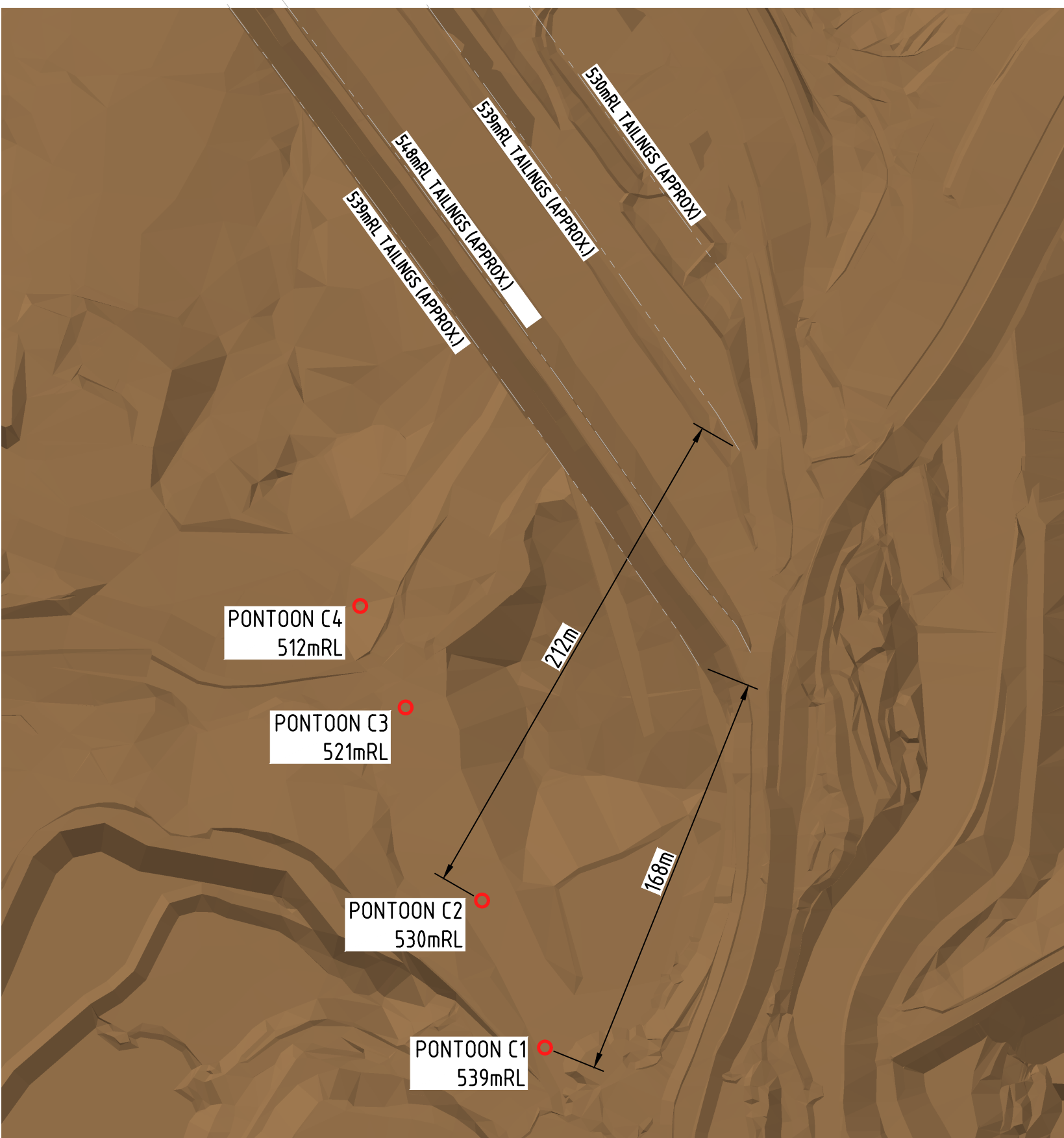
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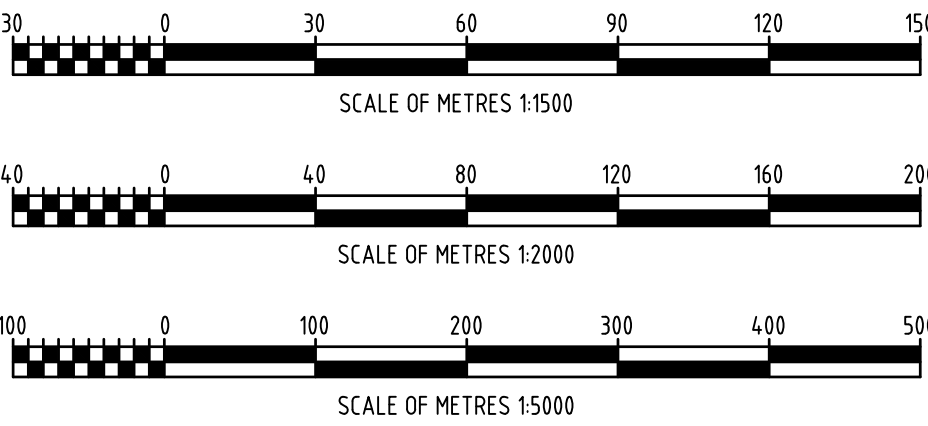
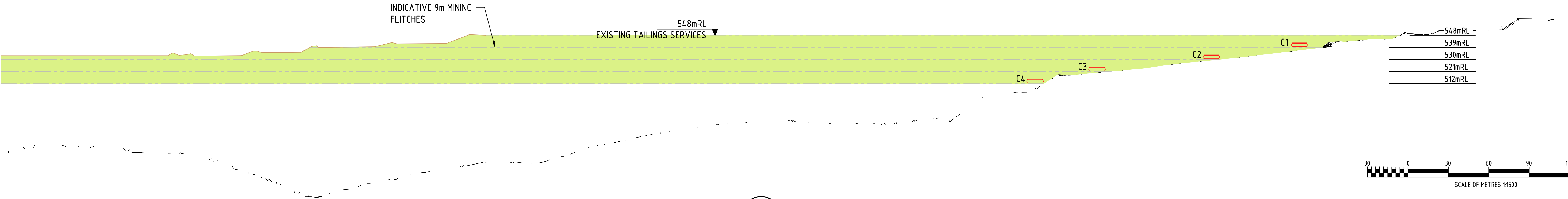
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		TITLE GENERAL ARRANGEMENT OF SP10 PONTOON LOCATIONS FROM 520mRL TO 442mRL		
SCALE	15000 U.N.O.	DRG No	RN25070-000-GE-1003	
DRAWN	F. WADDELL	CHECKED	ENGINEER APPROVED	PROJECT MANAGER
DATE	25.02.2026	N. KLOPPER	N. KLOPPER	M. BROWN
				REV C A1



PLAN ON MTI FOR MINING FROM 548mRL TO 512mRL
SCALE 1:5000



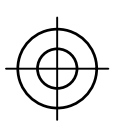
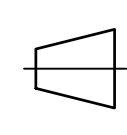
DETAIL
SCALE 1:2000
PONTON DISTANCES FROM TAILINGS PILE



REVIEW ISSUE
NOT FOR CONSTRUCTION

REFERENCE DRAWINGS:	REV	DESCRIPTION	DATE	DRN	CHK	APP
	E	ISSUED FOR STUDY	09.03.2026	F.W.	N.K.	N.K.
	D	ISSUED FOR CLIENT REVIEW	06.03.2026	F.W.	N.K.	N.K.
	C	ISSUED FOR CLIENT REVIEW	23.02.2026	F.W.	N.K.	
	B	ISSUED FOR CLIENT REVIEW	13.02.2026	F.W.	K.T.	N.K.
	A	ISSUED FOR INTERNAL REVIEW	11.02.2026	F.W.		



DO NOT SCALE PRINT	PROJECT MP4 TAILINGS RE-MINING PFS
 	TITLE GENERAL ARRANGEMENT OF MTI PONTON LOCATIONS FROM 548mRL TO 512mRL
SCALE 1:5000 U.N.O.	DRG No RN25070-000-GE-1001
DRAWN F. WADDELL	CHECKED K. TOMALIN
DATE 11.02.2026	ENGINEER APPROVED N. KLOPPER
	PROJECT MANAGER M. BROWN
	REV E

Appendix C - Geotechnical Assessment (FOS)

Geotechnical Assessment Temporary Hydraulic Mine Slopes

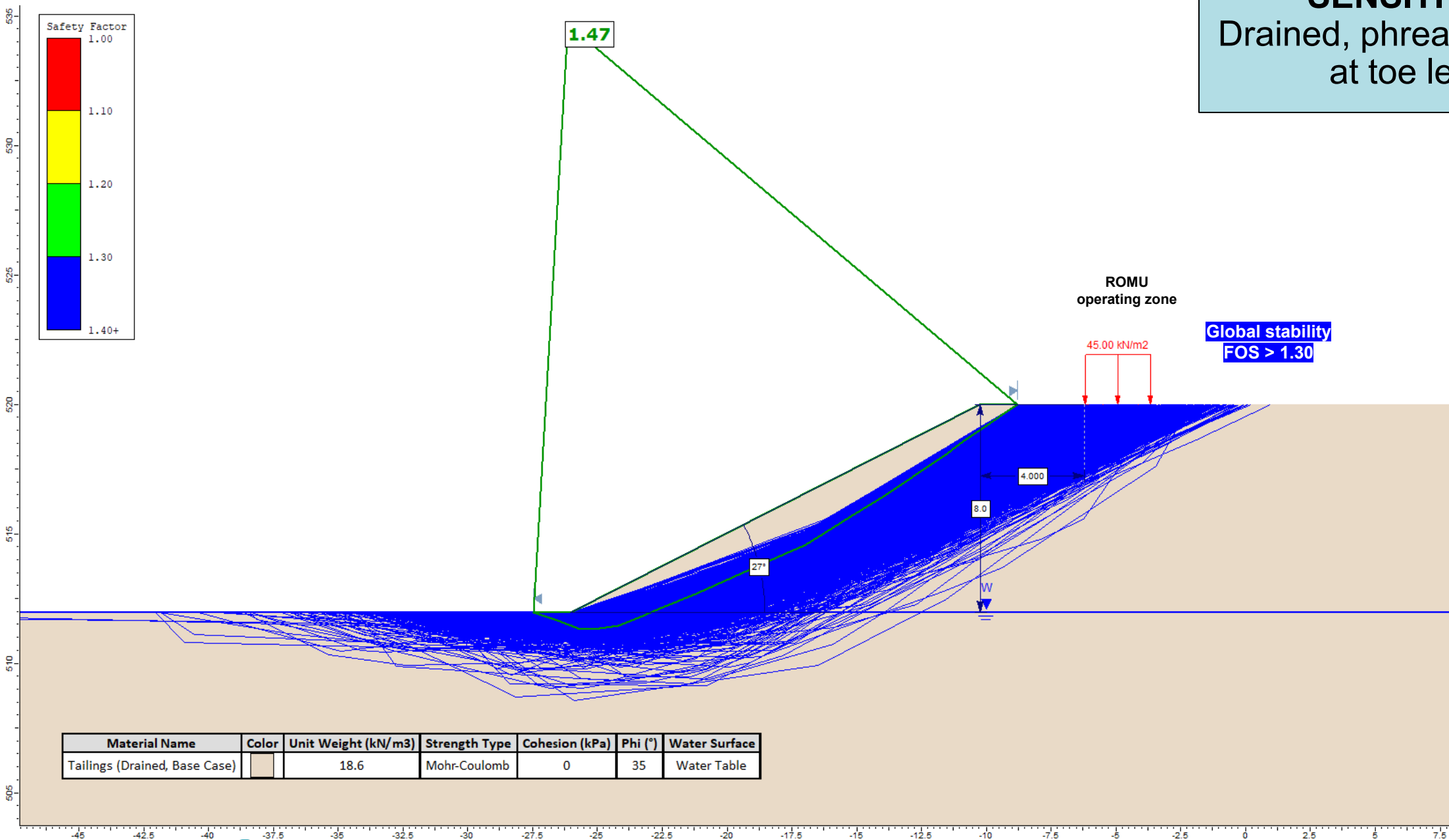
SP10/11

Bench Height 8 m and Angle 27°

**Shaping
Tomorrow
Together**

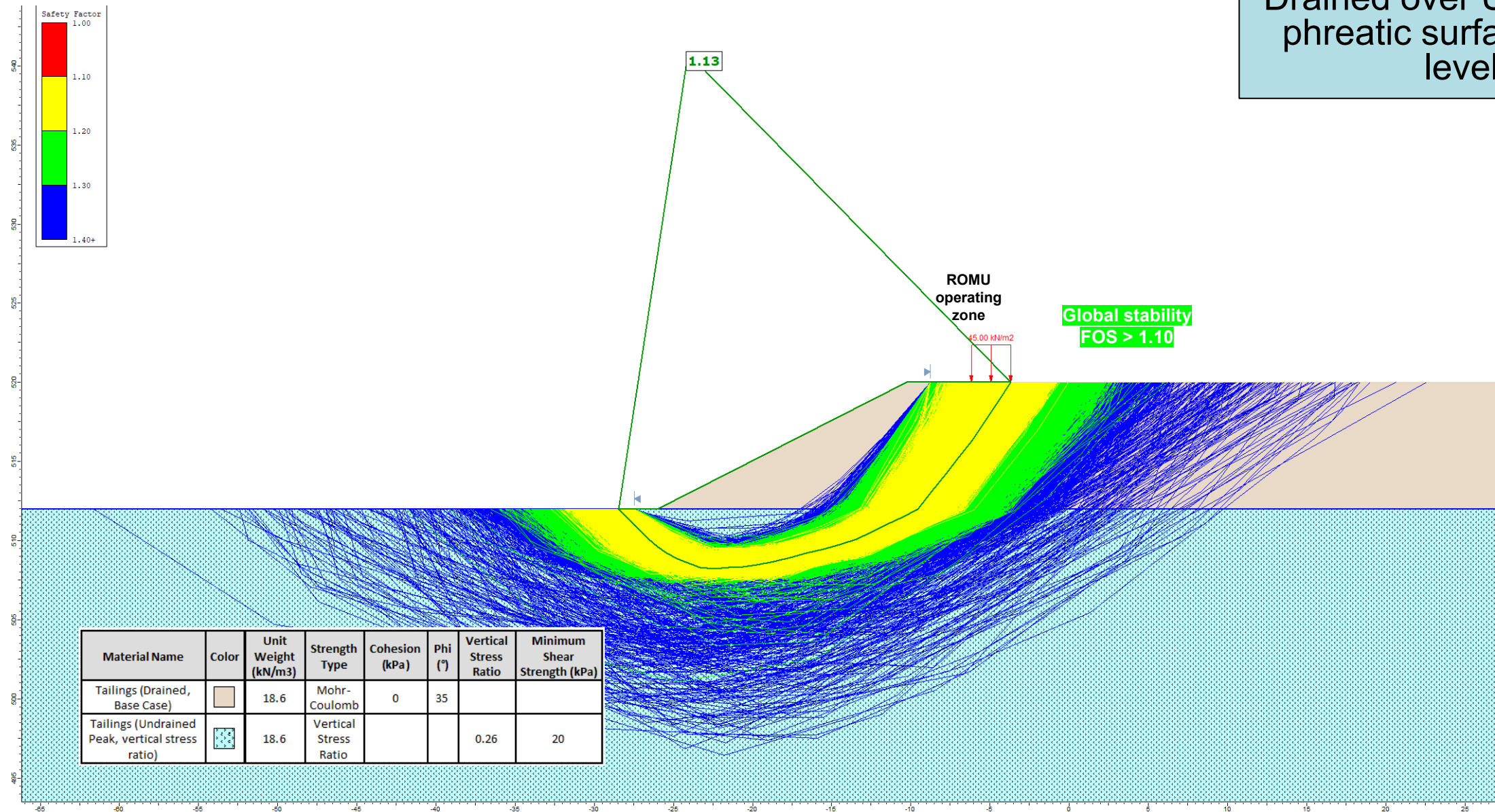
SENSITIVITY

Drained, phreatic surface
at toe level

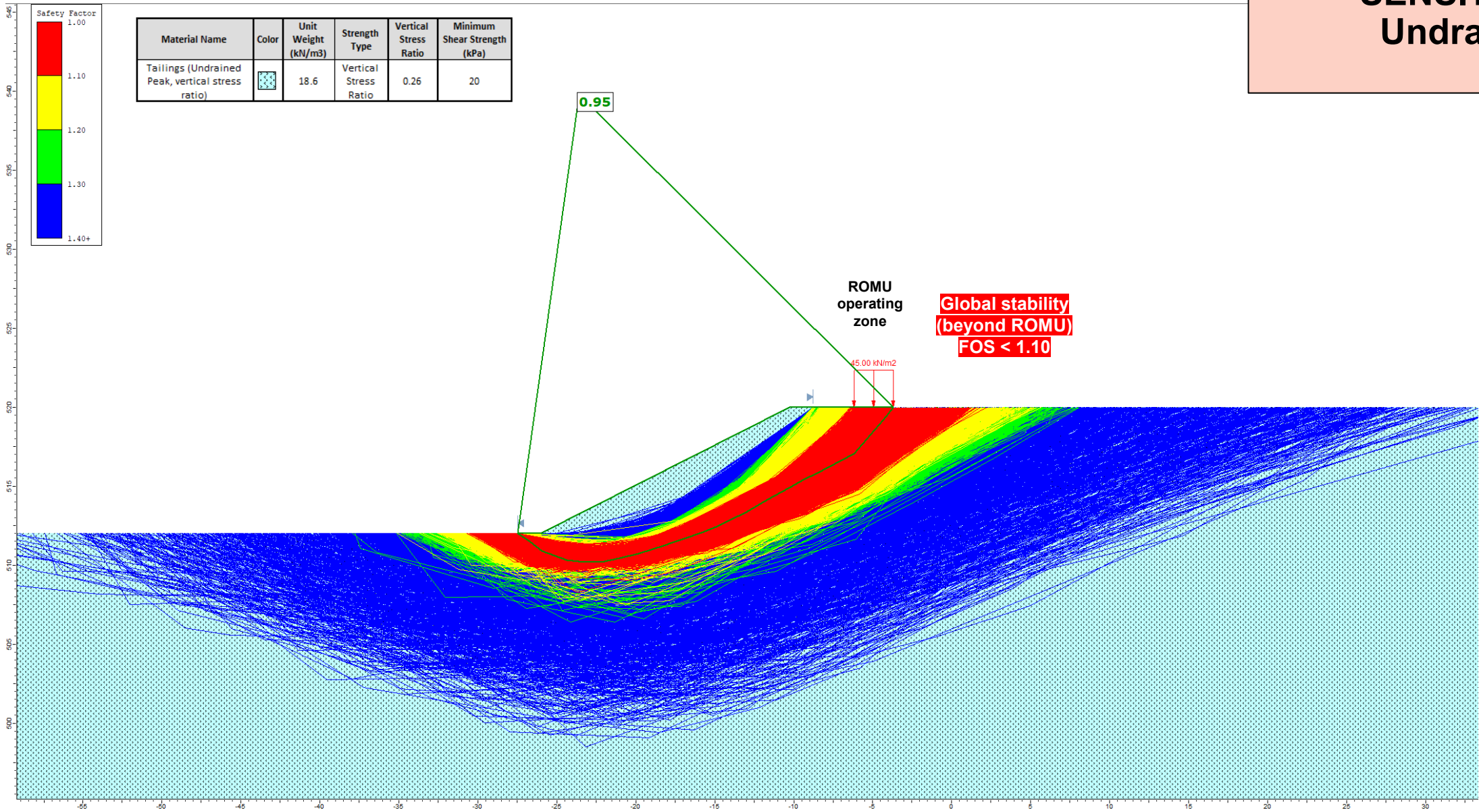


SENSITIVITY

Drained over Undrained,
phreatic surface at toe
level



SENSITIVITY
Undrained



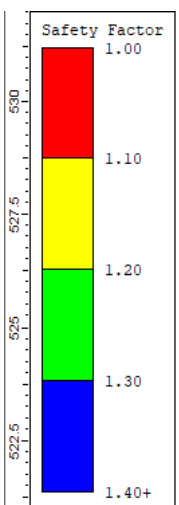
Geotechnical Assessment Temporary Hydraulic Mine Slopes

MTI

Bench Height 9 m and Angle 38°

**Shaping
Tomorrow
Together**

NORMAL OPERATION
Drained, phreatic surface
below depth of influence
(or > 3 m below toe)



Localised shallow mechanisms (face sloughing / surficial)
1.00 < FOS < 1.1; within 2.0 m of slope crest
Manage operationally (performance-based approach)

1.00

ROMU
operating
zone

Global stability
(beyond ROMU)
FOS > 1.30

45.00 kN/m2

4.0 m stand-off

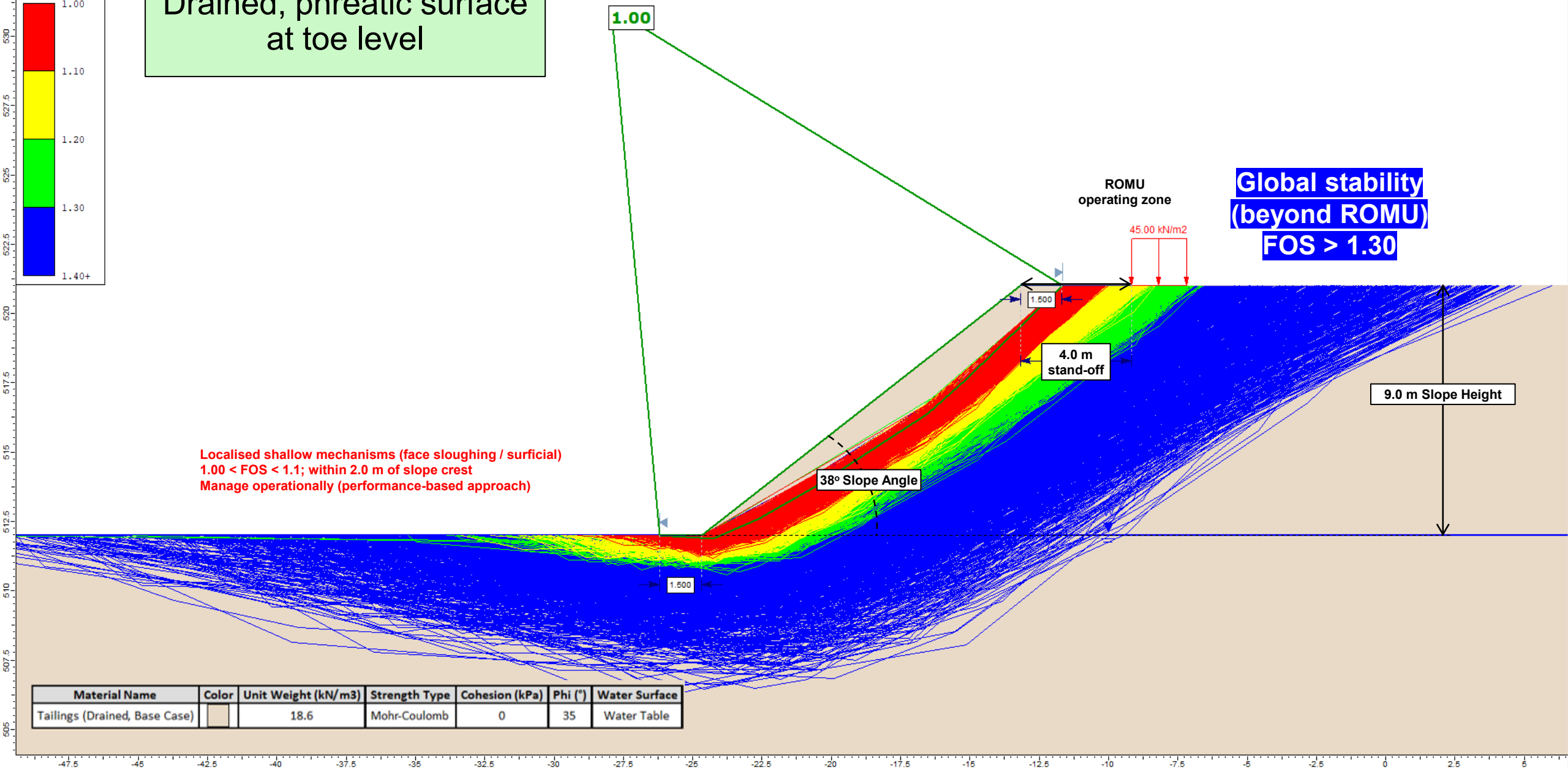
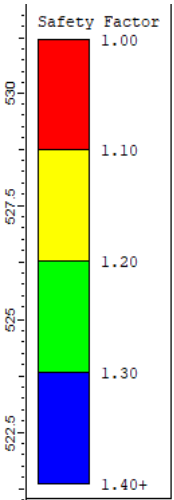
9.0 m Slope Height

38° Slope Angle

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface
Tailings (Drained, Base Case)		18.6	Mohr-Coulomb	0	35	Water Table

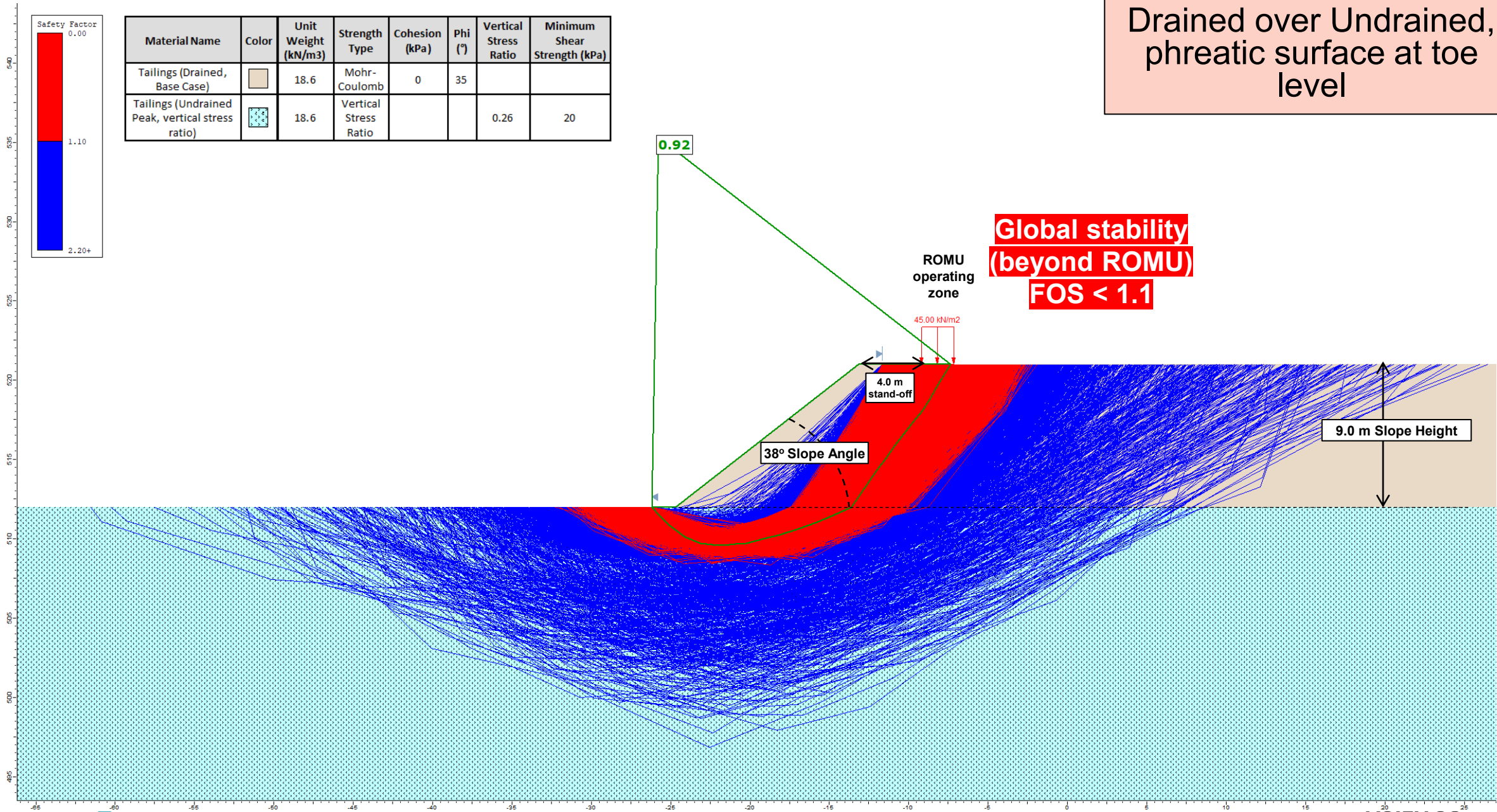
SENSITIVITY

Drained, phreatic surface
at toe level

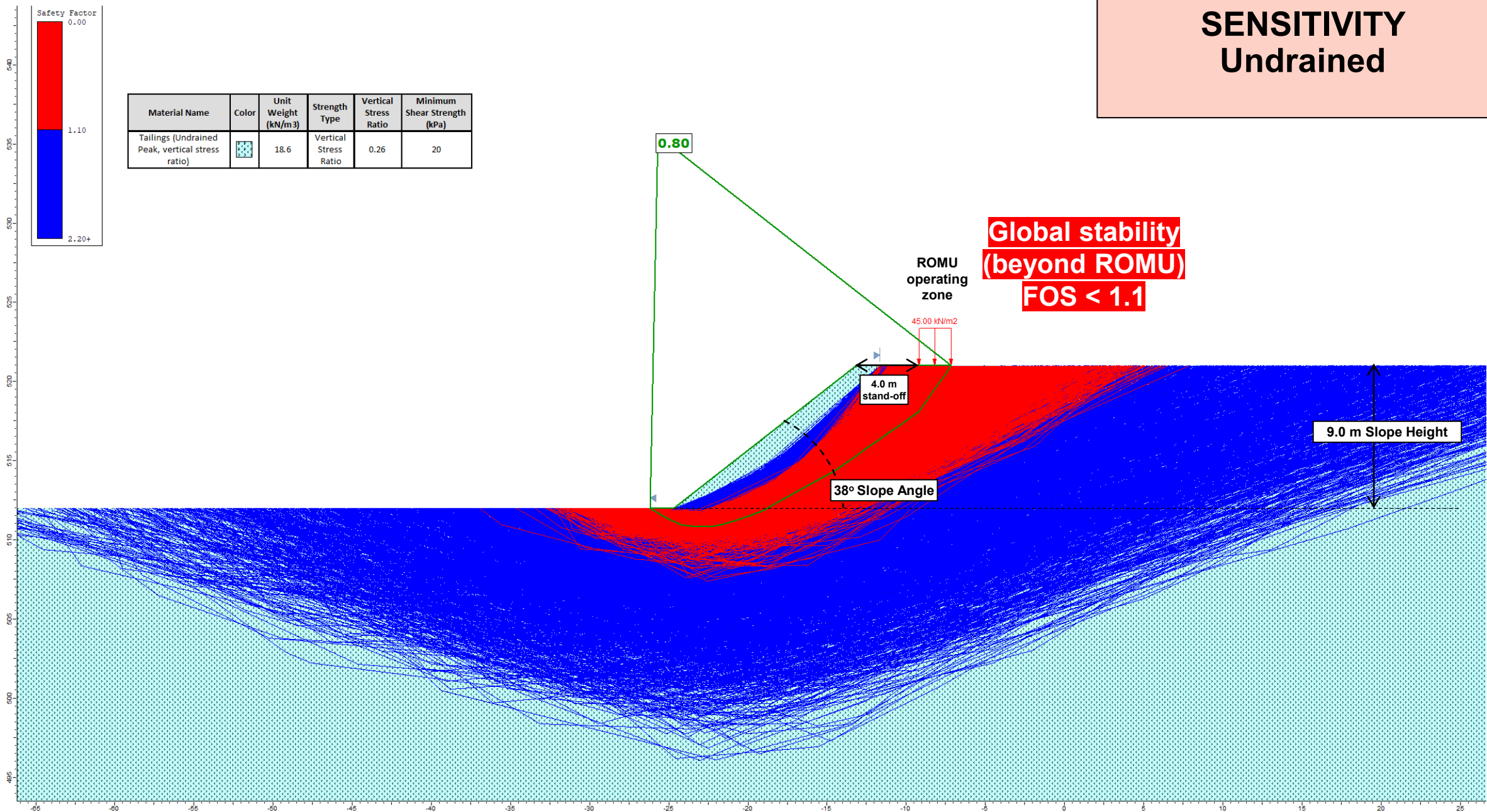


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	Water Surface
Tailings (Drained, Base Case)		18.6	Mohr-Coulomb	0	35	Water Table

SENSITIVITY
Drained over Undrained,
phreatic surface at toe
level



SENSITIVITY
Undrained



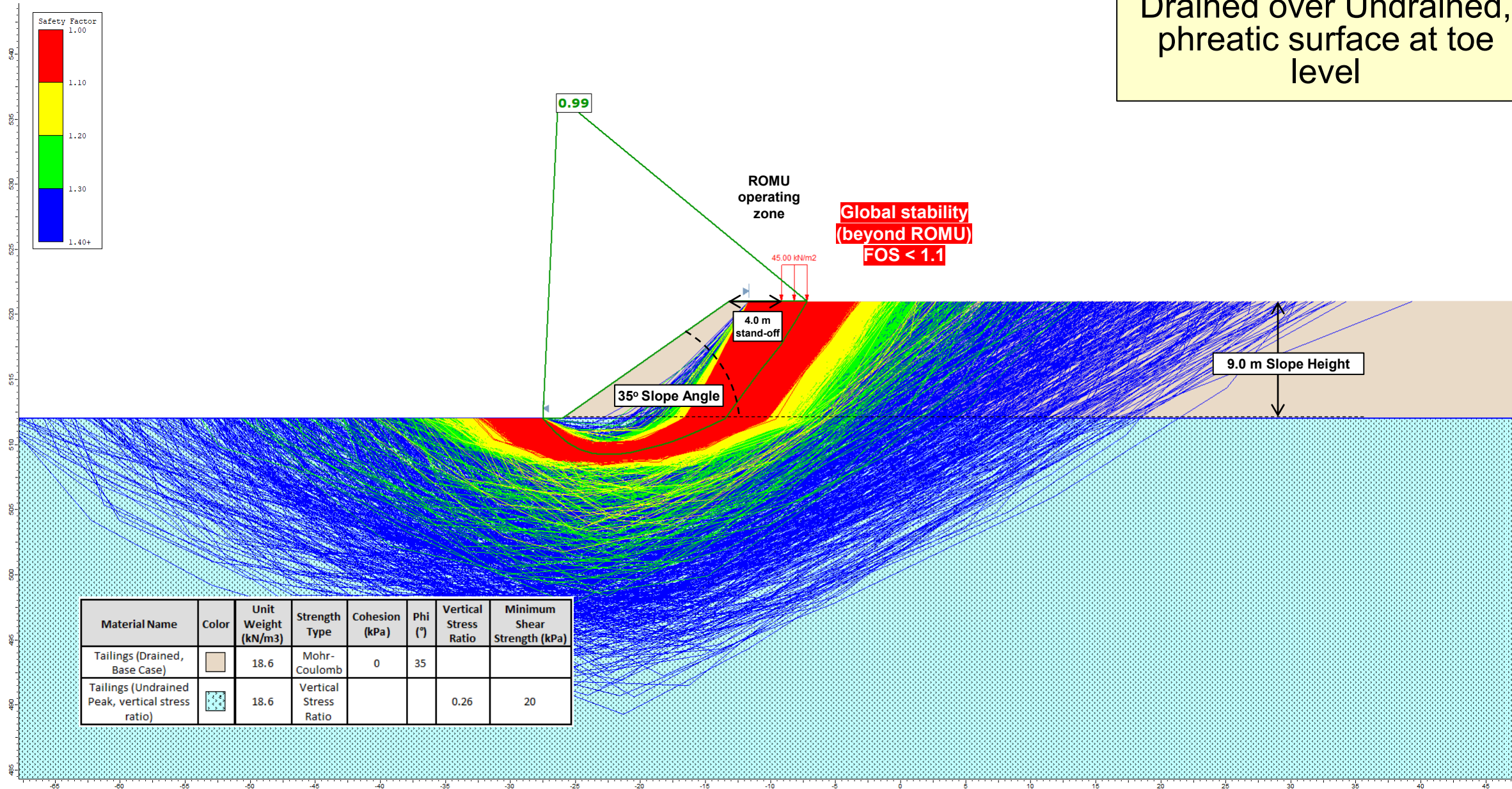
Geotechnical Assessment Temporary Hydraulic Mine Slopes

MTI

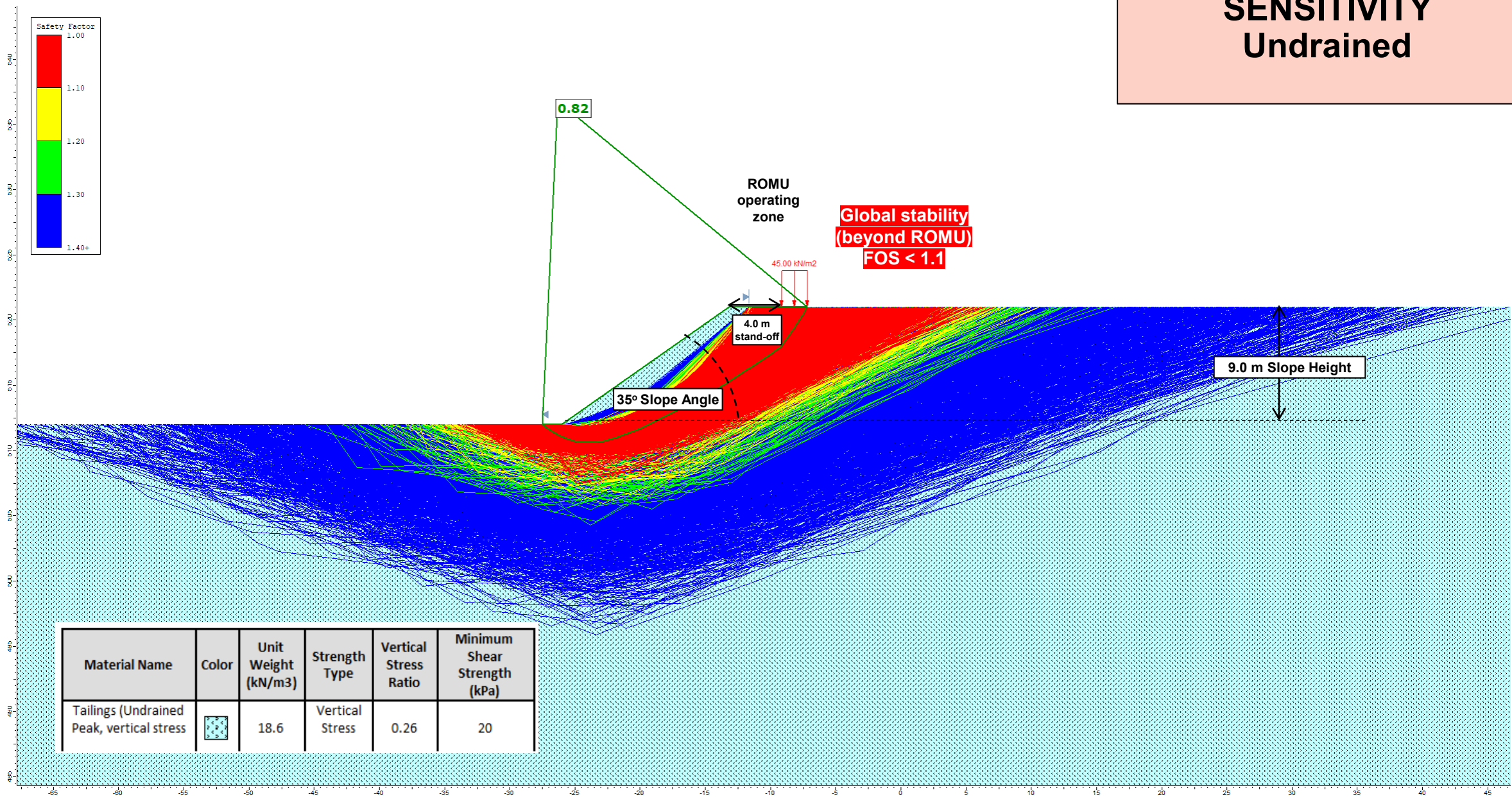
Bench Height 9 m and Angle 35°
(Undrained Only)

Shaping
Tomorrow
Together

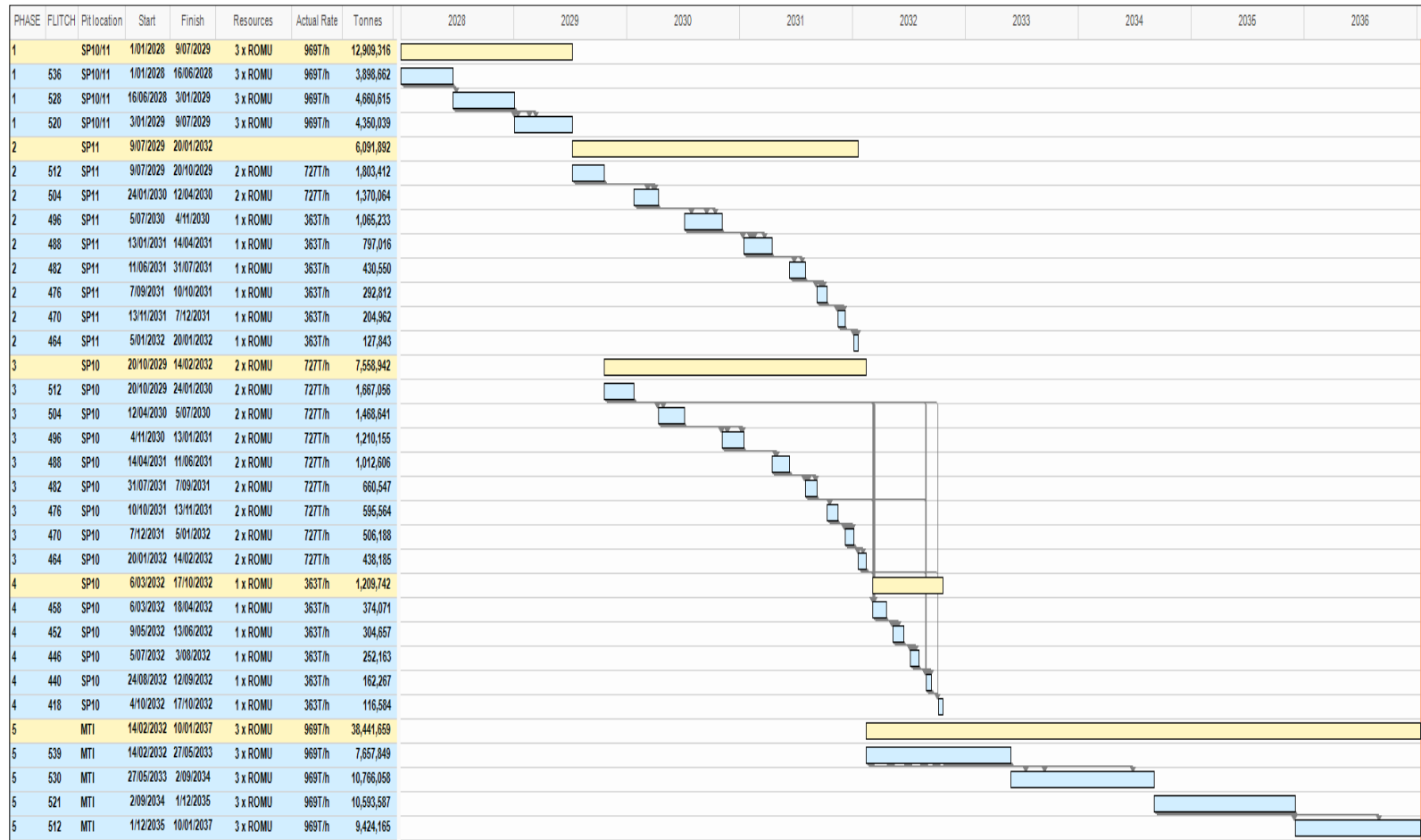
SENSITIVITY
Drained over Undrained,
phreatic surface at toe
level



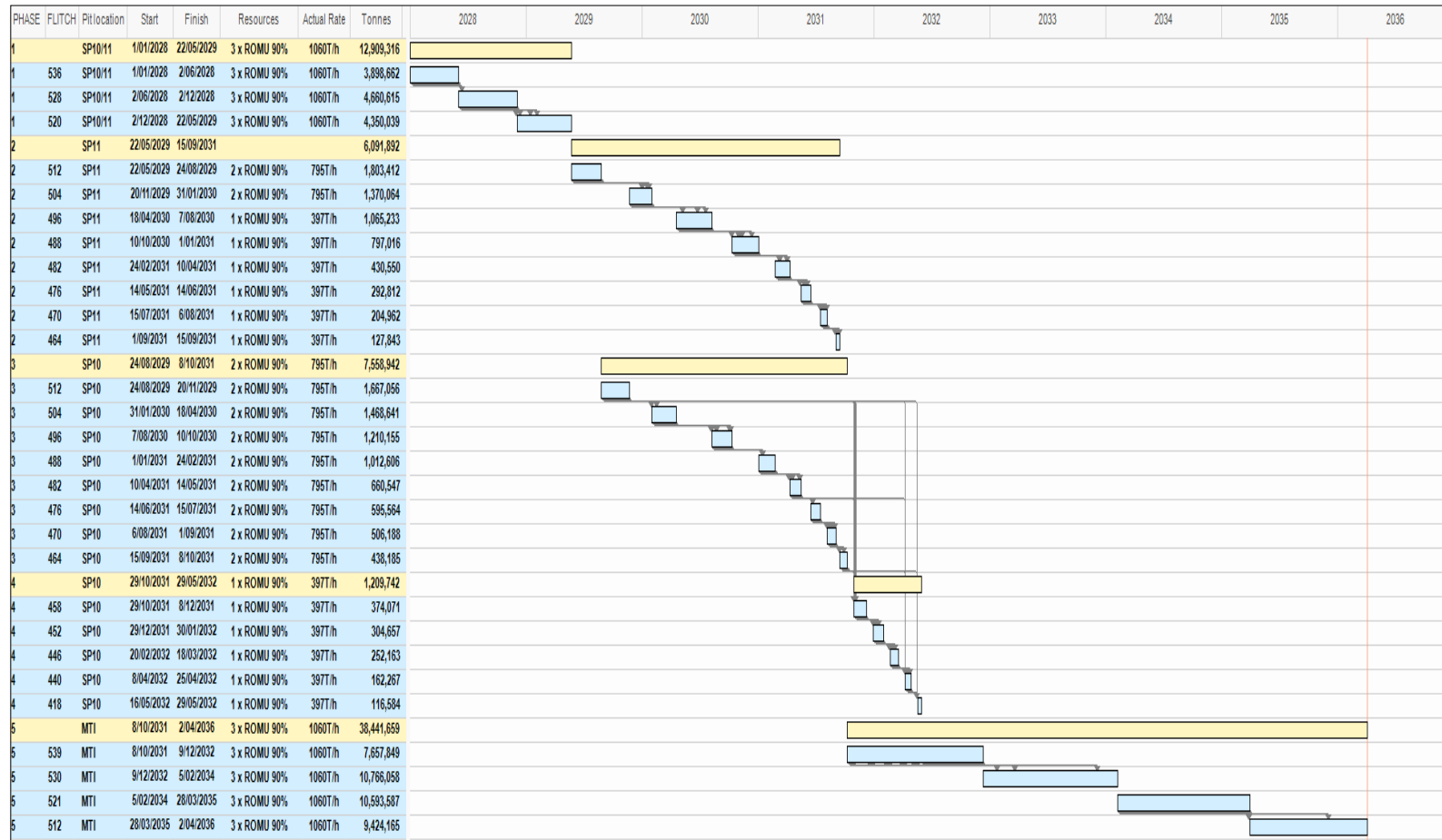
SENSITIVITY Undrained



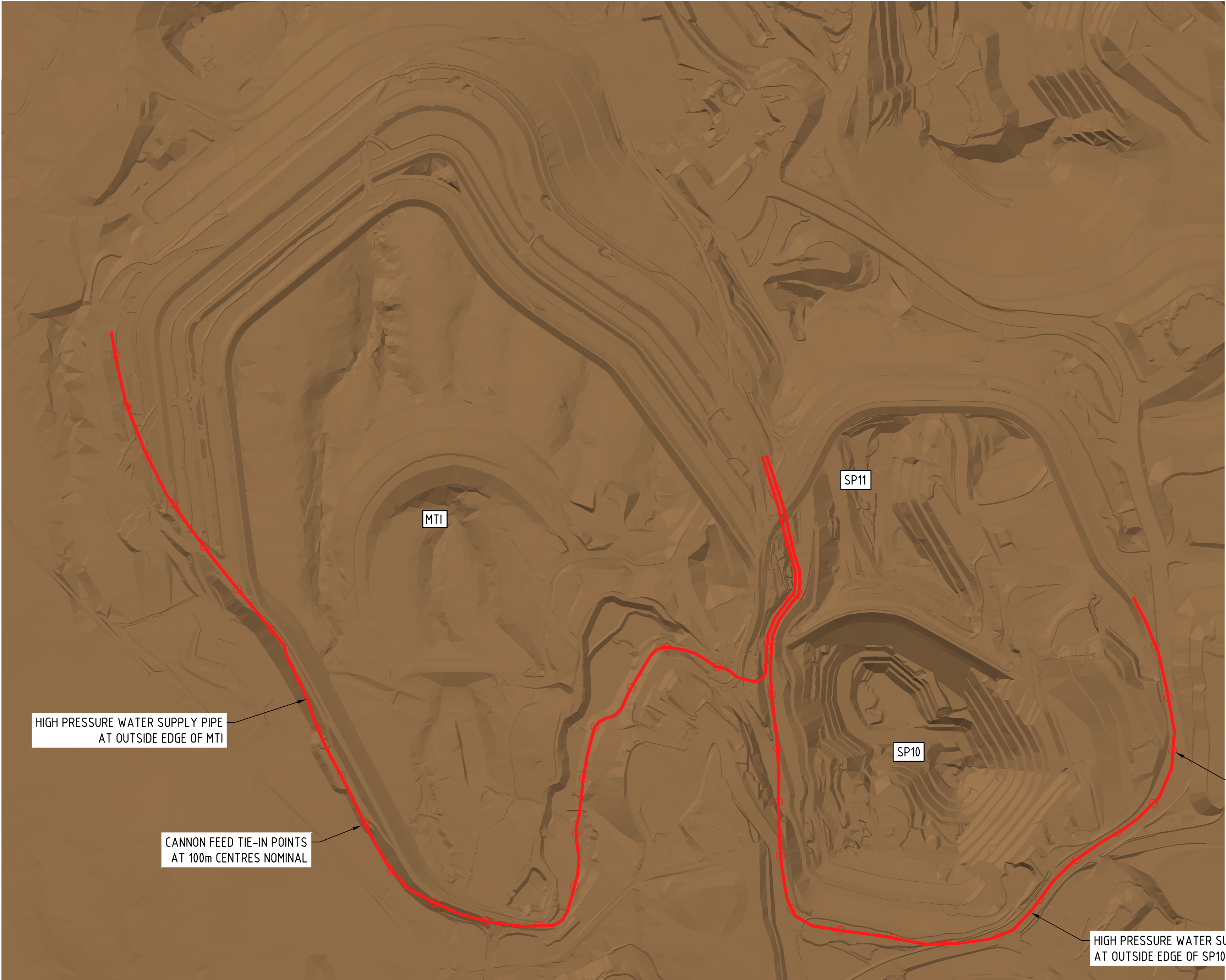
Appendix D - Production Schedules







Appendix E - High Pressure Water Supply line



PLAN ON HIGH PRESSURE WATER SUPPLY PIPE

Appendix F - Vendor Quotations and Equipment Specifications

Please note whole
pages with vendor
quotations have been
redacted and removed

Waterlord® Extra

Mine dewatering hose with extra abrasion protection



IDEAL FOR

- Mine dewatering
- Industrial high-pressure pumping
- Rapid deployment
- Compact storage
- Ease of transportation

Pioneered by Crusader Hose, **Waterlord Extra** has a double skin for superior abrasion protection. This is crafted by inserting a Waterlord hose inside another. The outer hose forms a second skin which protects the inside Waterlord hose from abrasion damage.

The extra abrasion protection of the outer skin ensures that the **Waterlord Extra** can be used on rough ground often found at mine sites. Care, however, must be taken to ensure that it is flat when dragged across the ground. It should not be dragged on the kink as this can create a pinch point for accelerated wear.

The couplings and clamps are the same as for the Waterlord hose. The outer hose is not clamped and stays in place due to the frictional force between the layers. The **Waterlord Extra** is more bulky due to its double layer. Mechanised reel systems are available to assist with the deployment and recovery of this layflat hose.

All the benefits of high pressure hose are enhanced with this superior abrasion cover. Available in continuous lengths up to 200 m. Some minimum order quantities may apply.

FEATURES

- ✓ High-pressure capability - for deep pits
- ✓ Reel systems for large diameter/long lengths
- ✓ Quick-connect couplings available
- ✓ Extra abrasion resistance against mixed terrain
- ✓ Australian Made

TECHNICAL DATA: Waterlord Extra

Diameter (ID)	102 mm	152 mm	203 mm	254 mm	305 mm
	4"	6"	8"	10"	12"
Working pressure*	2500 kPa	3000 kPa	2000 kPa	1500 kPa	1400 kPa
Min. burst pressure	5000 kPa	6000 kPa	4000 kPa	3000 kPa	2800 kPa
Weight/m	3.8 kg	6 kg	7.4 kg	8.6 kg	9.2 kg
Part #	HWE102XBA	HWE152XBA	HWE203XBA	HWE254XBA	HWE305XBA

TECHNICAL DATA: Waterlord Extra HP

Diameter (ID)	102 mm HP	152 mm HP	203 mm HP
	4"	6"	8"
Working pressure*	5000 kPa	4000 kPa	3000 kPa
Min. burst pressure	10000 kPa	8000 kPa	6000 kPa
Weight/m	4.8 kg	6.9 kg	9 kg
Part #	HWX102XBA	HWX152XBA	HWX203XBA

*Dependent on maximum working pressure of attached couplings if lower.
Refer to Waterlord Product Overview for full hose specifications.

Crusader Hose Pty Ltd

22 Industry Place, Bayswater VIC 3153 Australia

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www.crusaderhose.com.au

2506

Crusader Hose reserves the right to modify any specification as part of ongoing product development and without prior notice. Contact Crusader Hose to ensure that the most up-to-date information is used.



SWTL 4538

Skid Steer Loader



Sunward USA Corp

Address: 2710 Geesling Rd, Denton, Texas 76208
Phone: 469-353-6890 (Main), 469-353-6891 (Fax)
469-353-6876 (Sales), 469-353-6878 (Dealers)
469-353-6883 (Warranty), 469-353-6886 (Parts)
Email: info@sunwardusa.com
sales@sunwardusa.com
warranty@sunwardusa.com
parts@sunwardusa.com
Web: www.sunwardusa.com

- Engine power 74.3 hp (55.4kW)
- Machine weight 9700 lb (4400kg)
- Rated operating capacity 2650 lb (1200kg)

Please read the manual book and maintenance book before operation. Changes are periodically added to the information, and Sunward may change the products or services described in this book at any time without announcement. All rights of this manual book reserve to Sunward.

SWTL EN 2019



◆Strong Power



The customized Kutoba engine imported with original packaging can reach the strictest emission standards (EU Stage5 and EPA T4F), and it features strong power, high reliability, low noise, energy saving and environmental protection.

◆Unique Vertical Lifting Working Unit



Unique vertical lifting working unit, which contains bigger lifting capacity, higher lifting height and longer discharge distance.

◆Closed Hydrostatic Traveling System

Static hydraulic traveling system, equipped by advanced anti-overloading hydraulic device, large-torque motor, big driving force, with self-brake function, safe and reliable.



Operation with pilot handles

◆Pilot Handles

Traveling and actions are all controlled by pilot handles, featuring light and handy and agile operations.



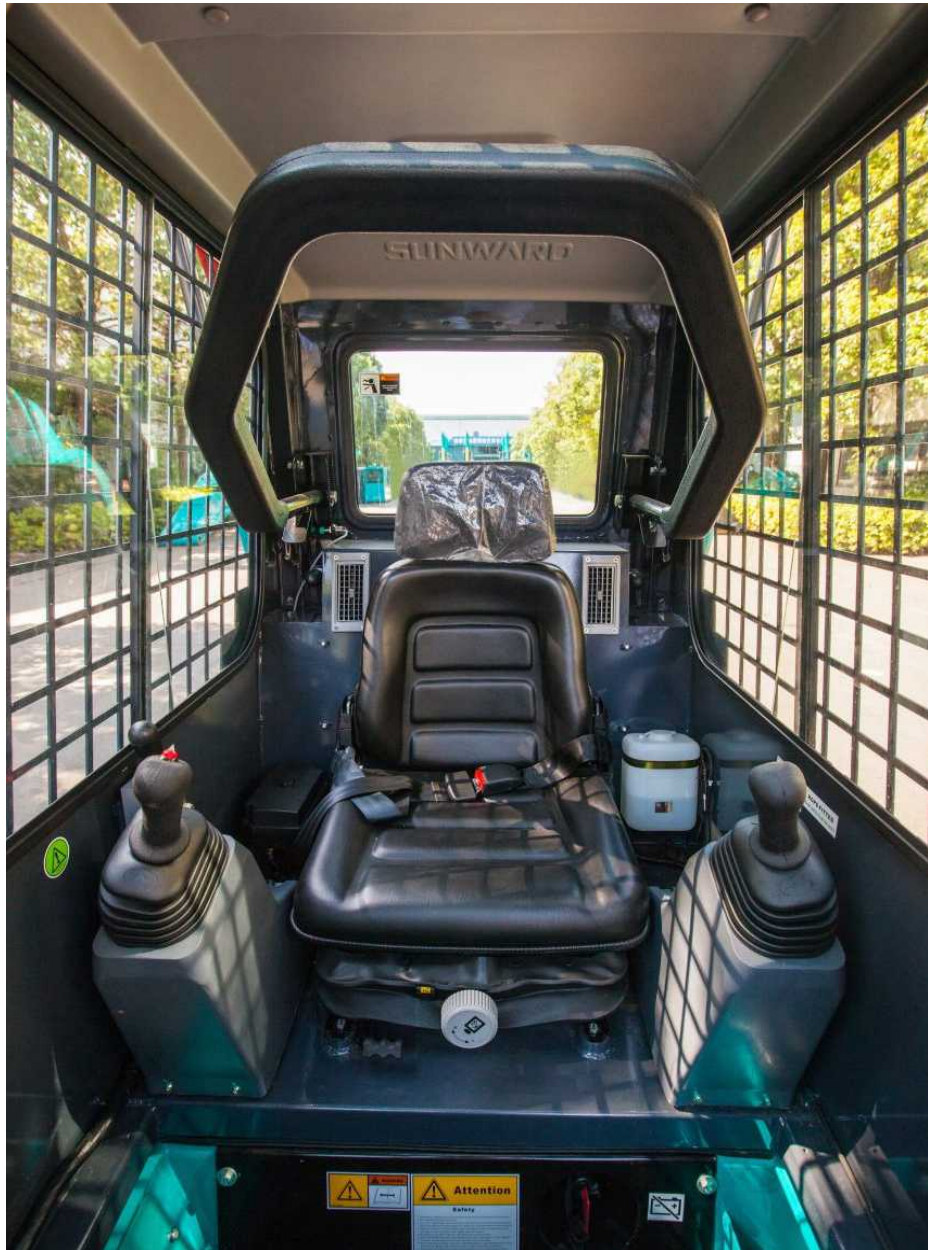
◆Double Accelerator Control

Adapt double accelerator control, hand accelerator for constant power in workplace, pedal accelerator for bucket loading.



◆Standard Quick Coupler

Adapt to international common quick coupler, fast change various kinds attachment. Majority of attachments can be used in Sunward skid steer loader.



Equipped with heater and air conditioning, choose appropriate configuration depending on different regions.



- Wide space and good vision, easy in and out, all of button and switch is reachable.
- Conform to FOPS/ROPS standard cab structure.
- Three-level electric starting protection system.
- Complete warning beacon, warning signal and reverse horn.
- Rear window detachable.



◆ Standard Hydraulic Horizontal Hoisting

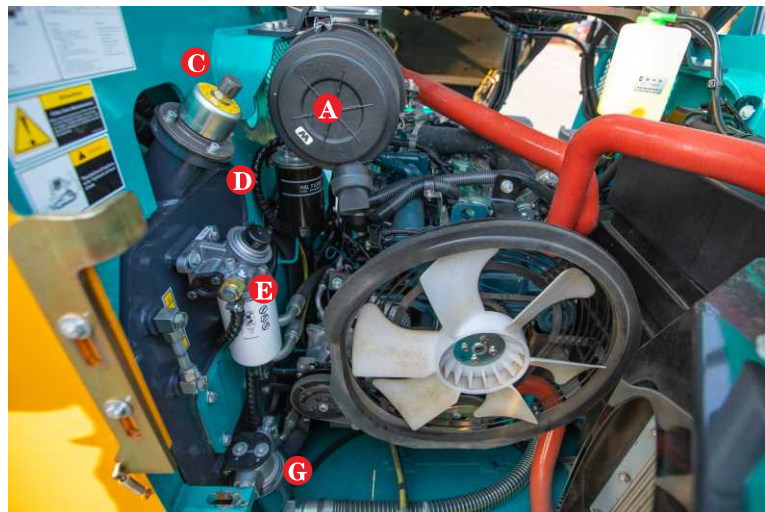
Standard hydraulic horizontally, lift the movable boom ensure invariant bucket angle with the ground, to prevent falling material, reduce the labor intensity of the operating personnel.

◆ Emergency Descent Function of Working Unit

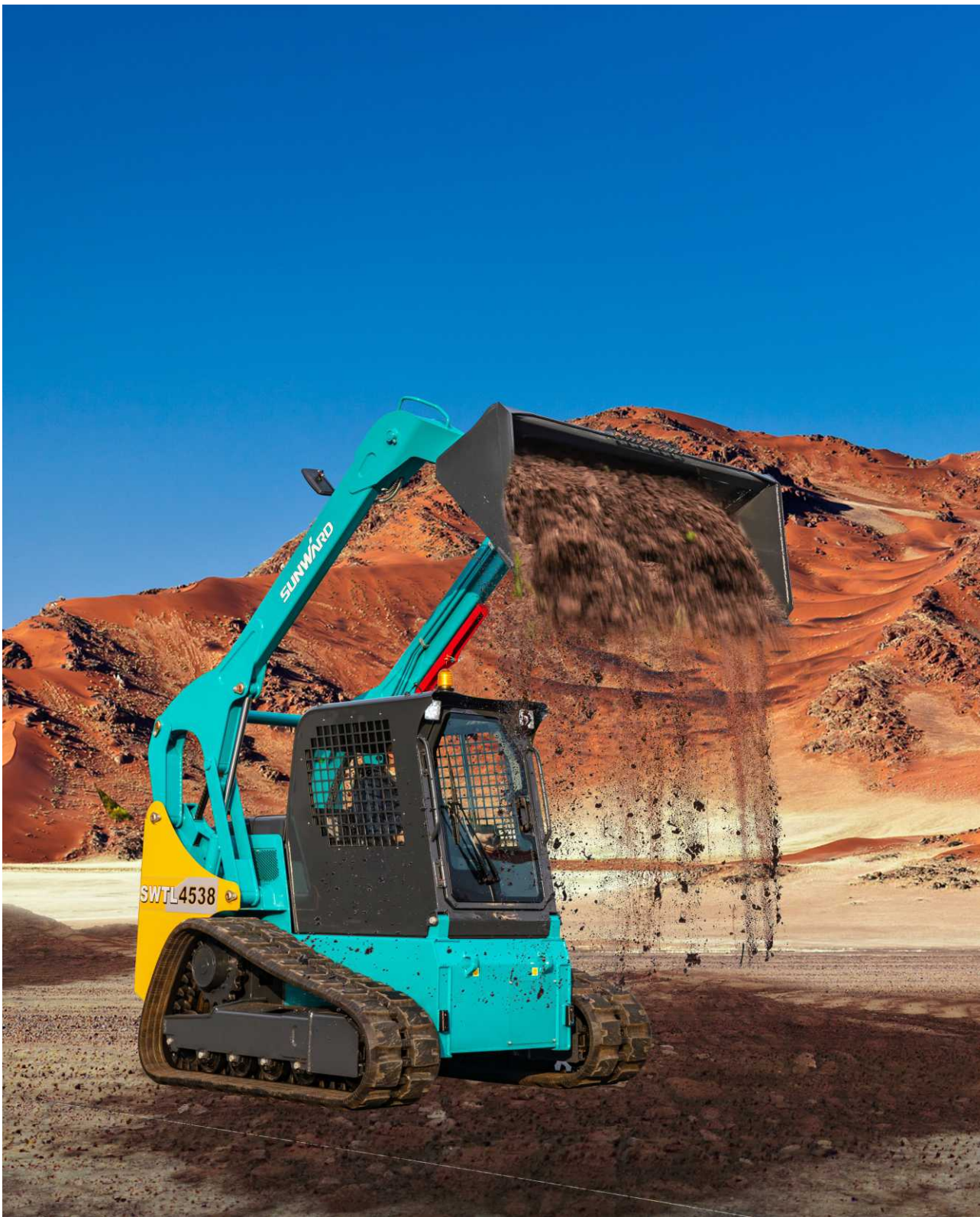
The boom can safely conduct the emergency descent in case of the stalling of engine.



Maintenance & Repair



- A** Air filter
- B** Oil return filter
- C** Hydraulic oil tank cap
- D** Fuel filter
- E** Oil-water separator
- F** Fuel tank cap
- G** Engine oil filter
- H** Auxiliary tank
- L** Heater valve switch



Equipment

The standard and optional equipment varies from country to country.
For more information, please contact with us.

Cab Unit		Working Unit	
FOPS/ROPS Cab, open, lift up	○	Standard quick coupler	●
FOPS/ROPS Cab, lift up	●	Standard bucket	●
Safety armrest	●	External counterweight	○
Adjustable seat	●	Various accessories	○
Centralized panels	●	Electrical System	
Double-accelerator Control	●	Front LED work light	●
Pilot control handles	●	Warning light	●
Fan heater	●	Backup alarm	●
Air conditioner	○	Horn	●
High-back mechanical suspension seat	○	External power supply	○
Hydraulic System		Attachments electronic control system	○
Boom-Emergency decent	●	Rear work LED light	○
Auto-levelling	●		
Standard/High flow system	●		
2-speed	○		

● Standard equipment

○ Optional equipment

Multi-function



Snow Blower



Cold Planer



Ditcher



Compact



Mixer



Auger



Breaker



4 in 1 bucket



Delver



Snow Blade

Product Parameter

Operation Parameter		
A	Maximum overall height	in (mm)160.6 (4079)
B	Height to hinge pin	in (mm)126.9 (3222)
C	Height to top of cab	in (mm)81.5 (2071)
D	Height to bottom of level bucket	in (mm)119.8 (3044)
E	Length without standard bucket	in (mm)116.9 (2969)
F	Length with sandard bucket	in (mm)147.6 (3750)
G	Maximum dump angle	degrees44
H	Dump height	in (mm)97.1 (2467)
J	Dump reach	in (mm)35.1 (891)
K	Rolback angle (bucket on ground)	degrees30
L	Rolback angle at maximum height	degrees89
M	Crawler base	mm63.0 (1600)
P	Ground	mm9.0 (228)
Q	Departure angle	degrees34
R	Turning radius from center (Coupler)	in (mm)53.9 (1368)
S	Turning radius from center (Bucket)	in (mm)88.7 (2253)
T	Turning radius from center (Machine rear)	in (mm)68.7 (1744)
U	Bumper overhang behind rear axle	in (mm)33.7 (855)
V	Track gauge	in (mm)59.0 (1500)
W	Bucket width	in (mm)79.3 (2015)
Performance		
Operating weight	lb (kg)	9700 (4400)
Rated operating capacity	lb (kg)	2650 (1200)
Tipping load	lb (kg)	7570 (3430)
Breakout force curl	lb (kg)	7470 (3385)
Breakout force lift	lb (kg)	5740 (2600)
Travel speed	mph (kph)	4.8/8.1 (7.8/13)
Track size		Rubber Track 450Wx56Lx86P
Engine		
Brand		KUBOTA
Model		V3307-CR-TE5B
Type		4-cylinder, water cooling, diesel engine
Emission level		EPA Tier4F / EU Stage V
Power	hp (kW)/rpm	74.3 (55.4)/2600
Peak torque	lb-ft (N·m)/rpm	195.5 (265)/1500
Electrical System		
Starter	V/kW	12/3.0
Alternator rating	V/A	12/80
Battery	Ah	120
Service Refill Capalities		
Hydraulic tank	gal (L)	10.6 (40)
Fuel tank	gal (L)	23.8 (90)
Hydraulic System		
Hydraulic flow_standard	gpm (lpm)	23.8 (90)
Hydraulic flow_high flow	gpm (lpm)	34.4 (130)
Standard flow pressure	psi (bar)	3045 (210)
High flow pressure	psi (bar)	3045 (210)

Worldwide Network for Sales and Service

