RESOURCES

MT CARBINE BANKABLE FEASIBILITY STUDY

CHAPTER 5: PROCESSING

DECEMBER 2021

Document History

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1. Introduction

1.1. Context

This Chapter 5: Processing shall be read in conjunction with Chapter 1: Executive Summary and additional references as listed in Section 9.

1.2. Purpose

The purpose of Chapter 5: Process is to discuss the approach to the development of the processing infrastructure to be implemented at Mt Carbine required to size, screen, sort and process the ore and rejects materials.

1.3. Existing Processing Infrastructure

The site processing infrastructure is split into two distinct areas on the site. Adjacent to the low grade ore stockpile (LGS) is the crushing, screening and sorting area, where ROM material is screened and sized. +6,-40mm material is sorted using XRT sorting equipment where approximately 12% of the XRT sorter feed is then crushed and stockpiled for feeding into the fine crushing circuit and gravity processing plant. The remaining 88% of material is barren of tungsten and utilised as quarry material, with the tailings material having the potential of being used as quarry feedstock.

-6mm material and the XRT sorter concentrate are then trucked and fed into the gravity processing plant located on the opposite side of the Mulligan Highway. The gravity processing plant is dry fed and produces a tungsten product and inert waste tailings material.

The locations of the crushing, screening and sorting area and processing area is shown in Figure 1.

The details of the current and future processing infrastructure is detailed further in this Chapter 5: Processing.

Figure 1: Processing Infrastructure Locations

1.4. Engineering Overview

For the feasibility study, two engineering consultants were engaged to provide their specific expertise to the separate areas of the process design.

Mincore was engaged to provide preliminary engineering and drafting for the crushing, screening and sorting plant. Ausenco was engaged to provide preliminary engineering and drafting for the gravity processing plant.

Both parties were engaged to deliver engineering design and capital and operating estimates in accordance with Class 3 AACE requirements.

Battery Limits

The battery limits for Mincore was receipt of ROM material from the mining activities and discharge of sized and sorted material into the gravity processing plant. Mincore also designed the tailings separation and dewatering circuit, with the battery limits being the discharge of the tailings pipe from the gravity processing plant and discharge of dewatered tailings into stockpiles for use at the quarry.

The battery limits for Ausenco was receipt of gravity processing plant feed material onto existing equipment to discharge of dewatered tungsten concentrate and discharge of plant rejects to a tailings line.

The electrical battery limits for both designers was the low voltage side of existing or future substations.

1.5. Processing Philosophy

The processing scope is split into two distinct phases as summarised in Section **Error! Reference source not found.**. These are summarised below.

1.5.1. Crushing Screening and Sorting Plant – Phase 1

The process design philosophy for Phase 1 for the crushing, screening and sorting plant was to achieve the following process outcomes for minimal capital expenditure requirements:

- Modify the existing crushing and screening infrastructure
- Increase ROM throughput to a nominal 170tph of -700mm material
- Introduce wet screening of -6mm material to improve screening efficiencies during the wet season
- Introduce direct process plant feed of -6mm material to reduce materials rehandling requirements

1.5.2. Crushing Screening and Sorting Plant – Phase 2

The process design philosophy for Phase 2 for the crushing, screening and sorting plant was to achieve the following process outcomes:

- Construct a new crushing, screening and sorting plant adjacent to the existing plant
- Increase ROM throughput to a nominal 350tph to allow day shift only operations (ore sorter circuit and gravity processing plant to operate 24/7) to reduce the overall operating costs of the operation
- Reduce material rehandling through combining the crushing and screening circuit with the ore sorting circuit
- Increase maximum feed size from 700mm to 1000mm through introduction of a jaw crusher

1.5.3. Gravity Processing Plant – Phase 1

The existing gravity processing plant at Mt Carbine is currently operating and successfully treating low grade stockpile and tailings material at a rate of approximately 60tph. EQR has an in-depth knowledge of the gravity processing plant as an owner operator that has treated significant material volumes.

Minimal modifications are required for the gravity processing plant as it is currently operating at the required throughput and availability for the Phase 1 requirements.

The gravity processing plant modifications for Phase 1 will support the increased operating hours as the plant operations will increase from week on- week off to full time.

The Phase 1 strategy for the gravity processing plant is not to alter the throughput capacity or the process circuitry.

The strategy for the process plant is one of continuous incremental improvements through the operations team and allowing for upgrades through sustaining capital projects.

The current operational gravity processing plant performance, throughput and yield data has been used as the basis of the Phase 1 plant design and philosophy.

1.5.4. Gravity Processing Plant – Phase 2

Based on the current recovery data, the existing gravity processing plant is performing well and the approach to the plant upgrades was to maintain the plant circuitry and process as much as possible while improving the plant recovery performance to support the higher-grade feed through the introduction of a scavenging circuit and additional tables capacity.

Similar to the gravity processing plant philosophy in Phase 1, given the EQR operations team will approach the process plant with an attitude of continuous incremental improvements. The Phase 2 scope has been designed to ensure that the plant recovery does not reduce through the introduction of high-grade ore from the open pit. However routine plant sampling and review will be ongoing continually analysing the plant performance and further opportunities to improve plant performance and recoveries will be identified based on real world data and trial work conducted on- or off-site.

2. Existing Crushing, Screening and Sorting Plant

The existing crushing and screening flowsheet consists of two stages crushing and dry screening circuits to produce two products:

1. –6mm wet plant feed
2. +6, -40mm ore sorter feed

Run of mine (ROM) ore (-700mm) is reclaimed from the low-grade waste stockpile and is delivered to the fixed jaw crusher. The jaw crusher has a closed side setting of -75mm. The jaw crusher discharge belt transfers primary crushed ore onto a 900mm wide screen feed conveyor.

The screening plant consists of a mobile Model 440 Sandvik screen powered by a diesel generator. The screen is fitted with two decks to split the feed into two streams:

1. Oversize (+40mm) to the cone crusher circuit
2. Undersize (-6mm) to the -6mm stockpile

The secondary cone crusher discharge is fed onto a 900mm wide belt conveyor and recirculates back to the sizing screen for separation into product sizes.

The existing dry crushing and screening circuit is shown in Figure 2.

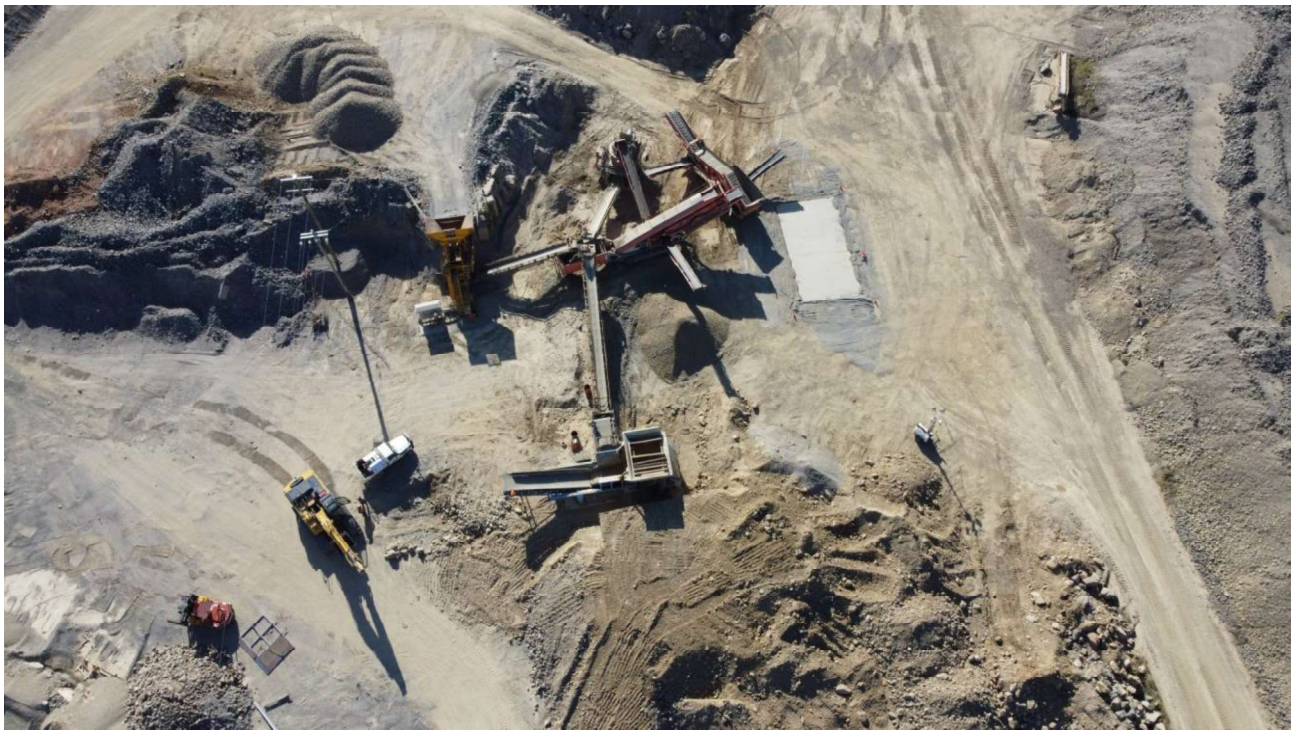


Figure 2: Photograph of the Existing Crushing and Screening Plant

To increase throughput of the existing crushing and screening circuit, a mobile rock screen has been integrated into the existing crushing and screening circuit. The rock screen is a model RSV 1400 and can handle ROM ore up to 700mm. Photographs of the mobile rock screen are shown in Figure 3.

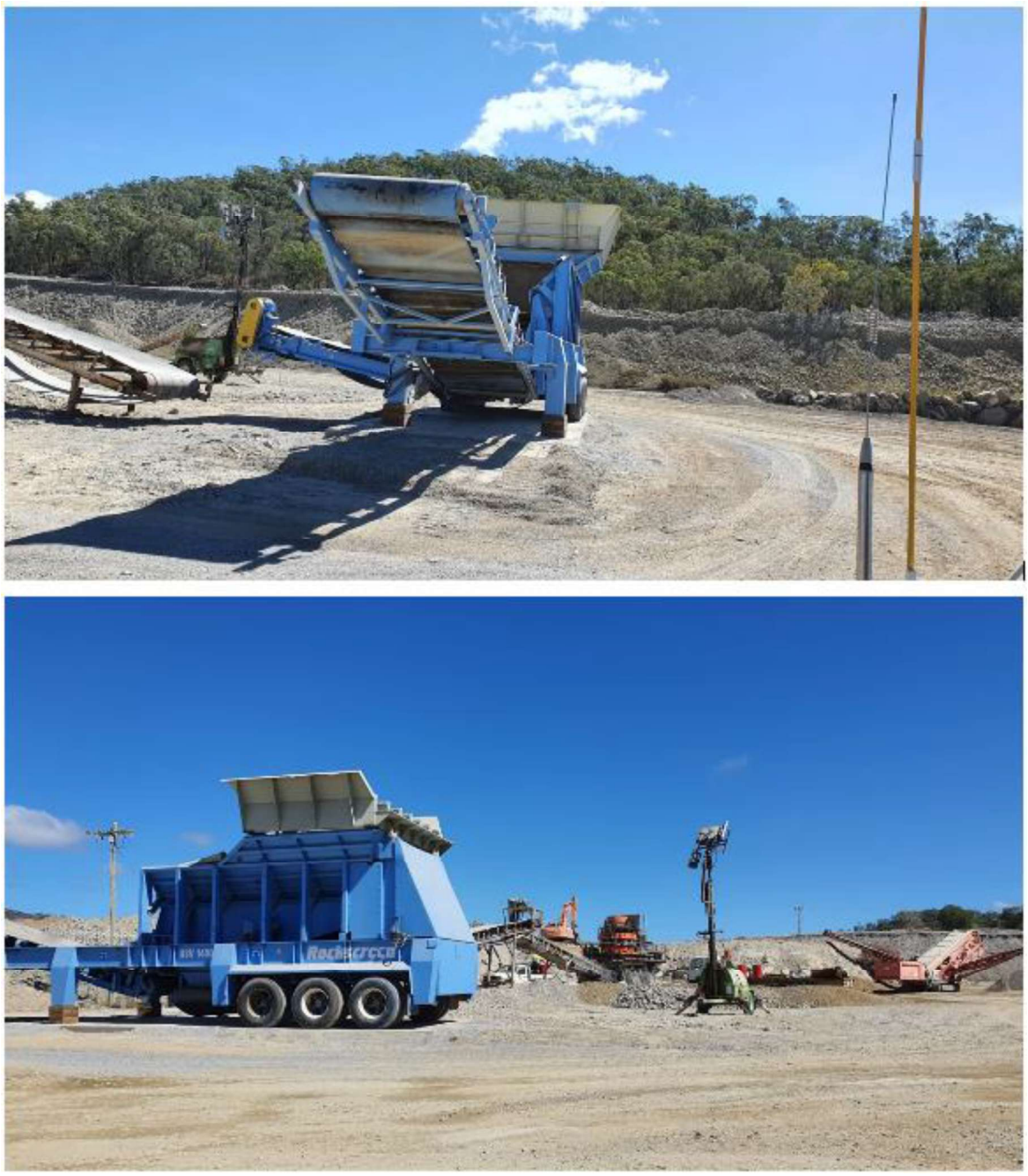


Figure 3: Photographs of Mobile Rock Screen

The rock screen will replace the fixed jaw crusher. The rock screen grizzly will scalp -400mm oversize to the RPM pad. -400mm ore will pass a vibrating grizzly feeder that has grizzly fingers spaced at 170mm. The -170mm ore will be directed via a belt conveyor to the Sandvik sizing screen.

The existing crushing and screening plant flowsheet is summarised in Figure 4.

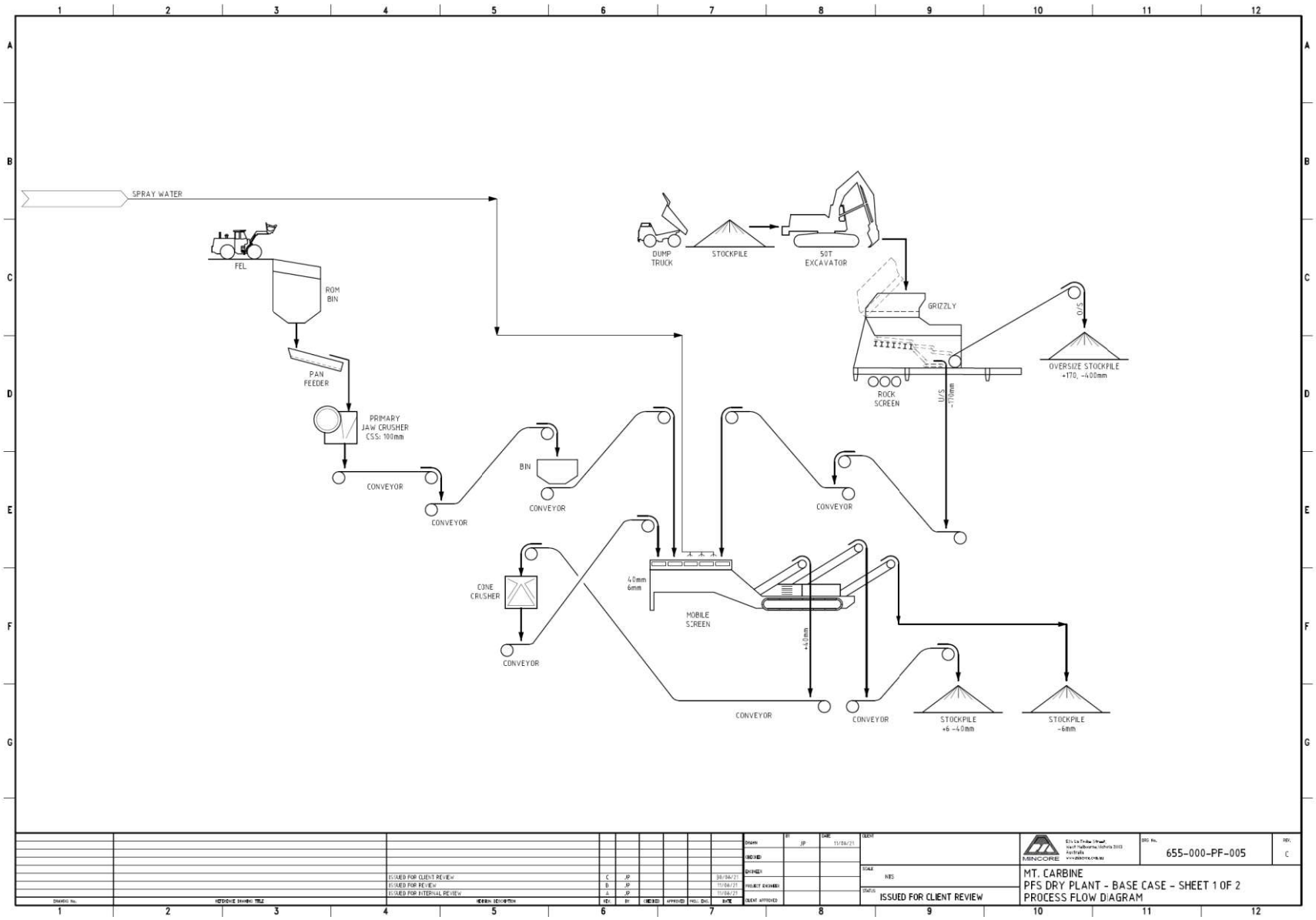


Figure 4: Existing Crushing and Screening Process Flowsheet

Plant Utilities

The existing crushing and screening plant is dry and requires no water addition.

Power

The existing crushing and screening plant is operated using part diesel generators on mobile equipment and other equipment connected to mains power.

3. Phase 1 Crushing Screening and Sorting Plant

3.1. Process Design Criteria

The Phase 1 crushing, screening and sorting circuits were designed in accordance with the design criteria in Table 1.

Table 1: Phase 1 Crushing, Screening and Sorting Design Criteria

Description	Criteria	Unit
General		
Location	Queensland	
Ore Type	Dry and clean ore	
Ore Hardness	7	Mpa
Ore Abrasiveness	0.79	Ai
Maximum Lump Size	750	mm
Design Life	20	Years
Plant Size	1,000,000	tpa
Operating Hours (Crusher)	2890.8	hrs
Availability	66%	%
Extraction Rate		
Source	Low Grade Stockpile	
Extraction rate	350	tph
Work Index	20	kWhr/T
Amount of Moisture (By Weight)	5	%
Bulk Density	1.6	t/m3
Amount of Clay (By Weight)	0	%
Abrasion Index	0.79	
Excavator Capacity	50	T
Rock Screen Module		
Model	RSV 1400	
Type	Double Deck Grizzly	
Throughput, Design	350	tph
Top Deck Aperture	400	mm
Bottom Deck Aperture	170	mm
Feed Top Size	700	Mm
Mass Split		

Description	Criteria	Unit
Oversize	112	tph
Undersize	238	tph
Product		
Oversize	+170,-400	mm
Undersize	-170	mm
Cone Crusher		
Throughput, Design	207	tph
Model	2 1/4 ft Symons Cone Crusher	
CSS	40	mm
Triple Deck Screen		
Type	Wet Screening	
Model	Sandvik SC2463	
Screening Type	Wet	
Top Deck Aperture	40	mm
Middle Deck Aperture	20	mm
Bottom Deck Aperture	6	mm
Load (with choke fed crusher)	53	%
Spray Water Requirements	115	m3/hr
Throughput		
Feed	445	tph
Top Deck Oversize	207	tph
Middle Deck Oversize	121	mm
Bottom Deck Oversize	64	tph
Undersize	52	tph
Particle Size		
Feed	-170	mm
Top Deck Oversize	-170,+40	mm
Middle Deck Oversize	-40,+20	mm
Bottom Deck Oversize	-20,+6	mm
Undersize	-6	mm
Ore Sorters		
Ore Sorter Model	Tomra Ore Sorter	
Quantity	1	

Description	Criteria	Unit
Throughput		
Feed	160	tph
Rejects	141	tph
Product	19	tph
Particle Size		
Feed	-40,+6	mm
Rejects	-40,+6	mm
Concentrate	-6,+0	mm
Mass Split %		
Product	12	%
Reject	88	%
Stockpiles		
Product Stockpile		
Type	Conical	
Stockpile Feed Rate	19	tph
Stockpile Capacity	230	tonnes
Product Size	+6,-40	mm
Rejects Stockpile		
Type	Radial	
Stockpile Feed Rate	141	tph
Stockpile Capacity	1690	tonnes
Product Size	+6,-40	mm
Rehandling Circuit		
Sizing Screen		
Throughput	80	tph
Recirculation Load	75	%
Type	Double-Deck Vibrating	
Model	Techroq 5’ x 12’	
Top Deck Aperture	10	mm
Bottom Deck Aperture	6	mm
VSI Crusher		
Quantity	1	
Model	Techroq T5R Single Drive MK0.5	

Description	Criteria	Unit
Product Dewatering Circuit		
Dewatering Screen		
Model	Weir SP100 Sand Wash Unit	
Screen Type	VD12 dewatering screen	
Screen Size	1,220 x 3,660	mm x mm
Screen Aperture	250	microns
Throughput	75	tph
Oversize	66	tph
Undersize	8	tph
Particle Size		
Feed	-6	mm
Oversize	-6,+0.25	mm
Undersize	-0.25	mm
Dewatering Cyclone		
Model	500CVX Cyclone	

The detailed equipment list for the crushing, screening and sorting plant is included in Appendix B.

3.2. Flowsheet

The crushing and screening flowsheet consist of crushing and dry screening circuit to produce two products:

1. –6mm wet plant feed
2. +6, -40mm ore sorter feed

ROM ore (-750mm) is reclaimed from the LGS and is delivered to the existing rock screen. The existing mobile Model 440 Sandvik screen is powered by a diesel generator. The rock screen has an aperture of 170mm. The oversize will form a stockpile. The undersize will feed onto a triple deck wet screen.

The triple deck screen is fitted with three decks to split the feed into three streams:

1. Oversize (+40mm) to the cone crusher circuit
2. Oversize (+6,-12mm & +12,-40mm) to ore sorter feed stockpile (to existing ore sorter circuit)
3. Undersize (-6mm) pumped to the gravity processing plant

The secondary cone crusher discharge is fed onto a 900mm wide belt conveyor and recirculates back to the triple deck wet screen for separation into product sizes.

The ore sorter product will be trucked to the wet plant where it will be fed to a rehandling circuit. The -6mm product from the triple deck screen underpan will be pumped to the gravity processing plant surge tank where it will be fed into an excess product dewatering circuit.

To increase throughput of the existing crushing and screening circuit, a mobile rock screen has been incorporated into the existing crushing and screening circuit. The rock screen is a model RSV 1400 and can handle ROM ore up to 700mm.

The existing ore sorter circuit will be utilized for Phase 1. The existing ore sorter is shown in Figure 5.

Figure 5: Existing Ore Sorter and Sorter Sizing

The process flowsheets for Phase 1 are shown in Figure 6, Figure 7 and Figure 8.

3.2.1. Mass Balance

The ROM feed will be 350tph. Ore sorters will treat at 160tph with approximately 88% of the feed going to the rejects and the remaining 12% will be the product. The yield of product from the feed varies over the life of the Project from 7% up to 24.5% dependent on the ore being processed during the year of production. For the purposes of this document, a 88%/12% split has been used throughout when referring to the sorter waste and product. Two products will be produced:

1. Product material (crushed to (+6,-40mm) for wet plant and dewatering circuit feed)
2. Waste material (rejects)

The overall process mass balance is included in Appendix A.

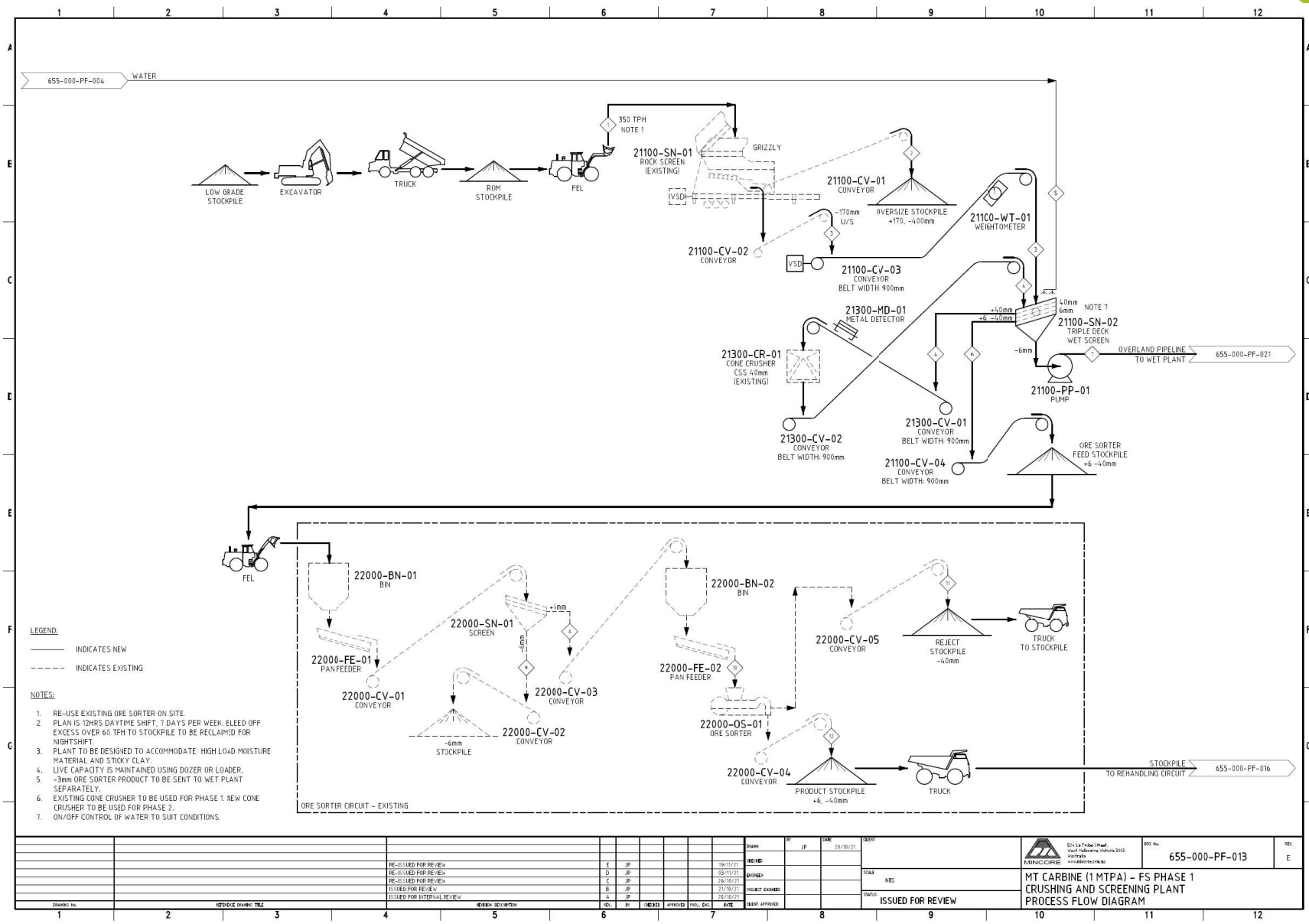


Figure 6: Crushing and Screening Plant

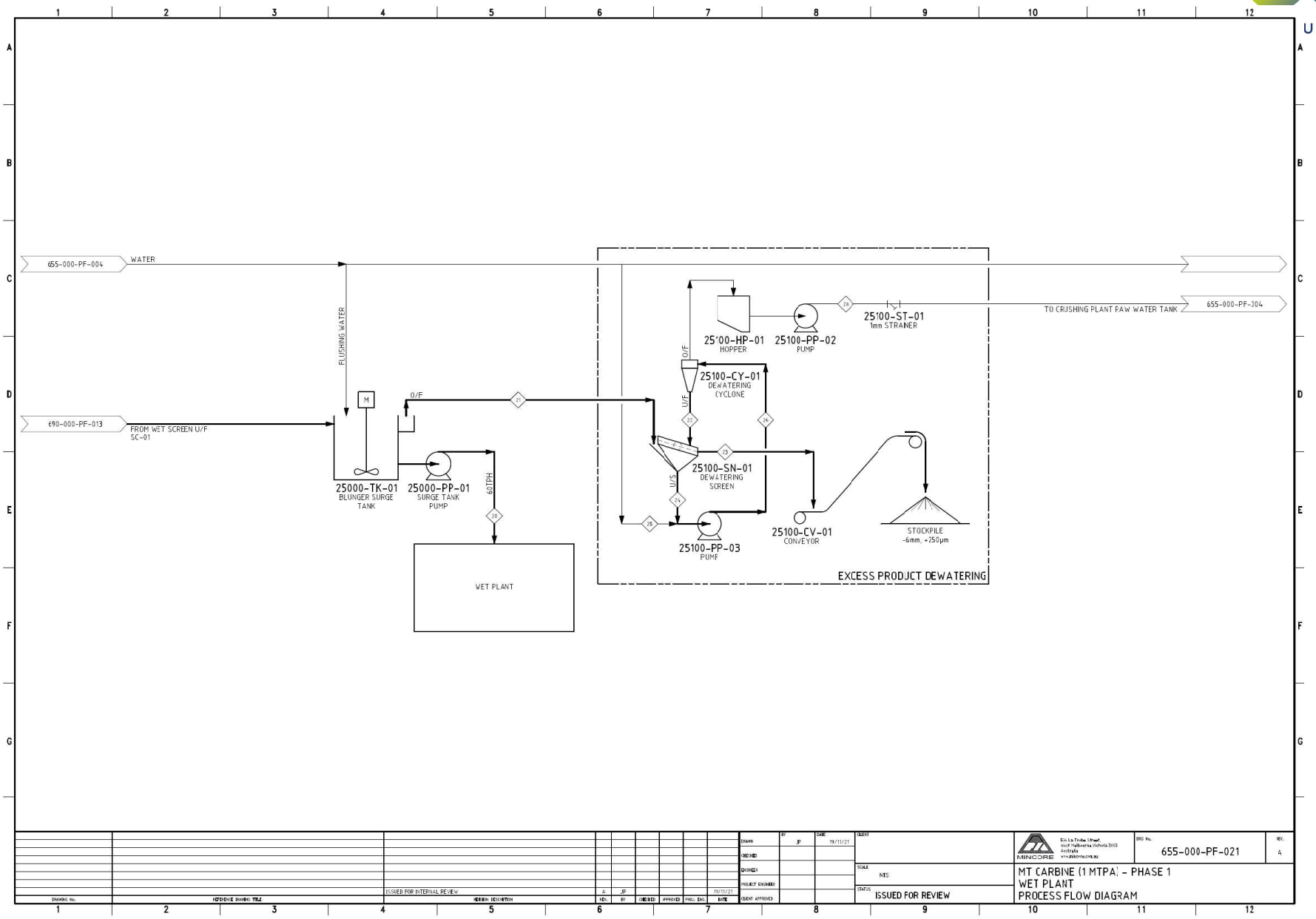


Figure 7: Plant Feed and Excess Product Dewatering

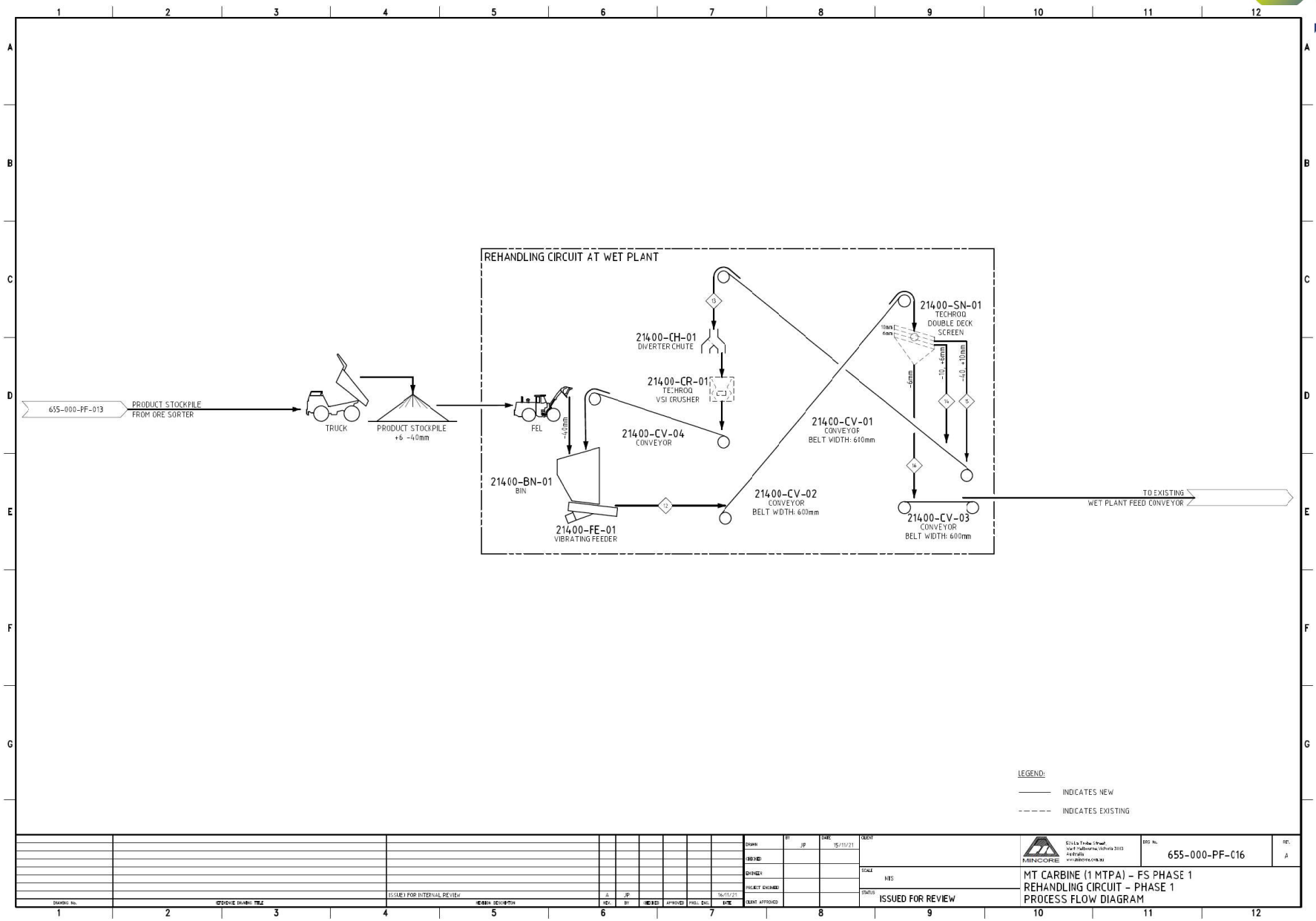


Figure 8: Ore Sorter Product Rehandling Circuit

3.3. Process Description

3.3.1. Crushing and Screening Plant – Existing Rock Screen

The rock screen is existing on-site. As shown in Figure 9, ore will be fed using a dump truck through the existing rock screen (21100-SN-01) with a gap of 170mm at a nominal rate of 350 tph. The rock screen oversize (-400, +170mm) will be formed into an oversize stockpile. The rock screen undersize (-170mm) will be fed onto a triple-deck fixed wet screen (21100-SN-02) having a 6mm, 12mm and 40mm aperture via the screen feed conveyor (21100-CV-03).

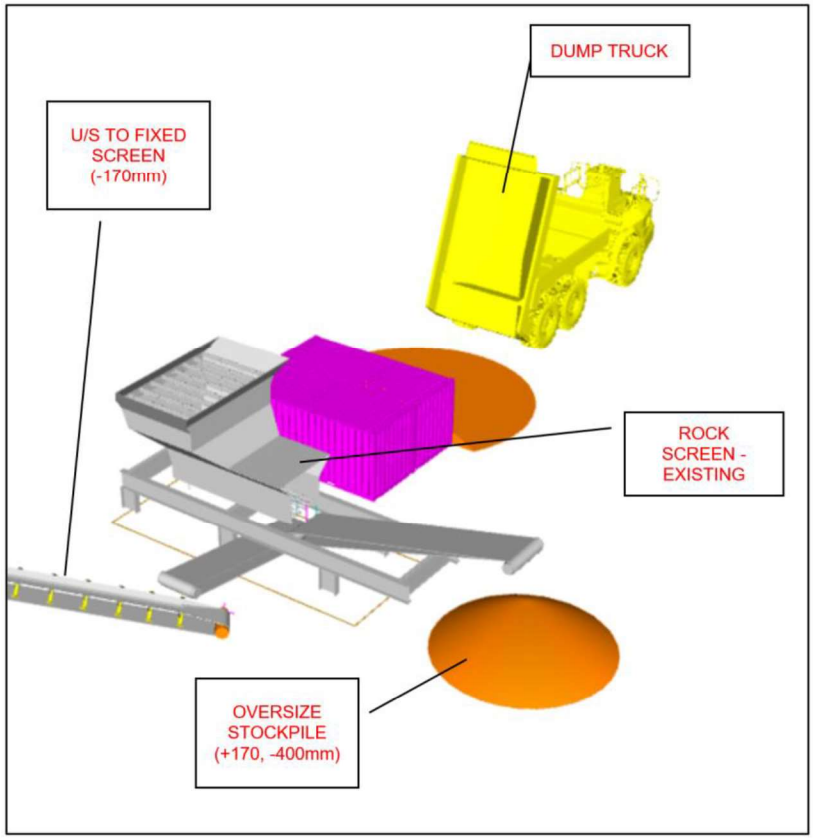


Figure 9: Existing Rock Screen

Process Controls:

- Hopper level by visual observation from operators
- VSD on conveyor to control feed to the double-deck vibrating screen
- Belt weigher on Screen Feed conveyor (21100-SN-02)

Power:

- Connected to existing 315kVA substation

3.3.1. Crushing and Screening Plant – Existing Cone Crusher

The existing cone crusher (21300-CR-01), a Symons 2 ¼ Cone Crusher, will treat the triple deck screen (21100-SN-02) top deck oversize (-170, +40mm). The existing cone crusher will be fed via conveyor (21300-CV-01) and the crushed material will return to the triple-deck screen via conveyor (21300-CV-02).

The screen undersize (-6mm) will be pumped to the wet plant via a slurry transfer pump (21100-PP-01).

The triple deck screen top deck oversize (-170,+40mm) will discharge onto the ore sorter feed stockpile stacking conveyor (21100-CV-04). The material will be stacked and then fed into the ore sorter feed bins for XRT sorting.

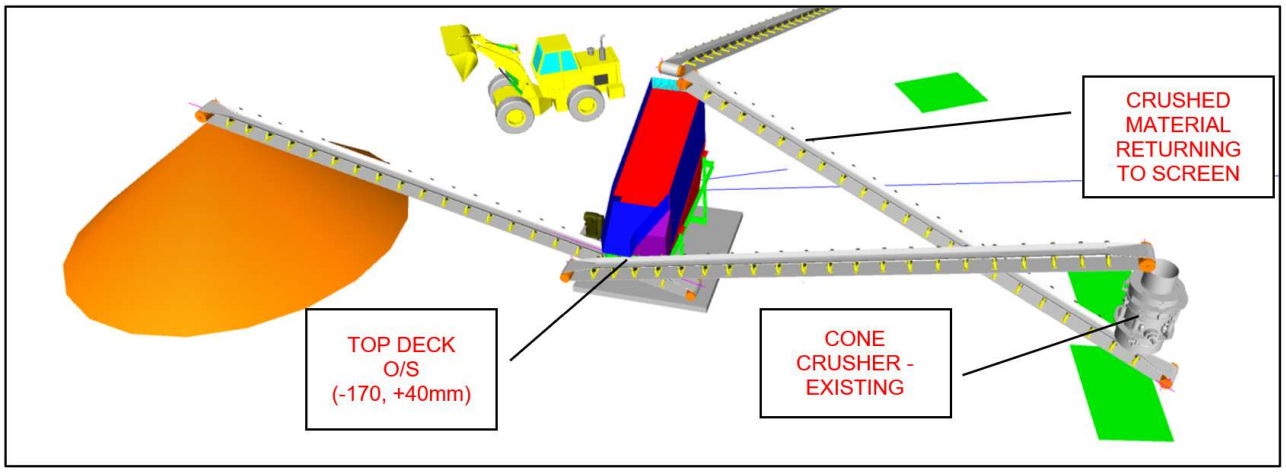


Figure 10: Cone Crushing Circuit

3.3.2. Ore Sorter Circuit

There is a currently one ore sorter operating at Mt Carbine. EQR is in the process of installing and commissioning a second ore sorter.

Each ore sorter is stand-alone, with independent feed bins and product and reject stockpiles.

The ore sorter feed bins will be fed via front end loader from the ore sorter feed stockpile. The ore sorter feed bins feed the ore sorter feed conveyors at a rate of 80tph (each ore sorter operates at 80tph). The ore sorter feed is then sorted and separately stacked into ore sorter concentrate and ore sorter reject.

The ore sorter concentrate is trucked to the process plant for feed into the process plant. The ore sorter reject is removed and stockpiled as quarry inventory. The nominal split in the sorting process is 88% waste and 12% product.

As per the information shown in Figure 11, the operation has continuously processed large bulk samples of feed material from the LGS through the XRT Sorter at Mt Carbine.

The XRT Pilot Plant has processed +40,000 of feed material trialling samples from all over the mineralised stockpile. The results have seen a +90% tungsten recovery through the XRT Sorter on a consistent basis with throughputs of +70tph and a +/-10-times upgrade of the feed to concentrate grade. A significant amount of the test work was completed under the successfully completed METS Ignited grant program and has been used as supporting information for this study. The METS Ignited program summary is provided in more detail in Chapter 3: Geology and Resources.

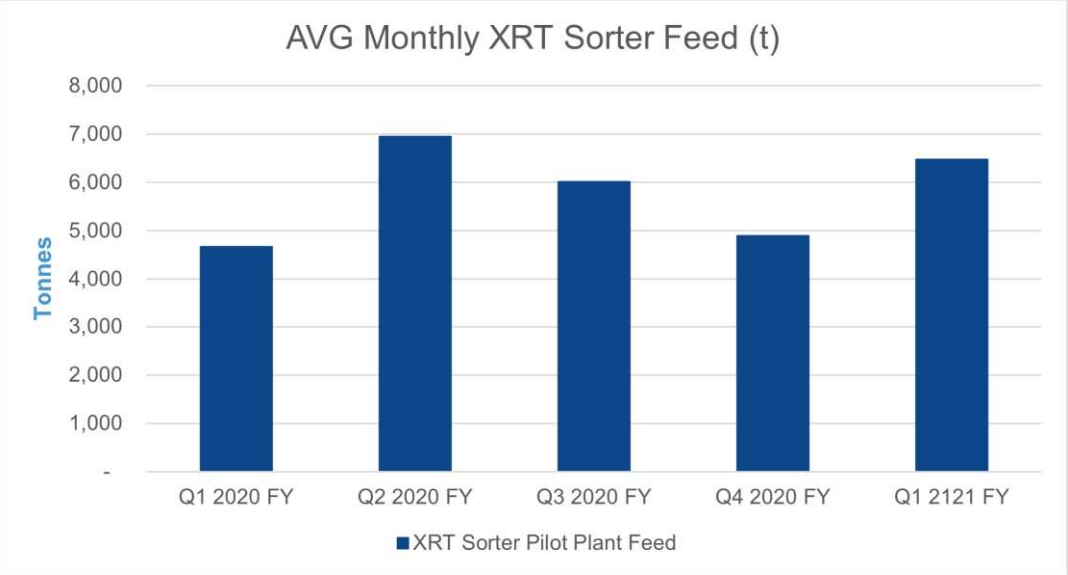


Figure 11: Avg Monthly Sorter Feed – Shown Monthly

Figure 12 shows a central test pit on the LGS that has been excavated and trialled through the crushing, screen and XRT Sorting section, with further beneficiation taking place through the gravity processing plant.

Figure 12: Central Test Pit on LGS for Sorter Feed and Gravity Plant Feed

3.3.3. Ore Sorter Product Rehandling Circuit

The product stockpile from the existing ore sorter circuit will be transferred to the rehandling circuit at the gravity processing plant. The rehandling circuit for Phase 1 will be fed at approximately 10tph, solids. The ore sorter product will be fed to a bin using a front end loader (FEL) and a vibrating feeder (21400-FE-01) will be used to feed the screen feed conveyor (21400-CV-02). The double deck screen (21400-SN-01) is fed using a conveyor (21400-CV-02). The sizing screen is a Techroq 5' x 12' (1525mm x 3660mm long) double deck

washing vibrating screen complete with two vibrator motors, top and bottom PU panels, integrated spray bars and coil spring isolators.

The oversize from the screen (-40,+10mm) and (-10,+6mm) will be fed to the existing Techroq VSI crusher (21400-CR-01). The crushed material will return to the feed bin and refed onto the sizing screen. The screen undersize (-6mm) will be fed onto the existing wet plant feed conveyor using the conveyor (21400-CV-03).

The VSI and screen are shown in Figure 13 and Figure 14.

Figure 13: Techroq VSI Crusher

Power:

- Connected to new Phase 1 MCC

Figure 14: Techroq Screen

Process Controls:

- Spray water on/off mechanism included
- Water addition rate is manually set based on feed rate to the screen

Power:

- Connected to new Phase 1 MCC

3.3.4. Product Transfer Pipeline

Description

The crushing and screening plant will produce a -6mm product using a triple deck wet screen. The product will be slurried in a hopper and pumped at 50% solids by weight to the gravity processing plant for further processing.

The product transfer pipeline will be a DN180, PN20, 900m long and consist of an HDPE delivery pipe and feed into a surge tank near the gravity processing plant for direct feed into the plant or dewatering.

Flow meters will be installed at the crusher wet screen and the gravity processing plant to provide real time monitoring of the product discharge pipeline, connected via telemetry or Wi-Fi directly to the alarm system at the plant.

Based on the monitoring and inspection program planned for the pipeline (inspection plus continuous monitoring of pipe discharge via flowmeters installed at the gravity processing plant), it is envisaged that any major leak will be detected, and pumping stopped immediately. All roads along which the product pipeline run will have the running surface sloped towards the containment channel or bund to limit discharge out of the system in the event of leakage or pipe failure.

Where required for internal trafficable roads, the product pipeline will be buried in a trench.

The route of the pipeline is shown in Figure 15.

Figure 15: Product Transfer Pipeline Route

Design

The product pipeline design is based on the conventional slurry pipeline technology using PE pipe, with the following specifications:

- The pipeline design will be fully engineered using Vinidex PE Pipeline Design Guidelines prior to execution
- The pipeline material is PE100 high density poly ethylene (HDPE)
- The pipe pressure rating is PN20 with white coextruded polyethylene cover to limit the wall temperature to 35 ^{o}C
- Pipe pressure rating is 1600kPa
- The pipeline operating pressure is 800kPa giving a safety of safety of 100% above design
- The operating velocity is between 2.5 and 3.5m/s depending on the volume of product to be transferred to the wet plant and minimum settling velocity for safe pipeline operation
- The overland pipeline has no bends which concentrate high wear.
- The estimated rate of pipeline wear is 1mm per 1Mtpa and the operating procedures will be set up to plan pipeline section changeouts when the actual wall thickness is within 3mm of the minimum design wall thickness

Monitoring

A comprehensive monitoring program will be required to ensure that any potential problems are discovered early in order to initiate contingency plans.

The monitoring systems will include the following items as a minimum:

- Flow monitoring on the product delivery and water return pipelines
- Regular inspections each shift of critical plant, pipelines and infrastructure
- Surface water monitoring stations to monitor water quality in surface flows downstream of the TSF and waste dumps
- Wall thickness monitoring every 3months
- Set up a pipe wall thickness monitoring plan and maintenance schedule for heigh wear area replacement

3.3.5. Excess Product Dewatering Circuit

The -6 mm product from the crushing and screening plant will be pumped to a surge tank (25000-TK-01) situated at the process plant. The surge tank will pump feed the slurry to the gravity processing plant at a nominal rate of 60tph.

The overflow from the surge tank will flow to an excess product dewatering circuit. The excess product dewatering circuit will be comprised of a dewatering screen (25100-SN-01) and dewatering cyclone (25100-CY-01). The fixed sizing screen (25100-SN-01) undersize will be fed to the dewatering screen underpan which will then feed to the dewatering cyclone. The dewatering cyclone will have a cut size of 75 microns. The cyclone underflow (-6mm, +75 microns) will return to the dewatering screen at 65%w/w solids. The cyclone overflow (-75 microns) is expected to be clear water which will be pumped back to the crushing plant raw water tank. The dewatering screen oversize (-6mm, +250 microns) will form a product stockpile and the dewatering screen undersize (-250 microns) will be recirculated back to the dewatering cyclone.

The excess product dewatering circuit is shown in Figure 16

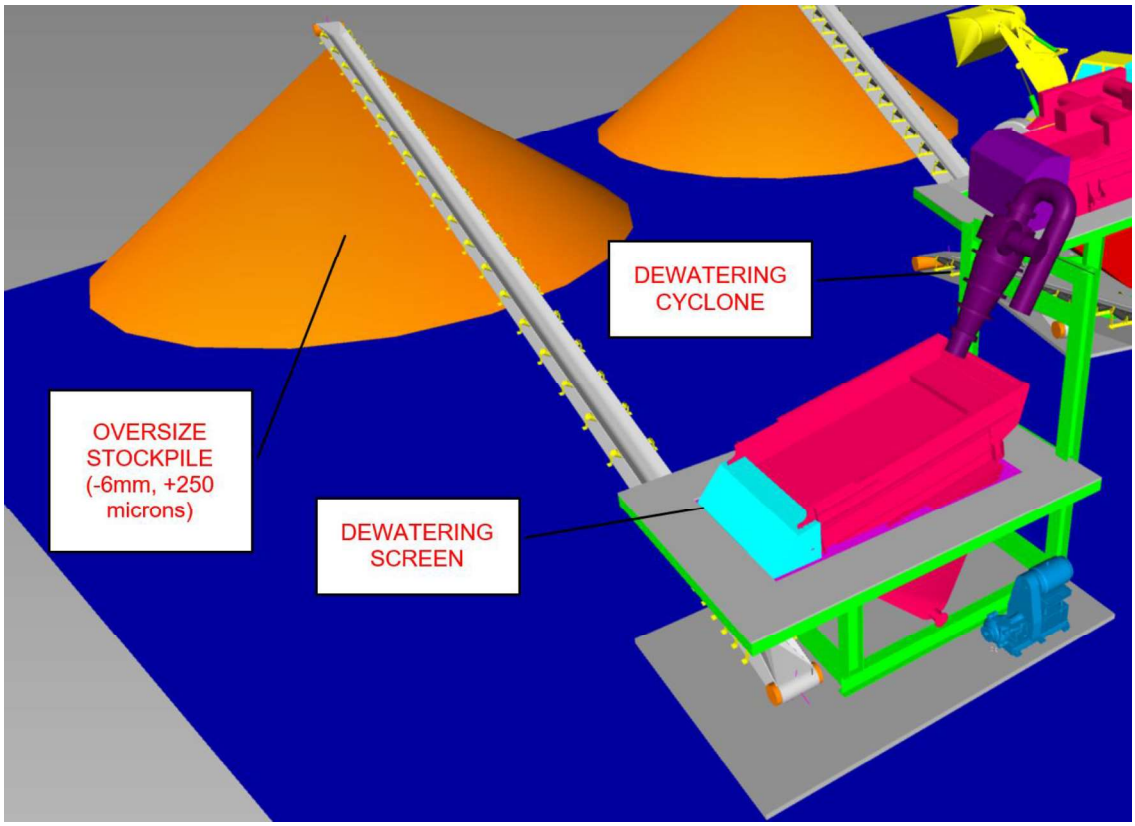


Figure 16: Excess Product Dewatering Circuit

Process Controls:

- Control system provided by vendor
- Underflow hopper level to control make-up water addition
- Underflow pump speed to control dewatering cyclone pressure
- Cyclone pressure gauge included
- Make-up water control valve to control hopper level
- Water addition rate is manually set based on feed rate to the screen

Power:

- Connected to new Phase 1 MCC

3.4. Process Water

Process water is provided for dust suppression and product transfer from the sizing screen to the dewatering screen. Water addition to the screen will be measured using a flow meter. A manual control valve will be used to set water flow rates. A field mounted digital display will provide water flow rate in m3/hr. Storage tanks will be manually filled daily or provided with a float valve. The average water demand for the circuit is approximately 65 m3/hr.

3.5. Electrical and Instrumentation

3.5.1. Electrical Reticulation

Plant distribution within the crushing, screening and sorting plant will be stepped down to 415 Vac, 3 phase, 50 Hz via a new 22/0.433kV 500kVA transformer.

A new LV Distribution board is to be installed adjacent to the new 500kVA transformer to feed the two ore sorters. This will also power the future Phase 2 crushing, screening and sorting plant MCC.

A new gravity processing plant MCC shall be installed as part of Phase 1 works. This MCC shall serve the Phase 1 gravity processing plant upgrades as well as have capacity for the Phase 2 gravity processing plant upgrades. This MCC shall be fed from an existing load centre.

General lighting and power for the site will be at 230/415 Vac.

3.5.2. Process Control System

Process control will utilise modern programmable logic controllers (PLCs) controlling the plant. The new standalone PLC and control equipment will be preassembled and installed in a control cabinet in the MCC.

Vendor PLC will be integrated into the main PLC at the crushing plant.

The intention is to have the same brand PLC at site and providing direct supervisory control of the different plant areas/units, with a higher level of interrogating PLC providing overview of the process parameters for remote operation.

A site process control specification will be adopted that directs equipment suppliers towards site preferred PLC brand, a standard PLC screen set up and standardised programming methodology. This process will be essential to only have a single PLC brand, to reduce spares and to simplify the programming methodology across site.

With PLCs being one of the most technical site systems, maintaining availability of suitably trained process control technicians to maintain the PLCs is critical.

All safety and system interlocks shall be included in the design of the site process control system.

Allowance has been made to install a wireless communications system dedicated to the PLC network. This network will allow for limited plant monitoring and control from within heavy machinery via a touchscreen PanelView mounted inside the plant equipment. Main operator stations will still be required for detailed telemetry and functional control. An example of a cabin mounted control system touch screen is shown in Figure 17.

Figure 17: Cabin Mounted Touch Screen

3.5.3. Maximum Demand

The maximum demand of the new equipment installation for Phase 1 has been calculated at 570kVA.

The total installed power for Phase 1 crushing, screening and sorting plant is 327kVA.

The total installed power for Phase 1 crushing infrastructure at the dry processing plant is 243kVA.

3.5.4. Conveyors

Conveyors and belt zipline feeders will have the following features:

- Belt pull-wire(s) will trip the conveyor drive on fault.
- Minor belt misalignment will raise a PCS alarm and severe misalignment will trip the conveyor drive.
- A belt speed detection switch will trip the drive on zero speed.
- The start-up of each conveyor will engage a locally mounted siren.

Pull wire emergency switches will be mounted adjacent to the conveyor, accessible to operations personnel. When tripped, pull wire emergency switches will initiate an emergency stop interlock sequence of downstream equipment. An appropriate upstream PCS alarm will also be activated. For conveyors each pull wire will be individually alarmed in the PCS. For feeders an alarm signal will be given for each side.

Activation of a belt drift switch will generate a PCS alarm.

Belt speed elements will generate a conveyor under-speed alarm if the conveyor stops at any time during normal operation or there is belt slip.

3.6. Site Plans

The site plans for Phase 1 are shown in Figure 18, Figure 19 and Figure 20.

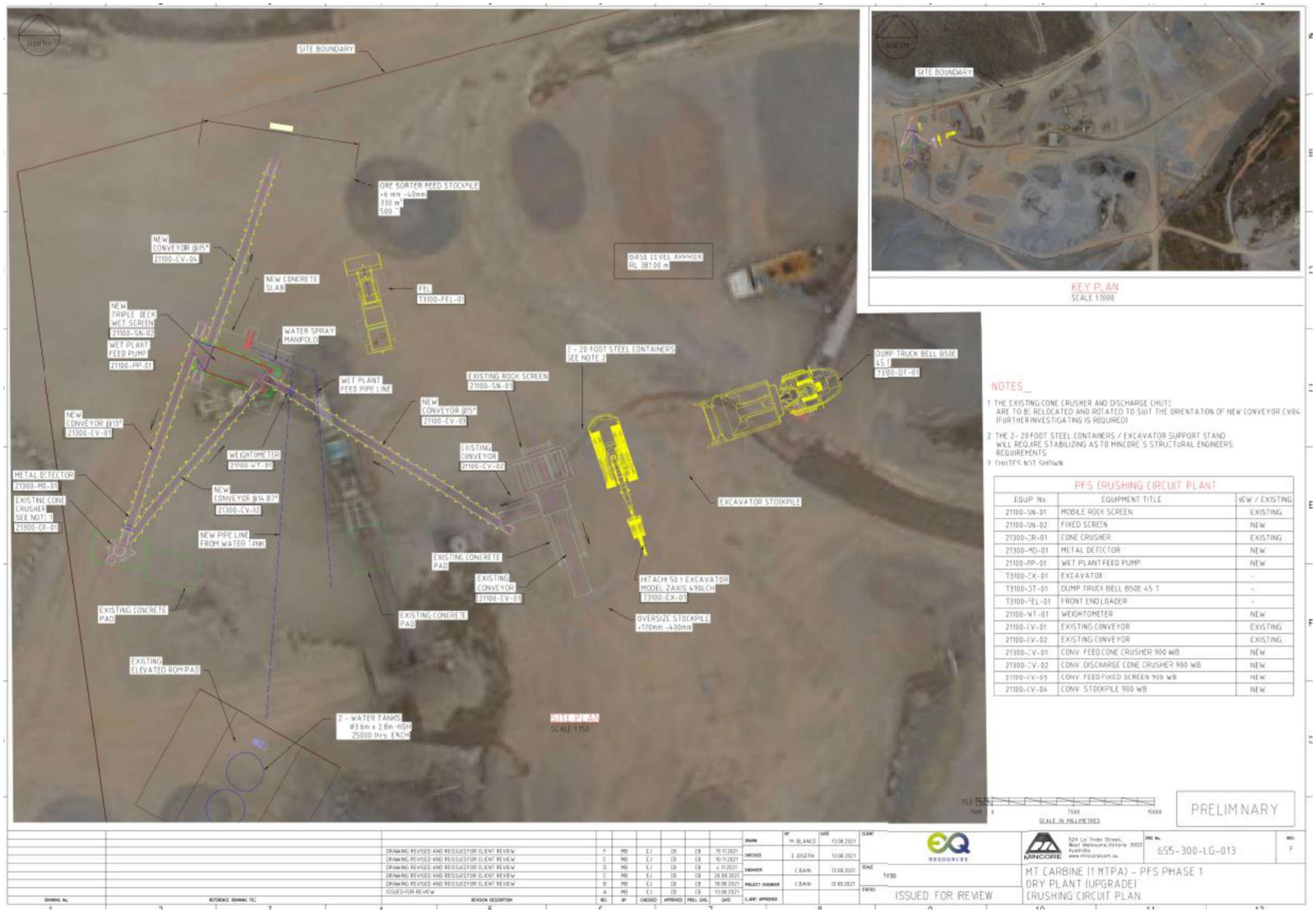


Figure 18: Phase 1 Crushing and Screening Circuit

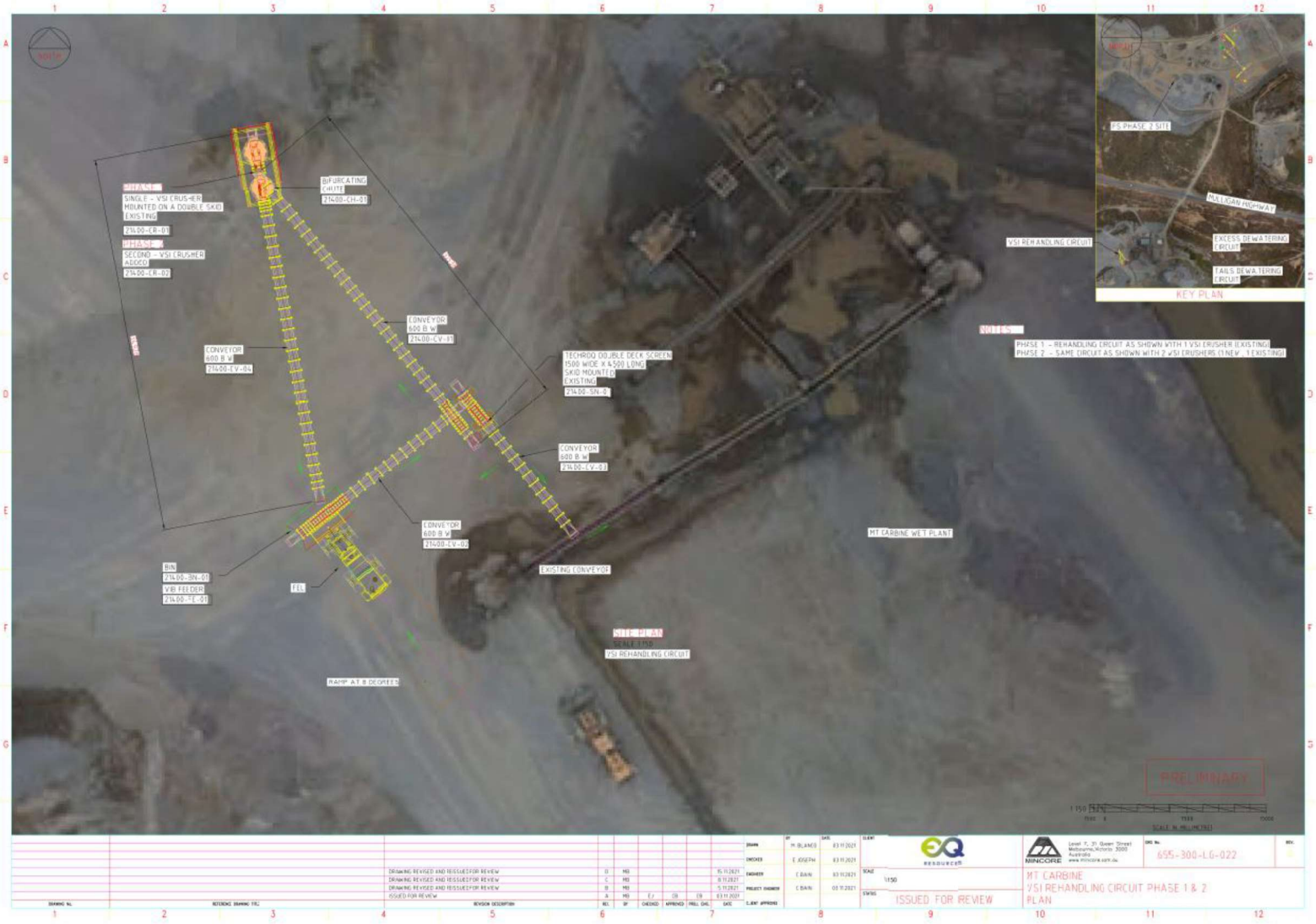


Figure 19: Rehandling Circuit

Figure 20: Excess Product Dewatering Circuit

4. Phase 2 Crushing Screening and Sorting Plant

4.1. Process Design Criteria

The Phase 2 crushing, screening and sorting circuits were designed in accordance with the design criteria in Table 2.

Table 2: Phase 2 Crushing, Screening and Sorting Design Criteria

Description	Criteria	Unit
General		
Location	Queensland	
Ore Type	Dry and clean ore	
Ore Hardness	7	Mpa
Ore Abrasiveness	0.79	Ai
Maximum Lump Size	750	mm
Design Life	20	Years
Plant Size	1,000,000	tpa
Operating Hours (Crusher)	2890.8	hrs
Availability	66%	%
Extraction Rate		
Source	Open Pit + Low Grade Stockpile	
Extraction rate	350	tph
Work Index	20	kWhr/T
Amount of Moisture (By Weight)	5	%
Bulk Density	1.6	t/m3
Amount of Clay (By Weight)	0	%
Abrasion Index	0.79	
Excavator Capacity	50	T
Mobile Jaw Crusher		
Model	Sandvik UJ440i	
Type	Mobile Jaw Crusher	
Throughput, Design	156	tph
CSS	95	mm
Crusher Load	83	%
Crushing Work Index	20	kWhr/t

Description	Criteria	Unit
Cone Crusher		
Throughput, Design	207	tph
Model	Sandvik CH830i	
CSS	24	mm
Triple Deck Screen		
Type	Wet Screening	
Model	Sandvik SC2463	
Screening Type	Wet	
Top Deck Aperture	40	mm
Middle Deck Aperture	12	mm
Bottom Deck Aperture	6	mm
Load (with choke fed crusher)	53	%
Spray Water Requirements	265	m3/hr
Throughput		
Feed	550	tph
Top Deck Oversize	200	tph
Middle Deck Oversize	166	mm
Bottom Deck Oversize	54	tph
Undersize	130	tph
Particle Size		
Feed	-170	mm
Top Deck Oversize	-170,+40	mm
Middle Deck Oversize	-40,+12	mm
Bottom Deck Oversize	-12,+6	mm
Undersize	-6	mm
Ore Sorters		
Ore Sorter Model	Tomra Ore Sorter	
Quantity	2	
Throughput		
Feed	160	tph
Rejects	141	tph
Product	19	tph
Particle Size		

Description	Criteria	Unit
Feed	-40,+6	mm
Rejects	-40,+6	mm
Concentrate	-6,+0	mm
Mass Split %		
Product	12	%
Reject	88	%
Stockpiles		
Product Stockpile		
Type	Conical	
Stockpile Feed Rate	19	tph
Stockpile Capacity	230	tonnes
Product Size	+6,-40	mm
Rejects Stockpile		
Type	Radial	
Stockpile Feed Rate	141	tph
Stockpile Capacity	1690	tonnes
Product Size	+6,-40	mm
Rehandling Circuit		
Sizing Screen		
Throughput	96	tph
Recirculation Load	75	%
Type	Double-Deck Vibrating	
Model	Sandvik SL1862	
Top Deck Aperture	10	mm
Bottom Deck Aperture	6	mm
VSI Crusher		
Quantity	2	
Model	Sandvik CV216	
Product Dewatering Circuit		
Dewatering Screen		
Model	Weir SP100 Sand Wash Unit	
Screen Type	VD12 dewatering screen	

Description	Criteria	Unit
Screen Size	1,220 x 3,660	mm x mm
Screen Aperture	250	microns
Throughput	75	tph
Oversize	66	tph
Undersize	8	tph
Particle Size		
Feed	-6	mm
Oversize	-6,+0.25	mm
Undersize	-0.25	mm
Dewatering Cyclone		
Model	500CVX Cyclone	
Tailings Dewatering Circuit		
Dewatering Screen		
Model	Schenck SLV1836W	
Screen Type	Dewatering Screen	
Screen Size	1,800 x 3,600	mm x mm
Screen Aperture	250	microns
Throughput	60	tph
Oversize	54	tph
Undersize	6	tph
Particle Size		
Feed	-6	mm
Oversize	-6,+0.25	mm
Undersize	-0.25	mm
Stockpiles (Tailings Dewatering)		
Product Stockpile		
Type	Conical	
Stockpile Feed Rate	6	tph
Stockpile Capacity	72	tonnes
Product Size	-0.25	mm
Rejects Stockpile		
Type	Conical	

Description	Criteria	Unit
Stockpile Feed Rate	54	tph
Stockpile Capacity	650	tonnes
Product Size	+0.25,-0.8	mm

The detailed equipment list for the crushing, screening and sorting plant is included in Appendix B.

4.2. Flowsheet

Ore is delivered to the ROM stockpile using trucks.

The crushing and screening flowsheet consists of crushing and screening circuit to produce two products:

1. Rejects Stockpile (+6mm, -40mm)
2. Product Stockpile (+6mm, -40mm)

ROM ore (-700mm) is reclaimed from the low-grade stockpile and open pit and is delivered to the mobile jaw crusher having a CSS of 95mm. It is then fed to the triple deck wet screen.

The triple deck screen is fitted with three decks to split the feed into 4 streams:

1. Oversize (-100, +40mm) to the cone crusher circuit having a CSS of 23mm
2. Oversize (+6, -12mm & -40, +12mm) to ore sorter feed stockpile (to ore sorters, 1 – Existing and 1 – new)
3. Undersize (-6mm) pumped to the gravity processing plant.

The secondary cone crusher discharge is fed onto a 900mm wide belt conveyor and recirculates back to the triple deck wet screen for separation into product sizes.

The ore sorter product will be trucked to the wet plant where it will be fed to a rehandling circuit. The -6mm product from the triple deck screen underpan will be pumped to the wet plant surge tank where it will be fed into an excess product dewatering circuit and a tails dewatering circuit.

VSI crusher and larger vibrating sizing screen is added into the existing rehandling circuit to increase the efficiency and throughput. The VSI Crusher will be a Sandvik CV217 VSI Crusher. The sizing screen will be a Sandvik SL1862 double deck screen.

The process flowsheets for Phase 2 are shown in Figure 21, Figure 22 and Figure 23.

4.2.1. Mass Balance

The ROM feed will be 350tph. Ore Sorters will treat at 160tph with 88% of the feed going to the rejects and the remaining 12% will be the product. Two products will be produced:

1. Product material (crushed to (+6, -40mm) for wet plant and dewatering circuit feed)
2. Waste material (rejects)

The overall process mass balance is included in Appendix A.

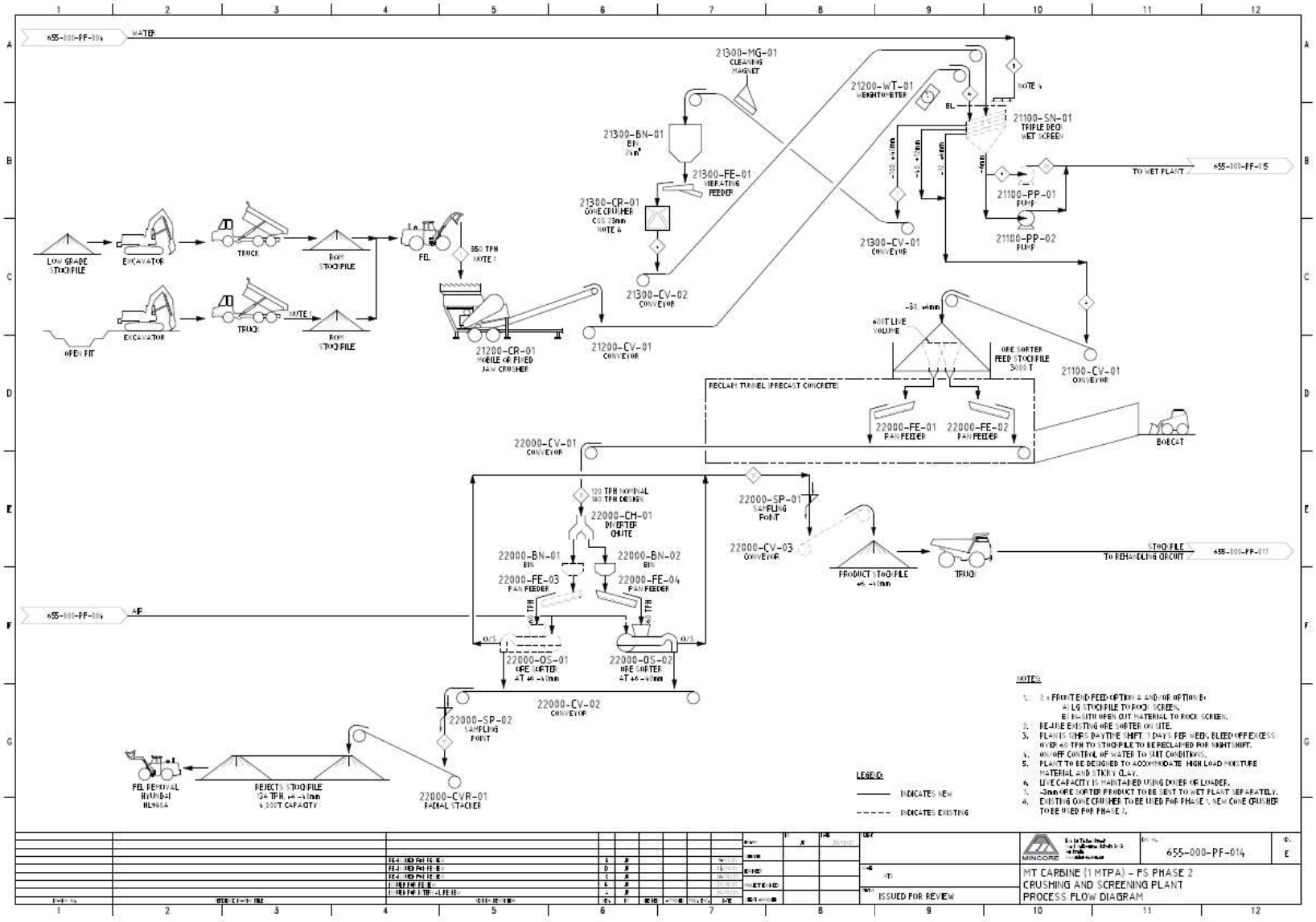


Figure 21: Crushing and Screening Plant – Phase 2

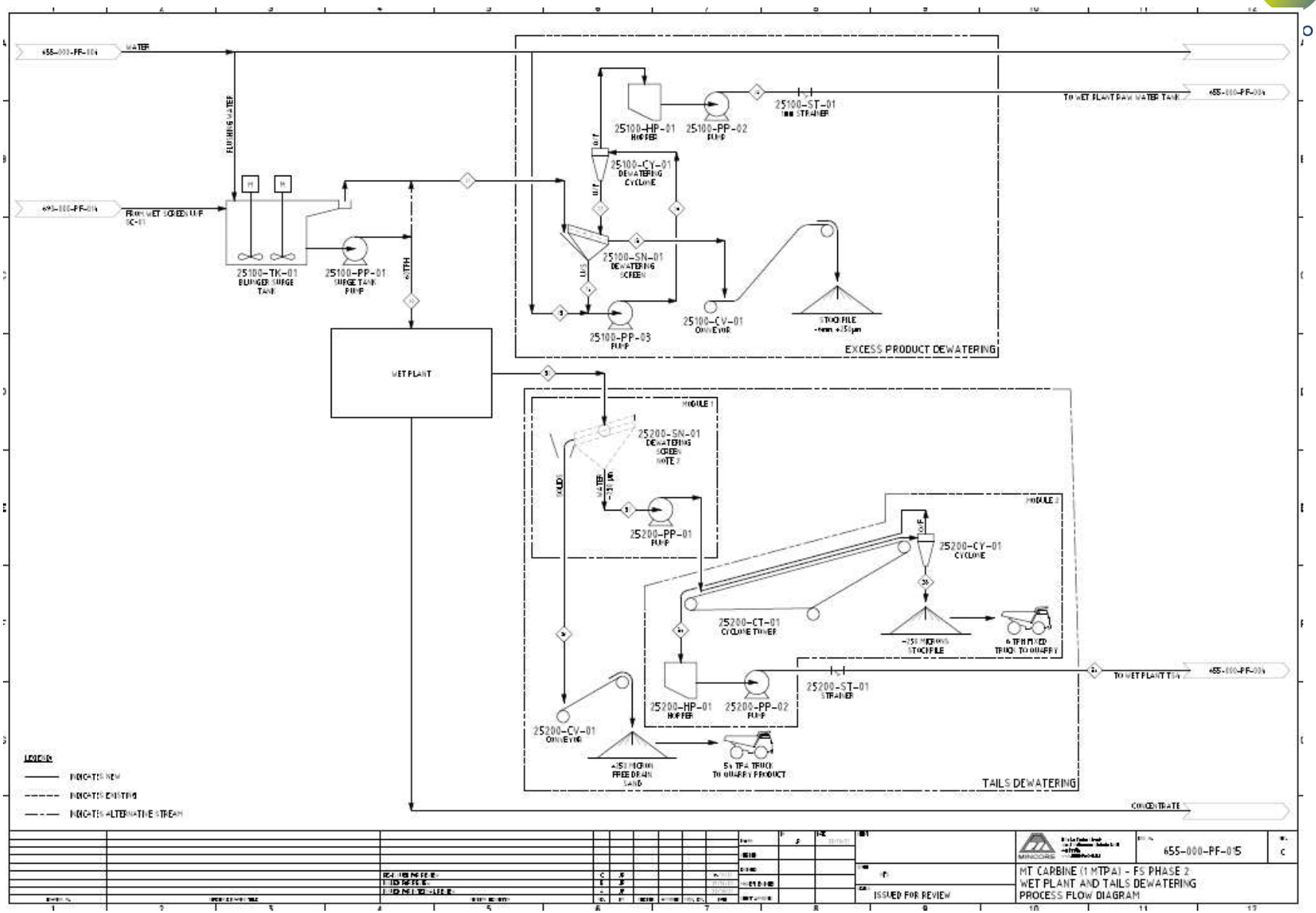


Figure 22: Excess Product Dewatering and Tailings Dewatering

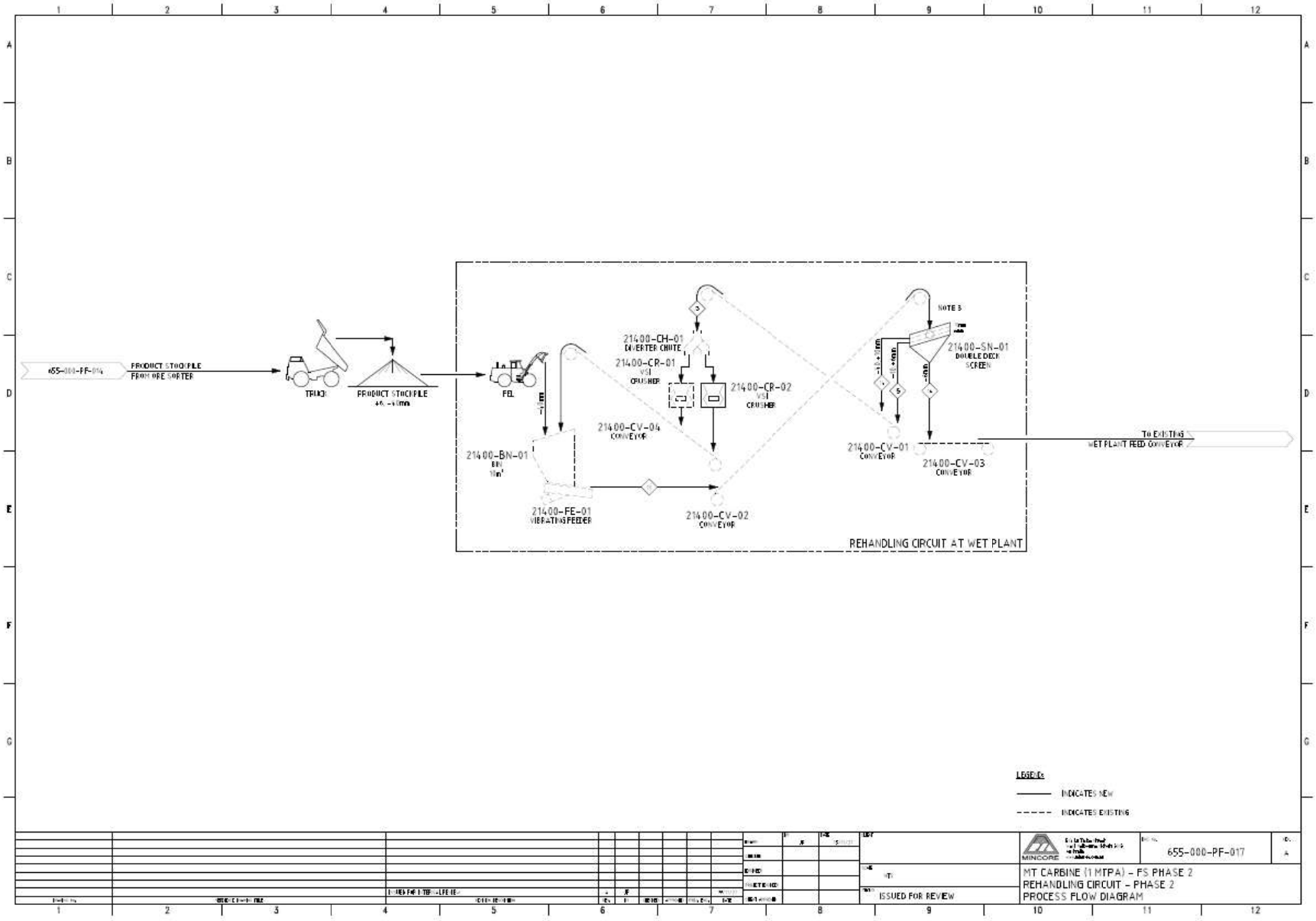


Figure 23: Ore Sorter Product Rehandling Circuit

4.3. Process Description

4.3.1. Crushing & Screening Plant and Ore Sorter Circuit

The feed from the ROM stockpile is fed to the jaw crusher (21200-CR-01) at 350tph using an FEL. It is then fed to the triple deck vibrating screen (21100-SN-01) using the conveyor (21200-CV-01). The deck sizes of the screen are 40mm, 20mm and 6mm. The feed from the top deck (-100, +40mm) will be fed to the cone crusher (21300-CR-01) having a CSS of 23mm by passing through a bin (21300-BN-01) and vibrating feeder (21300-FE-01). It is then fed back to the triple deck screen using a conveyor (21300-CV-02). The undersize from the triple deck wet screen (-6mm) is pumped to the wet plant.

The feed from the middle deck (-40, +12mm) and bottom deck (-12, +6mm) is fed to the ore sorter feed stockpile using a fixed conveyor (21100-CV-01). This stockpile has a total volume of 3,000t and a live volume of 600t. Tunnel reclaim feeders (22000-FE-01 and 22000-FE-02) will feed the ore sorter feed conveyor (22000-CV-01). The conveyor will feed the ore sorters (22000-OS-01) and (22000-OS-02).

The product from the ore sorters is fed to the product stockpile (+6, -40mm) by passing through a sampling point using a conveyor (22000-CV-03). The product is trucked to the rehandling circuit located at the dry processing plant. The rejects from the ore sorters are fed to the rejects stockpile (+6, -40mm) using a conveyor (22000-CV-02) passing through a sampling point. The conveyor then feeds onto a radial stacker which then forms a 4,000t rejects radial stockpile.

Process Controls:

- Hopper level by visual observation from operators
- VSD on conveyor to control feed to the double-deck vibrating screen
- Belt weigher on Screen Feed conveyor (21100-SN-01)

Power:

- Connected to Phase 2 MCC

4.3.2. Rehandling Circuit

The product stockpile from the ore sorter circuit will be transferred to the rehandling circuit at the gravity processing plant. The rehandling circuit for Phase 2 will be fed at approximately 25tph, solids. The ore sorter product will be fed to a bin using a FEL and a vibrating feeder (21400-FE-01) will be used to feed the screen feed conveyor (21400-CV-02). The double deck screen (21400-SN-01) is fed using a conveyor (21400-CV-02). The sizing screen for Phase 2 will replace the existing Techroq screen with a Sandvik SL1862 (1800mm x 6200mm long) Double deck washing vibrating screen complete with two vibrator motors, top and bottom PU panels, integrated spray bars and coil spring isolators.

The oversize from the screen (-40, +10mm) and (-10, +6mm) will be fed to the VSI Crushers. For Phase 2, an additional Sandvik CV217 VSI crusher will be added to the rehandling circuit. The crushed material will return to the feed bin and refed onto the sizing screen. The screen undersize (-6mm) will be fed onto the existing wet plant feed conveyor using the conveyor (21400-CV-03).

Power:

- Connected to Phase 1 MCC

4.3.3. Excess Product Dewatering

The feed from the wet screen underflow (21100-SN-01) is fed to a blunger surge tank where the overflow will be fed to the excess product dewatering circuit. The circuit will consist of a dewatering screen (25100-SN-01) and dewatering cyclone (25100-CY-01). The dewatering screen (25100-SN-01) undersize will be fed to the dewatering screen underpan which will then feed to the dewatering cyclone. The dewatering cyclone will have a cut size of 75 microns. The cyclone U/F (-6mm, +75 microns) will return to the dewatering screen at 65%w/w solids. The cyclone O/F (-75 microns) is expected to be clear water which will be pumped to an existing tank

(32200-TK-02). The dewatering screen oversize (-6mm, +250 microns) will form a product stockpile and the dewatering screen undersize (-250 microns) will be recirculated back to the dewatering cyclone.

The blunger surge tank will also pump at a nominal 60tph to the gravity processing plant.

Process Controls:

- Underflow hopper level to control make-up water addition
- Underflow pump speed to control dewatering cyclone pressure
- Cyclone pressure gauge included
- Make-up water control valve to control hopper level
- Water addition rate is manually set based on feed rate to the screen

Power:

- Connected to Phase 1 MCC

4.3.4. Tailings Dewatering

The tailings from the gravity processing plant will be fed to the tails dewatering circuit. The tailings dewatering screen (26100-SN-01) has an aperture of 250µm, the undersize of which will be pumped to cyclone (26100-CY-01) using a cyclone tower (26100-CT-01). The overflow from the cyclone tower will be pumped to the existing clean water dam.

The dewatering screen oversize will be conveyed and stacked to form a quarry free draining sand material that will be trucked to the quarry and stored as inventory.

The dewatering cyclone underflow will be stacked into storage cells where the remaining moisture will drain back to a settlement pond before the clean water dam for re-use in the water circuit. The dewatered ultrafine material will also be trucked back to the quarry and stored as inventory.

Power:

- Connected to Phase 1 MCC

4.4. Process Water

Process water is provided for dust suppression and product transfer from the sizing screen to the dewatering screen. Water addition to the screen will be measured using a flow meter. A manual control valve will be used to set water flow rates. A field mounted digital display will provide water flow rate in m3/hr. Storage tanks will be manually filled daily or provided with a float valve. The average water demand for the circuit is approximately 130m3/hr for Phase 2.

4.5. Electrical and Instrumentation

4.5.1. Electrical Reticulation

Plant distribution within the crushing, screening and sorting plant will be stepped down to 415 Vac, 3 phase, 50 Hz via the 22/0.433kV 500kVA transformer.

The Phase 2 crushing, screening and sorting plant will have a new MCC installed that will connect to the Phase 1 distribution board.

Phase 2 crushing and screening infrastructure at the gravity processing plant will be connected to the MCC installed in Phase 1.

General lighting and power will be at 230/415 Vac.

4.5.2. Process Control System

The site will adopt the process control system philosophy adopted for Phase 1 which is described in Section 3.5.2.

4.5.3. Maximum Demand

The Maximum demand of the new equipment installation for Phase 2 has been calculated at 1187kVA.

The total installed power for Phase 2 crushing, screening and sorting plant is 769kVA

The total installed power for Phase 2 crushing and screening infrastructure at the gravity processing plant is 418kVA.

The crushing and screening plant has a total of 815kVA capacity between its two transformers. The gravity processing plant has a 1000kVA transformer, currently limited with 800kVA supply. If required, additional power to the gravity processing plant will be requested to fully utilise its 1000kVA capacity.

4.5.4. Conveyors

Conveyors and belt zipline feeders will have the following features:

- Belt pull-wire(s) will trip the conveyor drive on fault.
- Minor belt misalignment will raise a PCS alarm and severe misalignment will trip the conveyor drive.
- A belt speed detection switch will trip the drive on zero speed.
- The start-up of each conveyor will engage a locally mounted siren.

Pull wire emergency switches will be mounted adjacent to the conveyor, accessible to operations personnel. When tripped, pull wire emergency switches will initiate an emergency stop interlock sequence of downstream equipment. An appropriate upstream PCS alarm will also be activated. For conveyors each pull wire will be individually alarmed in the PCS. For feeders an alarm signal will be given for each side.

Activation of a belt drift switch will generate a PCS alarm.

Belt speed elements will generate a conveyor under-speed alarm if the conveyor stops at any time during normal operation or there is belt slip.

4.6. Site Plans

The site plans for Phase 2 are shown in

Figure 24: Crushing, Screening and Sorting Plant Phase 2

5. Phase 1 Gravity Processing Plant

5.1. Processing Strategy

The existing gravity processing plant at Mt Carbine is currently operating and successfully treating low grade stockpile and tailings material at a rate of approximately 60tph. EQR has an in-depth knowledge of the gravity processing plant as an owner operator that has treated significant material volumes. This knowledge and expertise will be leveraged to make strategic decisions on the potential future process upgrades based on previous experience working with the Mt Carbine feed and existing plant.

Minimal modifications are required for the gravity processing plant as it is currently operating at the required throughput and availability for the Phase 1 project requirements. The operational hours will increase, so some minor upgrades have been included to improve plant operability.

The strategy for the process plant is one of continuous incremental improvements through the operations and allowing for upgrades through sustaining capital projects.

Focus on recovery improvement and throughput will be a focus of Phase 2 activities and beyond when higher grade feed is introduced.

The Phase 1 strategy for the gravity processing plant is not to alter the throughput capacity or the process circuitry.

The current operational gravity processing plant performance, throughput and yield data has been used as the basis of the processing assumptions for the Phase 1.

5.2. Background

The gravity processing plant in operation at Mt Carbine is currently achieving the desired plant performance requirements for the feasibility study. Since commencing operations and the treatment of the low-grade stockpiles, EQR has achieved significant plant performance improvements over time by modifying the plant and feed conditions to maximise performance and yield.

Ausenco was engaged as a process plant specialist to review and audit the existing gravity processing plant and identify and prioritise a range of upgrade options to further improve the plant performance for Phase 1.

5.3. Existing Gravity Processing Plant

5.3.1. Plant Layout

Layout drawings of the gravity processing plant are shown below in Figure 25 and Figure 26.

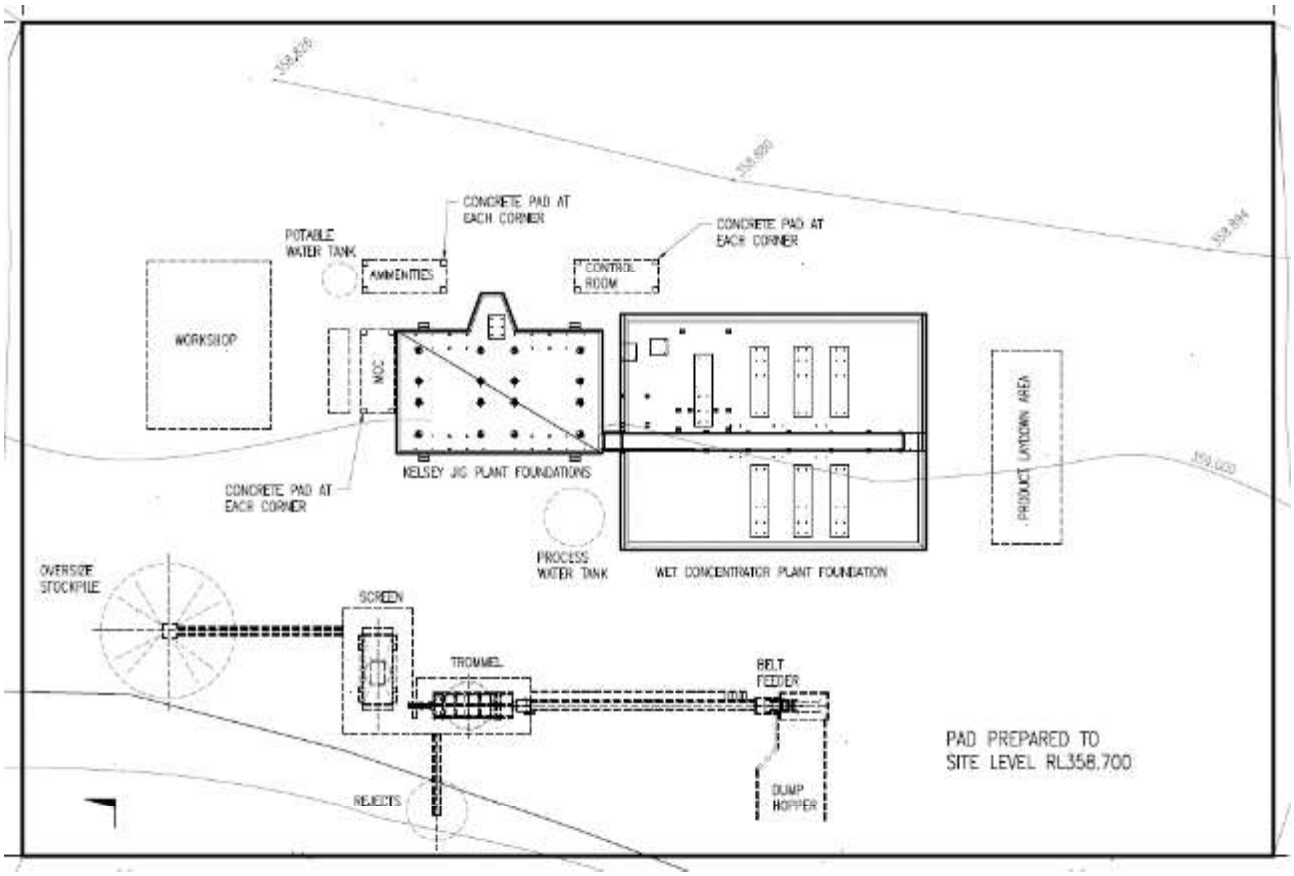


Figure 25: Gravity Processing Plant Site Layout

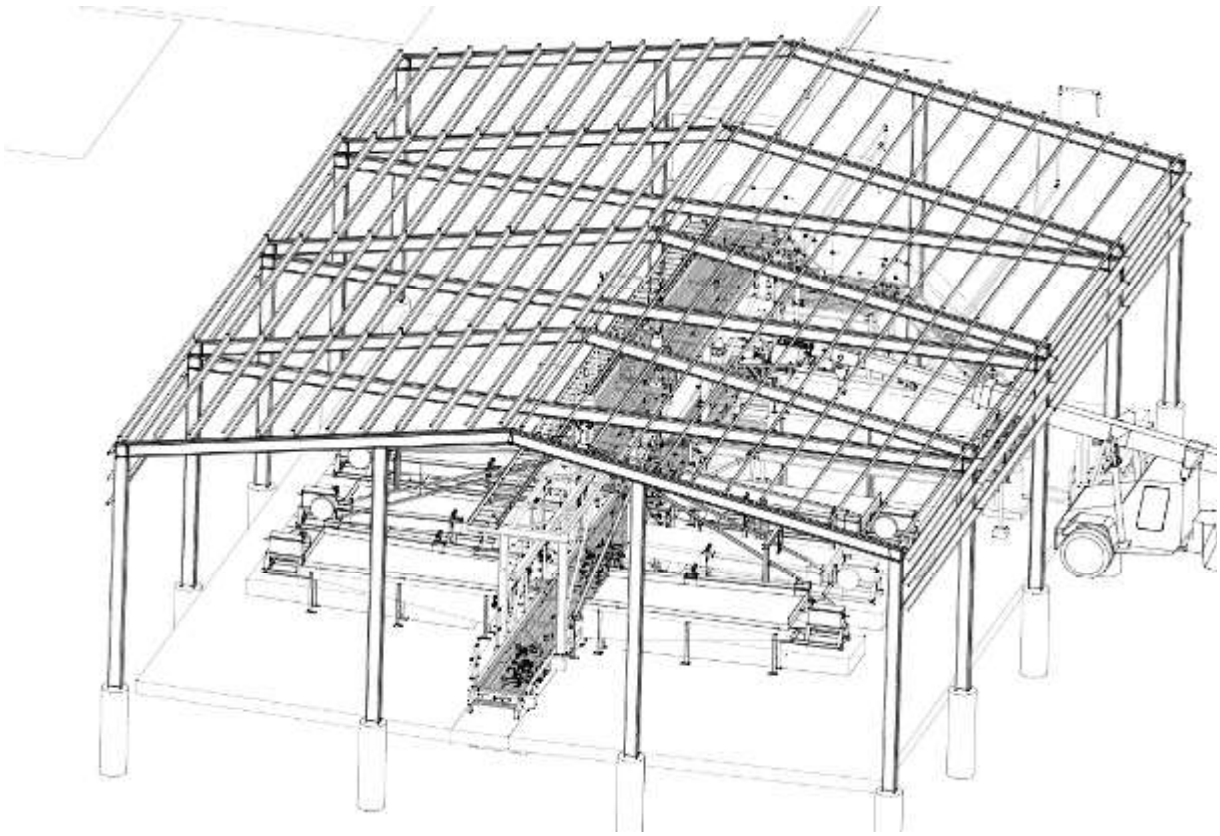


Figure 26: Wet Concentrator Plant

5.3.2. Process Plant Description

As can be seen in the gravity processing plant site layout, sized material is fed to a feed hopper which is then fed to a conveyor where it is currently conveyed to the wet screen. The trommel has now been removed from the process circuit and made redundant. The wet screen separates the -6mm material and the +6mm material. The +6mm material is discharged from a conveyor, stockpiled and sent back to the XRT Sorting plant for processing.

The -6mm particles are pumped to the pulse jig where the high density, tungsten bearing particles are concentrated, discharged into a sump and pumped to a secondary wet screen with 0.8mm panels on the screen. The waste material from the jig is pumped to tailings. The +0.8mm particles are fed to a rolls crusher and then pumped back to the front of the screen while the 0.8mm sized material is pumped to a cyclone for water removal and then to a distributor which sends the jig concentrate to six shaking tables.

The shaking tables produce a rougher concentrate, this is then gravity fed to a central sump and pumped to a final cleaner table. The tailings from the rougher tables are then pumped back to the screen, to be jigged once more to minimise losses and increase recovery. The cleaner table produces a final concentrate which is bagged immediately. The tailings from the cleaner table a pumped back to the secondary screen, to undergo sizing and crushing once more and back to the rougher tables to ensure minimal losses.

5.3.3. Process Plant Performance – 2021

The figures below summarise the historic process plant performance. In earlier months, a greater proportion of the plant feed was made up of tailings, however, the months of July and August demonstrate a focus on processing just the LGS material.

The figures clearly demonstrate the plant performance improvements as the operations have developed a greater understanding of the feed material and plant requirements.

Through an operational continuous improvement process, combined with a streamlining and simplification of the processing circuitry, the plant availability and recovery has improved demonstrably.

The data below underpins the feasibility study processing assumptions namely:

- +75% plant availability
- +75% recovery
- +50% concentrate grade

The grade and recovery improvements when the gravity processing plant handles predominantly LGS material in the months of July and August. As is clearly demonstrated in Figure 27 and **Error! Reference source not found.**, despite a significant reduction in head feed throughput compared to earlier months, the total concentrate production far exceeded the previous months where tailings was a significant component of the plant feed. The ratio of concentrate produced to head feed processed has drastically increased after swapping to primarily LGS material and helped accelerate the decision to progress with the Phase 1 expansion.

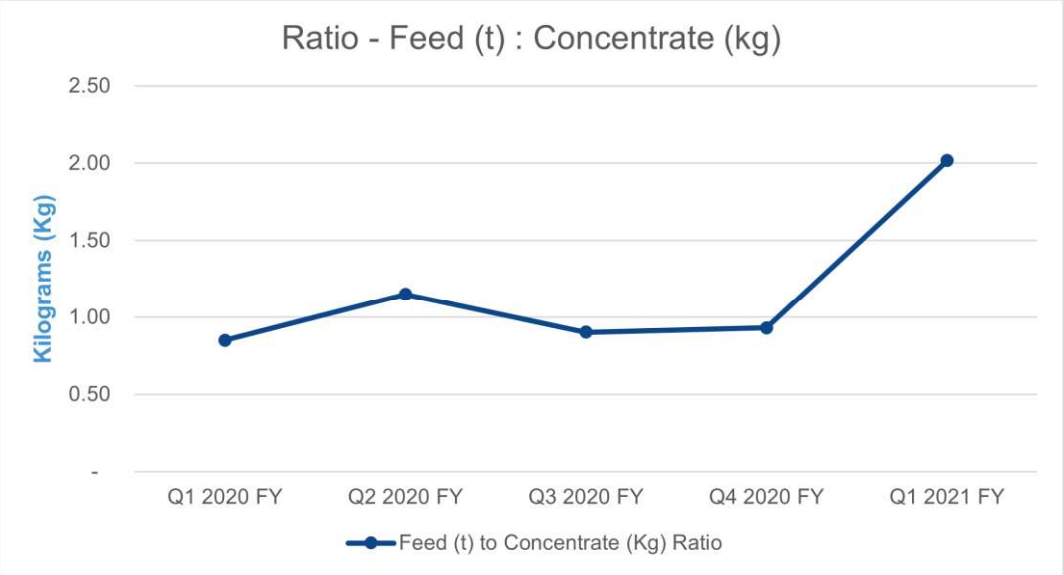


Figure 27: Ratio of concentrate produced from feed processed

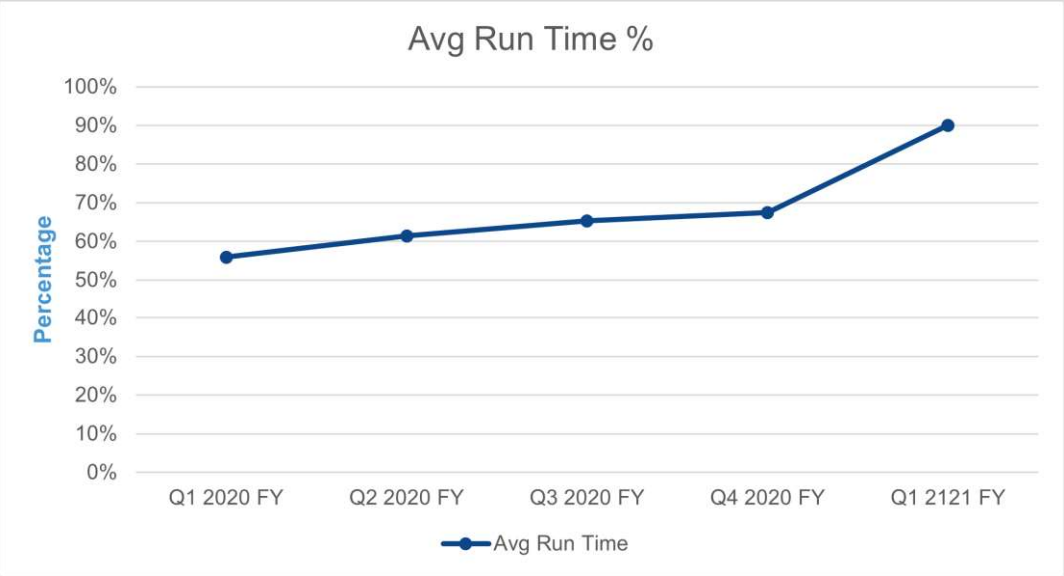


Figure 28: Historic Gravity Processing Plant Run Times

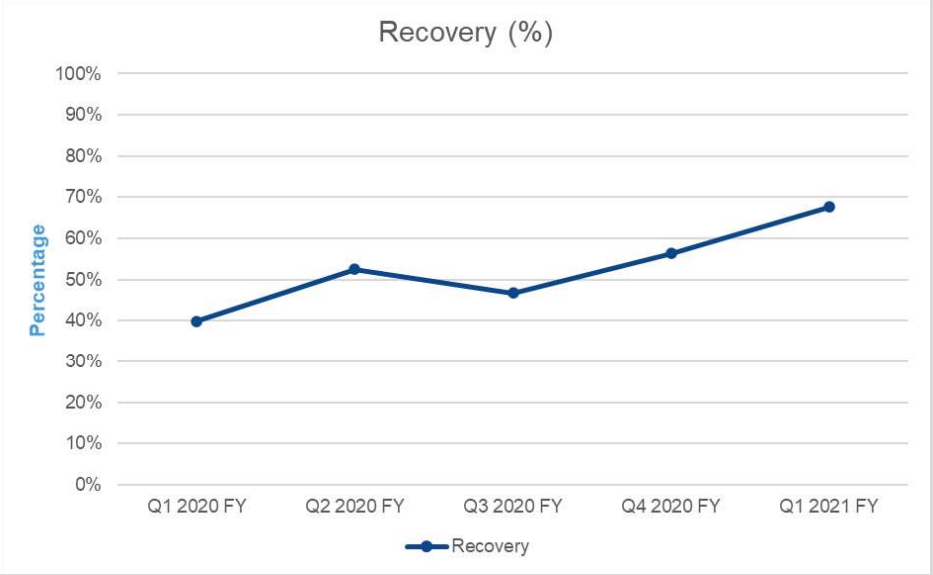


Figure 29: Historic Gravity Processing Plant Recovery

Recovery has continued trending upward since Q1 2021 with a +75% recovery now achieved on an ongoing basis based on the ongoing site sampling regime.

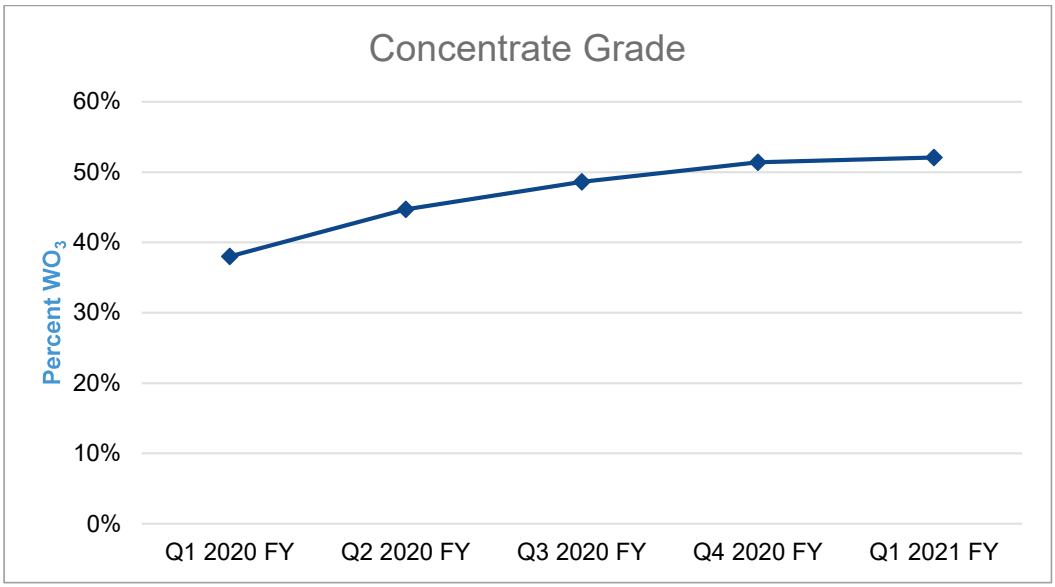


Figure 30: Historic Gravity Processing Plant Concentrate Grade

5.4. Gravity Processing Plant Upgrades

5.4.1. Pumps

A review was conducted for pumps in the gravity processing plant by Ausenco. The pump sizing was reviewed based on the following data:

- Preliminary mass balance based on 60tph production rates
- Assumed pulp densities from benchmark operations

- Elevations and piping information determined from on-site measurement

The preliminary review has concluded that many of the pumps in the circuit are oversized and are operating towards the lower left of their curves. Examples are shown for PU-008, CY-003 Feed Pump and PU-024A Final Tails Pump.

CY-003 Feed Pump (PU-008)

Based on the tonnage of 13.2tph indicated in the mass balance, the pump calculation was conducted at three different pulp densities (20, 30 and 40%). Sizing parameters and outcomes are shown in below.

Table 3: Sizing Parameters (PU-008)

Parameter	Units	Minimum Flow	Moderate Flow	High Flow
Solids	t/h	13.2		
Pulp Solids	% w/w	40	30	20
Flowrate	m³/h	24.2	35.2	57.2
Pipeline NB	mm	75 Alfagomma 10bar flex hose		
Pipe ID	mm	51		
Pipeline velocity	m/s	3.29	4.79	7.78
TDH	mwater	20.7	26.45	42.49
Minimum installed Power	kW	4.2	6.4	14.1
Actual installed power	kW	15		

Based on received suction & discharge piping data and lengths the system curve was calculated (Figure 31).

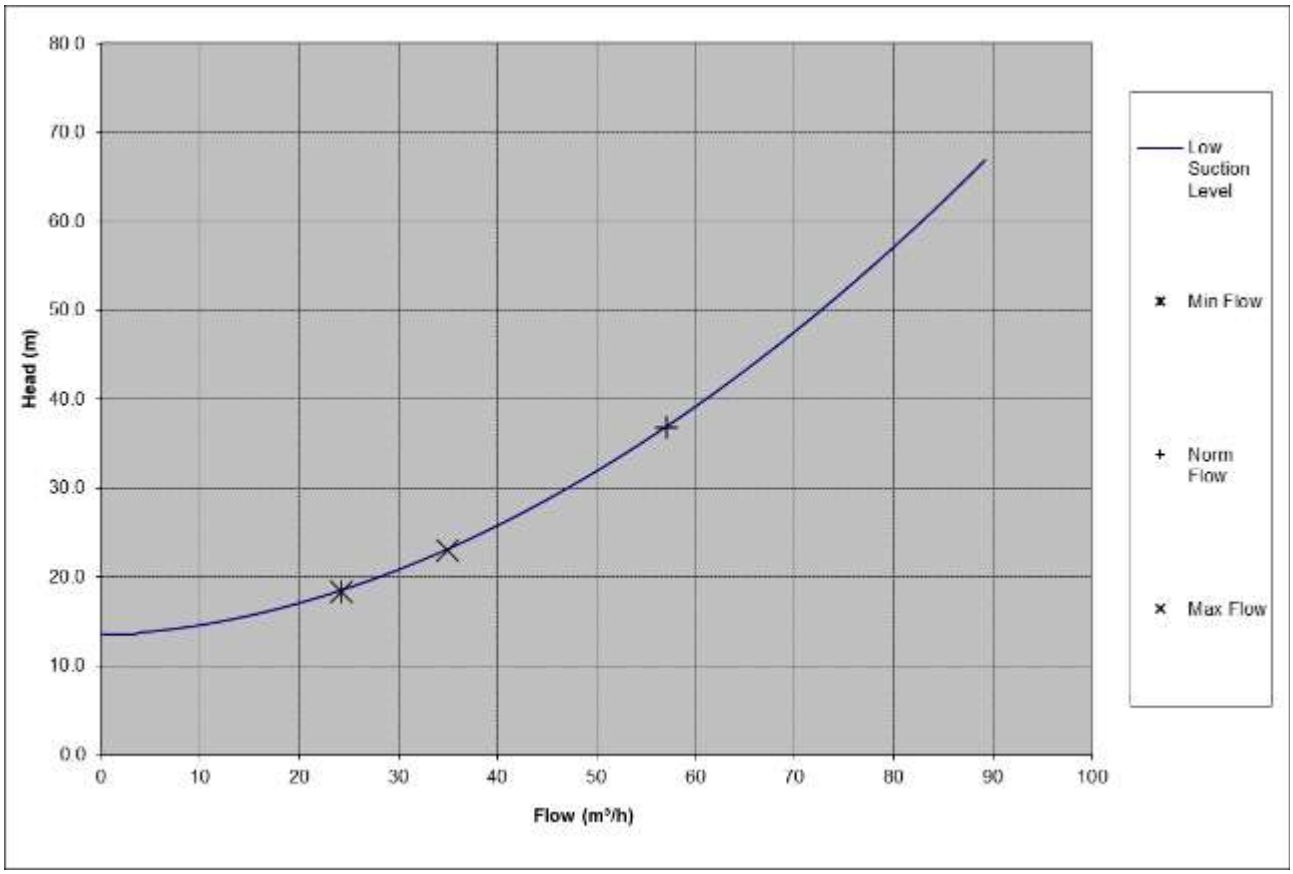


Figure 31: System Curve for PU-008

The operating points were plotted on the installed 4/3 AH pump curve (Figure 32). Based on motor (VSD) data supplied, the current operating range is between 1245-1740 rpm.

- Pump is operating to the low far left point of the BEP which causes increased wear
- Selecting a smaller sized pump 3/2 AH would improve the pump operating point and efficiency and reduce wear rate (see Figure 33).
- Based on the limited operational information available: estimates of SG, pulp density (%w/w), discharge pressure, actual flow rates we are very limited in review options for the pumps.

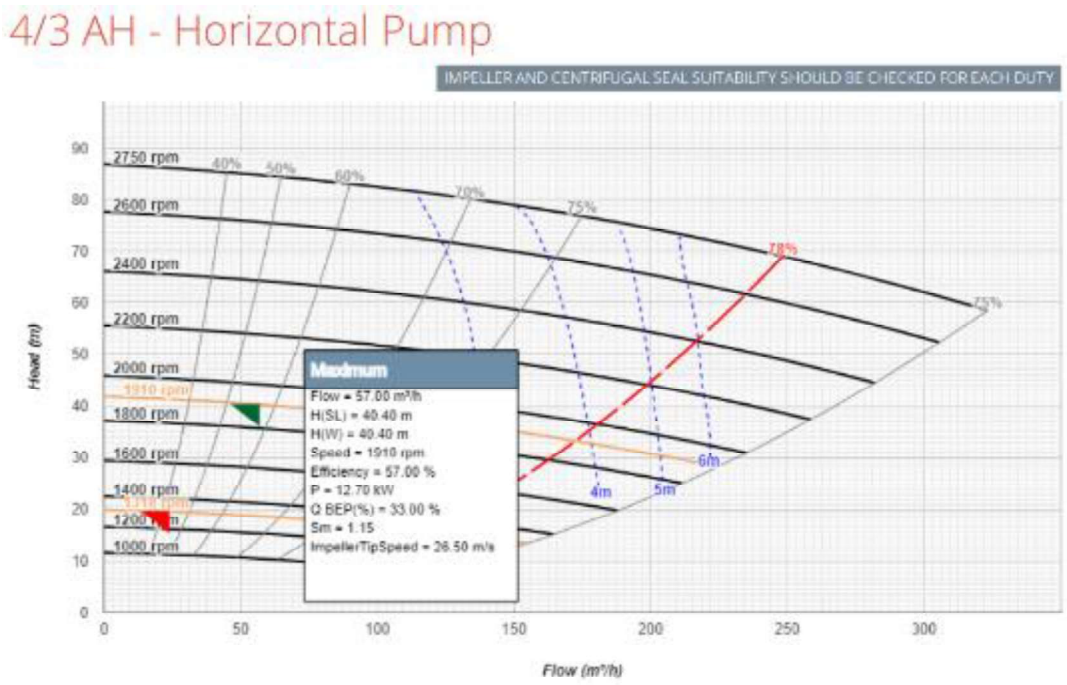


Figure 32: Assumed Operation of PU-008 with 4/3AH

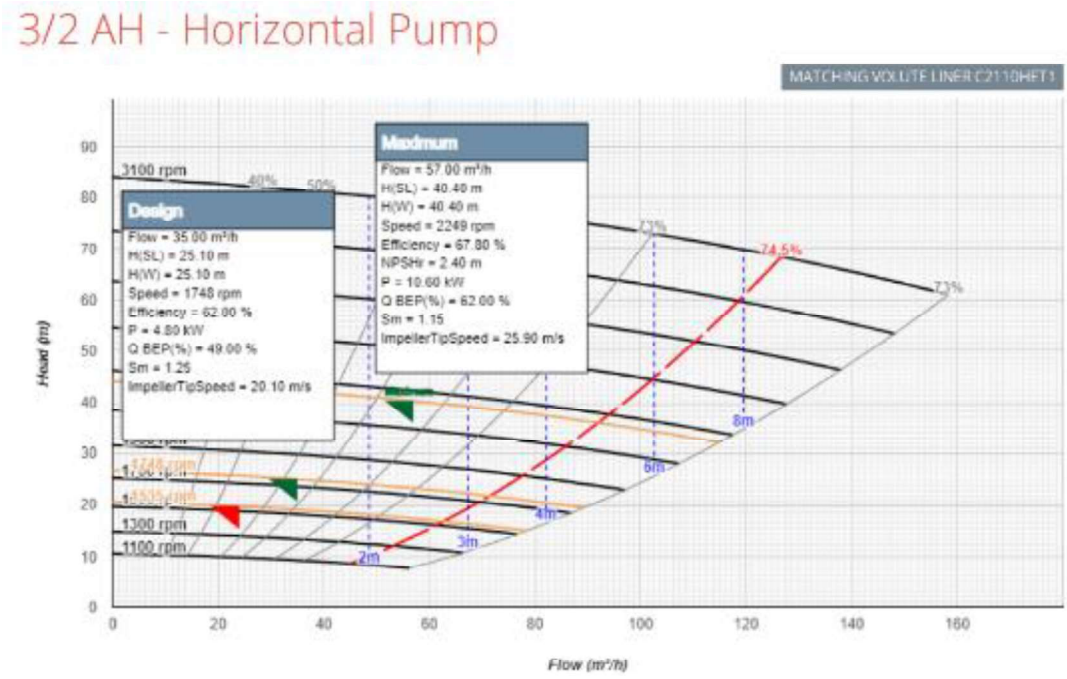


Figure 33: Curve for Smaller Pump in the PU-008 duty (3/2AH)

This situation was apparent for most of the 4/3AH pumps in circuit.

Final Tails Pump (PU-024A)

The sizing of the final tailings pump was reviewed using the same methodology. Sizing parameters and outcomes are shown in Table 4 below.

Table 4: Sizing Parameters (PU-024A)

Parameter	Units	Minimum Flow	Moderate Flow	High Flow
Solids	t/h	54		
Pulp Solids	% w/w	20	15	10
Flowrate	m³/h	235	325	503
Pipeline NB	mm	200 (HDPE)		
Pipe ID	mm	202		
Pipeline velocity	m/s	3.98	5.50	8.51
TDH	mwater	7.9	13.6	30.1
Minimum installed power	kW	10.4	24.9	83.4
Actual installed power	kW	**55**		

Based suction and discharge piping data and lengths, the system curve was calculated (Figure 34).

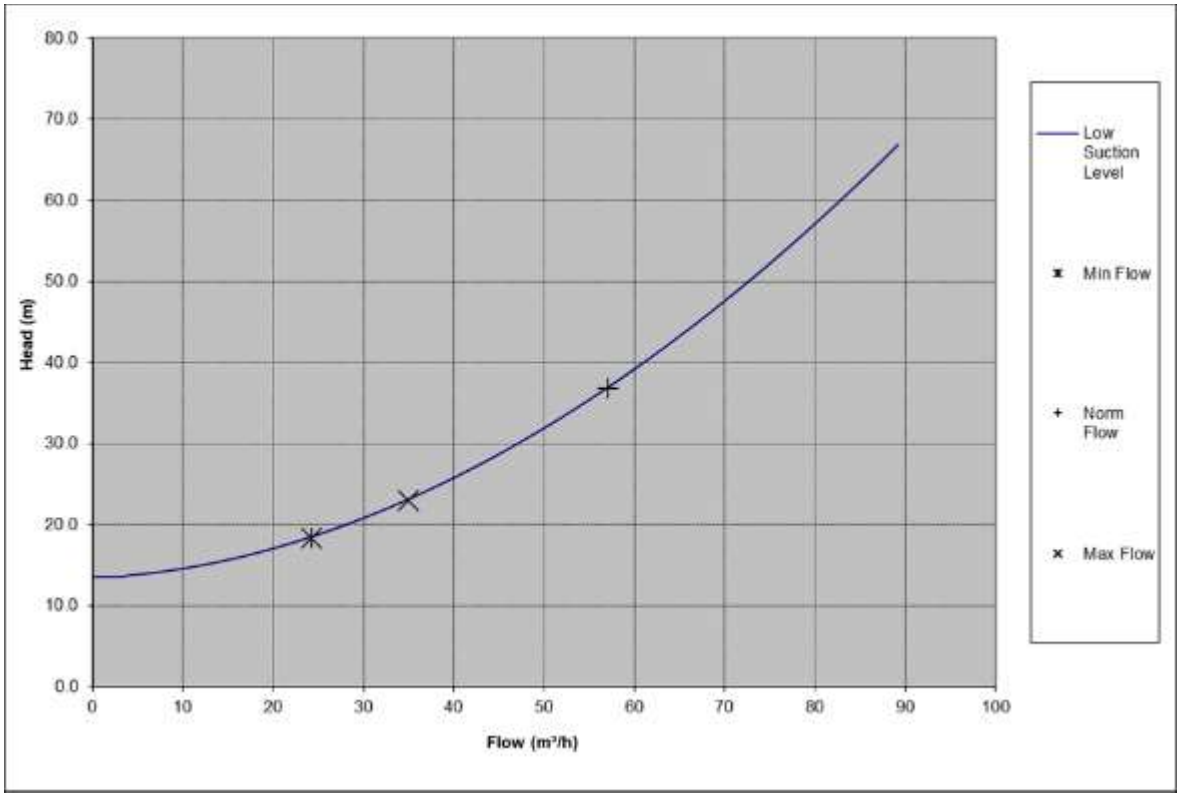


Figure 34: System Curve for PU-024A

The operating points were plotted on the installed 6/4 AH pump curve (Figure 5). Based on motor data supplied, the pump currently operating at 1356 rpm. This would mean that the pump is operating close to or even to far right of the BEP which causes increased wear. For this duty, and the assumed sizing data, the pump looks too small.

Impellor Wear

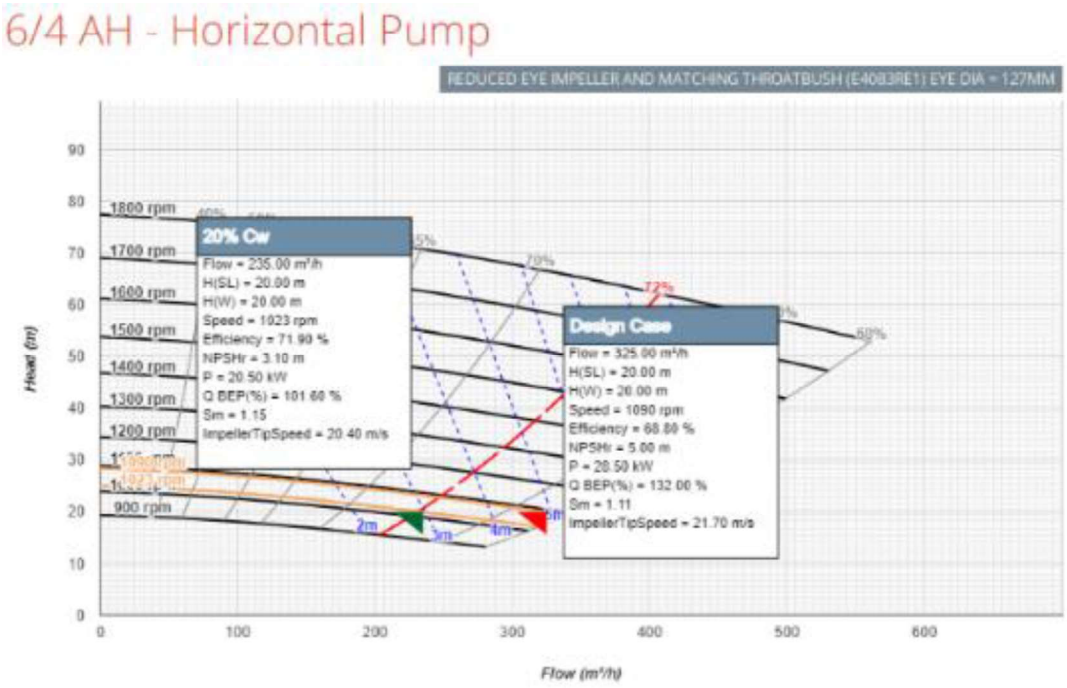


Figure 35: Assumed Operation of PU-024A with 6/4AH

Impellor Wear

The impellor wear (refer Figure 36 for example) was reviewed by Ausenco's pump specialist and they seem to confirm the assumption that the 4/3 pumps are operating in a region of low flow. The photos show that the pumps may be wearing with the eye squaring, which is caused by:

- Large solids
- Low flow operation
- Recirculation at impellor clearance

Typical eye squaring photos are shown in Figure 36.

Figure 36: AH 4/3 Impellor Wear

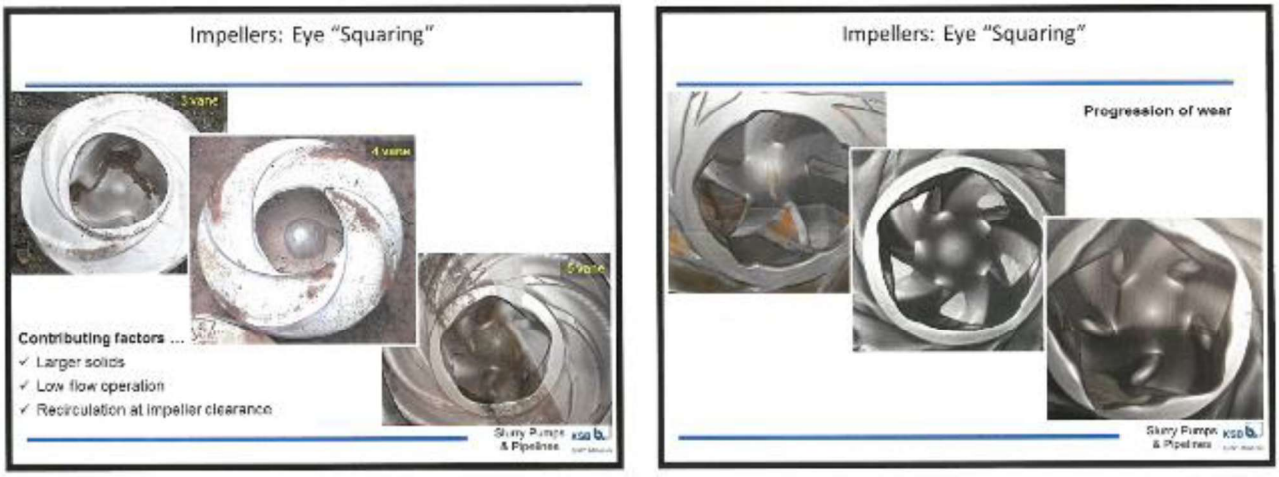


Figure 37: Typical Eye Squaring Wear

Review of a 6/4 AH pump impellor was also reviewed by Ausenco. The wear on this impellor indicates that the pump may be operating with a high suction velocity and causing back shroud blowout (Figure 38). This supports the sizing performed which shows that the pump is undersized for the duty.

PU-003 Mineral Jig OF pump, was also witnessed to be overflowing, indicating that the pump was unable to meet the required flowrate.

Figure 38: AH 6/4 Impellor Wear Photos

Proposed Pump Changes

Based on the investigation described above, Table 5 details the proposed pump change outs required to improve the pump reliability and availability.

Table 5: Proposed Pump Replacements

Equipment No.	Pump Name	Current Model	Proposed Model
PU-002A	Vibrating Screen Sump Pump (Fine)	4/3 AH	3/2 AH
PU-002B	Jig Feed Pump	4/3 AH	3/2 AH
PU-005	Cyclone Pump	4/3 AH	3/2 AH
PU-008	CY-003 Feed Pump	4/3 AH	3/2 AH
PU-009	Cleaner Tables Tails Pump	4/3 AH	3/2 AH
PU-024A	Final Tails Pump	6/4 AH	8/6 AH
PU-003	Mineral Jig OF pump	6/4 AH	8/6 AH

The pumps listed above will be changed out on a progressive basis to ensure there is minimal plant downtime and that the proposed pump size change achieves the desired outcome.

Pump Replacement

Given that the plant performance and availability with the existing pumps is within the targeted performance and availability, the replacement of the pumps identified above is not deemed a critical exercise.

Managed by the operations team, and budgeted through the opex budget, the identified pumps will be replaced progressively as and when required in line with major maintenance requirements for each item respectively.

5.4.2. Rolls Crusher

The existing process plant has a screen and rolls crusher installed after the jigs. Historically, two rolls crushers were installed (this is shown in Figure 39), but currently only a single crusher is installed.

Figure 39: Screen and Rolls Crusher

The screen is fed -2mm material from the jigs and the screen feeds +0.8mm material to the rolls crusher. The sized material is then recirculated back onto the screen.

The rolls crusher is a high wear item given the abrasive nature of the feed and rolls require replacement on a regular basis. To maintain plant availability when 24/7 operations commence, it was recommended to install a second rolls crusher into the circuit (the structure originally accommodated two rolls crushers (as shown in Figure 39), so the second rolls crusher can be installed in that position. The rolls crushers can be used in a duty/standby configuration to minimise downtime on crusher maintenance and repairs. The second rolls crusher will also add throughput capacity for Phase 2, when grade is increased and the duty of the rolls crusher increases.

The proposed flowsheet with the second rolls crusher (in red) is shown in Figure 40

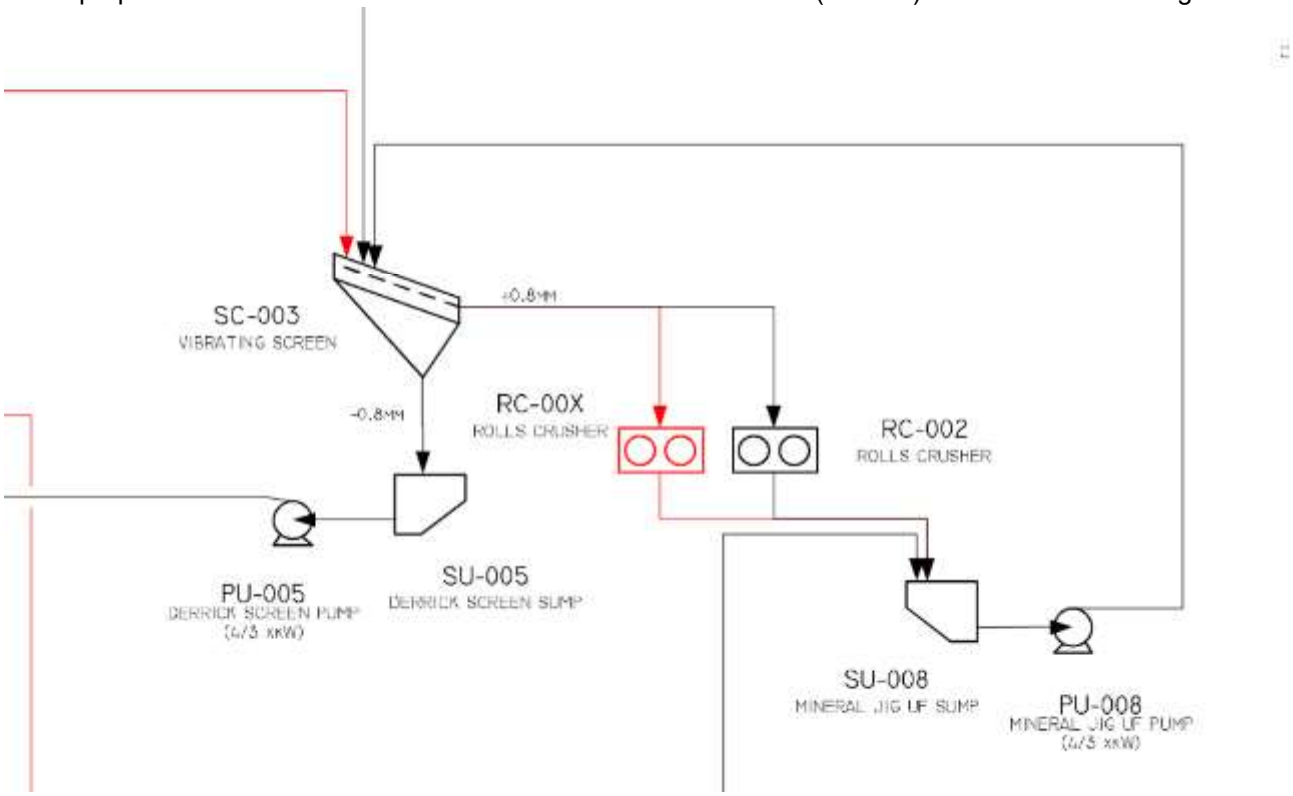


Figure 40: Additional Rolls Crusher in Flowsheet

Given that the structure already accommodates the second rolls crusher, minimal modifications are required to allow it to be installed into the circuit.

EQR has already purchased the rolls crusher and has it in stock. The costs associated with this item are for its installation only.

5.4.3. Control Room and SCADA Replacement

The existing Supervisory Control and Data Acquisition (SCADA) system at the process plant is aged and many existing components have been discontinued. To facilitate smooth ongoing operations through access to suitable parts as required, as well as allowing for future expansion activities for the gravity processing plant, the SCADA system will be replaced and installed in a new control room located adjacent to the gravity processing plant.

Haz-Elec is an electrical and controls contractor based in Cairns that was engaged to provide a lump sum quote for the supply and installation of the SCADA replacement system.

The scope for the SCADA replacements includes the works associated with the supply, installation and commissioning of:

Processor Replacement

- Replacement of existing processor
- 2Mb memory, 32 Ethernet/IP ports (max)
- Supports up to 16 local modules (in two banks)
- Firmware installed into processor with converted program installed

Panelview Plus 7 Graphics Terminal System

- 12” touch screen similar to existing touch screen with a wider format.

- Overall dimensions at front 340(w) x 246 (h)
- Panel cutout dimensions 312(w) x 218(h)
- 240VAC/24VDC72W power supply for installation into existing Panelview enclosure.
- Firmware installed on Panelview and existing SCADA program modified for new format and installed ready for exchange

SCADA System Installed in Control Room

- 30" monitor with rear mounted NUC, Windows Pro, SSD
- Perpetual visualisation license for up to 30 screens
- Transfer of existing Panelview layout into larger SCADA form and adjustments

The control room will be a stand-alone 6m x 3m demountable and relocatable Atco office structure. A similar building has recently been procured and installed by EQR to serve as the gravity processing plant office. The control room will be delivered to site whole with the internal fit out complete.

The proposed location for the control room is shown in Figure 41 and typical example of the control room is shown in Figure 42.

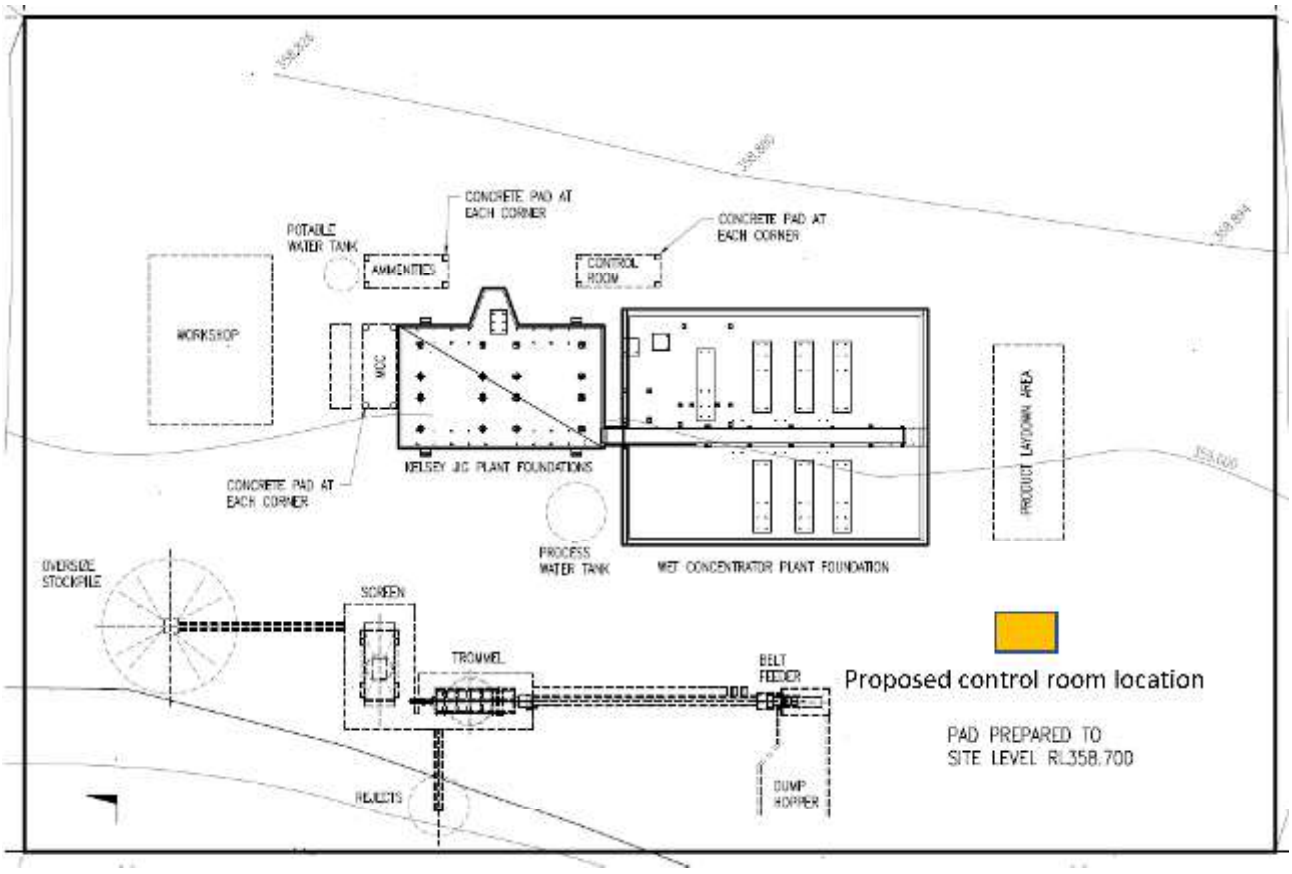


Figure 41: Proposed Control Room Location

Figure 42: Example Control Room Building

6. Gravity Processing Plant Phase 2

6.1. Processing Strategy

The processing strategy for Phase 2 is to maintain the current process plant configuration as much as possible to maintain the current performance.

The plant feed material for Phase 2 will have an increased head grade as a result of the high grade ore being introduced from the commencement of open pit mining.

The mining operations will introduce a blending strategy between open pit and LGS ore to achieve a nominal head grade of 0.5% WO_3.

To support the higher head grade, a scavenging circuit will be introduced to 62ummariz potential losses from the jig circuit. Additional tables will be included to account for the increased WO_3 grade in the feed.

Additionally, to meet product specifications and introduce potential additional markets, the a flotation cell will be introduced to remove arsenopyrite from the concentrate (near density to scheelite) and the concentrate shall be separated into wolframite and scheelite products.

6.2. Run of Mine Characteristics

The process plant will be fed from multiple streams:

- -6mm material will primarily be slurry fed onto the vibrating screen SC-002
- -6mm material may also be dewatered and fed directly onto the plant feed conveyor
- Ore sorter concentrate will be sized to -6mm and fed into sump SU-008 which will be sized to -2mm through the rolls crushers and fed into the tables circuit. Feeding the high grade ore sorter concentrate to the tables has been designed to 62ummariz the potential recovery losses that could occur through the jig circuit.

The metallurgical characterization of the process plant feed material is detailed in Chapter 3: Geology and Resources.

6.3. Operational Review

Ausenco attended the Mt Carbine site on two occasions. The first visit was in May 2021, where preliminary review of operating data and circuit configuration was conducted. Following the site visit several recommendations were made to improve the reliability and recovery of the operation and to collect data to confirm the tungsten losses and flowrates through the circuit.

A second site visit was performed at the beginning of September to further review the operation and to perform a plant sample campaign to confirm the operating parameters and performance for the plant. Two plant surveys were performed by Ausenco personnel during the visit to provide a snapshot of operational performance and to form the basis of engineering work.

6.3.1. Review of Site Operating Data

Initial review of the site operating data showed that the Mt Carbine plant had an average tungsten shift recovery of approximately 47% between January and May 2021 producing a concentrate grade of 49% WO_3 during the same period.

Analysis of the operating and shift samples showed that the key issue in the plant recovery was in the jigging circuit, associated with high losses from lower grade material. This data is shown in Figure 43.

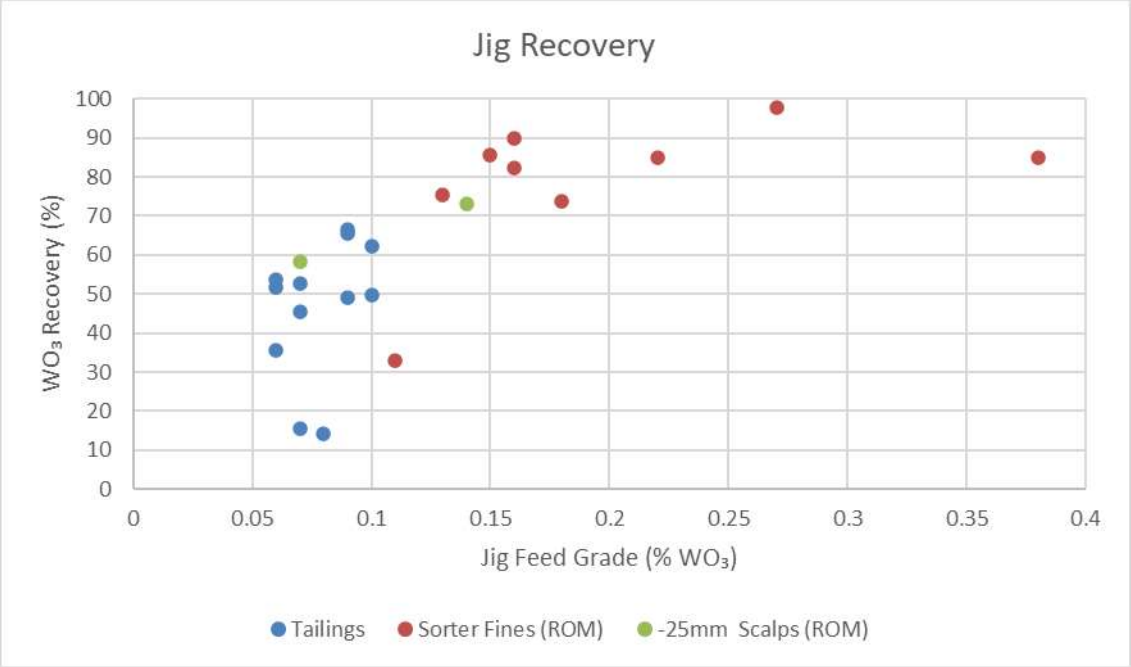


Figure 43: Jig Recovery vs Feed Grade by Feed Type

Low grade material losses were typically at each end of size range processed, typically decreasing outside of the 1 – 4 mm range as shown in Figure 44.

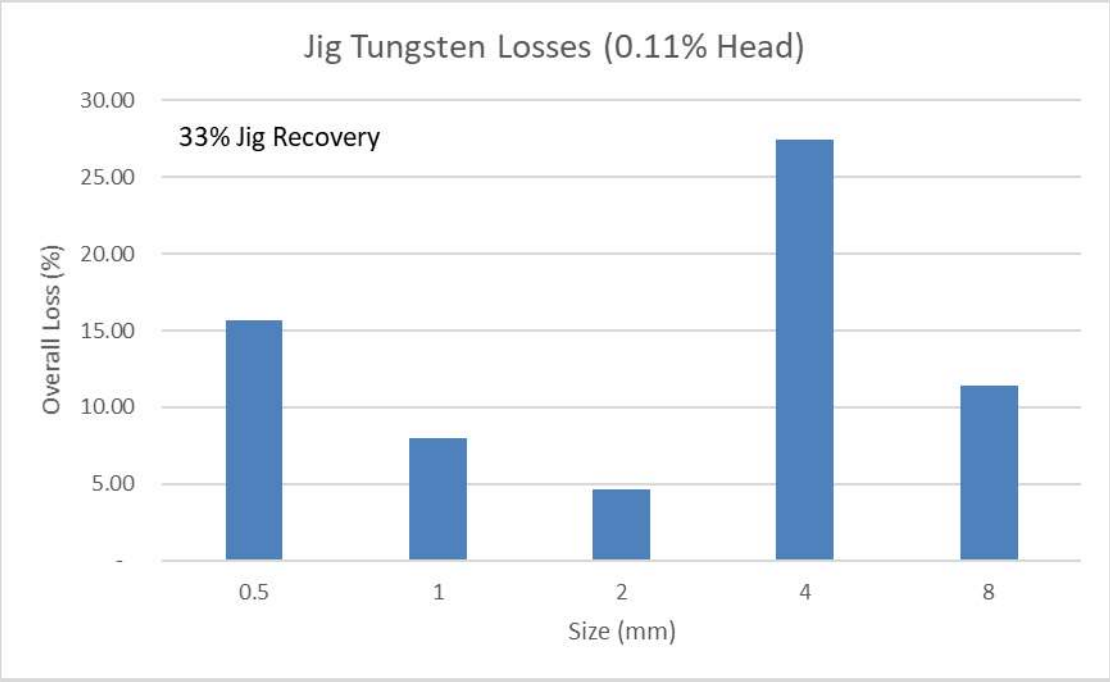


Figure 44: Jig Losses by Size for a Low Tungsten Tailings Feed

Losses in the tabling circuit were low, with overall table circuit recovery of +95% tungsten being achieved. It was thought that possibly tungsten was being lost prior to the tables circuit in the dewatering cyclone overflow, due to excessive generation of fines in the table feed crushing stage.

Due to the lack of coherent data across the circuit a site survey was planned to identify the true sources of tungsten loss in the circuit and to provide reference solids and water balances to design upgrades to the treatment route.

A subsequent review of overall plant recovery by ore feed showed two distinct periods of performance. Since the decision not to retreat tailings was made, plant recovery has increased and the range of performance outcomes has also increased.

Based on the data below recoveries on 'fresh' ore are ~25% higher than those with tailings mixed, averaging 85% WO_3 recovery vs 60%. The goal of the upgrades is to consistently produce above 80% recovery from the plant through scavenging the jig tailings and increasing the capacity of the table recovery circuit. This is clearly shown in Figure 45.

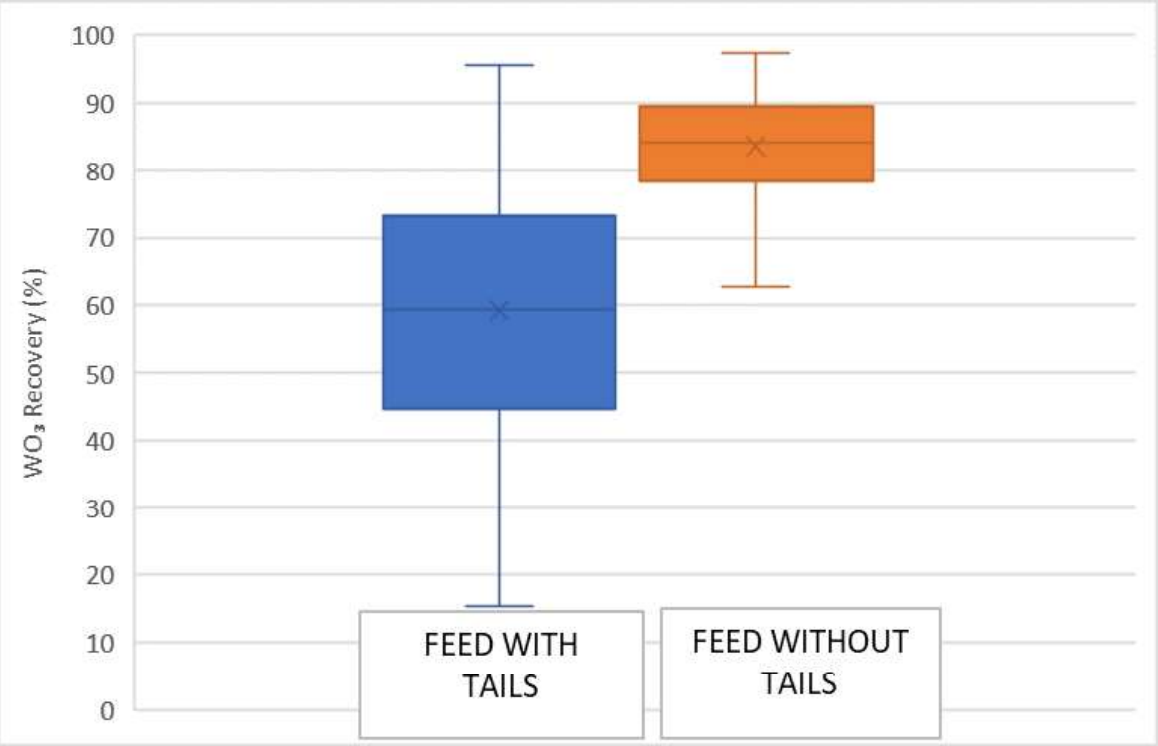


Figure 45: Plant Recovery Comparison with Tails and without Tails

6.3.2. Site Surveys

Two plant site surveys were conducted to gather data about plant operating conditions and to determine the losses by size for the two different ore types being fed to the plant. The first survey was conducted on -8 mm ore, and the second was conducted on 'high grade' (HG) ore.

The data from the surveys were entered into JKSimmet and reconciliation was performed on the assay by size data for the circuit. Due to inconsistencies in the assays by size data for the HG ore sample, reconciliation was not performed by size. The output of the reconciliation was used to develop the design criteria and the mass balance for the circuit upgrades.

High level results summary for the two surveys are shown in Table 6.

Table 6: Key Results from Site Surveys

Area	Units	-8mm Ore	High Grade (HG)
Plant Feed	t/h	48.9	42.4
Feed Grade	% WO_3	0.138	0.153
Screen 002			
Oversize	t/h	12.9	6.76
Undersize and Midsize	t/h	35.9	35.7

Area	Units	-8mm Ore	High Grade (HG)
Jig 001/002			
Mass Recovery	%	14.3	15.5
Tungsten Recovery	%	83.0	73.6
Rougher Tables			
Mass Recovery	%	6.17	2.04
Tungsten Recovery	%	97.9	78.7
Concentrate Grade	% WO_3	23.4	32.1
Cleaner Table			
Mass Recovery	%	39.4	57.9
Tungsten Recovery	%	73.4	97.4
Concentrate Grade	%	43.6	54.0
Overall			
Mass Recovery	%	0.231	0.166
Tungsten Recovery	%	73.0	58.8
Jig Feed to Product Recovery			
Mass Recovery	%	0.31	0.20
Tungsten Recovery	%	82.6	69.8

Note: Overall recovery of plant feed, assumes SC-002 oversize is sent to tailings and not reprocessed

6.3.3. Jig Recovery

Losses of tungsten from the -8mm ore was similar to the results recorded during the initial site visit with lower recovery in the +4mm material (64.8%). There was no recovery of the +4mm material for the HG ore which may explain the lower jig recovery (Table 7). Recovery of fines was higher than expected in the 8mm sample (76.2%) however there is room for additional recovery in the fine fraction.

Table 7: Jig Recovery by Size

Size (mm)	-8mm		HG Ore	
	Mass Recovery (%)	Tungsten Recovery (%)	Mass Recovery (%)	Tungsten Recovery (%)
8	0		0	*
+4	1.3	64.8	0.0	*
+2	3.2	80.5	3.2	*
+1	10.2	93.1	4.4	*
+0.5	21.4	88.4	26.6	*
+0	27.2	76.2	12.1	*
Overall	**14.3**	**83.0**	**15.5**	**73.6**

6.3.4. Table Recovery

Recovery by size data for the rougher table showed that although good recovery was achieved in coarse fraction (+1mm), this was the major loss in the cleaner table (Table 8). This material was much lower grade and would benefit from further liberation prior to cleaning. This material is currently returned to the rolls crusher prior to the rougher tables.

Table 8: Jig Recovery by Size

Size (mm)	Rougher		Cleaner		
	Mass Recovery (%)	Tungsten Recovery (%)	Mass Recovery (%)	Tungsten Recovery (%)	Tungsten Grade (% WO_3)
+1	12.1	98.4	15.4	20.5	26.8
+0.5	4.6	97.5	42.2	100	36.9
+0	6.8	97.9	40.0	70.0	47.0
Overall	**6.2**	**97.9**	**39.4**	**73.4**	**43.6**

6.4. Test Work

Test work described below was conducted by EQR and the outcomes reviewed and incorporated into the Phase 2 process design by Ausenco.

6.4.1. Spirals

Spirals test work had previously been conducted by Mineral Technologies, on behalf of EQR. Two samples representing a low-grade fines and coarse tailings sample was sent to Mineral Technologies in September and November 2020.

The samples were processed through a series of closed-circuit release tests which were conducted at a single feed loading (~2t/h at 30- 40% solids). Each of the samples was sized and head assays taken (Table 9).

Table 9: Spirals Feed Samples Sizing and Head Assays

Size (µm)	Coarse Tailings	Low Grade Fines
1400	100	100
1000	97.6	98.9
710	65.6	89.7
500	34.7	77.8
300	12.8	62.5
150	3.5	45.4
75	1.3	32.3
38	0.5	23.9
20	No results	19.1
-20	0	0
P_{50} (µm)	588	179
WO_3 Head Grade	0.14	0.41

Results from each of the samples showed that optimum recovery was achieved at 9-12% mass to concentrate. At optimum mass recovery, tungsten recovery from the coarse tailings and low-grade fines samples was 80%and 70% respectively. This is shown in Figure 46.

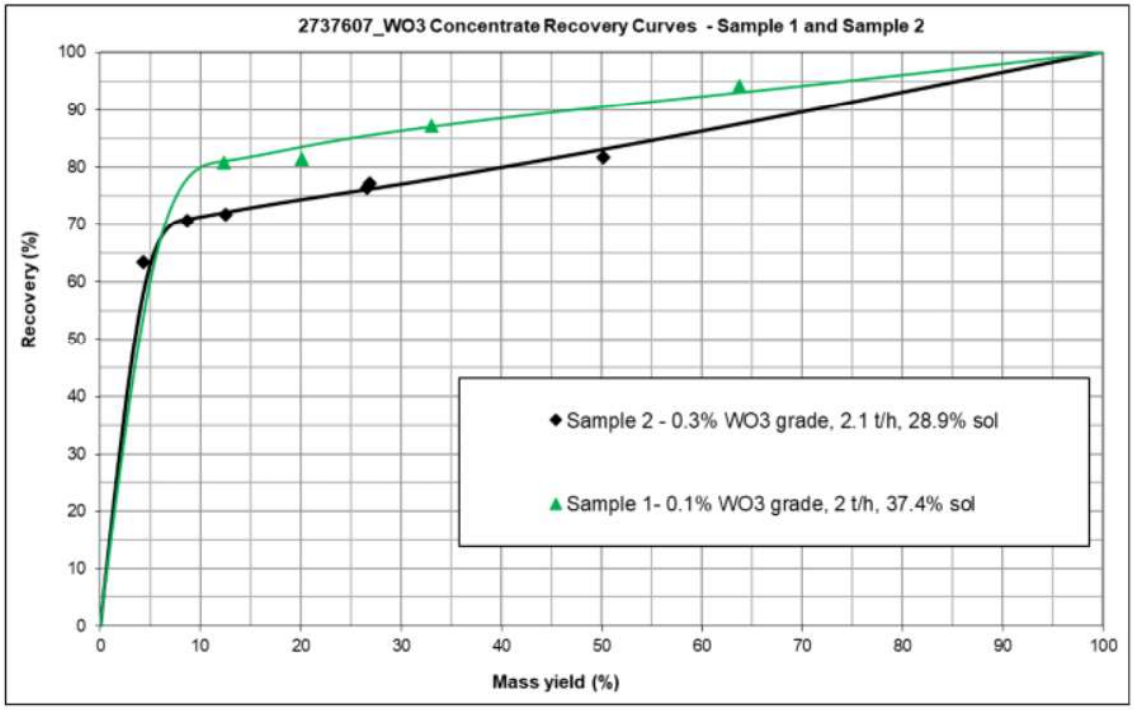


Figure 46: Mass vs Tungsten Recovery for Coarse Tailings (Sample 1) and Low Grade Fines (Sample 2)

Assays were also taken by size for the spirals tailings. Both sets of tailings assay results indicated that below 75 µm the spirals were not effective in recovering tungsten (Table 10).

Table 10: Jig Assay by Size of Tailings for the Spirals Tests

Size (µm)	Coarse Tailings			Low Grade Fines		
	%wt	Grade % WO_3	Dist % WO_3	%wt	Grade % WO_3	Dist % WO_3
710	36.7	0.03	43.4	14.2	0.03	3.6
500	33.8	0.03	30.3	1.7	0.02	3.3
300	21.8	0.02	14.8	18.6	0.02	3.4
150	6.2	0.02	3.7	14.8	0.02	2.7
75	0.7	0.01	0.3	8.6	0.03	2.2
38	No results			6.2	0.19	10.6
20	0.5	0.08	1.4	3	0.47	12.8
-20	0.3	0.55	5.9	17.9	0.38	61.4

6.4.2. Arsenic Removal and Product Separation

Flotation, electrostatic and electromagnetic separation were conducted to determine whether arsenic could be removed from the product. Another goal from this test work was to see if the wolframite could be separated

from the scheelite to produce a separate wolframite concentrate which could be used for ferrotungsten production.

Flotation

Flotation was conducted on a final concentrate sample to determine the tungsten losses of a sulphide flotation stage.

Two separate tests were conducted at different grind sizes to determine if arsenic could be separated from tungsten and the results are summarised in Table 11 and the flowsheet is shown in Figure 47.

Table 11: Summary of Results from Arsenic Removal Flotation Tests

Parameter	Units	Test 1	Test 2
Feed Grade			
Tungsten	% WO_3	55.3	54.7
Arsenic	% As	2.62	2.28
Sulphur	% S	2.15	1.99
Primary Grind	µm	75	100
Rougher			
Residence Time	min	8	12
Tungsten Loss	%	2.4	3.5
Arsenic Recovery	%	88	92.6
PAX Addition	g/t	100	130
Cleaner			
Regrind	µm	na	45
Residence Time	min		18
Tungsten Loss	%		0.55
Arsenic Recovery	%		75.6
PAX Addition	g/t		20

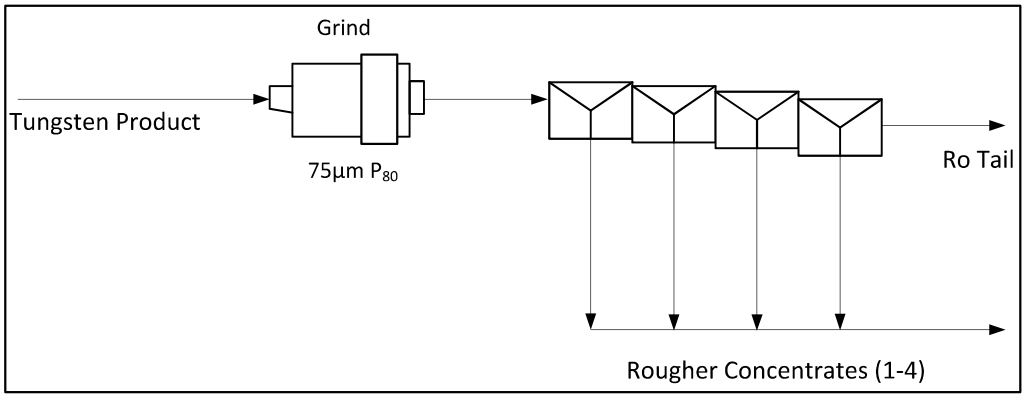


Figure 47: Rougher Flotation Test Flowsheet

Between the two tests, rougher results arsenic recovery and tungsten losses were similar (Figure 48). Given the similar results, the 100 µm concentrate was chosen for design.

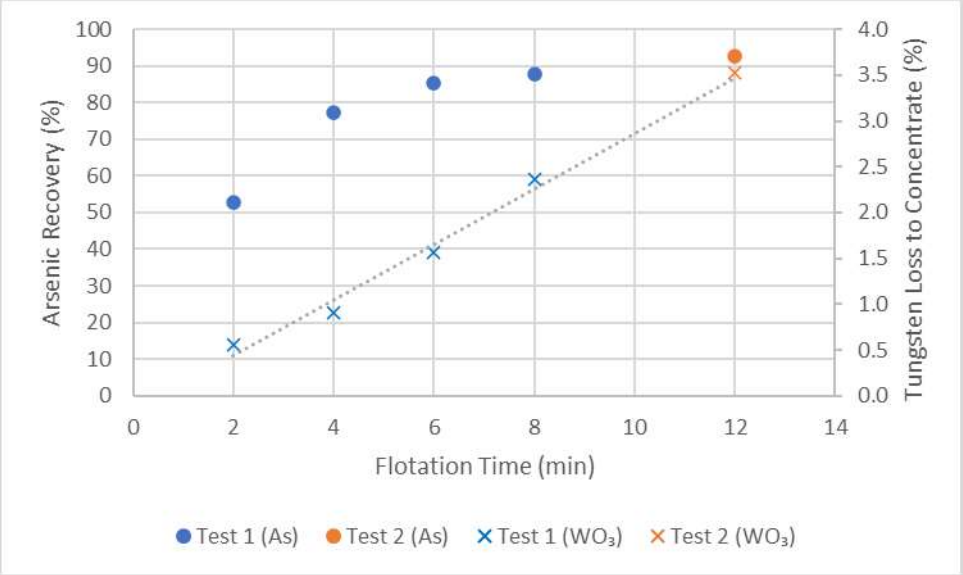


Figure 48: Arsenic and Tungsten Recovery for Test 1 (75 µm) and Test 2 (100 µm)

A Cleaner test was performed on the concentrate from the 100 µm rougher concentrate. The rougher concentrate from Test 2 was reground top a P80 of 45 µm and subjected to cleaner flotation as shown in Figure 49.

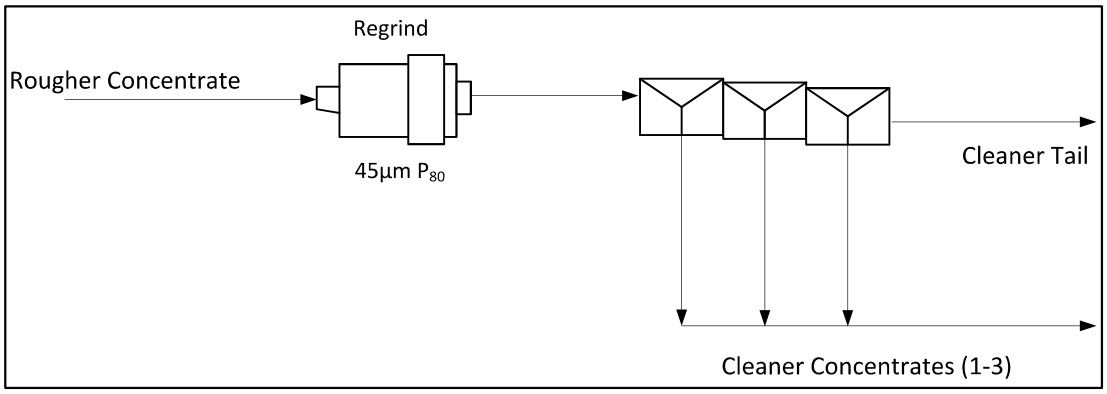


Figure 49: Cleaner Flotation Test Flowsheet

The regrind and cleaning test showed that the tungsten losses could be decreased in a single stage of cleaning (Figure 50). Arsenic recovery in the cleaner stage however was much lower and needs to be further optimised to meet final concentrate arsenic specifications.

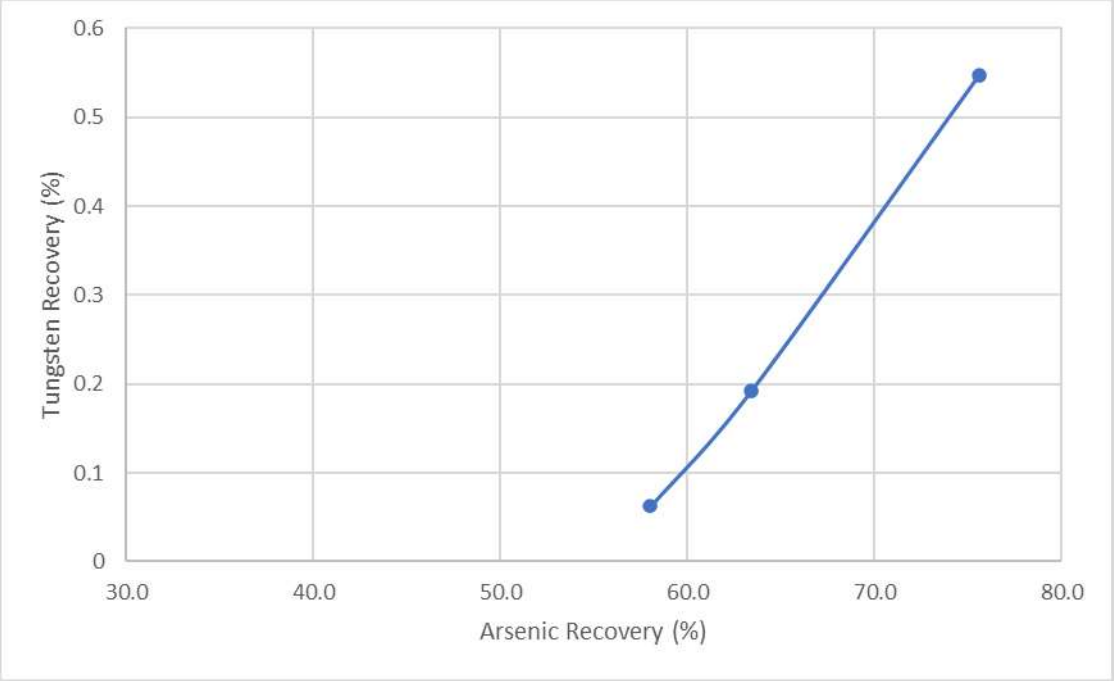


Figure 50: Cleaner Tungsten vs Arsenic Recovery to Cleaner Concentrate

Following cleaning, the rougher concentrate had reduced from 19.7% WO_3 to 5.35% WO_3 which accounted for 0.55% of the tungsten in the product. Further test work is required to determine whether lower arsenic grades and higher recovery can be achieved without substantial tungsten losses.

3.2.2 Magnetic and Electrostatic Separation

The possibility of separating the final tungsten product to a wolframite and scheelite concentrate was investigated using electrostatic and magnetic separation. It was thought that it may also be possible to reduce the amount of arsenic in the wolframite concentrate allowing a smaller mass of scheelite to treated via flotation for arsenic removal.

Results from the magnetic separation test work are summarised in Table 12.

Table 12: Magnetic Separation Sighter Test Results

Test	Recovery to Magnetics			Recovery to Mids			Recovery to Non-Magnetics		
	Mass (%)	Tungsten (%)	Arsenic (%)	Mass (%)	Tungsten (%)	Arsenic (%)	Mass (%)	Tungsten (%)	Arsenic (%)
LIMS	1.79	0.9	0.3				98.2	99.1	99.5
150mm RER	46.3	64.4	7.6	11.2	20.8	6.3	42.5	38.4	86.1
300mm RER	62.9	75.3	19.1	6.6	4.1	7.2	30.5	20.7	73.7
600mm RER	6.99	10.1	1.2	42.0	51.5	12.6	51.0	38.3	86.2

The magnetic separation test work found that the low intensity magnetic separator (LIMS) worked well to produce an iron rich magnetic concentrate with minimal loss of tungsten to magnetics.

The high intensity rare earth rolls (RER) enacted a decent separation between the scheelite and wolframite minerals, with the smaller rolls producing better separation of the arsenic minerals to the non-magnetics.

Review of the QEMSCAN data for the samples showed that all wolframite reports to the magnetics with 50% of the scheelite, giving a wolframite product with 72% of its contained WO_3 being wolframite and 27% being Scheelite. The wolframite product contained ~0.6% As of which 40% was non-liberated.

The electrostatic separators showed similar results to the magnetic separators for tungsten and overall mass recover, however the arsenic followed the scheelite to the conductive material (Table 8).

Table 13: Electrostatic Separation Sighter Test Results

Test	Recovery to Conductives			Recovery to Mids			Recovery to Non-Conductives		
	Mass (%)	Tungsten (%)	Arsenic (%)	Mass (%)	Tungsten (%)	Arsenic (%)	Mass (%)	Tungsten (%)	Arsenic (%)
T202	52.2	77.0	93.9	6.8	5.3	1.4	41.0	17.6	4.7

Electrostatic separation prior to magnetic separation using a 3 pass 150 mm RER was assessed to determine whether a combined circuit would produce acceptable results (Figure 51).

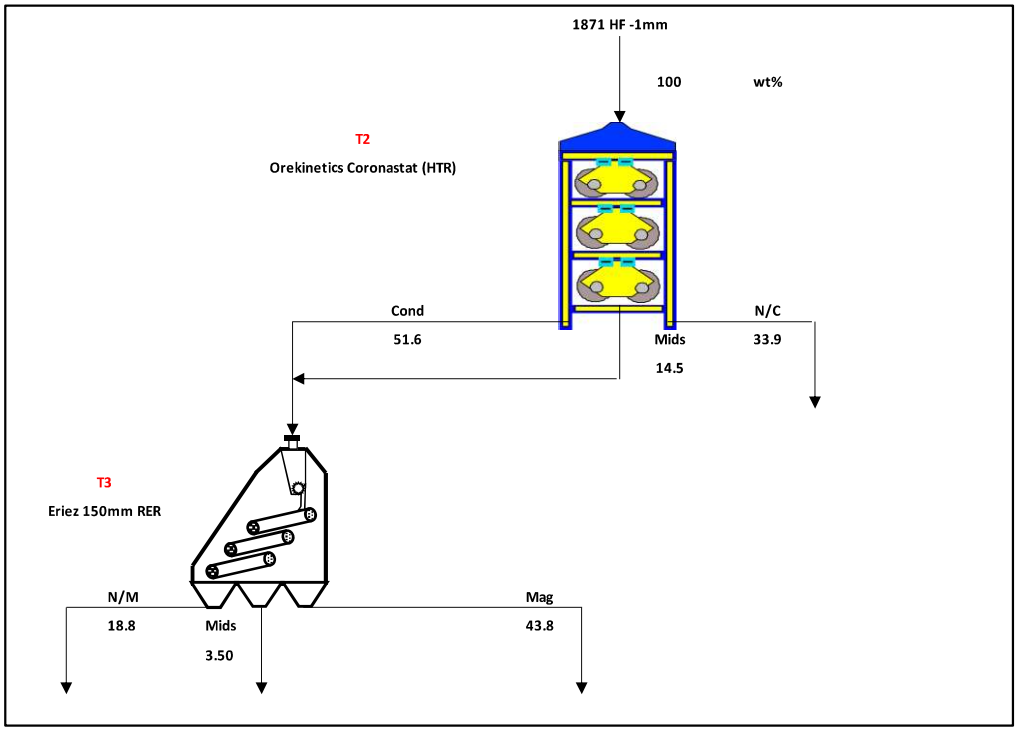


Figure 51: Combined Electrostatic and Magnetic Separation Test Flowsheet

It was unknown how the separate portions were to be treated, with tungsten split across the non-conductive (13.8%) and non-magnetics (15.6%) and arsenic not following a single stream split mainly between non-magnetics (72.2%) and magnetics (18.2%) (Figure 52). These streams would both need to be further treated to reduce the arsenic grades.

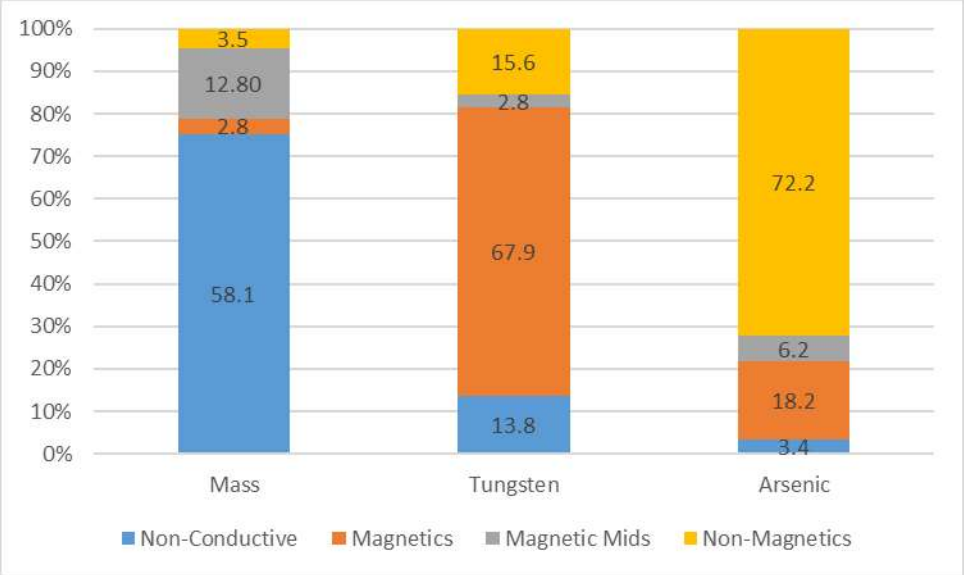


Figure 52: Mass, Tungsten and Arsenic Deportment Between Magnetic and Electrostatic separation

6.5. Process Design

6.5.1. Overview

Upgrades to the circuit have been developed based on an incremental and modular approach to design, with the additional facilities targeting the areas of major losses from the existing circuit. Where possible, changes to existing equipment have been minimised to reduce interruption to the existing operation, however due to capacity constraints upgrades to some equipment and pumps are required.

The basis for design (Table 14) for the process plant is summarised below:

- Plant nominal capacity of 60 t/h treating ore with a feed size of P95 -6mm
- Capacity to treat ore with feed grades into the front end of the circuit (jigs) of up to 0.5% WO_3
- Capacity to treat 16 t/h of ore sorter product at 0.85% WO_3 into the table circuit, with the balance of feed from the jigging circuit.
- Operate at average tungsten recovery of 79.5% from ROM feed to the Jig,
- Design flexibility to process 16 t/h of ore sorter product direct to the table circuit. Under this case, the circuit has been designed for 92% overall recovery which represents the maximum for design case.

Table 14: Design Basis

Criteria	Units	Design
Plant Throughput	t/h	60
Feed Size (P95)	mm	6
Design Feed Grade	% WO_3	0.5
Overall Recovery (nominal)	%	79.5
Overall Recovery (max for design for table circuit)	%	92%

6.5.2. Flowsheet Development

Recovery improvements to the current circuit have been assessed based on the following areas and have been guided by operating experience at the site, data analysis of losses from survey and benchmark data from other tungsten operations.

The main strategy to improve recovery through the circuit is based in increasing current jig capacity to reduce increase jig residence time. Review of the operating parameters and flow through the jigs highlighted that losses in the coarse fraction are most likely due to the low residence time in the jig and also due to the interstitial void of the ragging used.

As an additional means of recovery improvement, the two jigs will treat different size fractions (coarse and fine) which allows individual operating parameters and ragging to be optimised for each size fraction.

In addition to recovery improvements, equipment was checked for capacity constraints. At higher head grades, the table circuit will become overloaded and require additional table to remain within design loading rates.

Finally flowsheet modifications were driven by the future ore from the pit having elevated arsenic which necessitates removal for sale. As part of the arsenic removal circuit there is the opportunity to produce a separate wolframite product for production of ferrotungsten.

- Arsenic removal
- Drying and product separation

This section should be read in conjunction with the following documents:

- Process design criteria (105969-RX-DC-0001) Appendix C
- Overall block flow diagram (105969-0000-F-001) Appendix D
- Process flow diagrams (105969-0000-F-002 to 023) Appendix E
- Mass balance (105969-RX-MB-0001) Appendix F
- Mechanical equipment list (105969-LST-001) Appendix G
- Process Plant Layout (105969-2000-G-001) Appendix H

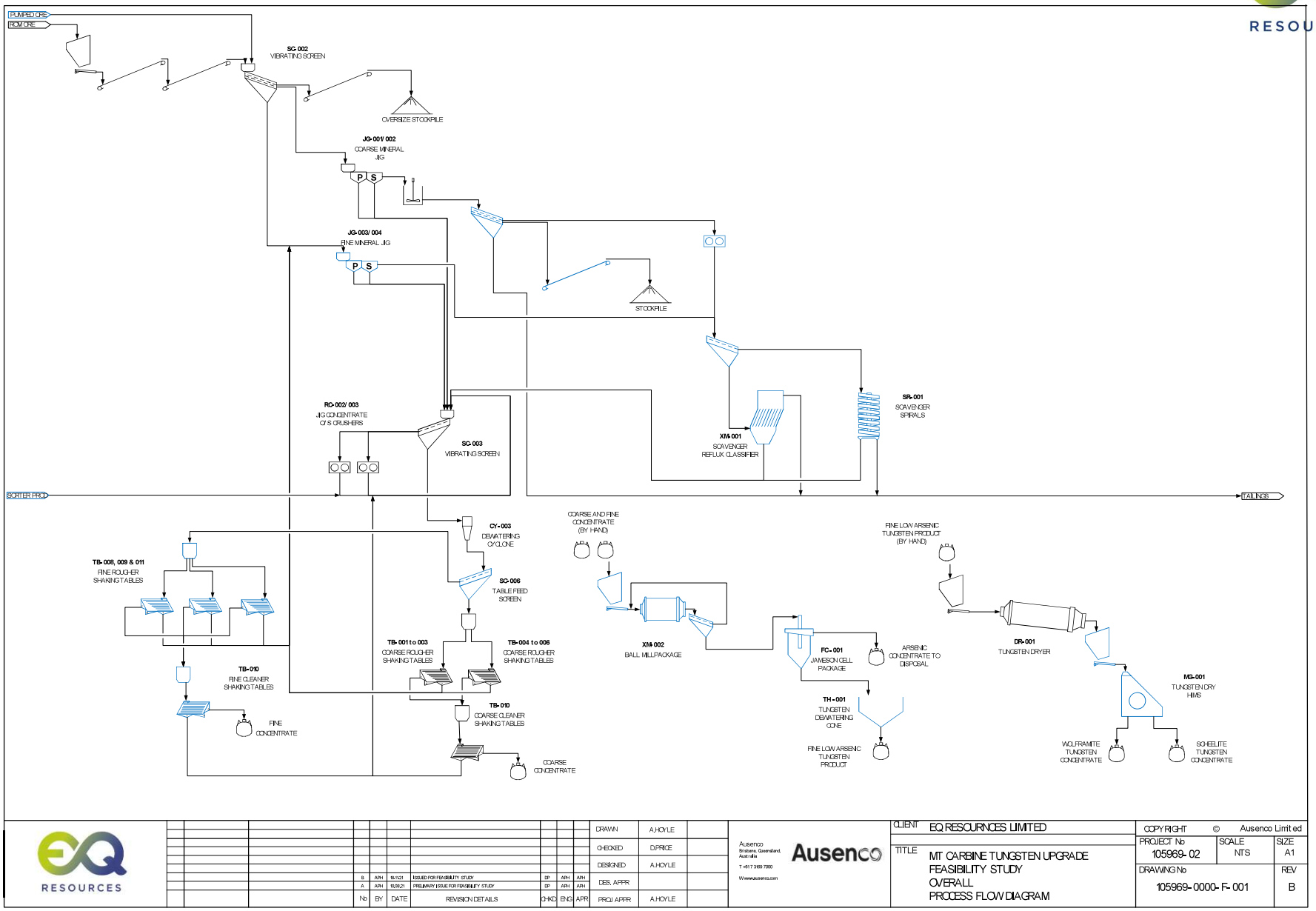


Figure 53: Overall Circuit Block Flow Diagram

Process Design Criteria

The process design criteria (PDC), detailed in Appendix C, was developed based on review of completed test work to date, and plant survey information as described in Section 6.3, as well as benchmarked data from similar operations. Where gaps remained in the test work, benchmark data was used until confirmatory test work is performed.

6.5.3. Plant Feed

Ore fed to the plant will be reduced from the current P95 of 8 mm to P95 of 6 mm to assess performance of the circuit at the new feed size. The tungsten deportation was also reduced according to the currently recorded deportation. Size distributions used as the basis for the plant design are shown in Figure 54 below.

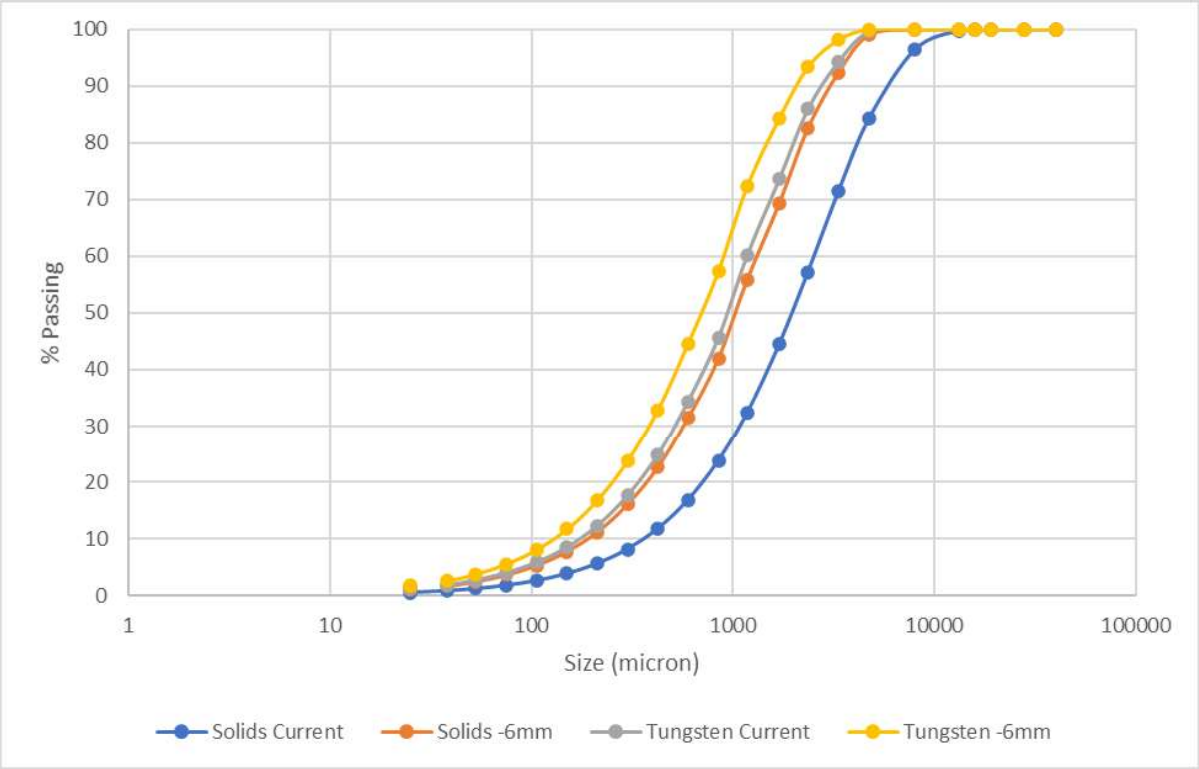


Figure 54: Plant Size and Tungsten Deportation

6.5.4. SC-002 Jig Feed Screen

The Jig Feed Screen (SC-002) will receive ore either from the existing feed conveyor system or from a new pipeline which is being designed by others. The screen will operate as per existing design scalping +6 mm oversize material from the top deck and delivering it to an oversize stockpile.

The undersize from the top deck will be separated into a 2-6 mm and 0-2 mm products on the bottom deck which will be pumped to the coarse and fine jigs.

6.5.5. Jig Duplication

Coarse Jig

The coarse jig will receive the 2-6 mm product from the jig feed screen and separate it into product for further processing with the overflow also being scavenged in subsequent stages. The recovery of the coarse jig has been based on existing performance of the coarse fractions through the jig. It is anticipated that jig performance will improve with higher residence time leading to more stable recovery through the circuit.

Table 15: Coarse Jig Design Basis

Criteria	Units	Design
Feed Rate	t/h	19.7
Feed Size	mm	4-6
Jig Type		Russell Jig Model J2/70 HT
Mass Recovery	% WO_3	5.97
Tungsten Recovery	%	87.2

Fine Jig

The fine jig will receive the 0-2mm product from the jig feed screen and separate it into product for further processing. Due to the higher liberation of the fine material the tailings from the circuit will be passed directly to the scavenging circuit without any feed preparation.

The recovery of the fine jig has been based on existing performance of the fine fractions through the jig. It is anticipated that jig performance will improve with higher residence time leading to more stable recovery through the circuit.

Table 16: Fine Jig Design Basis

Criteria	Units	Design
Feed Rate	t/h	40.3
Feed Size	mm	0-2
Jig Type		Russell Jig Model J2/70 HT
Mass Recovery	% WO_3	19.7
Tungsten Recovery	%	82.5

6.5.6. Jig Scavenging Circuit

Jig scavenging has been designed to recover the coarse and fine jig losses from the circuit which have been consistently shown in operating and survey data.

Crushing

The coarse jig overflow is passed over a coarse separation screen which scalps the +4 mm material from the jig tailings. This material is crushed in a roll crusher to P100 of nominally 2 mm. The crushed coarse rejects is combined with the fine rejects and pumped to the scavenging circuit. There is option to stack the 2-4mm rejects from the screen.

Scavenging

The scavenging circuit consists of a feed screen which separates the scavenger feed into two size fractions which are treated through a spiral circuit (coarse) and through a reflux classifier (fines).

Feed to the two circuit will need to be balanced to maximise feed to the reflux classifier, which will be refurbished and tested by EQR prior to installation of the new circuit.

Conservative mass and tungsten recovery have been used to design the scavenging circuit to allow for inefficient operation of both units to maximise recovery.

Table 17: Scavenging Circuit Design Basis

Criteria	Units	Reflux Classifier	Spirals
Feed Rate	t/h	20.7	37.6
Feed Size	mm	-0.5	+0.5
Type		M1000	
Mass Recovery	% WO_3	30	30
Tungsten Recovery	%	65	65

Table Feed Preparation

The table feed preparation circuit has a screen operating in closed circuit with a rolls crusher to reduce the feed size to the table circuit to P_{100} of 1 mm.

In the upgraded circuit SC-003 will require upgrading to treat the additional mass from the higher throughput from the scavenging circuit. In addition to the reinstallation of the crusher as part of the Phase 1 scope.

6.5.7. Table Duplication

To improve separation of the table circuit and allow efficient grade recovery and separation of fine and coarse particles at the higher feed rates the table circuit will be duplicated. To allow duplication of the circuit, a feed screen will be installed prior to the existing circuit. The screen aperture will be optimised in practice to ensure each table circuit receives the optimum feed rate and size.

Table 18: Table Circuit Feed Screening Basis

Criteria	Units	Feed Screen
Feed Rate	t/h	25.1
Aperture Size	mm	0.5

The existing tables will operate as the coarse table circuit. These tables have an inefficient linear motion for tungsten, however are currently performing well in this duty.

The new tables circuit will take a finer feed, and for this circuit, Diester tables have been selected as used in other fine recovery tabling operations.

Table 19: Table Circuit Design Basis

Criteria	Units	Coarse Tables (Existing)	Fine Tables
Feed Rate	t/h	17.34	7.75
Feed Size	mm	+0.5	-0.5
Type		Chinese/ Wilfley Motion	Deister
Rougher Circuit	No	6 x 1 decks	2 x 3 decks
Cleaner Circuit	No	1 x 2 decks (upgraded)	1 x 2 decks

The table products will be bagged individually and dewatering using current practice prior to being batched to the arsenic removal circuit or drying and separation circuit.

6.5.8. Arsenic Removal

As required the product will be batched to the arsenic removal circuit. The circuit consists of a small ball mill package and pilot Jameson cell with product dewatering cone. The concentrate from the Jameson cell will be bagged and dewatered, and the concentrate can be assayed and assessed whether rebatching through the milling and flotation circuit should occur to reduce the amount of entrained tungsten lost to the arsenic/ sulphide concentrate.

Table 20: Arsenic Circuit Design Basis

Criteria	Units	Design
Ball Mill		
Feed Rate (max)	kg/h	500
Product Feed Size (P80)	µm	100
Installed Power	kW	
Flotation		
Type		L500 Pilot Jameson Cell
Mass Recovery to Sulphide Concentrate	%	8.8
Tungsten Loss to Sulphide Concentrate	%	2.4
Tungsten Product Dewatering Cone		
Settling Rate	t/m2/h	1 (estimated)

6.5.9. Drying and Product Separation

Bagged tungsten product will be fed to the existing rotary dryer. This unit is complete with feed hopper and screw feeder. The unit performance has not been verified, however it is anticipated that a product moisture of 0.5% w/w can be achieved from the unit.

Following the product drying the dry concentrate will either be bagged or passed to the RER unit which will separate the concentrate into a wolframite and scheelite concentrate.

Table 21: Drying and Product Separation Design Basis

Criteria	Units	Feed Screen
Tungsten Dryer		
Type		Indirect rotary
Feed Rate (max)	kg/h	500
Product moisture (nominal)	% water (w/w)	0.5
Product Separation		
Type		300mm RER
Mass Recovery to Wolframite Concentrate	%	75
Tungsten Recovery to Wolframite Concentrate	%	62

6.5.10. Reagents

Table 22 summarises key design criteria for reagents.

Where possible reagents, PAX and MIBC will be sourced and delivered at dosing strength. Due to low volume dosing requirements, the reagents will dosed directly to the circuit from the received drums using dosing pumps.

Table 22: Key Reagents Design Criteria

Description	Use	Total Consumption	Unit Consumption
PAX			
MIBC (W24 alternative)	Sulphide flotation/ arsenic removal collector	1.8kg/day	150 g/t

6.5.11. Mass and Water Balance

The mass balances for the nominal and design grade cases, as well as the ore sorter to table case have been developed to a preliminary level based on the survey data. These balances are detailed in Appendix F. The data has been used for equipment sizing and selection and to derive the project water demand.

Stream data of the key process streams are shown in Table 23, whereas the water demand is summarised in Table 24. These are shown for the design feed grade case only.

Table 23: Key Process Stream Data

Stream	Description	Solids (t/h)	Slurry (m3/h)	% Solids (w/w)
S_001	Plant Feed	44.0	15.6	99.0
S_003	Vibrating Screen Feed	44.0	60.8	49.2
S_005	Vibrating Screen Midsize to SU-002B	14.4	8.6	80.0
S_006	Vibrating Screen Underpan to SU-002A	29.6	54.2	40.3
S_015	Coarse Jig Concentrate	0.9	13.8	6.0
S_016	Coarse Jig Tailings	13.6	102.3	12.2
S_022	Fine Jig Concentrate	11.7	187.8	6.0
S_023	Fine Jig Tailings	47.7	255.1	16.7
S_024	Jig Overflow Screen Feed	13.6	102.3	12.2
S_026	Jig Overflow Screen Oversize	5.1	2.3	90.0
S_028	Jig Overflow Screen Midsize	4.1	2.4	80.0
S_029	Jig Overflow Screen Undersize	4.4	99.5	4.3
S_032	Scavenging Feed Screen Feed	52.7	277.5	16.9
S_033	Scavenging Feed Screen Undersize	18.7	247.3	7.2
S_034	Reflux Classifier Concentrate	3.7	8.3	35.0
S_035	Reflux Classifier Tailings	15.0	239.0	6.0
S_039	Spiral Concentrate	6.8	15.0	35.0

Stream	Description	Solids (t/h)	Slurry (m3/h)	% Solids (w/w)
S_040	Spiral Tailings	27.2	76.3	29.0
S_041	Combined Scavenging Concentrate	10.5	23.3	35.0
P_113	Ore Sorter Product	16.0	35.3	35.0
S_047	Jig Concentrate Screen Feed	50.1	278.1	16.1
S_049	Concentrate Screen Oversize to Crushers	10.9	11.1	60.0
S_054	Dewatering Cyclone Feed	40.3	332.4	11.3
S_055	Dewatering Cyclone Overflow	8.8	54.7	14.5
S_056	Dewatering Cyclone Underflow	31.6	277.7	10.6
S_057	Table Feed Screen Oversize	21.8	235.2	8.8
S_061	Coase Rougher Table Feed	21.8	235.2	8.8
S_064	Coarse Rougher Table Concentrate	1.1	37.7	2.9
S_065	Coarse Rougher Table Tailings	20.7	212.5	9.2
S_070	Coarse Cleaner Table Concentrate	0.4	3.0	12.9
S_071	Coarse Cleaner Table Tailing	0.7	36.7	1.8
S_074	Fine Rougher Table Feed	9.8	42.5	20.0
S_077	Fine Rougher Table Concentrate	0.7	24.5	2.7
S_078	Fine Rougher Table Tailings	9.1	29.0	26.1
S_080	PW Fine Cleaner Table Wash	0.0	4.0	0.0
S_081	Fine Cleaner Table Concentrate	0.1	2.9	4.3
S_095	Grinding Product	0.6	6.1	8.5
S_097	Jameson Cell Concentrate	0.0	0.2	20.0
S_101	Tungsten Product	0.5	6.2	7.7
S_105	Tungsten Dryer Feed	0.5	0.3	70.0
S_109	Tungsten Non-magnetic Concentrate (Scheelite)	0.2	0.1	99.5
S_110	Tungsten Magnetic Concentrate (Wolframite)	0.3	0.1	99.5
S_086	Final Tailings	55.4	469.7	11.0

Table 24: Water in / output Stream Data

Description	Flowrate (m3/h)
Total water requirement	421.7
PW to Feed Prep Area	55.3
PW to Coarse Jig	99.3

Description	Flowrate (m3/h)
PW to Fine Jig	147.2
PW to Jig Tailings Scavenging	22.1
PW to Scavengers	61.2
PW to Table Feed Prep	9.8
PW to Coarse Tables	17.1
PW to Fine Tables	15.0
PW to Arsenic Removal	0.6

6.6. Plant Layout

Figure 13 shows the project site including the existing process plant and facilities.

Key design constraints that have been imposed on site layout include:

- Minimisation of disturbance to environmentally sensitive locations
- Maintaining existing process pad boundaries and
- Minimisation of development footprint

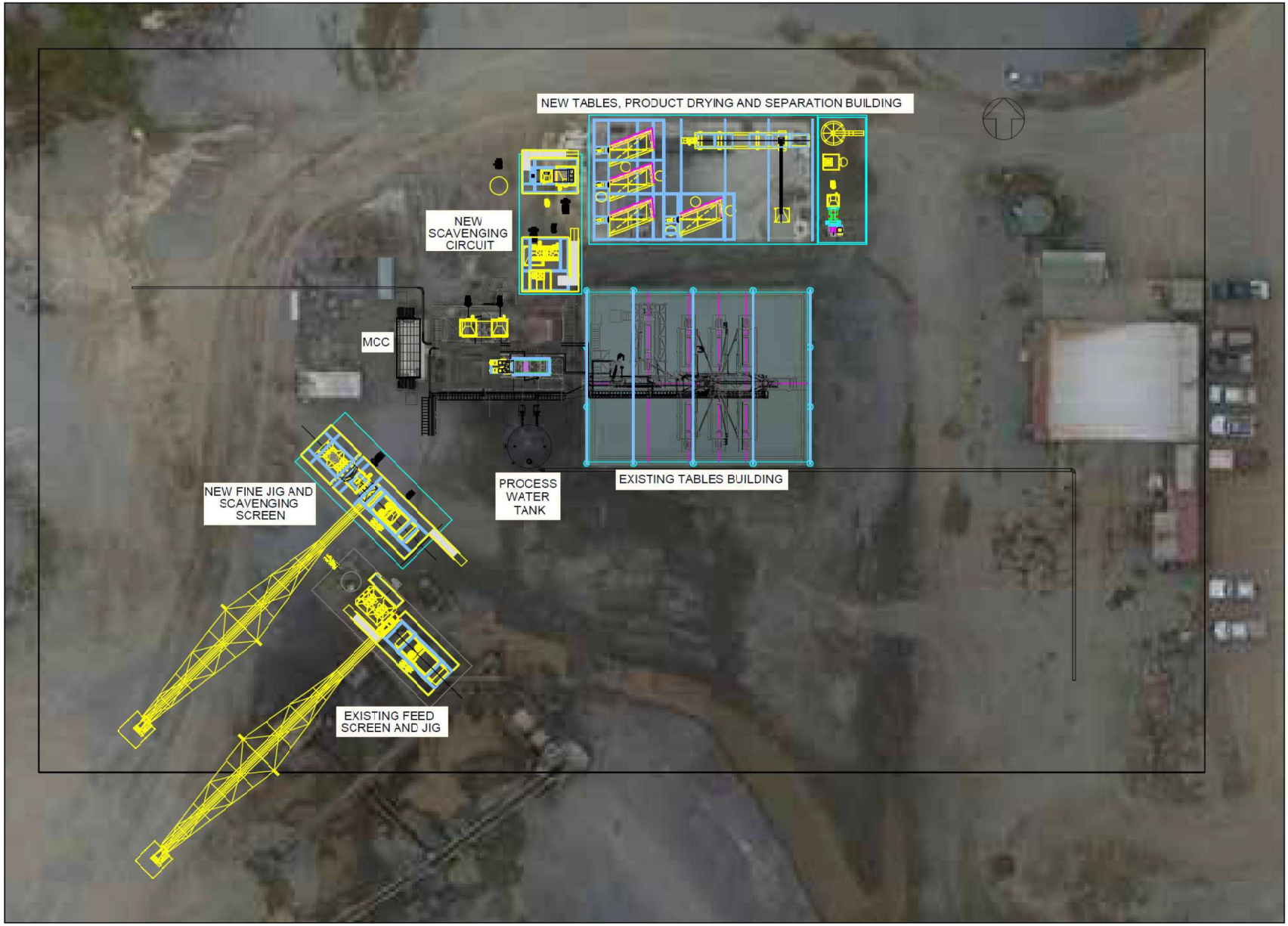


Figure 55: Process Plant Site Layout

The new fines mineral jig (JG-003/004) has been located close to the existing mineral jig (JG-001/002) (Figure 56). The orientation of the new jig has been turned 180 degrees to allow the fine mineral jig overflow to be combined with the coarse jig overflow once it has been crushed by the jig overflow crusher rolls (RC-004).

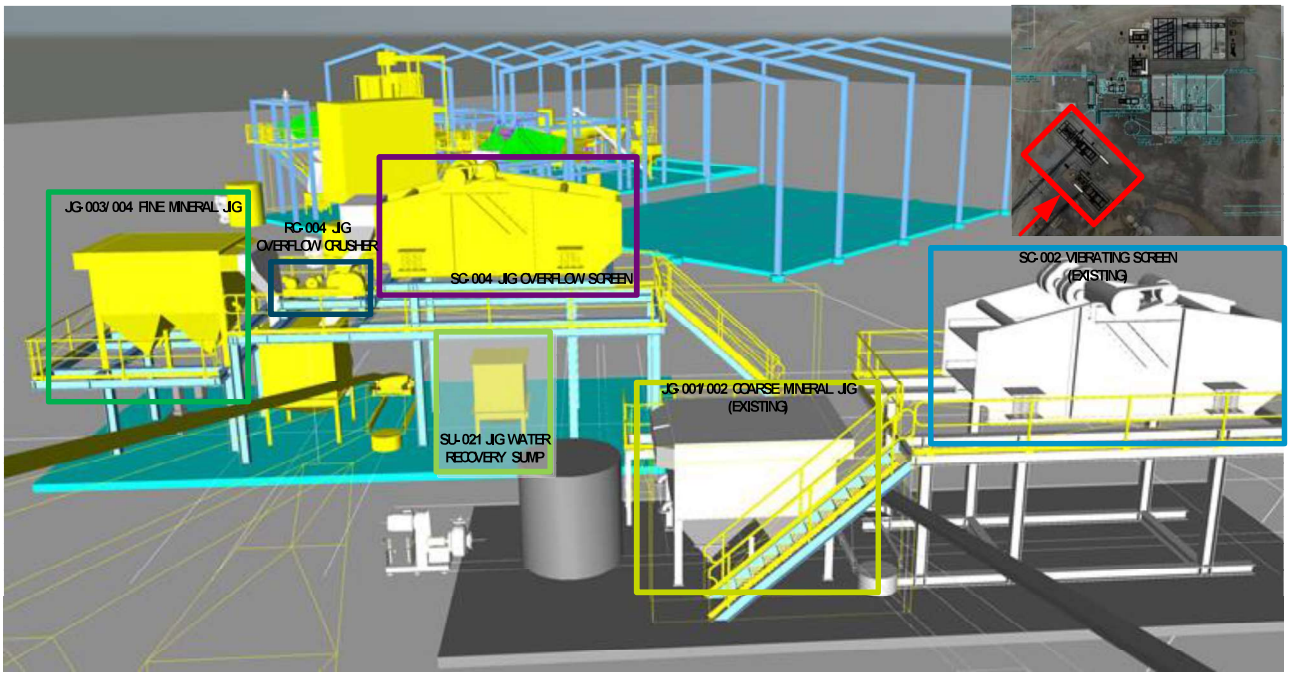


Figure 56: Fine Mineral Jig, Overflow Screen and Crushing Plant

The crushed jig overflow and fined jig overflow are pumped to the existing derrick screen located in the former Kelsey Jig plant (Figure 57). To facilitate feeding the screen oversize to the scavenger spirals (SR-001) and the undersize to the scavenger reflux classifier (XM-001) the current final tailing sump (SU-024) will be reinstated as the screen undersize sump. A new final tailings sump and pump will be located north of the current location.

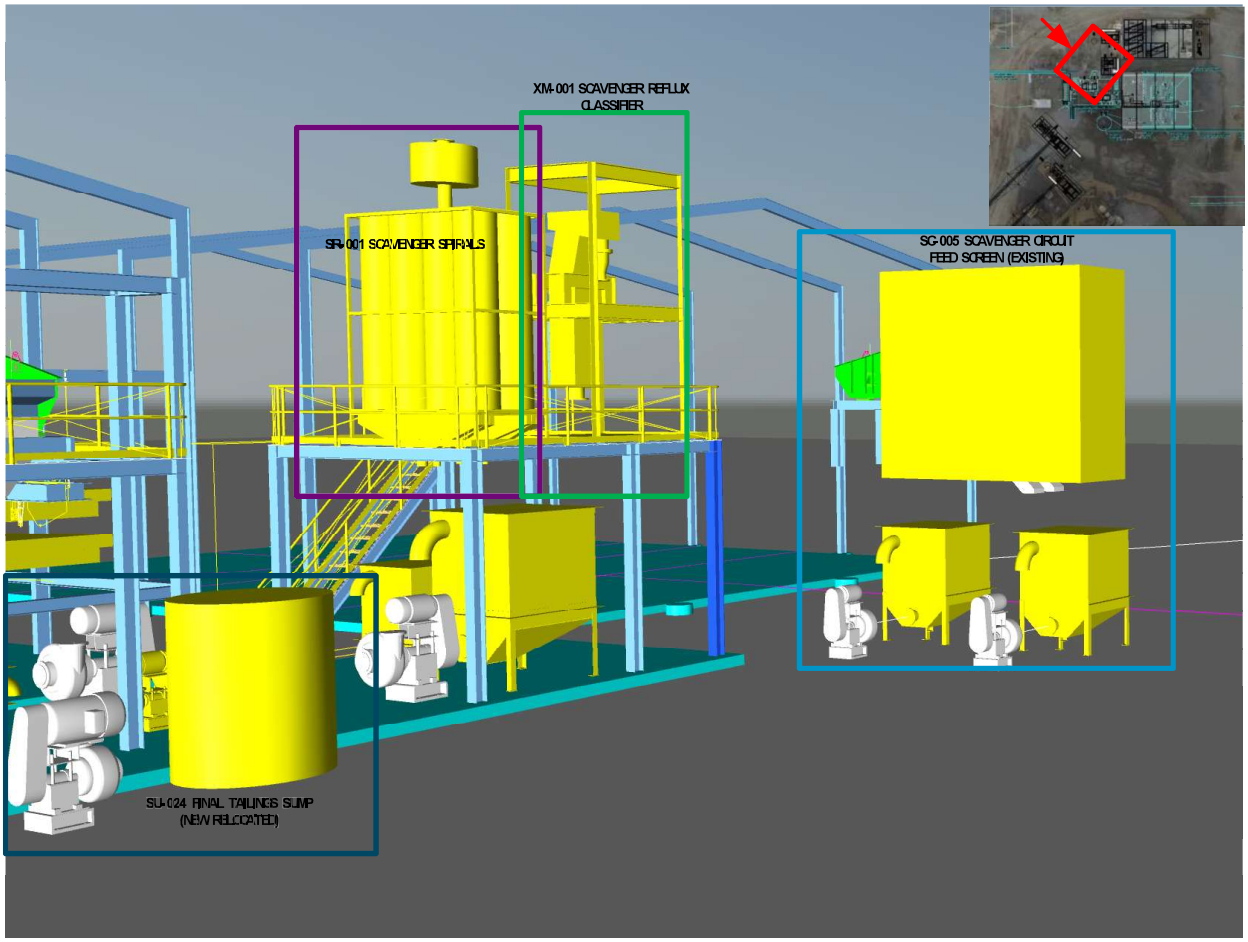


Figure 57: Jig Overflow Scavenging Area

Following scavenging, the concentrate from the spirals and reflux classifier are pumped to join the jig concentrate on vibrating screen (SC-003) (Figure 58). Due to the increased flow requirement, this screen will be upgraded, and an additional rolls crusher installed to crush the additional load. The ore sorter product will be pumped to the derrick screen sump (SU-008) which recirculates to (SC-003).

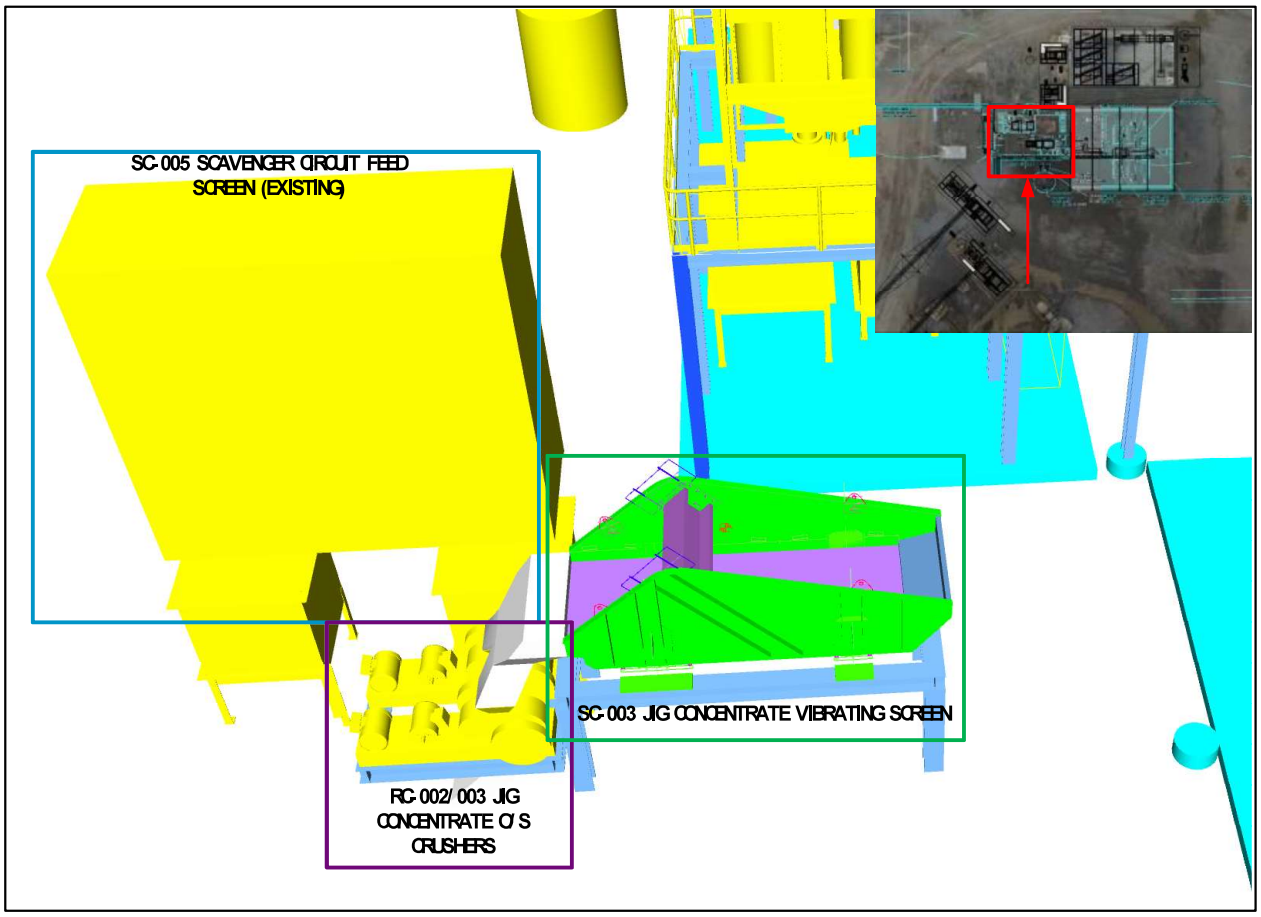


Figure 58: Upgrade Jig Concentrate Screen and Jig Oversize Crushing

The undersize from the screen is pumped to the dewatering cyclone which has been relocated above the new table feed screen (SC-006). The oversize from the table feed screen is transferred to the existing tables building which will process the coarse (0.5mm) product. The existing tables will be upgrade to double decks to facilitate the increased tonnage.

The fine fraction will be sent to a new fine tables circuit consisting of three stacks of three Deister rougher tables (Figure 59). These tables perform better separation on fine materials than existing tables due to the different table motion. The concentrate from these tables will be upgraded in a new cleaner table circuit consisting of a single stack of two Deister tables.

The concentrate from the fine and coarse cleaner table circuits will be bagged for sale, or further processing depending on the arsenic, wolframite and scheelite content.

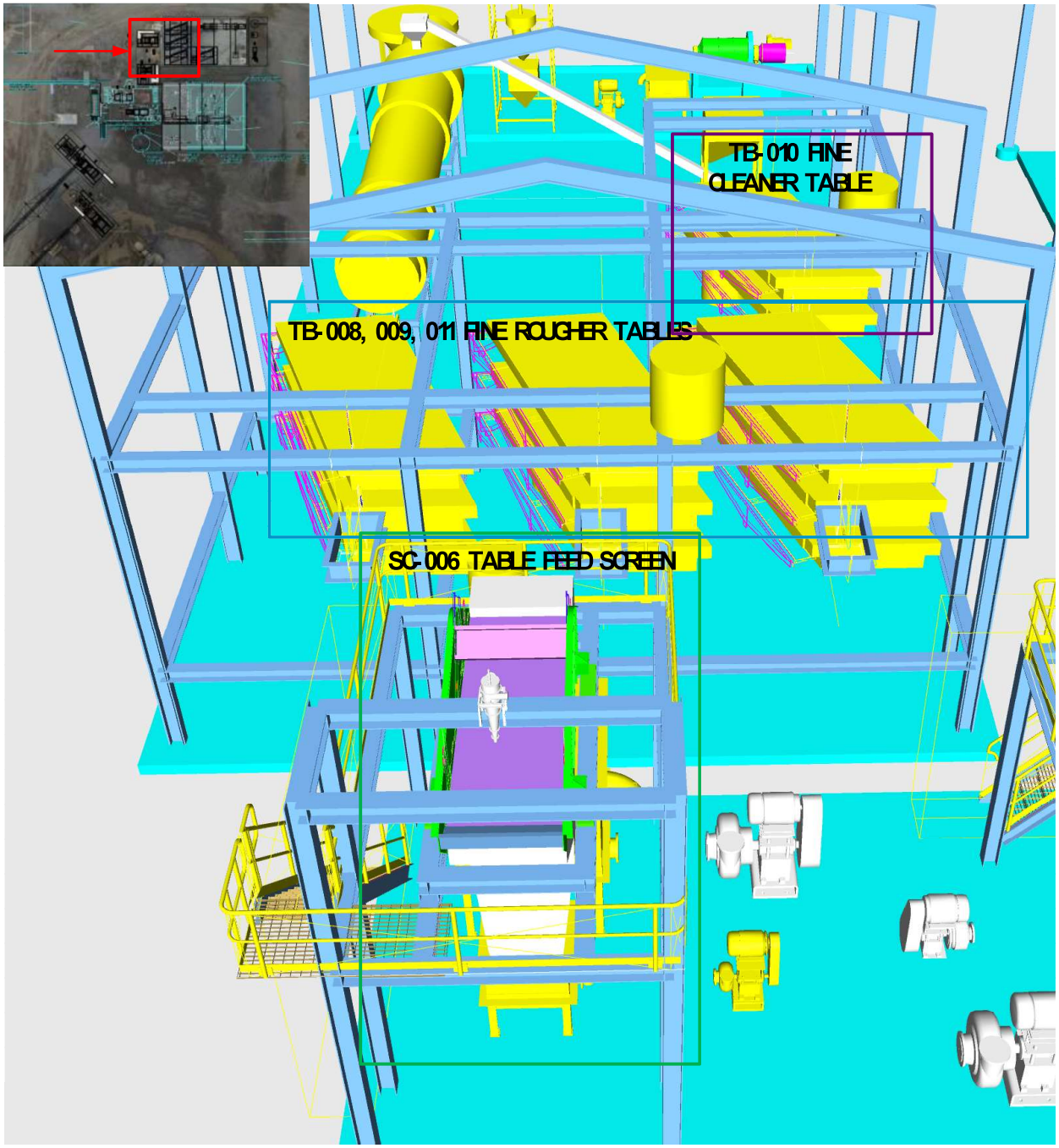


Figure 59: Table Feed Screening and Fine Tables

If the tungsten product has a high arsenic content, the product can be batched through the arsenic removal circuit which consist of a small pilot scale mill package and a pilot Jameson cell package (Figure 60). The tungsten product (flotation tailings) is dewatered in a dewatering cone, and the flotation concentrate is bagged for either further processing to improve tungsten recovery, or for disposal depending concentrate grades.

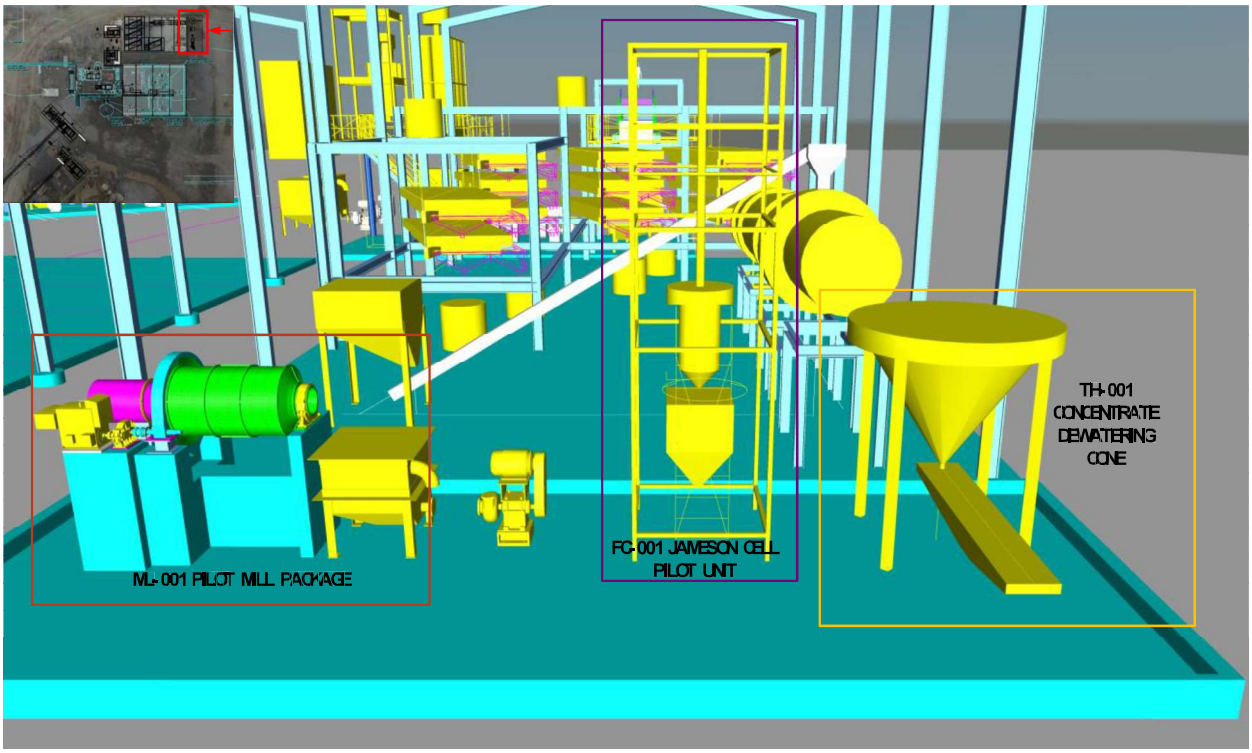


Figure 60: Arsenic Removal Circuit

If the table product is low in arsenic the removal circuit can be skipped with the product fed to the tungsten dryer via the hopper and screw feeder (HF-002) (Figure 61). The dry product can either be bagged for final shipment or processed through the tungsten dry HIMS (MG-001) to produce a separate wolframite and scheelite concentrate.

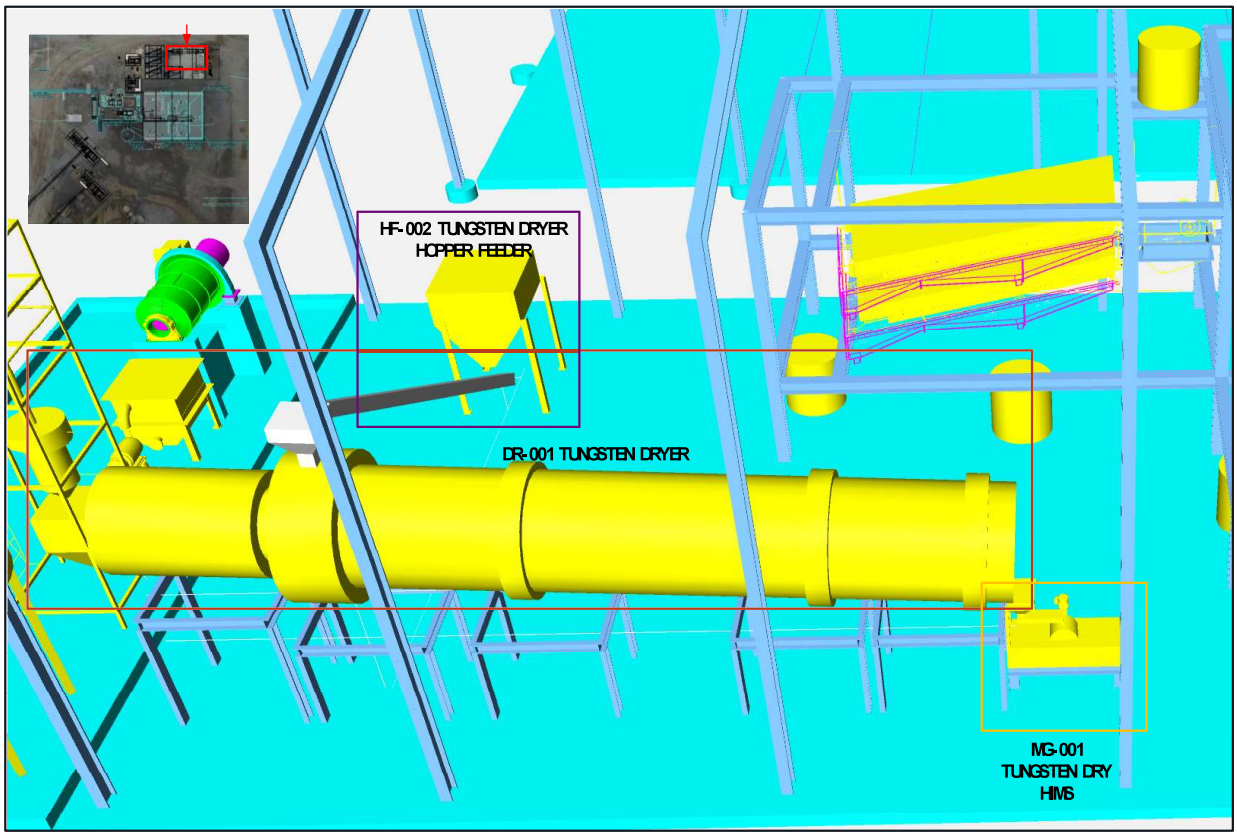


Figure 61: Tungsten Drying and Product Separation

7. Capital Cost Estimate

7.1. Capital Cost Summary

The summary of the capital costs for the process infrastructure as described in this Chapter 5: Processing is provided in Table 25.

Table 25: Capital Cost Summary

WBS	Item Description	Capital Cost (AUD)
Phase 1 – Crushing Screening and Sorting Plant		
21100	Screening	751,312
21300	Secondary Crushing	277,340
21400	Tertiary Crushing / Rehandling Circuit	715,039
25000	Product Handling and Dewatering	512,945
30000	Services	955,421
72500	First Fills and Spares	44,335
76000	Design	160,000
Subtotal – Phase 1 Crushing, Screening and Sorting Plant		**3,416,392**
Phase 1 – Gravity Processing Plant		
23000	Wet Processing	43,679
Subtotal – Phase 1 Processing Plant		**43,679**
Phase 2 – Crushing, Screening and Sorting Plant		
21100	Screening	1,278,908
21300	Secondary Crushing	780,281
21400	Tertiary Crushing / Rehandling Circuit	482,418
22000	Ore Sorting	2,129,165
25000	Product Handling	107,802
26100	Tailings Dewatering	364,675
30000	Services	765,791
72500	First Fills and Spares	137,743
76000	Design	413,633
Subtotal – Phase 2 Crushing, Screening and Sorting Plant		**6,460,416**
Phase 2 – Gravity Processing Plant		
23000	Wet Processing	5,226,669
26000	Tailings	135,813
72500	First Fills and Spares	151,501

WBS	Item Description	Capital Cost (AUD)
76000	Design	536,248
Subtotal – Phase 2 Gravity Processing Plant		**6,050,232**
TOTAL Processing		**15,970,719**

The detailed capital cost estimate for the crushing, screening and sorting plant is attached as Appendix I. The detailed capital cost estimate for the gravity processing plant is attached as Appendix J.

7.2. Basis of Capital Cost Estimate

The basis of estimate for the processing infrastructure is detailed in Chapter 12: Capital Cost Estimate.

8. Operating Cost Estimate

8.1. Operating Cost Summary and Basis of Operating Costs

The operating costs for the processing plants with the basis of estimate is detailed in Chapter 13: Operating Cost Estimate.

9. References

- Chapter 3: Geology and Resources
- Chapter 12: Capital Cost Estimate
- Chapter 13: Operating Cost Estimate

10. List of Abbreviations

Abbreviation	Description
BEP	Best efficiency point
EQR	EQ Resources Limited
FEL	Front end loader
HDPE	High density poly ethylene
HG	High grade (ore)
HIMS	High intensity magnetic separator
IP	Internet protocol
LGS	Low grade ore stockpile
MCC	Motor control centre
PDC	Process design criteria
PLC	Programmable logic controller
RER	Rare earth rolls
ROM	Run of mine
SCADA	Supervisory control and data acquisition
VSD	Variable speed drive
VSI	Vertical shaft impact crusher

Appendix A Crushing Plant Mass Balance

MOUNT CARBINE (1MTPA)
PRE-FEASIBILITY STUDY
Project No. 655

MASS BALANCE

Doc.No. 655-CA-R-001

Revision	Description	By	Checked	Approved	Client	Date
H	Issued for Internal Review	AY	CB	CB		9/Nov/21
G	Issued for Internal Review	AY	CB	CB		23/Sep/21
F	Issued for Internal Review	AY	CB	CB		25/Aug/21
E	Issued for Internal Review	AY	CB	CB		24/Aug/21
D	Issued for Internal Review	AY	CB	CB		17/Aug/21
C	Issued for Internal Review	AY	CB	CB		17/Aug/21
B	Issued for Internal Review	AY	CB	CB		19/Jul/21
A	Issued for Internal Review	AY	CB	CB		14/Jul/21

Project Mount Carbine (1 MTPA)
Project No. 655
Document Mass Balance
Rev H
Option PHASE 1

Mass Balance Inputs	Units	Design	Rev
Annual Throughput	Mtpa	1.0	A
Crushing Operating Hours (Design)	hrs	2857	A
Crushing Rate (Design)	tph	350	A
ROM Moisture	%	5%	A
Ore Solids S.G	t/m3	2.65	A
Water S.G	t/m3	1.0	A
Rock Screen O/S	%	32%	A
Primary Screen Top Deck O/S	%	47%	A
Primary Screen Bottom Deck O/S	%	42%	A

Mass Balance Inputs	Units	Design	Rev
Linear Screen O/S	%	94%	A
Ore Sorter Feed	tph	175	A
Ore Sorter Reject	%	85%	A
Rehandling Screen Top Deck O/S	%	61%	A
Rehandling Screen Bottom Deck O/S	%	14%	A
Wet Plant Feed Rate	tph	60	A
Rehandling Screen Recirc.	%	75%	A

Ore/Slurry
Stockpile
Water
Product
Reagent

TOTAL WATER REQUIREMENT

61.7 m3/hr

Stream Number		1	2	3	4	5	3 + 4	4	6	7	8	9
Stream Description		ROM	ROCK SCREEN O/S	ROCK SCREEN U/S	CONE CRUSHER	PRIMARY SCREEN SPRAY WATER	PRIMARY SCREEN FEED	PRIMARY SCREEN TOP DECK O/S	PRIMARY SCREEN BBOTTOM DECK O/S	PRIMARY SCREEN UNDERSIZE	LINEAR SCREEN O/S	LINEAR SCREEN U/S
Solids	t/h	350.0	112.0	238.0	207.0	0.0	445.0	207.0	186.0	52.0	174.8	11.2
	m^3/h	218.8	70.0	148.8	129.4	0.0	278.1	129.4	116.3	19.6	109.3	7.0
Solution	t/h	18.4	5.9	12.5	10.9	61.7	24.5	23.0	20.7	42.5	19.4	1.2
	m^3/h	18.4	5.9	12.5	10.9	61.7	24.5	23.0	20.7	42.5	19.4	1.2
Slurry	t/h	368.4	117.9	250.5	217.9	61.7	494.4	230.0	206.7	94.5	194.3	12.4
	m^3/h	237.2	75.9	161.3	140.3	61.7	302.7	152.4	136.9	62.2	128.7	8.2
	% solids	95%	95%	95%	95%	0%	90%	90%	90%	55%	90%	90%
Specific Gravity / Bulk Density												
Solids	t/m^3	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	2.65	1.60	1.60
Solution	t/m^3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry	t/m^3	1.55	1.55	1.55	1.55	1.00	1.63	1.51	1.51	1.52	1.51	1.51
PSD	mm	-700	+170,-400	-170	40	-	-170	-170,+40	-40,+6	-6	-40,+6	-6

Stream Number		10	11	12	12	13	12 + 13	14	15	16
Stream Description		ORE SORTER FEED	ORE SORTER REJECT STOCKPILE	ORE SORTER PRODUCT STOCKPILE	REHANDLING CIRCUIT FEED	VSI CRUSHER	REHANDLING SCREEN FEED	REHANDLING SCREEN TOP DECK O/S	REHANDLING SCREEN BOTTOM DECK O/S	REHANDLING SCREEN UNDERSIZE
Solids	t/h	174.8	162.6	12.2	10.0	30.0	40.0	24.4	5.6	10.0
	m^3/h	109.3	101.6	7.6	6.3	18.8	25.0	15.3	3.5	6.3
Solution	t/h	19.4	18.1	1.4	1.1	3.3	4.4	2.7	0.6	1.1
	m^3/h	19.4	18.1	1.4	1.1	3.3	4.4	2.7	0.6	1.1
Slurry	t/h	194.3	180.7	13.6	11.1	33.3	44.4	27.1	6.2	11.1
	m^3/h	128.7	119.7	9.0	7.4	22.1	29.4	18.0	4.1	7.4
	% solids	90%	90%	90%	90%	90%	90%	90%	90%	90%
Specific Gravity										
Solids	t/m^3	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Solution	t/m^3	1.0	1.00	1.00	1.00	1.0	1.0	1.0	1.0	1.0
Slurry	t/m^3	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51
PSD	mm	-40,+6	-40,+6	-40,+6	-40,+6	22	-40,+6	-40,+10	-10,+6	-6

Project Mount Carbine (1 MTPA)
Project No. 655
Document Mass Balance
Rev H
Option PHASE 2

Mass Balance Inputs	Units	Design	Rev
Annual Throughput	Mtpa	1.0	A
Crushing Operating Hours (Design)	hrs	2857	A
Crushing Rate (Design)	tph	350	A
ROM Moisture	%	5%	A
Ore Solids S.G	t/m3	2.65	A
Water S.G	t/m3	1.0	A
Rock Screen O/S	%	45%	A
Primary Screen Top Deck O/S	%	36%	A
Primary Screen Bottom Deck O/S	%	40%	A

Mass Balance Inputs	Units	Design	Rev
Linear Screen O/S	%	94%	A
Ore Sorter Feed	tph	160	A
Ore Sorter Reject	%	85%	A
Rehandling Screen Top Deck O/S	%	49%	A
Rehandling Screen Bottom Deck O/S	%	26%	A

Ore/Slurry
Stockpile
Water
Product
Reagent

TOTAL WATER REQUIREMENT
129.5 m3/hr

Stream Number		1	2	3	3	4	5	6	7	8	9
Stream Description		ROM	GRIZZLY O/S	GRIZZLY U/S	MOBILE JAW CRUSHER	CONE CRUSHER	PRIMARY SCREEN SPRAY WATER	PRIMARY SCREEN FEED	PRIMARY SCREEN TOP DECK O/S	PRIMARY SCREEN BBOTTOM DECK O/S	PRIMARY SCREEN UNDERSIZE
Solids	t/h	350.0	155.8	194.3	155.8	200.0	0.0	550.0	200.0	220.0	130.0
	m^3/h	218.8	97.3	121.4	97.3	125.0	0.0	343.8	125.0	137.5	49.1
Solution	t/h	18.4	8.2	10.2	8.2	10.5	129.5	23.5	22.2	24.4	106.4
	m^3/h	18.4	8.2	10.2	8.2	10.5	129.5	23.5	22.2	24.4	106.4
Slurry	t/h	368.4	163.9	204.5	163.9	210.5	129.5	611.1	222.2	244.4	236.4
	m^3/h	237.2	105.5	131.6	105.5	135.5	129.5	367.3	147.2	161.9	155.4
	% solids	95%	95%	95%	95%	95%	0%	90%	90%	90%	55%
Specific Gravity											
Solids	t/m^3	1.60	1.60	1.60	1.60	1.60	2.65	1.60	1.60	1.60	2.65
Solution	t/m^3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry	t/m^3	1.55	1.55	1.55	1.55	1.55	1.00	1.66	1.51	1.51	1.52
PSD	mm	-700	+100,-400	-100	-100	25	-	-100	-100,+30	-30,+6	-6

Stream Number		10	11	12	12	13	12 + 13	14	15	16
Stream Description		ORE SORTER FEED	ORE SORTER REJECT STOCKPILE	ORE SORTER PRODUCT STOCKPILE	REHANDLING CIRCUIT FEED	VSI CRUSHER	REHANDLING SCREEN FEED	REHANDLING SCREEN TOP DECK O/S	REHANDLING SCREEN BOTTOM DECK O/S	REHANDLING SCREEN UNDERSIZE
Solids	t/h	160.0	136.0	24.0	24.0	72.0	96.0	47.0	25.0	24.0
	m^3/h	100.0	85.0	15.0	15.0	15.0	60.0	29.4	15.6	15.0
Solution	t/h	17.8	15.1	2.7	2.7	10.7	10.7	5.2	2.8	2.7
	m^3/h	17.8	15.1	2.7	2.7	2.7	10.7	5.2	2.8	2.7
Slurry	t/h	177.8	151.1	26.7	26.7	26.7	106.7	52.3	27.7	26.7
	m^3/h	117.8	100.1	17.7	17.7	17.7	70.7	34.6	18.4	17.7
	% solids	90%	90%	90%	90%	90%	90%	90%	90%	90%
Specific Gravity										
Solids	t/m^3	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Solution	t/m^3	1.0	1.00	1.00	1.00	1.0	1.0	1.0	1.0	1.0
Slurry	t/m^3	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51
PSD	mm	-30,+6	-30,+6	-30,+6	-40,+6	22	-40,+6	-40,+10	-10,+6	-6

Project Mount Carbine (1 MTPA)
Project No. 655
Document Mass Balance
Rev H
Option WET PLANT

Mass Balance Inputs	Units	Design	Rev
Annual Throughput	Mtpa	1.0	A
Crushing Operating Hours (Design)	hrs	2857	A
Ore Solids S.G	t/m3	2.65	A
Water S.G	t/m3	1.0	A
Wet Plant Feed	tph	60	A
High Freq. Screen O/S	%	90%	A
Dewatering Cyclone U/F Split	%	95%	A

Ore/Slurry
Stockpile
Water
Product
Reagent

TOTAL WATER REQUIREMENT

N/R m3/hr

PRODUCT DEWATERING - PHASE 1 & 2

Stream Number		20	21	22	23	24	26	22	28
Stream Description		WET PLANT	TO DEWATERING CIRCUIT	DEWATERING SCREEN FEED	DEWATERING SCREEN O/S	DEWATERING SCREEN U/S	DEWATERING CYCLONE FEED	DEWATERING CYCLONE U/F	DEWATERING CYCLONE O/F
Solids	t/h	60	70	73.5	66.1	7.3	77.3	73.5	3.9
	m^3/h	22.6	26.4	27.7	25.0	2.8	29.2	27.7	1.5
Solution	t/h	49.1	57.3	31.5	7.3	24.1	81.4	31.5	49.9
	m^3/h	49.1	57.3	31.5	7.3	24.1	81.4	31.5	49.9
Slurry	t/h	109.1	127.3	105.0	73.5	31.5	158.8	105.0	53.8
	m^3/h	71.7	83.7	59.2	32.3	26.9	110.6	59.2	51.4
	% solids	55%	55%	70%	90%	23%	49%	70%	7%
Specific Gravity									
Solids	t/m^3	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65
Solution	t/m^3	1.0	1.0	1.0	1.0	1.00	1.0	1.00	1.00
Slurry	t/m^3	1.52	1.52	1.77	2.27	1.17	1.44	1.77	1.05
PSD	mm	-6	-6	+0.25	-6,+0.25	-0.25	-6	+0.25	-0.25

TAILS DEWATERING - PHASE 2 ONLY

Stream Number		30	30	31	32	32	33	34
Stream Description		WET PLANT TAILS	DEWATERING SCREEN FEED	DEWATERING SCREEN O/S	DEWATERING SCREEN U/S	DEWATERING CYCLONE FEED	DEWATERING CYCLONE U/F	DEWATERING CYCLONE O/F
Solids	t/h	60	60.0	54.0	6.0	6.0	5.7	0.3
	m^3/h	22.6	22.6	20.4	2.3	2.3	2.2	0.1
Solution	t/h	240.0	240.0	9.5	230.5	230.5	1.0	229.5
	m^3/h	240.0	240.0	9.5	230.5	230.5	1.0	229.5
Slurry	t/h	300.0	300.0	63.5	236.5	236.5	6.7	229.8
	m^3/h	262.6	262.6	29.9	232.7	232.7	3.2	229.6
	% solids	20%	20%	85%	3%	3%	85%	0%
Specific Gravity								
Solids	t/m^3	2.65	2.65	2.65	2.65	2.65	2.65	2.65
Solution	t/m^3	1.0	1.0	1.0	1.00	1.0	1.00	1.00
Slurry	t/m^3	1.14	1.14	2.12	1.02	1.02	2.12	1.00
PSD	mm	-6	+0.25	-6,+0.25	-0.25	-6	+0.25	-0.25

Appendix B Crushing Plant Equipment List

MINCORE

655 MT CARBINE PROJECT

Speciality Metals International Limited

Equipment List

Rev	Date	Description	Prepared	Reviewed	Func/Fac Appr'd	Project Auth'd	Client Appr'd
J	9/11/2021	Revised and Reissued for Client Review - Updated with Phase 1 & 2	AY			CB	
H	24/08/2021	Revised and Reissued for Client Review - Updated with Option 1, 2 & 3	SK			CB	
G	24/08/2021	Revised and Reissued for Client Review - Updated with Option 1, 2 & 3	SK			CB	
F	24/08/2021	Issued for Client Review - Updated with Option 1, 2 & 3	SK			CB	
E	15/07/2021	Issued for Client Review	SK			CB	
D	14/07/2021	Issued for Client Review	SK			CB	
C	25/06/2021	Issued for Client Review	SK			CB	
B	23/06/2021	Issued for Client Review	SK			CB	
A	10/06/2021	Issued for Client Review	SK			CB	

WORK BREAKDOWN STRUCTURE

Client:	**EQ RESOURCES**
Project:	**MT. CARBINE PROJECT**
Project No:	**655**
Title:	**Process Areas and Description**

SNO	AREA NUMBER		AREA DESCRIPTION		
	GENERAL		AREA DESCRIPTION	PHASE 1	PHASE 2
1	20000	-	**PROCESSING**	20001	20002
2	21000	-	**Crushing and Screening Plant**	21001	21002
3	21100	-	**Screening**	21101	21102
4	21200	-	**Primary Crushing**	21201	21202
5	21300	-	**Secondary Crushing**	21301	21302
6	21400	-	**Teritiary Crushing**	21401	21402
7	22000	-	**Ore Sorting**	22001	22002
8	22100	-	**Ore Storing process**	22101	22102
9	23000	-	**Ore Storage, Transport and Pumping**	23001	23002
10	25000	-	**Product Handling, Storage and Transportation**	25001	25002
11	25100	-	**Product Handling, Storage and Transportation process**	25101	25102
12	26000	-	**Reject Handling, Storage and Transportation**	26001	26002
13	26100	-	**Reject Handling, Storage and Transportation process**	26101	26102
14	30000	-	**ON-SITE INFRASTRUCTURE**	30001	30002
15	31000	-	**Civil Infrastructure**	31001	31002
16	31100	-	Roads	31101	31102
17	31200	-	Pads and Laydown Areas	31201	31202
18	31300	-	Dams and Drainage	31301	31302
19	32000	-	**Surface Services and Utilities (Dry and Wet Plant)**	32001	32002
20	32100	-	Power Supply and Distribution	32101	32102
21	32110	-	Main Substation	32111	32112
22	32120	-	Site Distribution	32121	32122
23	32200	-	Water Services	32201	32202
24	32210	-	**Potable Water (By others)**	32211	32212
25	32220	-	Fire Water	32221	32222
26	32230	-	Waste Water	32231	32232
27	32240	-	Storm Water	32241	32242
28	32250	-	Mine Affected Water	32251	32252
29	32300	-	Air Services	32301	32302
30	32400	-	Fuel and Lube Facilities and Distribution	32401	32402
31	32500	-	Communications	32501	32502
32	73000	-	**Construction Equipment, Tools And Supplies**	73001	73002
33	73100	-	Construction Equipment & Light Vehicles (Including maintenance)	73101	73102
34	73200	-	Tools & Consumables	73201	73202
35	73300	-	Fuels And Lubricants	73301	73302

655 MT CARBINE - EQUIPMENT LIST	
Client:	Speciality Metals International Limited
Project:	655 MT CARBINE PFS Dry Plant Upgrade
Document Number:	655-ME-LS-001
Updated:	4/11/2021
Revision:	J

PHASE 1/PFS

MINCORE

PFD NUMBER	Area Number	Equipment Type	Sequential Number	Equipment No.	Existing / New /Future	Qty Total	Oper. Units No. off	EQUIPMENT TITLE	DESCRIPTION	Installed Kw/unit	Total Consumed kW	Chosen Supplier	Rev
CRUSHING & SCREENING 21101										170	136		
655-000-PF-013	21101	RS	01	21101-RS-01	Existing	1	1	Mobile Rock Screen	Mobile Scalper / Rock Screen RSV 1400, Separating deck : 170 mm - Diesel operated				J
655-000-PF-013	21101	CV	01	21101-CV-01	Existing	1	1	Rock Screen O/S Conveyor	Existing Conveyor (Part of rock screen) - Rated 112tph	15	12		J
655-000-PF-013	21101	CV	02	21101-CV-02	Existing	1	1	Rock Screen U/S Conveyor	Existing Conveyor (Part of rock screen) - Rated 238tph	15	12		J
655-000-PF-013	21101	CV	03	21101-CV-03	New	1	1	Conveyor, Triple Deck Wet Screen	Rated 445 tph, Particle Top Size: 170mm, Length: 28m, Belt Width: 900mm, Lift: 7,5m, Belt Speed 1,5m/s	15	12		J
655-000-PF-013	21101	WT	01	21101-WT-01	New	1	1	Belt Weigher on Conveyor Feed Fixed screen		5	4		J
655-000-PF-013	21101	CH	01	21101-CH-01	New	1	1	Conveyor Chute, Feed Fixed Screen					J
655-000-PF-013	21101	SN	01	21101-SN-01	New	1	1	Triple Deck Wet Screen	Wet Screen, Feed rate : 445 tph, Feed size:'+170mm , Topdeck:+170,+40mm, Bottomdeck: '+40,+6mm, Undersize: '+6mm Sandvik SC2463	30	24		J
655-000-PF-013	21101	CV	04	21101-CV-04	New	1	1	Conveyor, Oversize feed Stockpile : +6 mm, -40mm	Rated 185tph, Particle Top Size: 40mm, Length: 24m, Belt Width: 900mm, Lift: 6,5m, Belt Speed 1,5m/s	15	12		J
655-000-PF-013	21101	CH	02	21101-CH-02	New	1	1	Conveyor Chute, Oversize feed Stockpile : +6 mm, -40mm					J
655-000-PF-013	21101	PP	01	21101-PP-01	New	1	1	Wet Plant Feed Pump 1	Flowrate: 60 tph solids @ 55% w/w solids, 120m3/hr Warman: 6/4 AH	75	60		J
SECONDARY CRUSHING 21301										192	154		
655-000-PF-013	21301	CV	01	21301-CV-01	New	1	1	Conveyor, Feed Cone Crusher	Rated 207tph, Particle Top Size: 170mm, Length: 24m, Belt Width: 900mm, Lift: 6,5m, Belt Speed 1,5m/s	15	12		J
655-000-PF-013	21301	CH	01	21301-CH-01	New	1	1	Chute, Feed Cone					J
655-000-PF-013	21301	CR	01	21301-CR-01	Existing	1	1	Cone Crusher	Direct Feed, CSS: 40 mm, Crusher Load : 99 %, Feed rate : 207 tph	160	128		J
655-000-PF-013	21301	MD	01	21301-MD-01	New	1	1	Metal Detector	Top portion stainless steel	2	2		J
655-000-PF-013	21301	CV	02	21301-CV-02	New	1	1	Conveyor, Discharge Cone Crusher	Rated 207tph, Particle Top Size: 40mm, Length: 24m, Belt Width: 900mm, Lift: 6,5m, Belt Speed 1,5m/s	15	12		J
ORE SORTING 22001										112	90		
655-000-PF-013	22001	BN	01	22001-BN-01	Existing	1	1	Feed Bin	8m3 - 2m x 2m x2m				J
655-000-PF-013	22001	FE	01	22001-FE-01	Existing	1	1	Pan Feeder	SP0818	2,4	1,9		J
655-000-PF-013	22001	CV	01	22001-CV-01	Existing	1	1	Conveyor, Sizing Screen	Existing - Ore Sorter Circuit - Rated 186tph	15	12		J
655-000-PF-013	22001	SN	01	22001-SN-01	Existing	1	1	Sizing Screen	6mm Sizing Screen		0		J
655-000-PF-013	22001	CV	02	22001-CV-02	Existing	1	1	Conveyor, Undersize feed Stockpile : -6 mm	Existing - Ore Sorter Circuit - Rated 11tph	15	12		J
655-000-PF-013	22001	CV	03	22001-CV-03	Existing	1	1	Conveyor, Screen Oversize : +6 mm	Existing - Ore Sorter Circuit - Rated 175tph	15	12		J
655-000-PF-013	22001	BN	02	22001-BN-02	Existing	1	1	Ore Sorting Feed Bin	8m3 - 2m x 2m x2m				J
655-000-PF-013	22001	FE	02	22001-FE-02	Existing	1	1	Pan Feeder - 1	Vibrating Pan Feeder	5	4		J
655-000-PF-013	22001	OS	01	22001-OS-01	Existing	1	1	Ore Sorter - 1		30	24		J
655-000-PF-013	22001	CV	05	22001-CV-05	Existing	1	1	Conveyor, Ore Sorter Reject Stockpile	Existing - Ore Sorter Circuit - Rated 163tph	15	12		J
655-000-PF-013	22001	CV	04	22001-CV-04	Existing	1	1	Conveyor, Ore Sorter Product Stockpile	Existing - Ore Sorter Circuit - Rated 12tph	15	12		J
WATER SERVICES 32201										105	84		
655-000-PF-004	32201	PP	01	32201-PP-01	Existing	1	1	Bore Pump 1		45	36		J
655-000-PF-004	32201	PP	02	32201-PP-02	Existing	1	1	Bore Pump 2					J
655-000-PF-004	32201	TK	01	32201-TK-01	Existing	1	1	Process Water Tank	12 hours Storage				J
655-000-PF-004	32201	PP	03	32201-PP-03	Existing	1	1	Process Water Pump	Warman: 3/2 AH	15	12		J
655-000-PF-004	32201	TK	02	32201-TK-02	Existing	1	1	Raw Water Tank	Wet Plant Raw Water Storage Tank				J
655-000-PF-004	32201	PP	04	32201-PP-04	Existing	1	1	Raw Water Pump	Warman: 3/2 AH	15	12		J
655-000-PF-004	32201	PP	05	32201-PP-05	Existing	1	1	Decant Water Pump		15	12		J
655-000-PF-004	32201	TK	03	32201-TK-03	New	1	1	Process Water Tank -1	Tank Volume: 25,000 m3				J
655-000-PF-004	32201	TK	04	32201-TK-04	New	1	1	Process Water Tank -2	Tank Volume: 25,000 m3				J
655-000-PF-004	32201	PP	06	32201-PP-06	New	1	1	Process Water Pump	Warman: 3/2 AH	15	12		J
AIR SERVICES 32301										40	32		
655-000-PF-004	32301	CP	01	32301-CP-01	Existing	1	1	Air Compressor	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package	30	24		J
655-000-PF-004	32301	FL	01	32301-FL-01	Existing	1	1	Primary Air Filter	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package	5	4		J
655-000-PF-004	32301	FL	02	32301-FL-02	Existing	1	1	Fine Air Filter	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package	5	4		J
655-000-PF-004	32301	PV	01	32301-PV-01	Existing	1	1	Pressure Vessel	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package				J
ORE SORTING' 22111 - To be confirmed										4	3		
655-000-PF-008	22111	BW	01	22111-BW-01	New	1	1	Belt Weighers - 1	Belt weighers feed the Ore Sorter	2	2		J
655-000-PF-008	22111	BW	02	22111-BW-02	New	1	1	Belt Weighers - 2	Belt Weigher Product of the Ore Sorter	2	2		J
MOBILE EQUIPMENT 73001													
655-000-PF-006	73101	EX	01	73101-EX-01	New	1	1	Excavator	Hitachi - 50 T				J
655-000-PF-006	73101	DT	01	73101-DT-01	New	1	1	Dump Truck -1	Assuming Caterpillar 785 D Mining Truck				J
655-000-PF-006	73101	FEL	01	73101-FEL-01	New	1	1	Front End Loader -1	Assuming Hyundai HL 980A				J
Total Demand (kW)										**624**	**499**		

Notes :
1. The equipment description is subject to change, after information received from Vendors.
2. The power rates are nominated from reference projects and are subject to change, after information received from Vendors.
3. 655-000-PF-008 Existing Ore sorter Circuit but considering Belt weighers for pricing

655 MT CARBINE - EQUIPMENT LIST	
Client:	Speciality Metals International Limited
Project:	655 MT CARBINE PFS Dry Plant Upgrade
Document Number:	655-ME-LS-001
Updated:	4/11/2021
Revision:	J

PHASE 2

MINCORE

PFD NUMBER	Area Number	Equipment Type	Sequential Number	Equipment No.	Existing / New /Future	Qty Total	Oper. Units No. off	EQUIPMENT TITLE	DESCRIPTION	Installed Kw/unit	Total Consumed kW	Chosen Supplier	Rev
PRIMARY CRUSHING 21202										16	13		
655-000-PF-014	21202	CR	01	21202-CR-01	New	1	1	Mobile Jaw Crusher	Diesel operated				J
655-000-PF-014	21202	CV	01	21202-CV-01	New	1	1	Conveyor, Feed Triple Deck Wet Screen	Rated 350tph, Particle Top Size: 170mm, Length: 38.5m, Belt Width: 800mm, Lift: 10m, Belt Speed 1.5m/s	11	9		J
655-000-PF-014	21202	WT	01	21202-WT-01	New	1	1	Belt Weigher on Conveyor Feed Triple Deck Wet Screen		5	4		J
CRUSHING & SCREENING 21102										191	153		
655-000-PF-014	21102	CH	01	21102-CH-01	New	1	1	Conveyor, Feed Fixed Screen Chute					J
655-000-PF-014	21102	SN	01	21102-SN-01	Existing	1	1	Triple Deck Wet Screen	Wet Screen, Feed rate : 445 tph, Feed size:'-170mm , Topdeck:-170,+40mm, Bottomdeck: '-40,+6mm, Undersize: '-6mm Sandvik SC2463	30	24		J
655-000-PF-014	21102	CH	02	21102-CH-02	New	1	1	Conveyor, Oversize feed Stockpile : +6 mm, -40mm Chute					J
655-000-PF-014	21102	PP	01	21102-PP-01	Existing	1	1	Wet Plant Feed Pump 1 (Duty)	Flowrate: 130 tph solids, 160m3/hr Warman: 8/6 AH	75	60		J
655-000-PF-014	21102	PP	02	21102-PP-02	New	1	1	Wet Plant Feed Pump 2 (Duty)	Flowrate: 130 tph solids, 160m3/hr Warman: 8/6 AH	75	60		J
655-000-PF-014	21102	CV	01	21102-CV-01	New	1	1	Conveyor, Oversize feed Stockpile : +6 mm, -40mm	Rated 220tph, Particle Top Size: 40mm, Length: 36m, Belt Width: 800mm, Lift: 9.5m, Belt Speed 1.5m/s	11	9		J
SECONDARY CRUSHING 21302										276	221		
655-000-PF-014	21302	CV	01	21302-CV-01	New	1	1	Conveyor, Feed Cone Crusher	Rated 200tph, Particle Top Size: 170mm, Length: 42m, Belt Width: 800mm, Lift: 11m, Belt Speed 1.5m/s	11	9		J
655-000-PF-014	21302	CH	01	21302-CH-01	New	1	1	Conveyor, Feed Cone Chute					J
655-000-PF-014	21302	BN	01	21302-BN-01	New	1	1	Secondary Cone Crusher Feed Bin	Bin Volume 24 m3				J
655-000-PF-014	21302	FE	01	21302-FE-01	New	1	1	Vibrating Feeder	Model SP0818, Feeder average load : 78 %	2	2		J
655-000-PF-014	21302	CR	01	21302-CR-01	New	1	1	Cone Crusher	Direct Feed, CSS: 40 mm, Crusher Load : 99 %, Feed rate : 58 tph	250	200		J
655-000-PF-014	21302	CV	02	21302-CV-02	New	1	1	Conveyor, Discharge Cone Crusher	Rated 200tph, Particle Top Size: 40mm, Length: 45m, Belt Width: 800mm, Lift: 12m, Belt Speed 1.5m/s	11	9		J
655-000-PF-014	21302	MG	01	21302-MG-01	New	1	1	Cleaning Magnet		2	2		J
ORE SORTING 22002										130	104		
655-000-PF-014	22002	FE	01	22002-FE-01	New	1	1	Reclaim Pan Feeder - 1	SP0725	2,4	1,9		J
655-000-PF-014	22002	FE	02	22002-FE-02	New	1	1	Reclaim Pan Feeder - 2	SP0725	2,4	1,9		J
655-000-PF-014	22002	CV	01	22002-CV-01	New	1	1	Conveyor, Tunnel Reclaim	Rated 160tph, Particle Top Size: 30mm, Length: 78m, Belt Width: 800mm, Lift: 20m, Belt Speed 1.5m/s	11	9		J
655-000-PF-014	22002	CH	01	22002-CH-01	Existing	1	1	Ore Sorter Diverter Chute					J
655-000-PF-014	22002	BN	01	22002-BN-01	Existing	1	1	Ore Sorting Feed Bin - 1	8m3 - 2m x 2m x2m				J
655-000-PF-014	22002	BN	02	22002-BN-02	New	1	1	Ore Sorting Feed Bin - 2	8m3 - 2m x 2m x2m				J
655-000-PF-014	22002	FE	03	22002-FE-03	Existing	1	1	Pan Feeder - 1	Vibrating Pan Feeder	5	4		J
655-000-PF-014	22002	FE	04	22002-FE-04	New	1	1	Pan Feeder - 2	Vibrating Pan Feeder	5	4		J
655-000-PF-014	22002	OS	01	22002-OS-01	Existing	1	1	Ore Sorter - 1	Tomra Ore Sorter	30	24		J
655-000-PF-014	22002	OS	02	22002-OS-02	New	1	1	Ore Sorter - 2	Tomra Ore Sorter	30	24		J
655-000-PF-014	22002	CV	02	22002-CV-02	New	1	1	Conveyor, Ore Sorter Reject Stockpile	Rated 136tph, Particle Top Size: 40mm, Length: 21.5m, Belt Width: 800mm, Lift: 6m, Belt Speed 1.5m/s	11	9		J
655-000-PF-014	22002	CVR	01	22002-CVR-01	New	1	1	Radial Stacker, Ore Sorter Reject Stockpile	Rated 136tph, Particle Top Size: 40mm, Length: 24m, Lift: 6,5m, Angle: 15 deg.	22	18		J
655-000-PF-014	22002	SP	02	22002-SP-02	New	1	1	Sampling Point, Ore Sorter Reject					J
655-000-PF-014	22002	CV	03	22002-CV-03	Existing	1	1	Conveyor, Ore Sorter Product Stockpile	Rated 24tph, Particle Top Size: 40mm, Length: 24m, Belt Width: 800mm, Lift: 6.5m, Belt Speed 1.5m/s	11	9		J
655-000-PF-014	22002	SP	01	22002-SP-01	New	1	1	Sampling Point, Ore Sorter Product					J
WATER SERVICES 32202										105	72		
655-000-PF-004	32202	PP	01	32202-PP-01	Existing	1	1	Bore Pump 1		45	36		J
655-000-PF-004	32202	PP	02	32202-PP-02	Existing	1	1	Bore Pump 2			0		J
655-000-PF-004	32202	TK	01	32202-TK-01	New	1	1	Process Water Tank	12 hours Storage		0		J
655-000-PF-004	32202	PP	03	32202-PP-03	New	1	1	Process Water Pump	Warman: 3/2 AH	15	12		J
655-000-PF-004	32202	TK	02	32202-TK-02	Existing	1	1	Raw Water Tank	Wet Plant Raw Water Storage Tank		0		J
655-000-PF-004	32202	PP	04	32202-PP-04	Existing	1	1	Raw Water Pump	Warman: 3/2 AH	15	12		J
655-000-PF-004	32202	PP	05	32202-PP-05	Existing	1	1	Decant Water Pump		15	12		J
655-000-PF-004	32202	TK	03	32202-TK-03	New	1	1	Process Water Tank -1	Tank Volume: 25,000 m3		0		J
655-000-PF-004	32202	TK	04	32202-TK-04	New	1	1	Process Water Tank -2	Tank Volume: 25,000 m3		0		J
655-000-PF-004	32202	PP	06	32202-PP-06	New			Process Water Pump	Warman: 3/2 AH	15	0		J
AIR SERVICES 32302										35	28		
655-000-PF-004	32302	CP	01	32302-CP-01	Existing	1	1	Air Compressor 1	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package	30	24		J
655-000-PF-004	32302	FL	01	32302-FL-01	Existing	1	1	Primary Air Filter 1	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package	5	4		J
655-000-PF-004	32302	PV	01	32302-PV-01	Existing	1	1	Pressure Vessel	Oil- Free Rotary screw ISO8573, ZE5D350-5E - package				J
ORE SORTING' 22112 - To be confirmed										4	3		
655-000-PF-008	22112	BW	01	22112-BW-01	New	1	1	Belt Weighers - 1	Belt weighers feed the Ore Sorter	2	2		J
655-000-PF-008	22112	BW	02	22112-BW-02	New	1	1	Belt Weighers - 2	Belt Weigher Product of the Ore Sorter	2	2		J
MOBILE EQUIPMENT 73002													
655-000-PF-006	73102	EX	01	73102-EX-01	New	1	1	Excavator	Hitachi - 50 T				J
655-000-PF-006	73102	DT	01	73102-DT-01	New	1	1	Dump Truck -1	Assuming Caterpillar 785 D Mining Truck				J
655-000-PF-006	73102	FEL	01	73102-FEL-01	New	1	1	Front End Loader -1	Assuming Hyundai HL 980A				J
Total Demand (kW)										**757**	**594**		

Notes :
1. The equipment description is subject to change, after information received from Vendors.
2. The power rates are nominated from reference projects and are subject to change, after information received from Vendors.
3. 655-000-PF-008 Existing Ore sorter Circuit but considering Belt weighers for pricing

655 MT CARBINE - EQUIPMENT LIST	
Client:	Speciality Metals International Limited
Project:	655 MT CARBINE PFS
Document Number:	655-ME-LS-001
Updated:	14/09/2021
Revision:	H

WET PLANT - PHASE 1

MINCORE

PFD NUMBER	Area Number	Equipment Type	Sequential Number	Equipment No.	Existing / New /Future	Qty Total	Oper. Units No. off	EQUIPMENT TITLE	DESCRIPTION	Stater	Total Installed Kw/unit	Total Consumed kW	Chosen Supplier	Rev
REHANDLING CIRCUIT 21401											104	84		
655-000-PF-016	21401	BN	01	21401-BN-01	New	1	1	Feed Bin	8m3 - 2m x 2m x2m					J
655-000-PF-016	21401	FE	01	21401-FE-01	New	1	1	Pan Feeder	SP0818		2.4	1.9		J
655-000-PF-016	21401	SN	01	21401-SN-01	Existing	1	1	Techroq Double Deck Screen	Double Deck Screen -Linear Motion Screen, Separation deck 1 : 12mm, Separation deck 2 : 6 mm, inclination 5 deg.		13	10.4		J
655-000-PF-016	21401	CV	01	21401-CV-01	New	1	1	Conveyor, VSI Feed	Rated 30tph, Particle Top Size: 40mm, Length: 22m, Belt Width: 600mm, Lift: 6m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-016	21401	CH	01	21401-CH-01	New	1	1	Ore Sorter Feed Bifurcating Chute						J
655-000-PF-016	21401	CR	01	21401-CR-01	Existing	1	1	Techroq VSI Crusher	Techroq T5R Single Drive MK0,5 VSI Crusher		45	36		J
655-000-PF-016	21401	CV	02	21401-CV-02	New	1	1	Conveyor, Sizing Screen Feed	Rated 40tph, Particle Top Size: 40mm, Length: 34m, Belt Width: 600mm, Lift: 9,5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-016	21401	CV	03	21401-CV-03	New	1	1	Conveyor, Screen Undersize	Rated 10tph, Particle Top Size: 6mm, Length: 18m, Belt Width: 600mm, Lift: 4.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-016	21401	CV	04	21401-CV-04	New	1	1	Conveyor, VSI Discharge	Rated 30tph, Particle Top Size: 6mm, Length: 36m, Belt Width: 600mm, Lift: 9.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
PRODUCT HANDLING, STORAGE AND TRANSPORTATION 25001											90	72		
655-000-PF-015	25001	TK	01	25001-TK-01	New	1	1	Wet Plant Surge Tank	3m Diameter x 3m Height					J
655-000-PF-015	25001	AG	01	25001-AG-01	New	1	1	Wet Plant Surge Tank Agitator			15	12		J
655-000-PF-015	25001	PP	01	25001-PP-01	New	1	1	Wet Plant Surge Tank Pump	Flowrate: 52 tph solids, 65m3/hr Warman: 6/4 AH		75	60		J
PRODUCT DEWATERING CIRCUIT 25101											79	63		
655-000-PF-015	25101	SN	01	25101-SN-01	New	1	1	Dewatering Screen	High Frequency Vibrating Screen, Feed rate : 75 tph, Feed size:-8mm , Undersize:-0.25mm , Oversize: '-6,+0.25mm		8	6		J
655-000-PF-015	25101	CY	01	25101-CY-01	New	1	1	Dewatering Cyclone, Cluster	500CVX Cyclone cluster					J
655-000-PF-015	25101	HP	01	25101-HP-01	New	1	1	Cyclone, Overflow hopper						J
655-000-PF-015	25101	PP	02	25101-PP-02	New	1	1	Cyclone, Overflow pump	Flowrate: 125 m3/hr, Warman: 6/4 AH		30	24		J
655-000-PF-015	25101	PP	03	25101-PP-03	New	1	1	Cyclone, Feed pump	Flowrate: 185 m3/hr, Warman: 6/4 AH		30	24		J
655-000-PF-015	25101	CV	01	25101-CV-01	New	1	1	Conveyor, Stockpile Feed -6mm	Rated 70tph, Particle Top Size: 6mm, Length: 24m, Belt Width: 600mm, Lift: 6.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-015	25101	ST	01	25101-ST-01	New	1	1	Strainer	1 mm					J
MOBILE EQUIPMENT 73001														
655-000-PF-012	73101	DT	01	73101-DT-01	New	1	1	Dump Truck - 1	Assuming Caterpillar 785 D Mining Truck					J
655-000-PF-012	73101	DT	01	73101-DT-01	New	1	1	Dump Truck - 2	Assuming Caterpillar 785 D Mining Truck					J
Total Demand (kW)											**273**	**219**		

Notes :
1. The equipment description is subject to change, after information received from Vendors.
2. The power rates are nominated from reference projects and are subject to change, after information received from Vendors.

655 MT CARBINE - EQUIPMENT LIST	
Client:	Speciality Metals International Limited
Project:	655 MT CARBINE PFS
Document Number:	655-ME-LS-001
Updated:	14/09/2021
Revision:	H

WET PLANT - PHASE 2

MINCORE

PFD NUMBER	Area Number	Equipment Type	Sequential Number	Equipment No.	Existing / New /Future	Qty Total	Oper. Units No. off	EQUIPMENT TITLE	DESCRIPTION	Stater	Total Installed Kw/unit	Total Consumed kW	Chosen Supplier	Rev
REHANDLING CIRCUIT 21402											186	149		
655-000-PF-014	21402	BN	01	21402-BN-01	Existing	1	1	Feed Bin	8m3 - 2m x 2m x2m					J
655-000-PF-014	21402	FE	01	21402-FE-01	Existing	1	1	Pan Feeder	SP0818		2.4	1.9		J
655-000-PF-014	21402	SN	01	21402-SN-01	New	1	1	Tertiary Double deck screen	Double Deck Screen -Linear Motion Screen, Separation deck 1 : 12mm, Separation deck 2 : 6 mm, inclination 5 deg.		30	24		J
655-000-PF-014	21402	CV	01	21402-CV-01	Existing	1	1	Conveyor, Feed VSI Bin	Rated 72tph, Particle Top Size: 40mm, Length: 22m, Belt Width: 600mm, Lift: 6m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-016	21402	CH	01	21402-CH-01	New	1	1	Ore Sorter Feed Bifurcating Chute						J
655-000-PF-014	21402	CR	01	21402-CR-01	Existing	1	1	VSI Crusher - 1 (Duty)	VSI Crusher CV217, Top Speed CV 217		110	88		J
655-000-PF-014	21402	CR	02	21402-CR-02	New	1	1	VSI Crusher - 2 (Standby)	VSI Crusher CV217, Top Speed CV 217		0	0		J
655-000-PF-014	21402	CV	02	21402-CV-02	Existing	1	1	Conveyor, VSI Crusher discharge	Rated 96tph, Particle Top Size: 40mm, Length: 34m, Belt Width: 600mm, Lift: 9.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-014	21402	CV	03	21402-CV-03	Existing	1	1	Conveyor, Screen Undersize	Rated 24tph, Particle Top Size: 6mm, Length: 18m, Belt Width: 600mm, Lift: 4.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
655-000-PF-013	21402	CV	04	21402-CV-04	Existing	1	1	Conveyor, VSI Discharge	Rated 30tph, Particle Top Size: 6mm, Length: 36m, Belt Width: 600mm, Lift: 9.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	8.8		J
PRODUCT HANDLING, STORAGE AND TRANSPORTATION 25002											60	24		
655-000-PF-015	25002	TK	01	25002-TK-01	New	1	1	Wet Plant Surge Tank	Blunger Tank					J
655-000-PF-015	25002	AG	01	25002-AG-01	New	1	1	Wet Plant Surge Tank Agitator 1			15			J
655-000-PF-015	25002	AG	02	25002-AG-02	New	1	1	Wet Plant Surge Tank Agitator 2			15			J
655-000-PF-015	25002	PP	01	25002-PP-01	New	1	1	Wet Plant Surge Tank Pump	Flowrate: 130 tph solids, 160m3/hr Warman: 6/4 AH		30	24		J
PRODUCT DEWATERING CIRCUIT 25102											79	63		
655-000-PF-015	25102	SN	01	25102-SN-01	Existing	1	1	Dewatering Screen	High Frequency Vibrating Screen, Feed rate : 89 tph, Feed size:-6mm , Undersize:'-0.25mm , Oversize: '-6,+0.25mm		8	6		J
655-000-PF-015	25102	CY	01	25102-CY-01	Existing	1	1	Dewatering Cyclone, Cluster	250CVX Cyclone cluster					J
655-000-PF-015	25102	HP	01	25102-HP-01	New	1	1	Cyclone, Overflow hopper						J
655-000-PF-015	25102	PP	01	25102-PP-01	Existing	1	1	Cyclone, Overflow pump	Flowrate: 55 m3/hr, Warman: 3/2 AH		30	24		J
655-000-PF-015	25102	PP	02	25102-PP-02	Existing	1	1	Cyclone, Feed pump	Flowrate: 55 m3/hr, Warman: 3/2 AH		30	24		J
655-000-PF-015	25102	CV	01	25102-CV-01	Existing	1	1	Conveyor, Stockpile Feed -6mm	Rated 70tph, Particle Top Size: 6mm, Length: 24m, Belt Width: 600mm, Lift: 6.5m, Angle: 15 deg., Belt Speed 1.5m/s		11	9		J
655-000-PF-015	25102	ST	01	25102-ST-01	Existing	1	1	Strainer	1 mm					J
TAILS DEWATERING CIRCUIT 26102											75	60		
655-000-PF-015	26102	SN	01	26102-SN -01	New	1	1	Dewatering Screen	Single Deck, 69tph, (Skid mounted, excl cyclone))		15	12		J
655-000-PF-015	26102	PP	01	26102-PP-01	New	1	1	Dewatering Pump	133m3/hr 8/6 Warman		30	24		J
655-000-PF-015	26102	CV	01	26102-CV-01	New	1	1	Conveyor Feed cyclone tower	Rated 54tph, - 0.25mm, Length: 10,880 mm, Belt Width: 800mm, Lift: 2,310mm, Angle: 15 deg.					J
655-000-PF-015	26102	CT	01	26102-CT-01	New	1	1	Cyclone Tower	Cyclone cut size 0.25mm, (Incl cyclone and feed piping, pump)					J
655-000-PF-015	26102	CV	02	26102-CV-02	New	1	1	Conveyor feed Stockpile	Rated 54tph, + 0,25mm, Length: 24m, Belt Width: 800mm, Lift: 6.5m, Angle: 15 deg.		15	12		J
655-000-PF-015	26102	HP	01	26102-HP-01	New	1	1	Cyclone O/F Hopper				0		J
655-000-PF-015	26102	PP	02	26102-PP-02	New	1	1	Cyclone O/F Pump			15	12		J
655-000-PF-015	26102	ST	01	26102-ST-01	Existing	1	1	Strainer	1 mm					J
MOBILE EQUIPMENT 73002														
655-000-PF-012	73102	DT	01	73102-DT-01	New	1	1	Dump Truck -1	Assuming Caterpillar 785 D Mining Truck					J
655-000-PF-012	73102	DT	01	73102-DT-01	New	1	1	Dump Truck -2	Assuming Caterpillar 785 D Mining Truck					J
Total Demand (kW)											**400**	**296**		

Notes :

1. The equipment description is subject to change, after information received from Vendors.
2. The power rates are nominated from reference projects and are subject to change, after information received from Vendors.

Appendix C Process Plant Process Design Criteria

105969-RX-DC-0001

Revision Number A

EQ Resources
Mount Carbine Feasbility Study

Process Design Criteria

Rev	Date	Description	Prepared	Checked	Approved
A	19-Oct-21	Preliminary For Client Review	Doug Price	Andrew Hoyle	Andrew Hoyle
B	15-Nov-21	Issued for Study	Andrew Hoyle		Andrew Hoyle

Units of Measure

Measurement systems and nomenclature used in the design criteria are outlined as follows:

(i) Metric units are used throughout, unless otherwise specified.
(ii) A period, not comma, is used as the decimal marker.
(iii) A comma is used to separate groups of three integers.
(iv) Reference conditions for gas volumes are typically 0°C and 101.325 kPa, at molar (ideal) gas volume of 22.414 m^3/(kg×mol) unless specified differently. Volume is shown as "m^3 (normal)" or abbreviated to "Nm^3."

(v) Gas volumes quoted for site conditions or atmosphere are abbreviated to "FAD m^3."

Units and Abbreviations

Description	Symbol / Unit
amperes	A
ampere per square metre	A/m^2
atmosphere (101.3 kPa)	Atm
average	ave
bed volume	BV
centimeters	cm
centipoise	cP
cubic metres	m^3
cubic metres per hour	m^3/h
days	d
days per year	d/y
decibel	dB
degrees Celsius	°C
degrees	deg
diameter	dia
front-end loader (wheeled)	FEL
grams	g
grams per litre	g/L
grams per tonne	g/t
hectares	ha
hours	h
hours per day	h/d
inside diameter	ID
intermediate bulk container	IBC
kilograms	kg
kilogram per cubic metre	kg/m^3
kilogram per hour	kg/h
kilopascals	kPa
kilowatthour	kWh
kilowatthour per tonne	kWh/t
life of mine	LOM
litres	L
maximum	max
megawatt	MW
metres	m
metres above sea level	masl
metres per minute	m/min
metres per second	m/s

Description	Symbol / Unit
microns	µm
milliamperes	mA
milligrams	mg
milligrams per litre	mg/L
millimetres	mm
millimeters mercury	mm Hg
millions	M
millions per tonnes	M/t
minimum	Min
minutes	min
Newton (force)	N
normal cubic meters	Nm^3
normal cubic meters per hour	Nm^3/h
parts per billion	ppb
parts per million	ppm
percentage	%
run of mine	ROM
second (time)	s
specific gravity	SG
specific heat capacity	J/(kg.°C)
square metres	m^2
thousands	k
tonnes (metric)	t
tonnes per cubic meter	t/m^3
tonnes per day	t/d
tonnes per hour	t/h
tonnes per year	t/y
total dissolved solids	TDS
volts	V
volume	vol
volume per volume	v/v
volume percent	% v/v
weight (mass)	wt
weight (mass) percent	% w/w
weight per mass	w/w
weight per volume	w/v
years	y

Ausenco

Facility and Area Codes

The process plant is defined by the following facility and area codes:

Area	Description
2000	Process Plant
2100	Feed Preparation
2200	Jig Circuit
2300	Scavenging Circuit
2400	Table Feed Preparation
2500	Coarse Tables
2600	Fines Tables
2700	Arsenic Removal
2800	Drying and Separation
2900	Process Water
3000	Tailings

Sources of Information and Data

The following codes are used to reference the origin of items of information and data that appear in the design criteria:

Code	Source of Information and Data
1.	Data provided by Client
2.	Testwork - metallurgical and other process data
3.	Consultants reports or data
4.	Standard industry / operating practice
5.	Vendor data
6.	Engineering Handbook, Regulatory Standards and Codes
7.	Environmental regulation, licences or permits
8.	Ausenco recommendation, standard procedures or in-house data
9.	Not available. To be provided by Client, test work, others - as available.

Disclaimer

Any recovery or similar data stated herein is used for design purposes only and is not a statement of predicted plant performance. The combination of design values neither relate to the annual productions defined nor integrate to represent a metallurgical balance.

Ausenco

Area	Description	Units	Criteria	Source	Rev
2000	**Process General**				
	Mine Design Basis				
	Mining method	-	open pit/ stockpiles	1	A
	Plant design capacity	t/h	60.0	1	A
	Ore Types				
	Plant Feed Grade				
	Grades				
	Tungsten, Nominal	% WO_3	0.138	8	A
	Tungsten, Design (Overall)	% WO_3	0.5	1	A
	Tungsten, Design (Ore Sorter)	% WO_3	0.85	1	C
	Product Grades and Recoveries				
	Overall product recoveries, nominal				
	Tungsten	%	77.0	1	C
	Tungsten (Design, Ore sorter to Feed)	%	92.8	8	C
	Tungsten (Design, Ore sorter to Tables)	%	92.8	8	C
	Product grades, nominal				
	Wolfamite				
	Tungsten	% WO_3	32.9	8	C
	Scheelite				
	Tungsten	% WO_3	60.5	8	B
	Overall				
	Tungsten	% WO_3	50.0	8	C
2000	**Ore Characteristics**				
	ROM Ore				
	Ore specific gravity				
	design	t/m^3	2.89	8	C
	Ore bulk density				
	for volume calculations (dry)	t/m^3	1.80	8	C
	for weight calculations (dry)	t/m^3	2.10	8	C
	Angle of repose	degrees	38	8	C
	Ore moisture				
	nominal for design	% water (w/w)	1.0	2	A
	Ore Size Distribution				
	feed F_{100}	mm	6	5	C
	feed F_{80}	mm		5	C
	feed F_{50}	mm		5	C

2100 Feed Preparation

Feed Screen

Screen type	-	Double deck vibrating	1	A
Number of screens, operating	#	1	1	A
Screen aperture size, top deck	mm	6	8	A
Screen aperture size, bottom deck	mm	2	8	A
Secondary screen undersize product P_{80}	mm			
Split to top deck				
Mass	%	0	2	A
WO_3	%	0	2	A
Moisture	%w/w	na	2	A
Split to mid deck				
Mass	%	33	2	A
WO_3	%	31	2	A
Moisture	%w/w	20		
Split to bottom deck				
Mass	%	67	2	A
WO_3	%	69	2	A
Moisture	%w/w	59.7	2	C
Screen Spray Water	m^3/h	2	8	C

2200 Jig Circuit

4mm Jig

Type		Russell Jig Model J2/70 HT	9	A
Number of units	#	1	9	A
Number of Cells	#	4 (2 in series, 2 in paralel)	9	A
Unit capacity, maximum for design	m^3/h			
Mass to product	% feed to circuit	5.97	2	C
Tungsten Recovery	%	87.16	2	C
Feed Pulp Density	% w/w	13.7	8	C
Concentrate Pulp Density	% w/w	6	8	C
Tailings Pulp Density	% w/w	16.7	8	C
Total Hutch Water	m^3/h	20	8	C

2mm Jig

Type		Russell Jig Model J2/70 HT	1	A
Number of units	#	1	1	A
Number of Cells	#	4 (2 in series, 2 in paralel)	1	A
Unit capacity, maximum for design	m^3/h			
Mass to product	% feed to circuit	19.70	2	C
Tungsten Recovery	%	82.52	2	C
Product Grade, % Tungsten	%			
Feed Pulp Density	% w/w	13.7	8	C
Concentrate Pulp Density	% w/w	6	8	C
Tailings Pulp Density	% w/w	16.7	8	C
			8	C
Total Hutch Water	m^3/h	20		

Dewatering Screen

Screen type	-	Double Deck Vibrating Screen	8	A
Number of screens, operating	#	1	8	A
Screen aperture size, top deck	mm	4	8	C
Screen aperture size, bottom deck	mm	2	8	A
Secondary screen undersize product P_{80}	mm			
Split to top deck				
Mass	%	37.3	2	A

WO_3	%	7.6	2	A
Moisture	%w/w	90		
Split to mid deck				
Mass	%	48.1	2	A
WO_3	%	61.3	2	A
Moisture	%w/w	20		
Split to bottom deck				
Mass	%	14.6	2	A
WO_3	%	31.1	2	A
Screen Spray Water	m^3/h	2	8	C
Jig Overflow Crusher				
Type	-	Rolls	8	B
Circuit	open/closed	Open	8	B
Crusher feed size				
feed F_{100}	mm	6	1	A
Product in crusher discharge				
product P_{100}	mm	1	8	A

2300 Scavenging Circuit

Scavenger Circuit Feed Screen				
Screen type	-	Single Deck Vibrating	8	A
Number of screens, operating	#	1	8	A
Screen aperture size, top deck	mm	0.5	8	A
Secondary screen undersize product P_{80}	mm			
Split to Oversize	%	30	2	A
Tungsten to Oversize	%	4.6		
Split to Oversize				
Scavenger Spirals				
Type			5	C
Unit capacity, maximum for design	t/h/start	1	5	C
Feed pulp density, nominal	% solids (w/w)	30	5	C
Wash water requirement (total)	m^3/h		8	C
Concentrate mass recovery	% feed to stage	30	2	A
Concentrate pulp density	% solids (w/w)	55	2	A
WO_3 recovery	% by stage	65	2	A
Middlings mass recovery	% feed to stage	na	2	A
Middlings pulp density	% solids (w/w)	na	2	A
WO_3 recovery	% by stage	na	2	A
Scavenger Reflux Classifier				
Type			5	C
Unit capacity, maximum for design	t/h	25-30	5	C
Wash water requirement (total)	m^3/h	tba	8	C
Concentrate mass recovery	% feed to stage	30	2	A
Concentrate pulp density	% solids (w/w)	55	2	A
WO_3 recovery	% by stage	65	2	A

2400 Table Feed Preparation

Rolls Crusher Feed Screen

Screen type	-	Single Deck Vibrating	8	A
Number of screens, operating	#	1	8	A
Screen aperture size, top deck	mm	0.8	8	A
Secondary screen undersize product P_{80}	mm			
Split to undersize	%			

Intermediate Rolls Crusher

Type	-	Rolls	8	A
Circuit	open/closed	Closed	8	A
Number	#	2		A
Circulating load, nominal	%	28	8	A
Mass to OS	%	60	2	C
OS pulp denisty	% w/w	3	2	C
Screen Spray Water	t/h			
Crusher feed size				
feed F_{100}	mm	2	8	A
feed F_{80}	mm			
feed F_{50}	mm			
Product in crusher discharge				
product P_{100}	mm	1	5	A
product P_{80}	mm			
product P_{50}	mm			
Rolls gap - CSS				
design	mm	0	1	A

Dewatering Cyclone

Feed pulp density, nominal	% solids (w/w)	11.3	8	C
Underflow pulp density	% solids (w/w)	10	5	C
Mass to cyclone underflow	%	78	8	A
Tungsten to cyclone underflow	%	100	5	C

Tables Feed Screen

Screen type	-	Single Deck Vibrating	8	A
Number of screens, operating	#	1	8	A
Screen aperture size, top deck	mm	0.5	9	A
Split to oversize	%	30.9	5	B
Tungsten to oversize	%	23	5	B
Oversize % Solids	%	20	5	B

2500 Coarse Tables

Coarse Rougher Tables

Type	-		1	A
Table Motion			1	A
Unit capacity, maximum for design	t/h/deck	1.5	5	A
Feed pulp density, nominal	% solids (w/w)	5-15	5	A
Wash water requirement	m3/h per deck	2.5	5	A
Concentrate mass recovery	% feed to stage	5.1	2	A
Concentrate pulp density	% solids (w/w)	2.9	2	A
WO_3 recovery	% by stage	97.5	2	A
Tailings pulp denisty	% solids (w/w)	9.2	5	A

Coarse Cleaner Tables

Type	-	Double Deck	1	A
Unit capacity, maximum for design	t/h/deck	1.1	5	C
Feed pulp density, nominal	% solids (w/w)	2.9	5	A
Wash water requirement	m3/h per deck	2	5	C
Concentrate grade	% WO3	50	2	A
WO_3 recovery	% by stage	84.8	2	A
Concentrate pulp density	% solids (w/w)	12.9	2	A
Tailings pulp density	% solids (w/w)	~2	5	C

2600 Fines Tables

Fine Rougher Tables

Type	-	Triple Deck	1	A
Table Motion		Diester/ Holman	1	A
Unit capacity, maximum for design	t/h/deck	1.5	5	A
Feed pulp density, nominal	% solids (w/w)	23	5	A
Wash water requirement	m3/h per deck	1.5	5	A
Concentrate mass recovery	% feed to stage	6.8	2	A
Concentrate pulp density	% solids (w/w)	2.9	2	A
WO_3 recovery	% by stage	97.5	2	A
Tailings pulp denisty	% solids (w/w)	~25	5	C

Coarse Cleaner Tables

Type	-	Double Deck	1	A
Unit capacity, maximum for design	t/h/deck	1.1	5	C
Feed pulp density, nominal	% solids (w/w)	23	5	C
Wash water requirement	m3/h per deck	2	5	C
Concentrate grade	% WO3	50	2	A
WO_3 recovery	% by stage	22.5	2	A
Concentrate pulp density	% solids (w/w)	12.9	2	A
Tailings pulp density	% solids (w/w)	2.4	5	C

2700 Arsenic Removal

TUNGSTEN CONCENTRATE MILLING

Grinding Plant Capacity

Grinding circuit capacity, design (dry)	t/d	17	8	C

Ball Mill

Type	-	Wet overflow	4	A
Circuit	open/closed	Closed	4	A
Mill feed F_{100}	mm	1	4	A
Mill feed F_{80}	mm	0.8	4	A
Mill product P_{80}	µm	75-100	4	A
Mill discharge pulp density	% solids (w/w)	70	4	A

Grinding Screens

Type	-	tba vendor	9	C
Feed pulp density, nominal	% solids (w/w)	35	4	A
Oversize pulp density	% solids (w/w)	70	4	A

TUNGSTEN CONCENTRATE FLOTATION

Rougher

Cell type	-	Jameson	8	A
Feed pulp density, nominal	% solids (w/w)	8.50%	8	A
Aeration hold-up factor in flotation cell	%	15	4	A
Stage recovery				
mass, at average grade	%	9	2	A
WO_3, at average grade	%	2.4	2	A
As, at average grade	%		2	A
S, at average grade	%		2	A
Concentrate pulp density, nominal	% solids (w/w)	20	8	A
Concentrate solids specific gravity, nominal	t/m^3	4.2	8	A
Feed Flow	m3/h	5.0	5	A
Wash Water	m3/h	0.3	8	A

2800 Drying and Separation

Product Drying

Dryer type	-	Indirect rotary	8	A
Fuel type	-	Diesel	8	A
Unit capacity, maximum for design	t/h	tba	9	A
Product moisture	% water (w/w)	0.5	8	A
Cooler type	-	tba	9	A
Cooler fluid	-	tba	9	A
Discharge temperature	°C	< 80	8	A
Product moisture	% water (w/w)	< 0.5	8	A

Magnetic Separation

Type	-		8	C
Number of passes	-		8	A
Unit capacity, maximum for design	t/h		8	A
Solids Recovery		62	2	A
Tungsten recovery to mag	%	75	2	A

2700 Reagents

Flotation

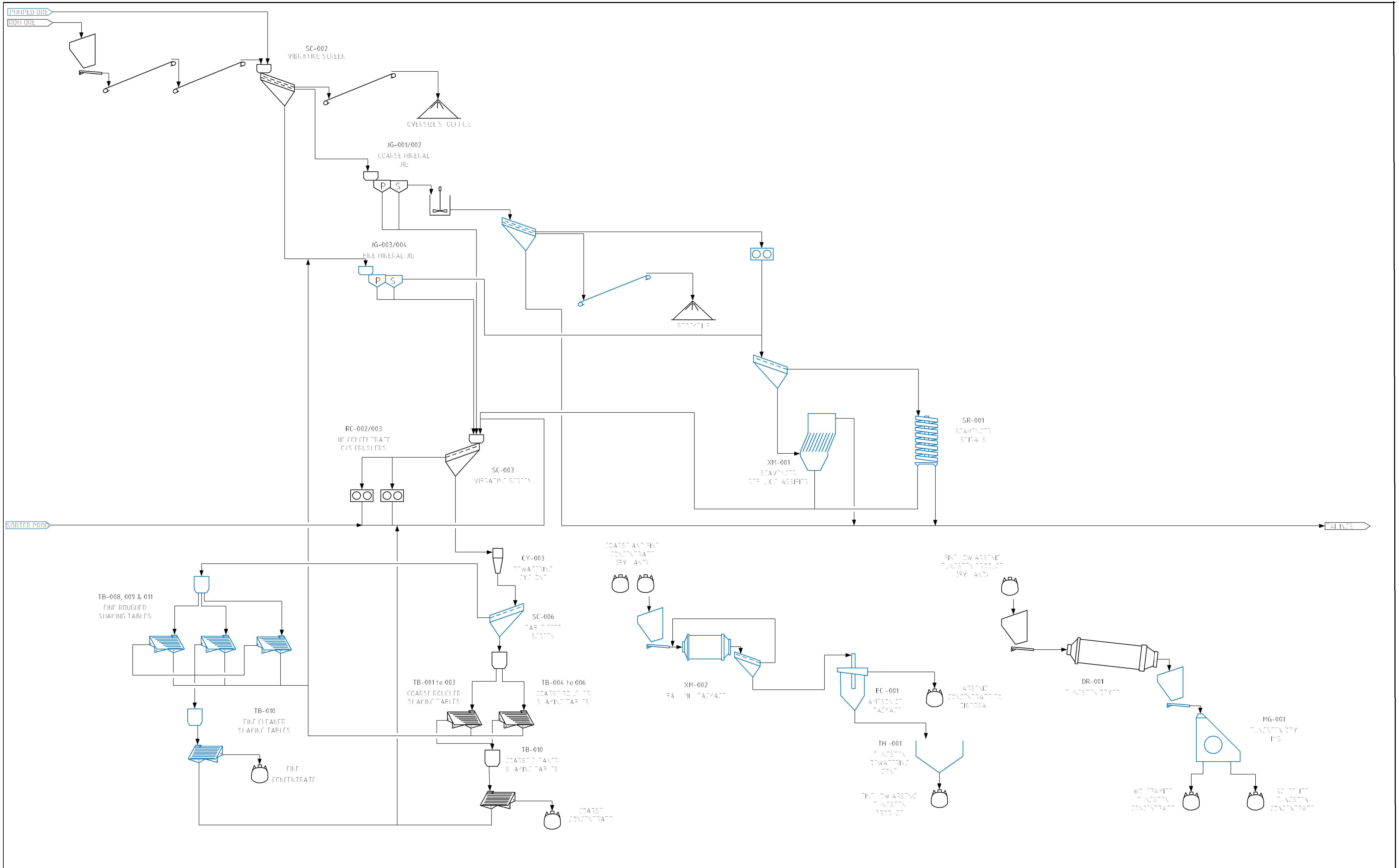
Primary Collector

Use	-	Collector	2	C
Type	-	PAX	2	C
Primary delivery system				
physical form	-	Liquid	8	C
package form	-	Bucket	4	C
package size	t	20L	4	C
Purity, minimum	%w/w		8	C
Solid specific gravity	t/m^3		8	C
Addition rate, nominal	g/t Feed		8	C

Frother

Use	-	Frother	4	C
Type	-	MIBC	2	C
Primary delivery system				
physical form	-	Liquid	5	C
package form	-	Bucket	5	C
package size	L	20L	5	C
Solution concentration	% w/v		8	C
Solution specific gravity	-		5	C

Appendix D Process Plant Block Flow Diagram



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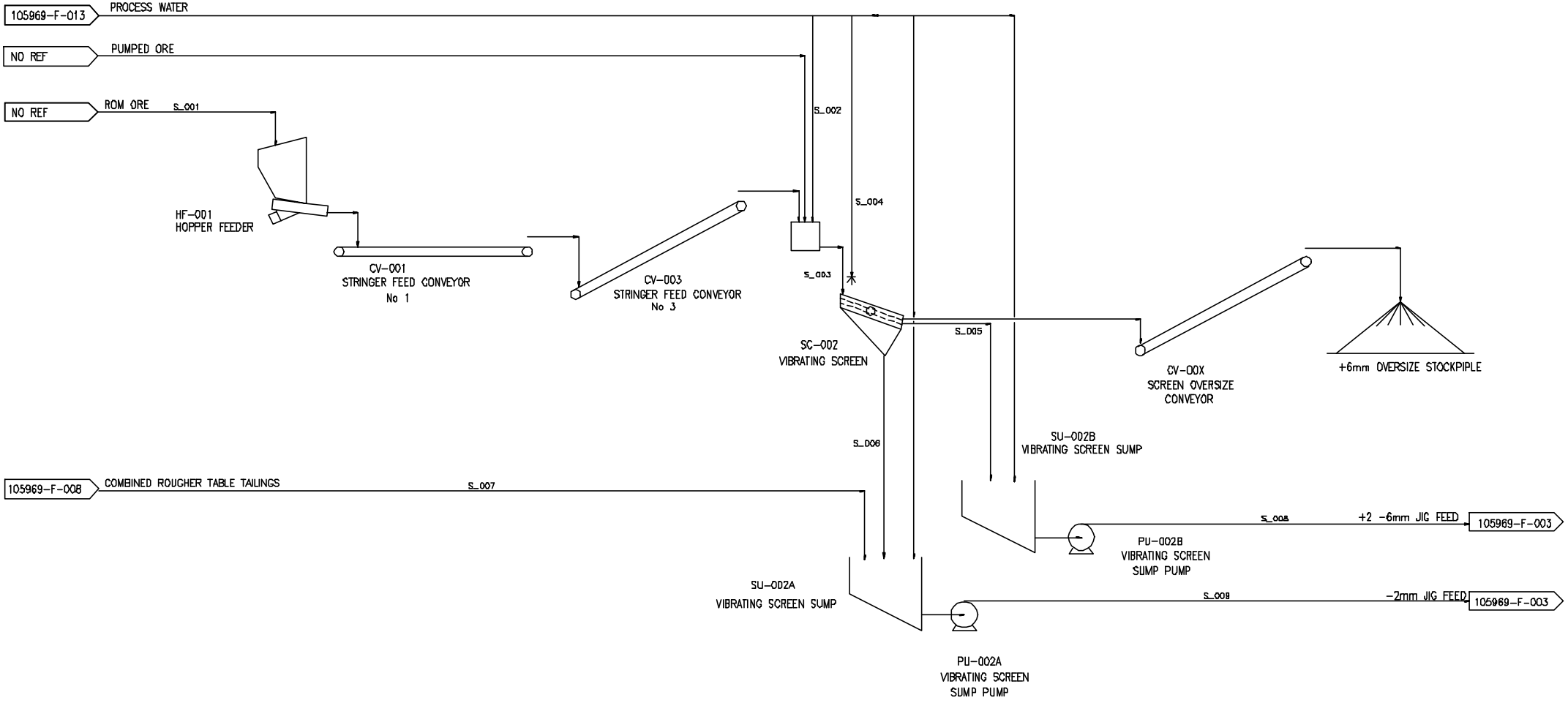
TITLE: MT CARBINE TUNGSTEN UPGRADE
FEASIBILITY STUDY
OVERALL
PROCESS FLOW DIAGRAM

PROJECT No: 105969-02	SCALE: NTS	SIZE: A1
DRAWING No: 105969-0000-F-001		REV: B

Appendix E Process Plant Process Flow Diagrams



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TITLE: MT CARBINE TUNGSTEN UPGRADE
FEASIBILITY STUDY
FEED PREPARATION
PROCESS FLOW DIAGRAM

PROJECT No	SCALE	SIZE
105969-02	NTS	A1

DRAWING No	REV
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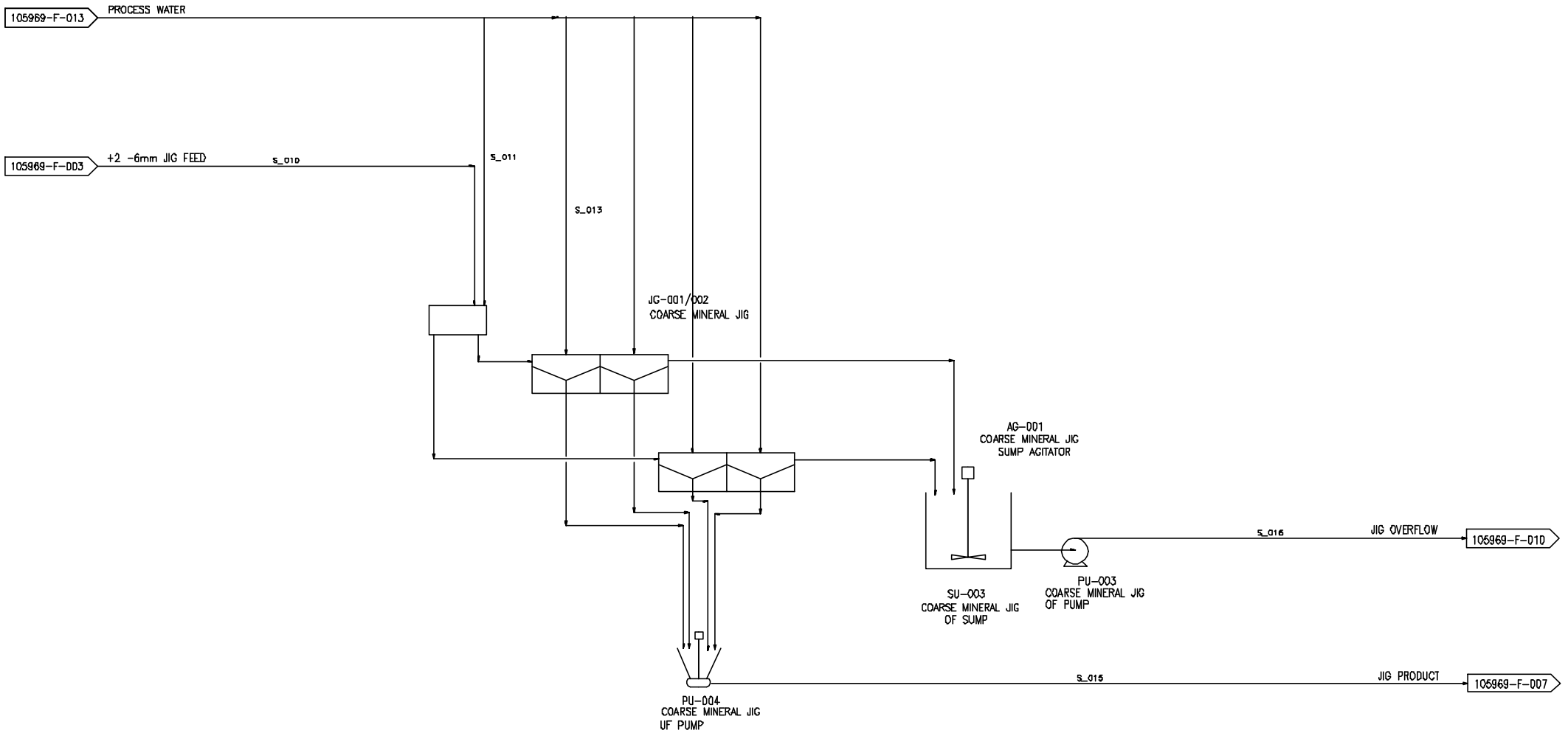

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CLIENT EQ RESOURCES LIMITED

TITLE MT CARBINE TUNGSTEN UPGRADE
FEASIBILITY STUDY
COARSE JIG CIRCUIT
PROCESS FLOW DIAGRAM

PROJECT No	SCALE	SIZE
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DRAWING No	REV
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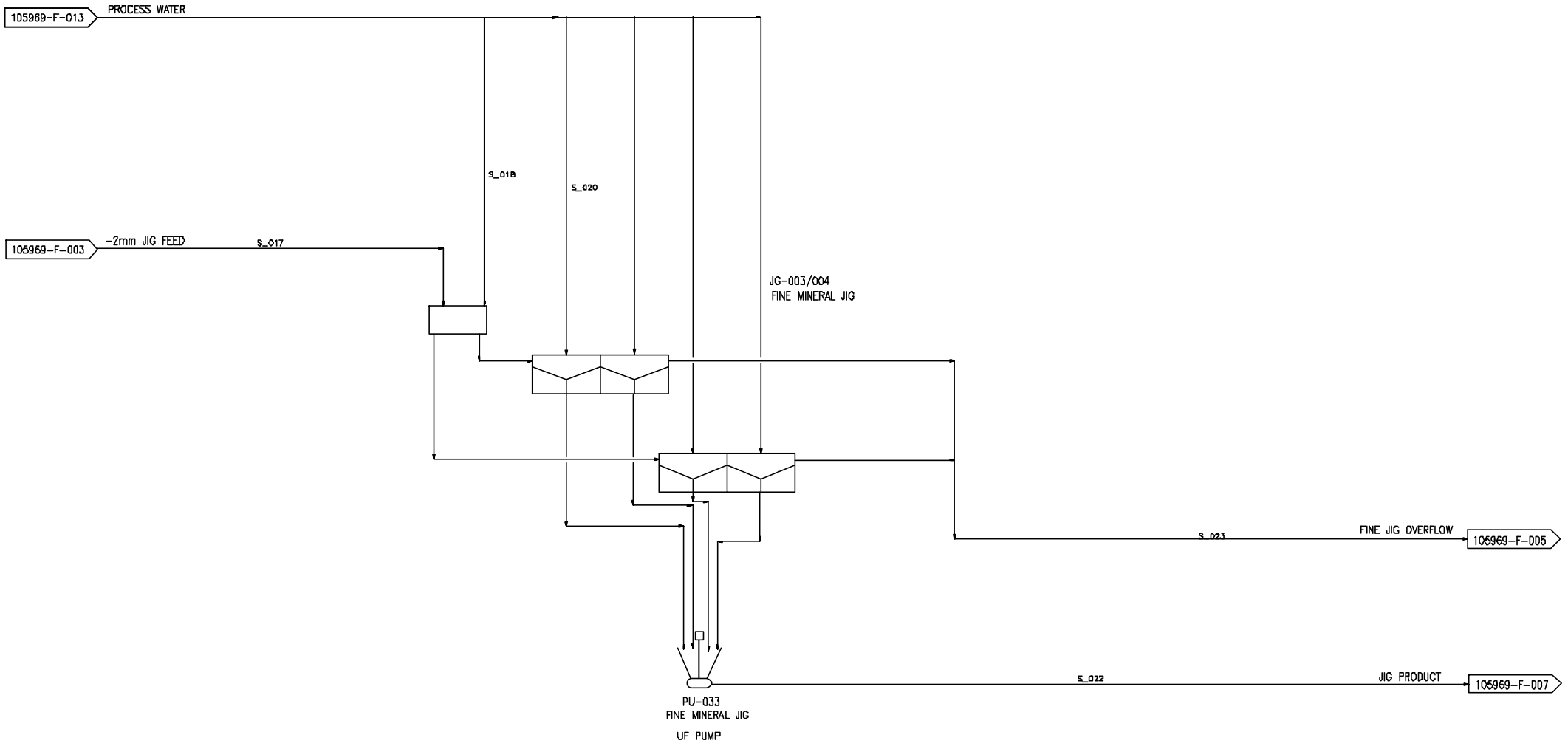

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FEASIBILITY STUDY
FINE JIG CIRCUIT
PROCESS FLOW DIAGRAM

PROJECT No	SCALE	SIZE
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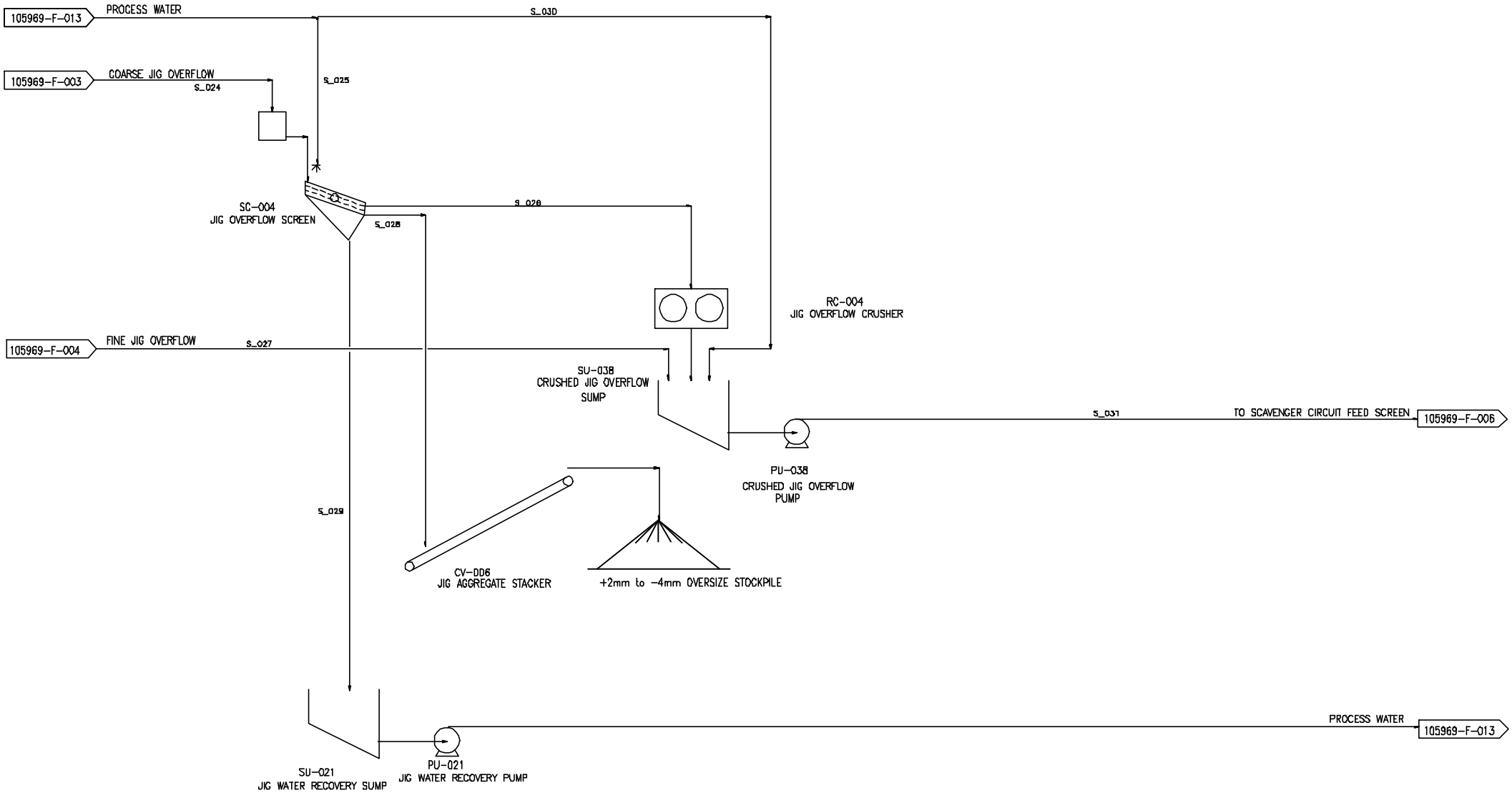

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FEASIBILITY STUDY
JIG TAILINGS SCAVENGING
PROCESS FLOW DIAGRAM

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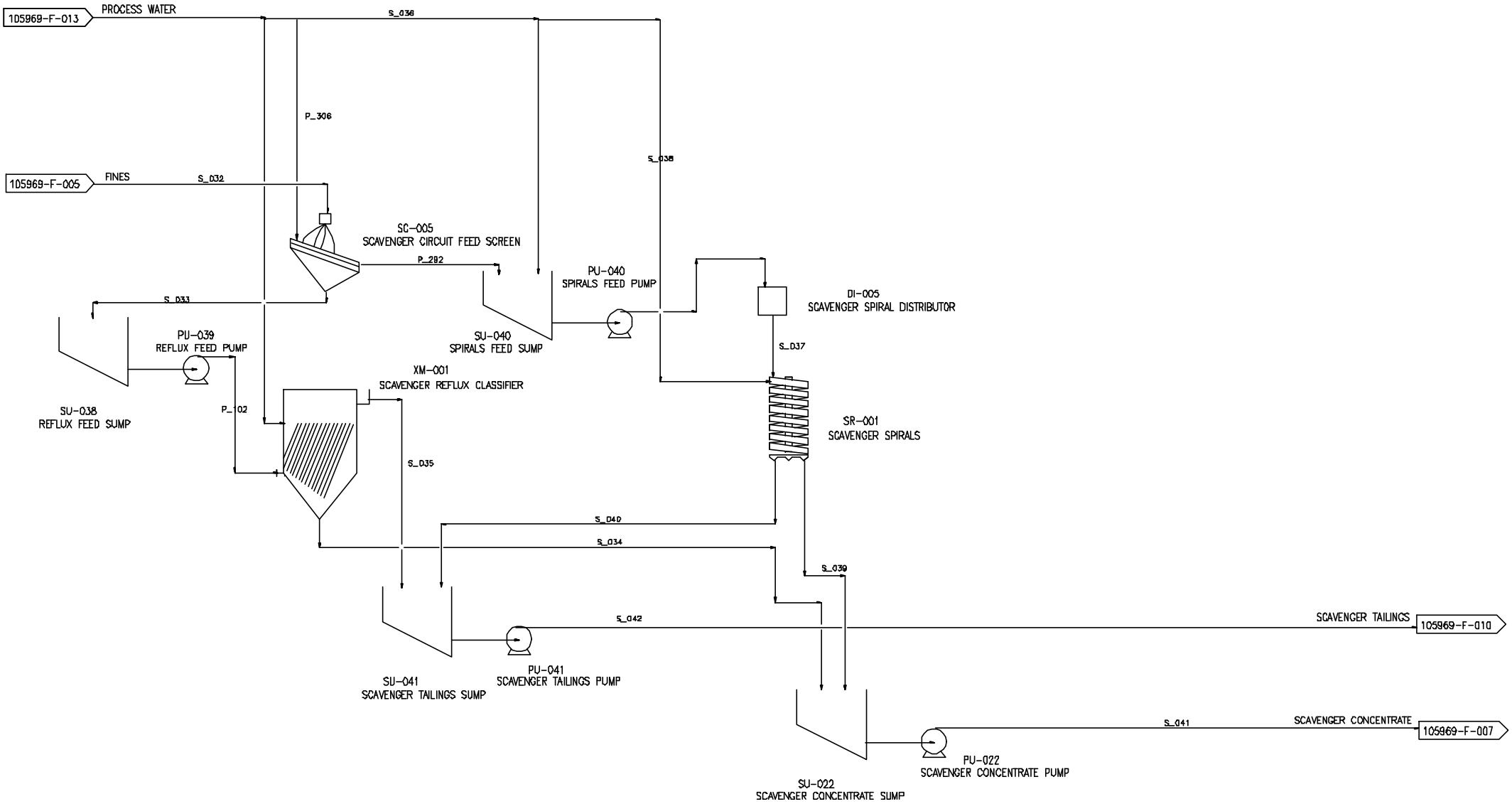

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FEASIBILITY STUDY
SPIRALS AND REFLUX CIRCUIT
PROCESS FLOW DIAGRAM

PROJECT No	SCALE	SIZE
105969-02	NTS	A1

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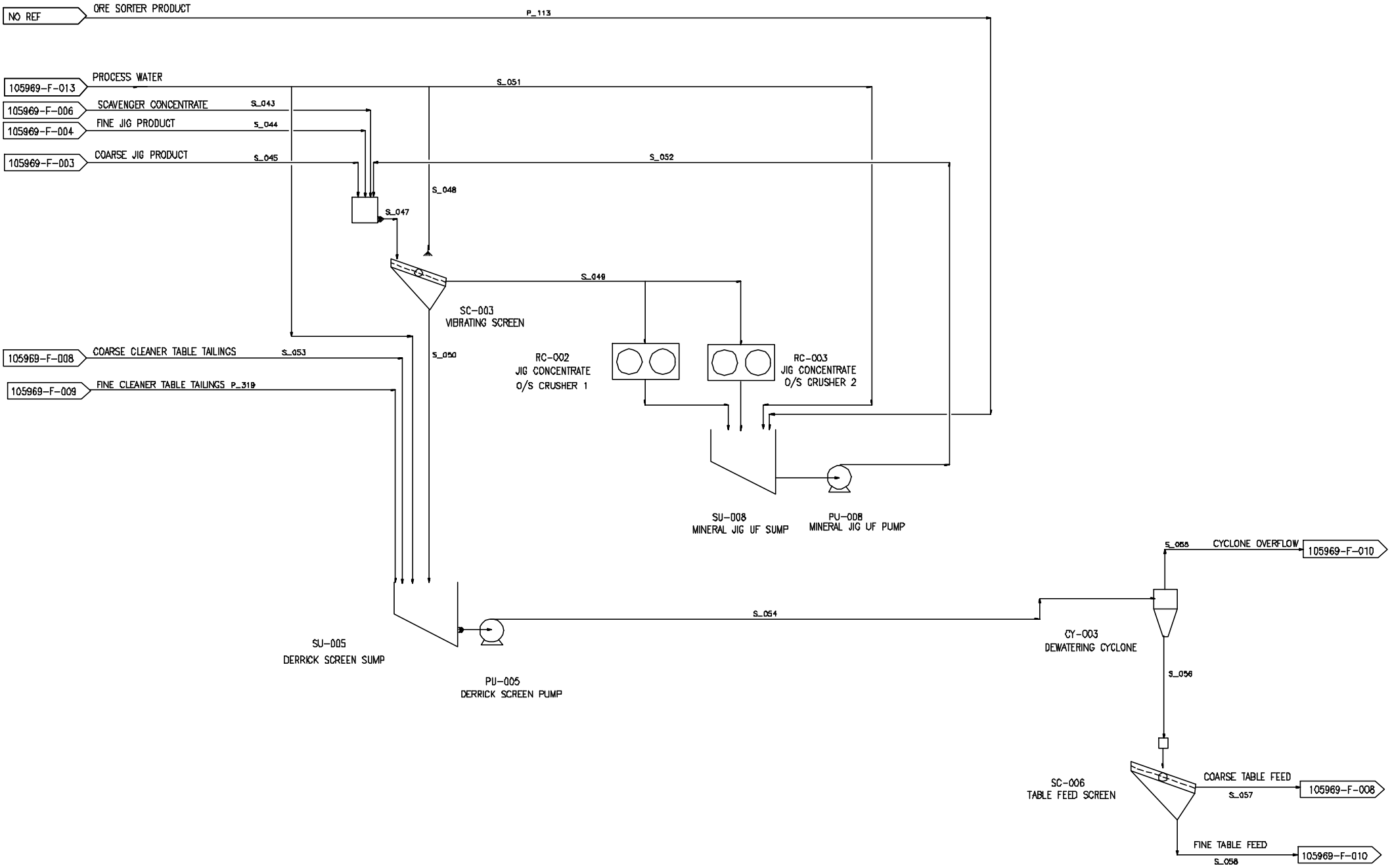

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TITLE MT CARBINE TUNGSTEN UPGRADE
FEASIBILITY STUDY
TABLE PREPARATION
PROCESS FLOW DIAGRAM

PROJECT No	SCALE	SIZE
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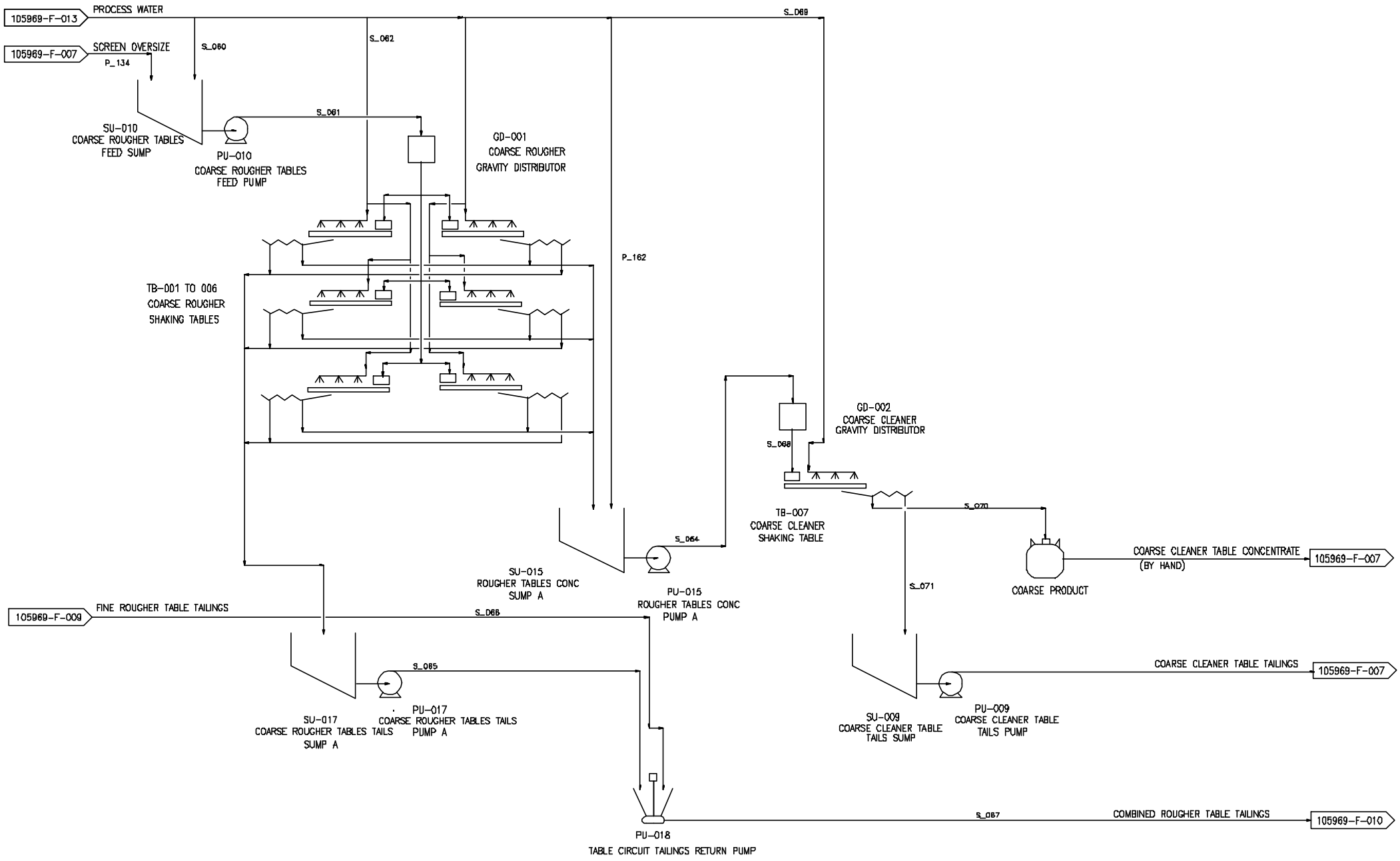

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FEASIBILITY STUDY
TABLES
PROCESS FLOW DIAGRAM

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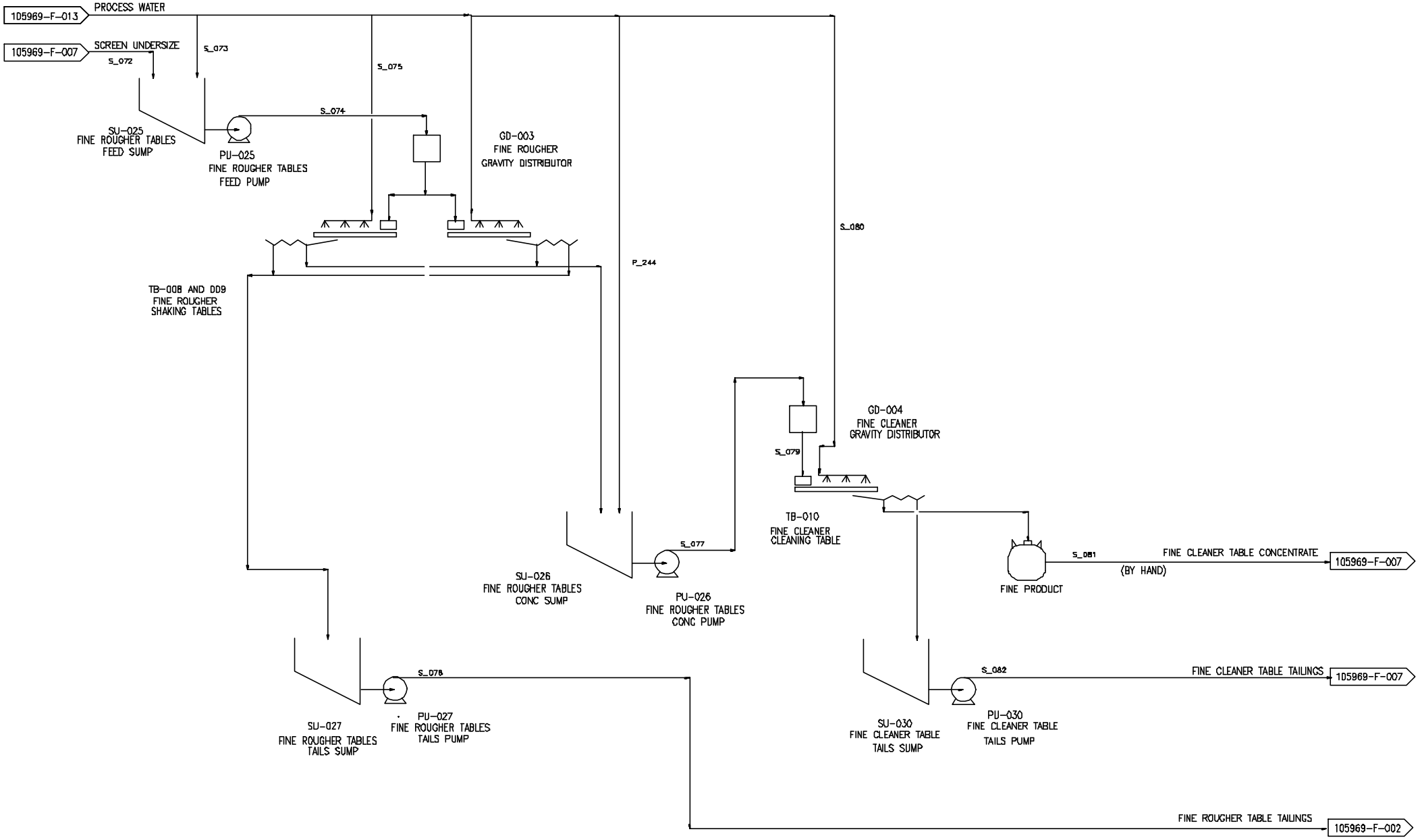

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FEASIBILITY STUDY
FINE TABLES
PROCESS FLOW DIAGRAM

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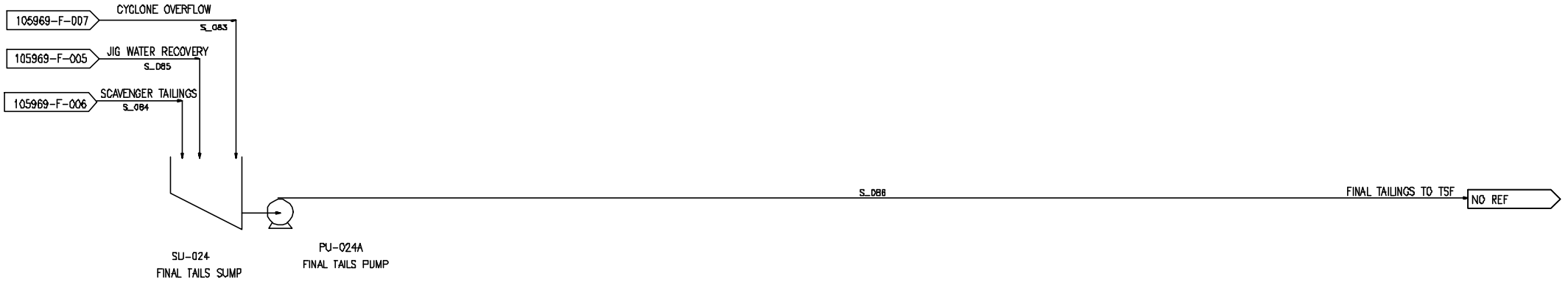

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FEASIBILITY STUDY
TAILINGS
BLOCK FLOW DIAGRAM

PROJECT No	SCALE	SIZE
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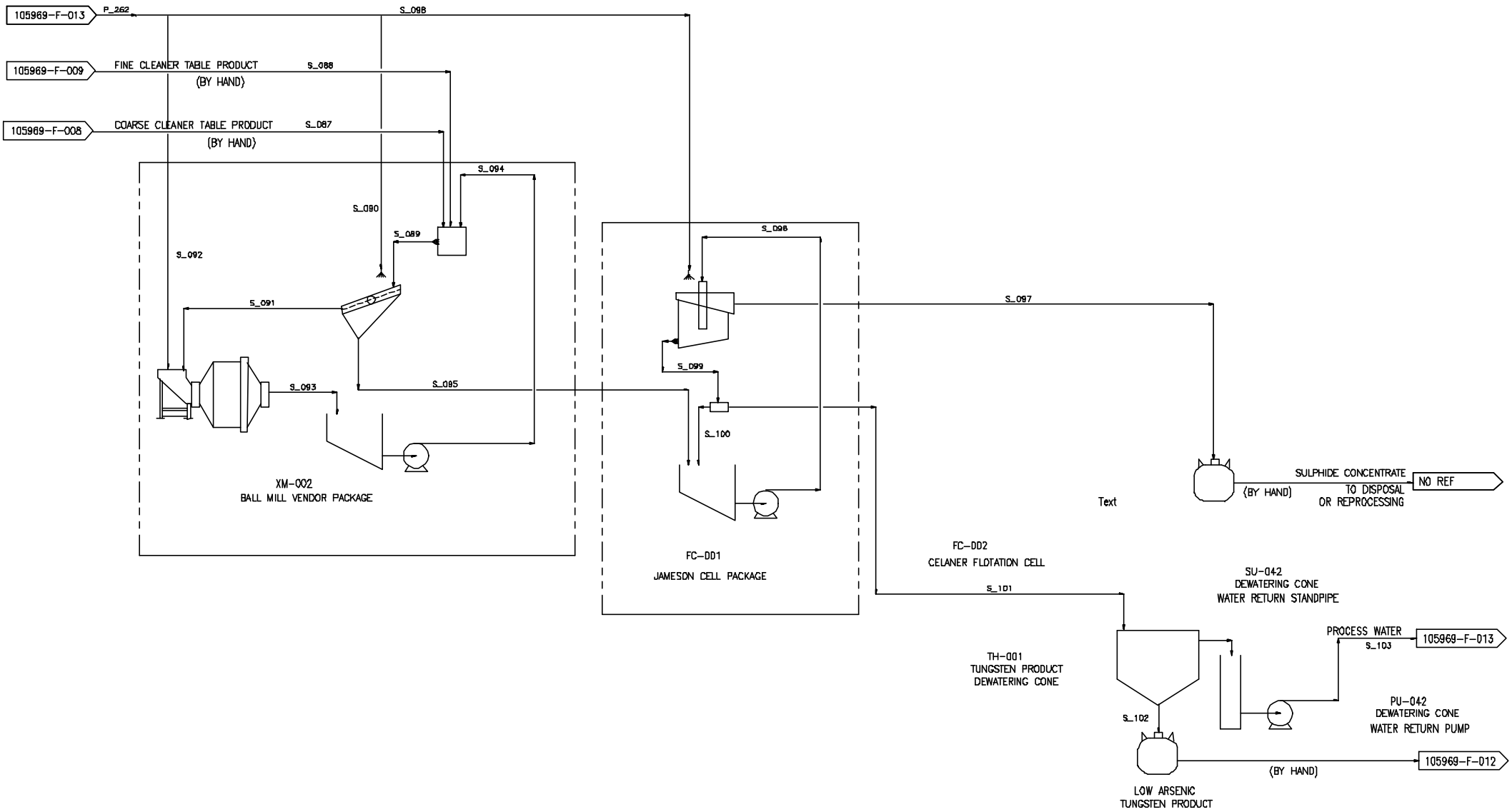

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FEASIBILITY STUDY
ARSENIC REMOVAL
BLOCK FLOW DIAGRAM

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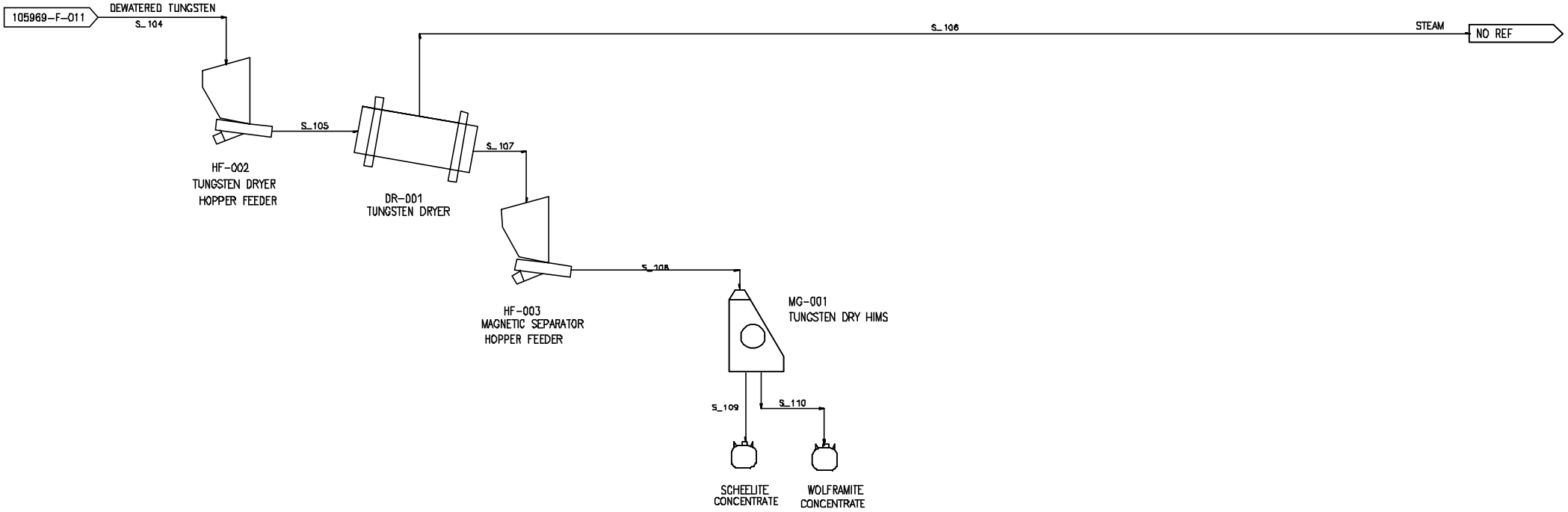

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DRYING AND PRODUCT SEPARATION
BLOCK FLOW DIAGRAM

PROJECT No	SCALE	SIZE
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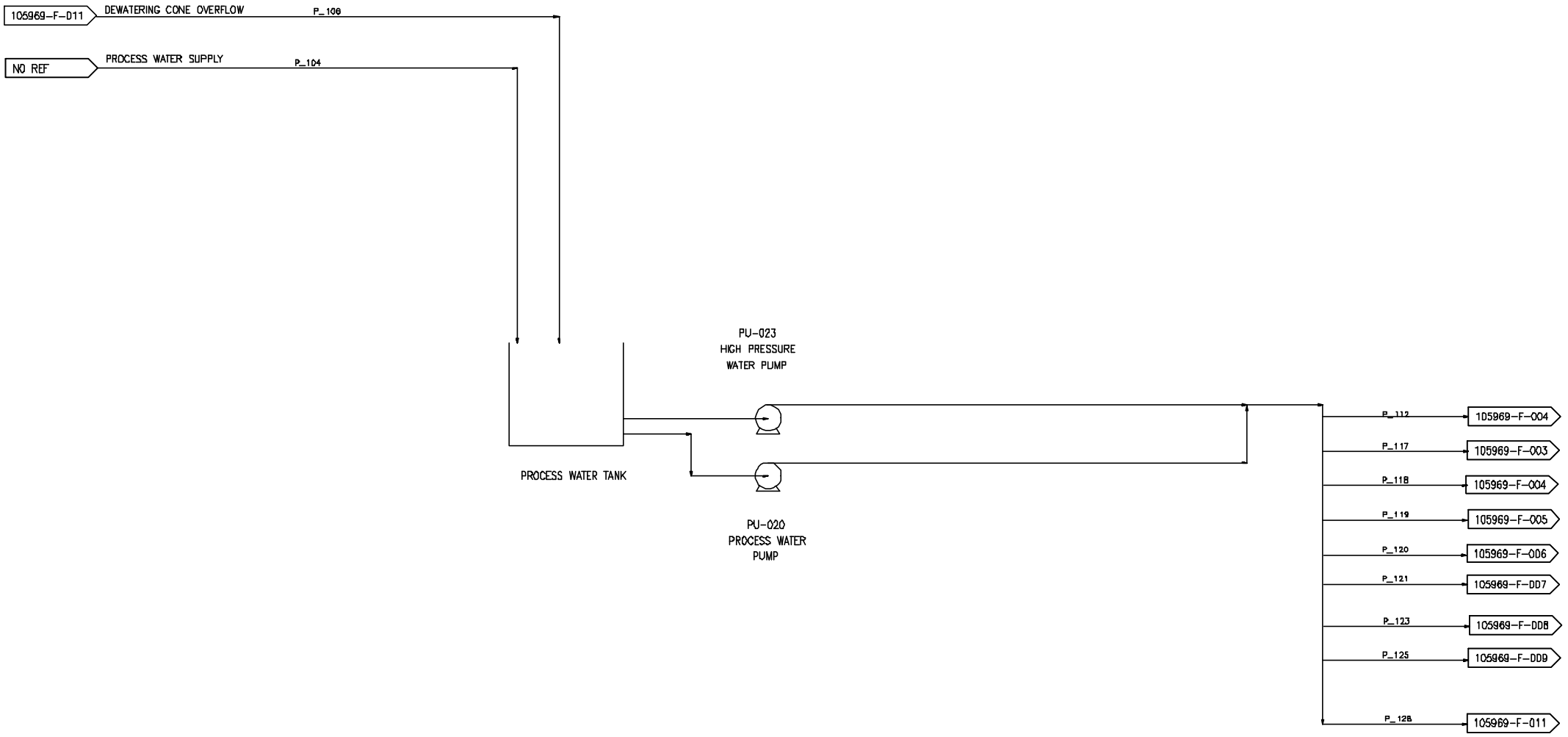

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CLIENT EQ RESOURCES LIMITED

TITLE MT CARBINE TUNGSTEN UPGRADE
FEASIBILITY STUDY
PROCESS WATER
BLOCK FLOW DIAGRAM

PROJECT No	SCALE	SIZE
105969-02	NTS	A1

DRAWING No	REV
1015969-0000-F-013	B

Appendix F Process Plant Mass Balance

Ausenco

Minerals & Metals

105969-0000-MB-0001
Revision Number B

EQ Resources

Mt Carbine Tungsten Feasibility Study Support Mass Balance

Revision No.	Description	Prepared By		Checked By		Approved By	
		Name	Date	Name	Date	Name	Date
A	Issued for Study	A. Hoyle	4/11/2021	D. Price	4/11/2021	A. Hoyle	4/11/2021
B	Updated (Ore sorter feed) for Study	A. Hoyle	17/11/2021	D. Price	17/11/2021	A. Hoyle	17/11/2021

EQ Resources
Stream List

Mt Carbine Tungsten Feasibility Study Support
Mass Balance

Stream Number	Stream Name
S_001	Plant Feed
S_002	PW to Vibrating Screen Feed Dilution
S_003	Vibrating Screen Feed
S_004	PW to Vibrating Screen Sprays
S_005	Vibrating Screen Midsize to SU-002B
S_006	Vibrating Screen Underpan to SU-002A
S_007	Combined Rougher Table Tailings
S_008	Midsize to Coarse Jig
S_009	Undersize to Fine Jig
S_010	Midsize to Coarse Jig
S_011	PW to Coarse Jig Feed
S_012	Coarse Jig Feed
S_013	Hutch Water
S_014	PW to Coarse Jig Hutch Water
S_015	Coarse Jig Concentrate
S_016	Coarse Jig Tailings
S_017	Undersize to Fine Jig
S_018	PW to Fine Jig Feed
S_019	Fine Jig Feed
S_020	Hutch Water
S_021	PW to Fine Jig Hutch Water
S_022	Fine Jig Concentrate
S_023	Fine Jig Tailings
S_024	Jig Overflow Screen Feed
S_025	PW to Jig Overflow Screen
S_026	Jig Overflow Screen Oversize
S_027	Fine Jig Overflow to Crusher Discharge
S_028	Jig Overflow Screen Midsize
S_029	Jig Overflow Screen Undersize
S_030	PW to Crusher Discharge Hopper
S_031	Fines to Scavenging Circuit
S_032	Scavenging Feed Screen Feed
S_033	Scavenging Feed Screen Undersize
S_034	Reflux Classifier Concentrate
S_035	Reflux Classifier Tailings
S_036	PW to Spiral Feed
S_037	Spiral Feed
S_038	PW to Spiral Wash
S_039	Spiral Concentrate
S_040	Spiral Tailings
S_041	Combined Scavenging Concentrate
S_042	Combined Scavenging Tailings
S_043	Combined Scavenger Concentrate
S_044	Fine Jig Product
S_045	Coarse Jig Product
S_046	Jig Concentrate Screen Fresh Feed
S_047	Jig Concentrate Screen Feed
S_048	PW to Screen Sprays
S_049	Concentrate Screen Oversize to Crushers
S_050	Concentrate Screen Undersize
S_051	PW to Concentrate O/S Crusher Discharge Dilution
S_052	Diluted Concentrate O/S Crusher Discharge
S_053	Coarse Cleaner Tailings
S_054	Dewatering Cyclone Feed
S_055	Dewatering Cyclone Overflow
S_056	Dewatering Cyclone Underflow
S_057	Table Feed Screen Oversize
S_058	Table Feed Screen Undersize
S_059	Table Feed Screen Oversize
S_060	PW to Coase Rougher Table Feed
S_061	Coase Rougher Table Feed
S_062	PW Coarse Rougher Table Wash (Per Deck)
S_063	PW Coarse Rougher Table Wash
S_064	Coarse Rougher Table Concentrate
S_065	Coarse Rougher Table Tailings
S_066	Fine Rougher Tailings
S_067	Combined Rougher Table Tailings
S_068	Coarse Cleaner Table Feed
S_069	PW Coarse Cleaner Table Wash

EQ Resources
Stream List

Mt Carbine Tungsten Feasibility Study Support
Mass Balance

Stream Number	Stream Name
S_070	Coarse Cleaner Table Concentrate
S_071	Coarse Cleaner Table Tailing
S_072	Table Feed Screen Undersize
S_073	PW to Fine Rougher Table Feed
S_074	Coase Fine Table Feed
S_075	PW Fine Rougher Table Wash (Per Deck)
S_076	PW Fine Rougher Table Wash
S_077	Fine Rougher Table Concentrate
S_078	Fine Rougher Table Tailings
S_079	Fine Cleaner Table Feed
S_080	PW Fine Cleaner Table Wash
S_081	Fine Cleaner Table Concentrate
S_082	Fine Cleaner Table Tailing
S_083	Cyclone Overflow
S_084	Scavenger Tailings
S_085	Current Non Defined Stream
S_086	Fine Tailings
S_087	Coarse Cleaner Table Product
S_088	Fine Cleaner Table Product
S_089	Grinding Classifier Feed
S_090	PW to Grinding Classifier Feed
S_091	Grinding Mill Feed
S_092	PW to Grinding Mill
S_093	Grinding Mill Discharge
S_094	Classifier Feed Pump
S_095	Grinding Product
S_096	Jameson Cell Feed
S_097	Jameson Cell Concentrate
S_098	PW to Jameson Cell Wash
S_099	Jameson Cell Tailings
S_100	Jameson Cell Recycle
S_101	Tungsten Product
S_102	Dewatered Tungsten Product
S_103	Dewatering Cone Overflow
S_104	Dewatered Tungsten Product
S_105	Tungsten Dryer Feed
S_106	Dryer Steam
S_107	Dried Tungsten Product
S_108	Tungsten HIMS Feed
S_109	Tungsten Magnetic Concentrate (Wolframite)
S_110	Tungsten Non-magnetic Concentrate (Scheelite)

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Revision: B
Date: 17/11/2021

Area	Description	Units	Data	Source	Rev
0000	**PLANT OPERATING SUMMARY**				
	Plant Design Throughput	t/h	60	1	A
	Ore Sorter Feed Rate	t/h	16	1	A
	Plant Feed Grade				
	Feed grades				
	Tungsten, max design	% WO_3	0.5	1	A
	Tungsten, nominal	% WO_3	0.138	1	A
	Tungsten, ore sorter design	% WO_3	0.85	1	A
	Concentrate Grades and Recoveries				
	Concentrate production				
	Nominal			8	A
	for design mass balance	kg/h	442.3	8	A
	Wolframite Product	kg/h	168.1	2	A
	Sheelite Product	kg/h	274.2	2	A
	Concentrate grades				
	Overall	% WO_3	50	2	A
	Wolframite Product	% WO_3	60.5	2	A
	Sheelite Product	% WO_3	32.9	2	A
	Recovery to final concentrate, design	%	92.8	2	A
	Overall, Tungsten (nominal)	%	77.0	2	A
0000	**ORE CHARACTERISTICS**				
	ROM Ore Characteristics				
	Moisture (% H_2O), design	w/w	1.0	2	A
1000	**SCREENING AND JIGGING CIRCUIT**				
	Primary Screening (SC-002)				
	Top deck apperture	mm	6	1	A
	Bottom deck apperture	mm	2	1	A
	oversize				
	Mass	%	0.0	2	A
	Tungsten	%	0.0	2	A
	% solids	% w/w	0.0	2	A
	midsize solids				
	Mass	%	32.8	2	A
	Tungsten	%	31.4	2	A
	% solids	% w/w	80.0	2	A
	undersize solids				
	Mass	%	67.2	2	A
	Tungsten	%	68.6	2	A
	% solids	% w/w	40.3	2	A
	Screen spray water	t/h	2	8	A
	Coarse Jig (JG-001/002)				
	Jig feed solids	% w/w	14.66	2	A
	Jig concentrate solids	% w/w	5.69	2	A
	Jig tails solids	% w/w	15.88	2	A
	Overall Mass Recovery	% of feed	6.04	2	A
	Rougher Tungsten Recovery	%	87.16	2	A
	Coarse Jig Total Hutch Water	t/h			
	Fine Jig (JG-003/004)				
	Jig feed solids	% w/w	14.66	8	A
	Jig concentrate solids	% w/w	5.69	8	A
	Jig tails solids	% w/w	15.88	8	A
	Overall Mass Recovery	% of feed	19.70	8	A
	Rougher Tungsten Recovery	%	82.52	8	A
	Coarse Jig Total Hutch Water	t/h	20	8	A
2000	**JIG SCAVENGING**				
	Coarse Jig Scalping Screen				
	Top deck apperture	mm	4	8	A
	Bottom deck apperture	mm	2	8	A

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Area	Description	Units	Data	Source	Rev
	Top Deck				
	Mass Recovery	%	37.3	8	A
	Tungsten Recovery	%	7.6	8	A
	Solids	% w/w	90.0	8	A
	Bottom Deck				
	Mass Recovery	%	30.1	8	A
	Tungsten Recovery	%	56.6	8	A
	Solids	% w/w	80.0	8	A
	Screen Spray Water	t/h	2	8	A
	Scavenger Feed Screen				
	Top deck apperture	mm	0.5	8	A
	Top Deck				
	Mass Recovery	%	64.5	8	A
	Tungsten Recovery	%	28.8	8	A
	Solids	% w/w	65.0	8	A
	Spirals Concentrator				
	Feed % Solids	% w/w	30	8	A
	Mass Recovery	%	30	8	A
	Tungsten Recovery	%	65	8	A
	Concentate pulp density	%	35	8	A
	Reflux Classifier				
	Mass Recovery	%	30	8	A
	Tungsten Recovery	%	65	8	A
	Concentate pulp density	%	35	8	A
3000	**Tables Crushing**				
	SC-003 Vibrating Screen				
	Oversize to crushing	%	60	2	A
	Oversize % solids	% w/w	60	2	A
	Screen spray water	t/h	3	8	A
	Crusher discharge pulp denisty	% w/w	3.7	2	A
4000	**Tables Classification**				
	Table Feed Dewatering Cyclone				
	Feed % Solids	% w/w	1.28	2	A
	Underflow % Solids	% w/w	10.61	2	A
	Mass Recovery	%	78.3	2	A
	Tungsten Recovery	%	100.0	2	A
	Table Classification Screen				
	Top deck apperture	mm	0.5		
	Top Deck				
	Mass Recovery	%	30.9	2	A
	Tungsten Recovery	%	22.9	2	A
	Oversize pulp density	% w/w	20	8	A
	Undersize				
	Mass Recovery	%	69.1	2	A
	Tungsten Recovery	%	77.1	2	A

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Area	Description	Units	Data	Source	Rev
	Coarse Rougher Table				
	Feed % Solids	% w/w	23	8	A
	Tailings % Solids	% w/w	0.92	2	A
	Wash Water	t/h/deck	2	8	A
	Mass Recovery	%	5.1	2	A
	Tungsten Recovery	%	97.5	2	A
	Concentrate Pulp Density	%	2.9	2	A
	Coarse Cleaner Table				
	Tailings % Solids	% w/w	1.95	2	A
	Wash Water	t/h/deck	2	8	A
	Tungsten Recovery	%	84.8	2	A
	Tungsten Grade	%	50.0	2	A
	Concentrate Pulp Density	% w/w			
	Fine Rougher Table				
	Feed % Solids	% w/w	23	8	A
	Tailings % Solids	% w/w	0.92	8	A
	Wash Water	t/h/deck	1.5	8	A
	Mass Recovery	%	6.8	8	A
	Tungsten Recovery	%	97.5	8	A
	Concentrate Pulp Density	% w/w	2.9	8	A
	Fine Cleaner Table				
	Tailings % Solids	% w/w	14.39	8	A
	Wash Water	t/h/deck	2	8	A
	Tungsten Recovery	%	22.5	8	A
	Fine Concentrate Grade	$\%WO_3$	50.0	8	A
	Concentrate Pulp Density	% w/w			
5000	**ARSENIC REMOVAL**				
	Rougher Flotation (Batch)				
	Jameson Feed Flow	m3/h	5	5	A
	Stage recovery				
	mass, at average grade		8.8	2	A
	WO_3, at average grade		2.4	2	A
	Concentrate pulp density, nominal		20	8	A
	Cleaner Flotation (Batch)				
	Feed pulp density, nominal				
	Jameson Feed Flow	m3/h	5	8	A
	Stage recovery				
	mass, at average grade		8	8	A
	WO_3, at average grade		50	8	A
	Concentrate pulp density, nominal		15	8	A
	Concentrate Drying and Separation				
	Tailings Dewatering Cone				
	UF Solids	% w/w	70	8	A
	Solids Recovery to Underflow	%	100	8	A
	Concentrate Dryer				
	Concentrate Moisutre	% w/w	0.5	4	A
	HIMS				
	Mass to Wolframite Concentrate	%	62	2	A
	Tungsten to Wolframite Concentrate	%	75	2	A

105969-0000-F-003

Stream Information		S_001	S_002	S_003	S_004	S_005	S_006	S_007	S_008	S_009
Description	Units	Plant Feed	PW to Vibrating Screen Feed Dilution	Vibrating Screen Feed	PW to Vibrating Screen Sprays	Vibrating Screen Midsize to SU-002B	Vibrating Screen Underpan to SU-002A	Combined Rougher Table Tailings	Midsize to Coarse Jig	Undersize to Fine Jig
Solids	t/h	44.0	0.0	44.0	0.0	14.4	29.6	29.8	14.4	59.4
Liquids	t/h	0.4	45.0	45.4	2.0	3.6	43.8	230.6	11.8	274.4
Slurry	t/h	44.4	45.0	89.4	2.0	18.0	73.4	260.4	26.2	333.8
Solids	m^3/h	15.2	0.0	15.2	0.0	5.0	10.2	10.3	5.0	20.5
Liquids	m^3/h	0.4	45.1	45.6	2.0	3.6	44.0	231.3	11.8	275.2
Slurry	m^3/h	15.6	45.1	60.8	2.0	8.6	54.2	241.6	16.8	295.7
Solids SG		2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	2.8	1.0	1.5	1.0	2.1	1.4	1.1	1.6	1.1
% Solids	%w/w	99.0	0.0	49.2	0.0	80.0	40.3	11.4	55.0	17.8
Tungsten	WO_3%	0.37	0.00	0.37	0.00	0.35	0.38	0.04	0.35	0.21
Tungsten Mass	kg/h (WO_3)	162.8	0.0	162.8	0.0	51.1	111.7	11.8	51.1	123.6

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Stream Information		S_010	S_011		S_013		S_015	S_016
Description	Units	Midsize to Coarse Jig	PW to Coarse Jig Feed	Coarse Jig Feed	Hutch Water	PW to Coarse Jig Hutch Water	Coarse Jig Concentrate	Coarse Jig Tailings
Solids	t/h	14.4	0.0	14.4	0.0	0.0	0.9	13.6
Liquids	t/h	11.8	79.0	90.8	5.0	20.0	13.5	97.3
Slurry	t/h	26.2	79.0	105.2	5.0	20.0	14.4	110.9
Solids	m^3/h	5.0	0.0	5.0	0.0	0.0	0.3	4.7
Liquids	m^3/h	11.8	79.2	91.1	5.0	20.1	13.5	97.6
Slurry	m^3/h	16.8	79.2	96.0	5.0	20.1	13.8	102.3
Solids SG		2.9	0.0	0.0	0.0	0.0	3.0	2.9
Liquids SG		1.0	1.0	2.9	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.6	1.0	1.0	1.0	1.0	1.0	1.1
% Solids	%w/w	55.0	0.0	13.7	0.0	0.0	6.0	12.2
Tungsten	WO_3%	0.35	0.00	0.36	0.00	0.00	5.17	0.05
Tungsten Mass	kg/h (WO_3)	51.1	0.0	51.5	0.0	0.0	44.5	6.6

105969-0000-F-004

Stream Information		S_017	S_018		S_020		S_022	S_023
Description	Units	Undersize to Fine Jig	PW to Fine Jig Feed	Fine Jig Feed	Hutch Water	PW to Fine Jig Hutch Water	Fine Jig Concentrate	Fine Jig Tailings
Solids	t/h	59.4	0.0	59.4	0.0	0.0	11.7	47.7
Liquids	t/h	274.4	126.7	274.4	5.0	20.0	183.3	237.9
Slurry	t/h	333.8	126.7	333.8	5.0	20.0	195.0	285.6
Solids	m^3/h	20.5	0.0	20.5	0.0	0.0	4.0	16.5
Liquids	m^3/h	275.2	127.1	0.0	5.0	20.1	183.8	238.6
Slurry	m^3/h	295.7	127.1	0.0	5.0	20.1	187.8	255.1
Solids SG		2.9	0.0	0.0	0.0	0.0	2.9	2.9
Liquids SG		1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	1.0	0.0	1.0	1.0	1.0	1.1
% Solids	%w/w	17.8	0.0	17.8	0.0	0.0	6.0	16.7
Tungsten	WO_3%	0.21	0.00	0.21	0.00	0.00	0.87	0.05
Tungsten Mass	kg/h (WO_3)	123.6	0.0	0.0	0.0	0.0	102.0	21.6

105969-0000-F-005

Stream Information		S_024	S_025	S_026	S_027	S_028	S_029	S_030	S_031
Description	Units	Jig Overflow Screen Feed	PW to Jig Overflow Screen	Jig Overflow Screen Oversize	Fine Jig Overflow to Crusher Discharge	Jig Overflow Screen Midsize	Jig Overflow Screen Undersize	PW to Crusher Discharge Hopper	Fines to Scavenging Circuit
Solids	t/h	13.6	0.0	5.1	47.7	4.1	4.4	0.0	52.7
Liquids	t/h	97.3	2.0	0.6	237.9	1.0	97.7	20.0	258.4
Slurry	t/h	110.9	2.0	5.6	285.6	5.1	102.1	20.0	311.2
Solids	m^3/h	4.7	0.0	1.7	16.5	1.4	1.5	0.0	18.2
Liquids	m^3/h	97.6	2.0	0.6	238.6	1.0	98.0	20.1	259.2
Slurry	m^3/h	102.3	2.0	2.3	255.1	2.4	99.5	20.1	277.5
Solids SG		2.9	0.0	2.9	2.9	2.9	2.9	0.0	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	1.0	2.4	1.1	2.1	1.0	1.0	1.1
% Solids	%w/w	12.2	0.0	90.0	16.7	80.0	4.3	0.0	16.9
Tungsten	WO_3%	0.05	0.00	0.01	0.05	0.09	0.05	0.00	0.04
Tungsten Mass	kg/h (WO_3)	6.6	0.0	0.5	21.6	3.7	2.3	0.0	22.1

105969-0000-F-006

Stream Information		S_032	S_033	S_034	S_035	S_036	S_037	S_038	S_039	S_040	S_041	S_042
Description	Units	Scavenging Feed Screen Feed	Scavenging Feed Screen Undersize	Reflux Classifier Concentrate	Reflux Classifier Tailings	PW to Spiral Feed	Spiral Feed	PW to Spiral Wash	Spiral Concentrate	Spiral Tailings	Combined Scavenging Concentrate	Combined Scavenging Tailings
Solids	t/h	52.7	18.7	3.7	15.0	0.0	34.0	0.0	6.8	27.2	10.5	42.2
Liquids	t/h	258.4	240.1	7.0	233.2	61.0	79.3	0.0	12.6	66.7	19.6	299.9
Slurry	t/h	311.2	258.9	10.7	248.2	61.0	113.3	0.0	19.4	93.9	30.1	342.1
Solids	m^3/h	18.2	6.5	1.3	5.2	0.0	11.8	0.0	2.4	9.4	3.6	14.6
Liquids	m^3/h	259.2	240.8	7.0	233.9	61.2	79.6	0.0	12.7	66.9	19.6	300.8
Slurry	m^3/h	277.5	247.3	8.3	239.0	61.2	91.3	0.0	15.0	76.3	23.3	315.4
Solids SG		2.9	2.9	2.9	2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	1.0	1.3	1.0	1.0	1.2	0.0	1.3	1.2	1.3	1.1
% Solids	%w/w	16.9	7.2	35.0	6.0	0.0	30.0	0.0	35.0	29.0	35.0	12.3
Tungsten	WO_3%	0.04	0.08	0.13	0.07	0.00	0.02	0.00	0.03	0.02	0.06	0.04
Tungsten Mass	kg/h (WO_3)	22.1	15.7	4.7	11.0	0.0	6.4	0.0	1.9	4.5	6.6	15.5

105969-0000-F-007

Stream Information		S_043	S_044	S_045		S_047	S_048	S_049	S_050	S_051	S_052	S_053	S_054	S_055	S_056	S_057	S_058
Description	Units	Combined Scavenger Concentrate	Fine Jig Product	Coarse Jig Product	Jig Concentrate Screen Fresh Feed	Jig Concentrate Screen Feed	PW to Screen Sprays	Concentrate Screen Oversize to Crushers	Concentrate Screen Undersize	PW to Concentrate O/S Crusher Discharge Dilution	Diluted Concentrate O/S Crusher Discharge	Coarse Cleaner Tailings	Dewatering Cyclone Feed	Dewatering Cyclone Overflow	Dewatering Cyclone Underflow	Table Feed Screen Oversize	Table Feed Screen Undersize
Solids	t/h	10.5	11.7	0.9	23.1	50.1	0.0	10.9	39.1	0.0	26.9	0.7	40.3	8.8	31.6	21.8	9.8
Liquids	t/h	19.6	183.3	13.5	216.3	260.1	3.0	7.3	255.8	6.8	43.8	36.4	317.6	51.6	266.0	227.0	39.0
Slurry	t/h	30.1	195.0	14.4	239.4	310.2	3.0	18.2	294.9	6.8	70.7	37.1	357.9	60.3	297.6	248.8	48.8
Solids	m^3/h	3.6	4.0	0.3	8.0	17.2	0.0	3.8	13.5	0.0	9.3	0.2	13.9	3.0	10.8	7.5	3.4
Liquids	m^3/h	19.6	183.8	13.5	217.0	260.9	3.0	7.3	256.6	6.8	43.9	36.5	318.5	51.7	266.8	227.7	39.1
Slurry	m^3/h	23.3	187.8	13.8	224.9	278.1	3.0	11.1	270.1	6.8	53.2	36.7	332.4	54.7	277.7	235.2	42.5
Solids SG		2.9	2.9	3.0	0.0	2.9	0.0	2.9	2.9	0.0	2.9	3.3	2.9	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.3	1.0	1.0	0.0	1.1	1.0	1.6	1.1	1.0	1.3	1.0	1.1	1.1	1.1	1.1	1.1
% Solids	%w/w	35.0	6.0	6.0	9.7	16.1	0.0	60.0	13.3	0.0	38.1	1.8	11.3	14.5	10.6	8.8	20.0
Tungsten	WO_3%	0.06	0.87	5.17	0.67	0.84	0.00	1.20	0.74	0.00	0.99	20.80	1.18	0.00	1.50	1.67	1.11
Tungsten Mass	kg/h (WO_3)	6.6	102.0	44.5	154.2	420.7	0.0	131.5	289.1	0.0	267.5	142.5	474.0	0.0	474.0	365.4	108.5

105969-0000-F-008

Stream Information		S_057	S_060	S_061	S_062		S_064	S_065	S_066	S_067	S_068	S_069	S_070	S_071
Description	Units	Table Feed Screen Oversize	PW to Coase Rougher Table	Coase Rougher Table Feed	PW Coarse Rougher Table	PW Coarse Rougher Table	Coarse Rougher Table Concentrate	Coarse Rougher Table Tailings	Fine Rougher Tailings	Combined Rougher Table	Coarse Cleaner Table Feed	PW Coarse Cleaner Table Wash	Coarse Cleaner Table Concentrate	Coarse Cleaner Table Tailing
Solids	t/h	21.8	0.0	21.8	0.0	0.0	1.1	20.7	9.1	29.8	1.1	0.0	0.4	0.7
Liquids	t/h	227.0	0.0	227.0	2.5	15.0	37.3	204.8	25.8	230.6	37.3	2.0	2.9	36.4
Slurry	t/h	248.8	0.0	248.8	2.5	15.0	38.4	225.5	34.9	260.4	38.4	2.0	3.3	37.1
Solids	m^3/h	7.5	0.0	7.5	0.0	0.0	0.3	7.2	3.1	10.3	0.3	0.0	0.1	0.2
Liquids	m^3/h	227.7	0.0	227.7	2.5	15.0	37.4	205.4	25.9	231.3	37.4	2.0	2.9	36.5
Slurry	m^3/h	235.2	0.0	235.2	2.5	15.0	37.7	212.5	29.0	241.6	37.7	2.0	3.0	36.7
Solids SG		2.9	0.0	2.9	0.0	0.0	3.6	2.9	2.9	2.9	3.6	0.0	4.1	3.3
Liquids SG		1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	0.0	1.1	1.0	0.0	1.0	1.1	1.2	1.1	1.0	1.0	1.1	1.0
% Solids	%w/w	8.8	0.0	8.8	0.0	0.0	2.9	9.2	26.1	11.4	2.9	0.0	12.9	1.8
Tungsten	WO_3%	1.67	0.00	1.67	0.00	0.00	32.02	0.04	0.03	0.04	32.02	0.00	50.00	20.80
Tungsten Mass	kg/h (WO_3)	365.4	0.0	365.4	0.0	0.0	356.3	9.1	2.7	11.8	356.3	0.0	213.8	142.5

105969-0000-F-009

Stream Information		S_058	S_073	S_074	S_075		S_077	S_078	S_079	S_080	S_081	S_082
Description	Units	Table Feed Screen Undersize	PW to Fine Rougher Table	Fine Rougher Table Feed	PW Fine Rougher Table Wash (Per	PW Fine Rougher Table Wash	Fine Rougher Table Concentrate	Fine Rougher Table Tailings	Fine Cleaner Table Feed	PW Fine Cleaner Table Wash	Fine Cleaner Table Concentrate	Fine Cleaner Table Tailing
Solids	t/h	9.8	0.0	9.8	0.0	0.0	0.7	9.1	0.7	0.0	0.1	0.5
Liquids	t/h	39.0	0.0	39.0	4.5	9.0	24.2	25.8	24.2	4.0	2.8	25.4
Slurry	t/h	48.8	0.0	48.8	4.5	9.0	24.9	34.9	24.9	4.0	2.9	25.9
Solids	m^3/h	3.4	0.0	3.4	0.0	0.0	0.2	3.1	0.2	0.0	0.0	0.2
Liquids	m^3/h	39.1	0.0	39.1	4.5	9.0	24.3	25.9	24.3	4.0	2.8	25.5
Slurry	m^3/h	42.5	0.0	42.5	4.5	9.0	24.5	29.0	24.5	4.0	2.9	25.6
Solids SG		2.9	0.0	2.9	0.0	0.0	3.2	2.9	3.2	0.0	4.1	3.0
Liquids SG		1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	0.0	1.1	1.0	0.0	1.0	1.2	1.0	1.0	1.0	1.0
% Solids	%w/w	20.0	0.0	20.0	0.0	0.0	2.7	26.1	2.7	0.0	4.3	2.1
Tungsten	WO_3%	1.11	0.00	1.11	0.00	0.00	15.95	0.03	15.95	0.00	50.00	7.89
Tungsten Mass	kg/h (WO_3)	108.5	0.0	108.5	0.0	0.0	105.8	2.7	105.8	0.0	63.5	42.3

105969-0000-F-010

Stream Information		S_083	S_084	S_085	S_086
Description	Units	Cyclone Overflow	Scavenger Tailings	Jig Scavenging Screen Undersize	Fine Tailings
Solids	t/h	8.8	42.2	4.4	55.4
Liquids	t/h	51.6	299.9	97.7	449.2
Slurry	t/h	60.3	342.1	102.1	504.5
Solids	m^3/h	3.0	14.6	1.5	19.2
Liquids	m^3/h	51.7	300.8	98.0	450.5
Slurry	m^3/h	54.7	315.4	99.5	469.7
Solids SG		2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	1.1	1.0	1.1
% Solids	%w/w	14.5	12.3	4.3	11.0
Tungsten	WO_3%	0.00	0.04	0.05	0.03
Tungsten Mass	kg/h (WO_3)	0.0	15.5	2.3	17.8

105969-0000-F-011

Stream Information		S_087	S_088	S_089	S_090	S_091	S_092	S_093	S_094	S_095	S_096	S_097	S_098	S_099	S_100	S_101	S_102	S_103
Description	Units	Coarse Cleaner Table Product	Fine Cleaner Table Product	Grinding Classifier Feed	PW to Grinding Classifier Feed	Grinding Mill Feed	PW to Grinding Mill	Grinding Mill Discharge	Classifier Feed Pump	Grinding Product	Jameson Cell Feed	Jameson Cell Concentrate	PW to Jameson Cell Wash	Jameson Cell Tailings	Jameson Cell Recycle	Tungsten Product	Dewatered Tungsten Product	Dewatering Cone Overflow
Solids	t/h	0.4	0.1	1.4	0.0	0.8	0.0	0.8	0.8	0.6	0.6	0.0	0.0	0.5	0.0	0.5	0.5	0.0
Liquids	t/h	2.9	2.8	6.1	0.0	0.1	0.3	0.4	0.4	6.0	6.0	0.2	0.3	6.1	0.0	6.1	0.2	5.9
Slurry	t/h	3.3	2.9	7.5	0.0	0.9	0.3	1.2	1.2	6.5	6.5	0.2	0.3	6.6	0.0	6.6	0.7	5.9
Solids	m³/h	0.1	0.0	0.3	0.0	0.2	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0
Liquids	m³/h	2.9	2.8	6.1	0.0	0.1	0.3	0.4	0.4	6.0	6.0	0.2	0.3	6.1	0.0	6.1	0.2	5.9
Slurry	m³/h	3.0	2.9	6.4	0.0	0.3	0.3	0.6	0.6	6.1	6.1	0.2	0.3	6.2	0.0	6.2	0.3	5.9
Solids SG		4.1	4.1	4.1	0.0	4.1	0.0	4.1	4.1	4.1	4.1	3.1	0.0	4.2	0.0	4.2	4.2	0.0
Liquids SG		1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0
Slurry Density	t/m³	1.1	1.0	1.2	0.0	3.1	1.0	2.1	2.1	1.1	1.1	1.2	1.0	1.1	0.0	1.1	2.1	1.0
% Solids	%w/w	12.9	4.3	18.6	0.0	90.0	0.0	70.0	70.0	8.5	8.5	20.0	0.0	7.7	0.0	7.7	70.0	0.0
Tungsten	WO_3%	50.00	50.00	50.00	0.00	50.00	0.00	50.00	50.00	50.00	50.00	13.64	0.00	53.51	0.00	53.51	53.51	0.00
Tungsten Mass	kg/h (WO_3)	213.8	63.5	693.2	0.0	415.9	0.0	415.9	415.9	277.3	277.3	6.7	0.0	270.6	0.0	270.6	270.6	0.0

105969-0000-F-012

Stream Information		S_104	S_105	S_106	S_107	S_108	S_109	S_110
Description	Units	Dewatered Tungsten Product	Tungsten Dryer Feed	Dryer Steam	Dried Tungsten Product	Tungsten HMS Feed	Tungsten Non-magnetic Concentrate (Scheelite)	Tungsten Magnetic Concentrate (Wolframite)
Solids	t/h	0.5	0.5	0.0	0.5	0.5	0.2	0.3
Liquids	t/h	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Slurry	t/h	0.7	0.7	0.2	0.5	0.5	0.2	0.3
Solids	m³/h	0.1	0.1	0.0	0.1	0.1	0.1	0.1
Liquids	m³/h	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Slurry	m³/h	0.3	0.3	321.3	0.1	0.1	0.1	0.1
Solids SG		4.2	4.2	4.2	4.2	4.2	3.7	4.7
Liquids SG		1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m³	2.1	2.1	0.0	4.2	4.2	3.6	4.6
% Solids	%w/w	70.0	70.0	0.0	99.5	99.5	99.5	99.5
Tungsten	WO_3%	53.51	53.51	53.51	53.51	53.51	35.20	64.73
Tungsten Mass	kg/h (WO_3)	270.6	270.6	0.0	270.6	270.6	67.7	203.0

105969-0000-F-013

Stream Information		P_104	P_106	P_112	P_117	P_118	P_119	P_120	P_121	P_123	P_125	P_128
Description	Units	Total PW Demand	PW from Dewatering Cone	PW to Feed Prep Area	PW to Coarse Jig	PW to Fine Jig	PW to Jig Tailings Scavening	PW to Scavengers	PW to Table Feed Prep	PW to Coarse Tables	PW to Fine Tables	PW to Arsenic Removal
Solids	t/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liquids	t/h	420.4	5.9	55.2	99.0	146.7	22.0	61.0	9.8	17.0	15.0	0.6
Slurry	t/h	420.4	5.9	55.2	99.0	146.7	22.0	61.0	9.8	17.0	15.0	0.6
Solids	m³/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liquids	m³/h	421.7	5.9	55.3	99.3	147.2	22.1	61.2	9.8	17.1	15.0	0.6
Slurry	m³/h	421.7	5.9	55.3	99.3	147.2	22.1	61.2	9.8	17.1	15.0	0.6
Solids SG		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m³	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
% Solids	%w/w	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten	WO_3%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tungsten Mass	kg/h (WO_3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

105969-0000-F-003

Stream Information		S_001	S_002	S_003	S_004	S_005	S_006	S_007	S_008	S_009
Description	Units	Plant Feed	PW to Vibrating Screen Feed Dilution	Vibrating Screen Feed	PW to Vibrating Screen Sprays	Vibrating Screen Midsize to SU-002B	Vibrating Screen Underpan to SU-002A	Combined Rougher Table Tailings	Midsize to Coarse Jig	Undersize to Fine Jig
Solids	t/h	60.0	0.0	60.0	0.0	19.7	40.3	17.6	19.7	57.9
Liquids	t/h	0.6	62.1	62.7	2.0	4.9	59.8	145.9	16.1	205.6
Slurry	t/h	60.6	62.1	122.7	2.0	24.6	100.1	163.4	35.7	263.5
Solids	m^3/h	20.7	0.0	20.7	0.0	6.8	13.9	6.1	6.8	20.0
Liquids	m^3/h	0.6	62.3	62.9	2.0	4.9	59.9	146.3	16.1	206.2
Slurry	m^3/h	21.3	62.3	83.6	2.0	11.7	73.9	152.4	22.9	226.2
Solids SG		2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	2.8	1.0	1.5	1.0	2.1	1.4	1.1	1.6	1.2
% Solids	%w/w	99.0	0.0	48.9	0.0	80.0	40.3	10.8	55.0	22.0
Tungsten	WO_3%	0.50	0.00	0.50	0.00	0.48	0.51	0.06	0.48	0.37
Tungsten Mass	kg/h (WO_3)	300.0	0.0	300.0	0.0	94.1	205.9	11.2	94.1	217.0

105969-0000-F-003

Stream Information		S_010	S_011		S_013		S_015	S_016
Description	Units	Midsize to Coarse Jig	PW to Coarse Jig Feed	Coarse Jig Feed	Hutch Water	PW to Coarse Jig Hutch Water	Coarse Jig Concentrate	Coarse Jig Tailings
Solids	t/h	19.7	0.0	19.7	0.0	0.0	1.2	18.5
Liquids	t/h	16.1	107.7	123.8	5.0	20.0	18.4	125.4
Slurry	t/h	35.7	107.7	143.5	5.0	20.0	19.6	143.9
Solids	m^3/h	6.8	0.0	6.8	0.0	0.0	0.4	6.4
Liquids	m^3/h	16.1	108.1	124.2	5.0	20.1	18.4	125.8
Slurry	m^3/h	22.9	108.1	131.0	5.0	20.1	18.8	132.2
Solids SG		2.9	0.0	0.0	0.0	0.0	3.0	2.9
Liquids SG		1.0	1.0	2.9	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.8	1.0	1.0	1.0	1.0	1.0	1.1
% Solids	%w/w	55.0	0.0	13.7	0.0	0.0	6.0	12.8
Tungsten	WO_3%	0.48	0.00	0.48	0.00	0.00	6.99	0.07
Tungsten Mass	kg/h (WO_3)	94.1	0.0	94.1	0.0	0.0	82.1	12.1

105969-0000-F-004

Stream Information		S_017	S_018		S_020		S_022	S_023
Description	Units	Undersize to Fine Jig	PW to Fine Jig Feed	Fine Jig Feed	Hutch Water	PW to Fine Jig Hutch Water	Fine Jig Concentrate	Fine Jig Tailings
Solids	t/h	57.9	0.0	57.9	0.0	0.0	11.4	46.5
Liquids	t/h	205.6	185.1	390.8	5.0	20.0	178.7	232.0
Slurry	t/h	263.5	185.1	448.7	5.0	20.0	190.2	278.5
Solids	m^3/h	20.0	0.0	20.0	0.0	0.0	3.9	16.1
Liquids	m^3/h	206.2	185.7	0.0	5.0	20.1	179.3	232.7
Slurry	m^3/h	226.2	185.7	0.0	5.0	20.1	183.2	248.8
Solids SG		2.9	0.0	0.0	0.0	0.0	2.9	2.9
Liquids SG		1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.2	1.0	0.0	1.0	1.0	1.0	1.1
% Solids	%w/w	22.0	0.0	22.0	0.0	0.0	6.0	16.7
Tungsten	WO_3%	0.37	0.00	0.37	0.00	0.00	1.57	0.08
Tungsten Mass	kg/h (WO_3)	217.0	0.0	0.0	0.0	0.0	179.1	37.9

105969-0000-F-005

Stream Information		S_024	S_025	S_026	S_027	S_028	S_029	S_030	S_031
Description	Units	Jig Overflow Screen Feed	PW to Jig Overflow Screen	Jig Overflow Screen Oversize	Fine Jig Overflow to Crusher Discharge	Jig Overflow Screen Midsize	Jig Overflow Screen Undersize	PW to Crusher Discharge Hopper	Fines to Scavenging Circuit
Solids	t/h	18.5	0.0	6.9	46.5	5.6	6.0	0.0	53.4
Liquids	t/h	125.4	2.0	0.8	232.0	1.4	125.3	20.0	252.8
Slurry	t/h	143.9	2.0	7.7	278.5	7.0	131.3	20.0	306.2
Solids	m^3/h	6.4	0.0	2.4	16.1	1.9	2.1	0.0	18.5
Liquids	m^3/h	125.8	2.0	0.8	232.7	1.4	125.6	20.1	253.5
Slurry	m^3/h	132.2	2.0	3.2	248.8	3.3	127.7	20.1	272.0
Solids SG		2.9	0.0	2.9	2.9	2.9	2.9	0.0	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	1.0	2.4	1.1	2.1	1.0	1.0	1.1
% Solids	%w/w	12.8	0.0	90.0	16.7	80.0	4.6	0.0	17.4
Tungsten	WO_3%	0.07	0.00	0.01	0.08	0.12	0.07	0.00	0.07
Tungsten Mass	kg/h (WO_3)	12.1	0.0	0.9	37.9	6.8	4.3	0.0	38.9

105969-0000-F-006

Stream Information		S_032	S_033	S_034	S_035	S_036	S_037	S_038	S_039	S_040	S_041	S_042
Description	Units	Scavenging Feed Screen Feed	Scavenging Feed Screen Undersize	Reflux Classifier Concentrate	Reflux Classifier Tailings	PW to Spiral Feed	Spiral Feed	PW to Spiral Wash	Spiral Concentrate	Spiral Tailings	Combined Scavenging Concentrate	Combined Scavenging Tailings
Solids	t/h	53,4	19,0	3,8	15,2	0,0	34,4	0,0	6,9	27,5	10,7	42,7
Liquids	t/h	252,8	234,2	7,0	227,2	61,8	80,3	0,0	12,8	67,6	19,8	294,7
Slurry	t/h	306,2	253,2	10,8	242,4	61,8	114,8	0,0	19,7	95,1	30,5	337,5
Solids	m^3/h	18,5	6,6	1,3	5,2	0,0	11,9	0,0	2,4	9,5	3,7	14,8
Liquids	m^3/h	253,5	234,9	7,1	227,9	62,0	80,6	0,0	12,8	67,8	19,9	295,6
Slurry	m^3/h	272,0	241,5	8,4	233,1	62,0	92,5	0,0	15,2	77,3	23,6	310,4
Solids SG		2,9	2,9	2,9	2,9	0,0	2,9	0,0	2,9	2,9	2,9	2,9
Liquids SG		1,0	1,0	1,0	1,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0
Slurry Density	t/m^3	1,1	1,0	1,3	1,0	1,0	1,2	0,0	1,3	1,2	1,3	1,1
% Solids	%w/w	17,4	7,5	35,0	6,3	0,0	30,0	0,0	35,0	29,0	35,0	12,7
Tungsten	WO_3%	0,07	0,15	0,22	0,13	0,00	0,03	0,00	0,05	0,03	0,11	0,06
Tungsten Mass	kg/h (WO_3)	38,9	27,7	8,3	19,4	0,0	11,2	0,0	3,4	7,8	11,7	27,2

105969-0000-F-007

Stream Information		S_043	S_044	S_045		S_047	S_048	S_049	S_050	S_051	S_052	S_053	S_054	S_055	S_056	S_057	S_058
Description	Units	Combined Scavenger Concentrate	Fine Jig Product	Coarse Jig Product	Jig Concentrate Screen Fresh Feed	Jig Concentrate Screen Feed	PW to Screen Sprays	Concentrate Screen Oversize to Crushers	Concentrate Screen Undersize	PW to Concentrate O/S Crusher Discharge Dilution	Diluted Concentrate O/S Crusher Discharge	Coarse Cleaner Tailings	Dewatering Cyclone Feed	Dewatering Cyclone Overflow	Dewatering Cyclone Underflow	Table Feed Screen Oversize	Table Feed Screen Undersize
Solids	t/h	10.7	11.4	1.2	23.3	29.8	0.0	6.5	23.3	0.0	6.5	0.3	23.8	5.2	18.6	12.9	5.8
Liquids	t/h	19.8	178.7	18.4	217.0	231.7	3.0	4.4	230.3	10.3	14.7	21.3	268.8	111.8	156.9	133.9	23.0
Slurry	t/h	30.5	190.2	19.6	240.2	261.5	3.0	10.9	253.6	10.3	21.2	21.5	292.6	117.0	175.6	146.8	28.8
Solids	m^3/h	3.7	3.9	0.4	8.0	10.2	0.0	2.2	8.0	0.0	2.2	0.1	8.1	1.8	6.4	4.4	2.0
Liquids	m^3/h	19.9	179.3	18.4	217.6	232.4	3.0	4.4	231.0	10.4	14.7	21.3	269.6	112.2	157.4	134.3	23.1
Slurry	m^3/h	23.6	183.2	18.8	225.6	242.6	3.0	6.6	239.0	10.4	17.0	21.4	277.7	113.9	163.8	138.7	25.1
Solids SG		2.9	2.9	3.0	0.0	2.9	0.0	2.9	2.9	0.0	2.9	4.2	2.9	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.3	1.0	1.0	0.0	1.1	1.0	1.6	1.1	1.0	1.3	1.0	1.1	1.0	1.1	1.1	1.1
% Solids	%w/w	35.0	6.0	6.0	9,7	11.4	0.0	60.0	9.2	0.0	30.8	1.2	8.1	4.4	10.6	8.8	20.0
Tungsten	WO_3%	0.11	1.57	6.99	1.17	1.33	0.00	1.90	1.17	0.00	1.90	53.15	1.88	0.00	2.40	2.68	1.78
Tungsten Mass	kg/h (WO_3)	11.7	179.1	82.1	272,8	396.9	0.0	124.1	272.8	0.0	124.1	134.5	447.2	0.0	447.2	344.8	102.4

105969-0000-F-008

Stream Information		S_057	S_060	S_061	S_062		S_064	S_065	S_066	S_067	S_068	S_069	S_070	S_071
Description	Units	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!
Solids	t/h	12,9	0,0	12,9	0,0	0,0	0,7	12,2	5,4	17,6	0,7	0,0	0,4	0,3
Liquids	t/h	133,9	0,0	133,9	2,5	15,0	22,0	126,9	18,9	145,9	22,0	2,0	2,7	21,3
Slurry	t/h	146,8	0,0	146,8	2,5	15,0	22,6	139,1	24,3	163,4	22,6	2,0	3,1	21,5
Solids	m³/h	4,4	0,0	4,4	0,0	0,0	0,2	4,2	1,9	6,1	0,2	0,0	0,1	0,1
Liquids	m³/h	134,3	0,0	134,3	2,5	15,0	22,0	127,3	19,0	146,3	22,0	2,0	2,7	21,3
Slurry	m³/h	138,7	0,0	138,7	2,5	15,0	22,2	131,5	20,8	152,4	22,2	2,0	2,8	21,4
Solids SG		2,9	0,0	2,9	0,0	0,0	4,2	2,9	2,9	2,9	4,2	0,0	4,1	4,2
Liquids SG		1,0	0,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Slurry Density	t/m³	1,1	0,0	1,1	1,0	0,0	1,0	1,1	1,2	1,1	1,0	1,0	1,1	1,0
% Solids	%w/w	8,8	0,0	8,8	0,0	0,0	2,9	8,8	22,1	10,8	2,9	0,0	12,9	1,2
Tungsten	WO_3%	2,68	0,00	2,68	0,00	0,00	51,22	0,07	0,05	0,06	51,22	0,00	50,00	53,15
Tungsten Mass	kg/h (WO_3)	344,8	0,0	344,8	0,0	0,0	336,2	8,6	2,6	11,2	336,2	0,0	201,7	134,5

105969-0000-F-009

Stream Information		S_057	S_060	S_061	S_062		S_064	S_065	S_066	S_067	S_068	S_069	S_070	S_071
Description	Units	Table Feed Screen Oversize	PW to Coase Rougher Table Feed	Coase Rougher Table Feed	PW Coarse Rougher Table Wash (Per Deck)	PW Coarse Rougher Table Wash	Coarse Rougher Table Concentrate	Coarse Rougher Table Tailings	Fine Rougher Tailings	Combined Rougher Table Tailings	Coarse Cleaner Table Feed	PW Coarse Cleaner Table Wash	Coarse Cleaner Ta	Coarse Cleaner Table Tailing
Solids	t/h	5,8	0,0	5,8	0,0	0,0	0,4	5,4	0,4	0,0	0,1	0,3		
Liquids	t/h	23,0	0,0	23,0	4,5	9,0	15,1	18,9	15,1	4,0	1,9	17,2		
Slurry	t/h	28,8	0,0	28,8	4,5	9,0	15,5	24,3	15,5	4,0	2,0	17,5		
Solids	m³/h	2,0	0,0	2,0	0,0	0,0	0,1	1,9	0,1	0,0	0,0	0,1		
Liquids	m³/h	23,1	0,0	23,1	4,5	9,0	15,1	19,0	15,1	4,0	1,9	17,2		
Slurry	m³/h	25,1	0,0	25,1	4,5	9,0	15,3	20,8	15,3	4,0	1,9	17,3		
Solids SG		2,9	0,0	2,9	0,0	0,0	3,4	2,9	3,4	0,0	4,1	3,2		
Liquids SG		1,0	0,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0	1,0	1,0		
Slurry Density	t/m³	1,1	0,0	1,1	1,0	0,0	1,0	1,2	1,0	1,0	1,0	1,0		
% Solids	%w/w	20,0	0,0	20,0	0,0	0,0	2,5	22,1	2,5	0,0	5,9	1,6		
Tungsten	WO_3%	1,78	0,00	1,78	0,00	0,00	25,51	0,05	25,51	0,00	50,00	14,71		
Tungsten Mass	kg/h (WO_3)	102,4	0,0	102,4	0,0	0,0	99,9	2,6	99,9	0,0	59,9	39,9		

105969-0000-F-010

Stream Information		S_083	S_084	S_085	S_086
Description	Units	Cyclone Overflow	Scavenger Tailings	Jig Scavenging Screen Undersize	Fine Tailings
Solids	t/h	5,2	42,7	6,0	53,9
Liquids	t/h	111,8	294,7	125,3	531,8
Slurry	t/h	117,0	337,5	131,3	585,7
Solids	m³/h	1,8	14,8	2,1	18,6
Liquids	m³/h	112,2	295,6	125,6	533,4
Slurry	m³/h	113,9	310,4	127,7	552,1
Solids SG		2,9	2,9	2,9	2,9
Liquids SG		1,0	1,0	1,0	1,0
Slurry Density	t/m³	1,0	1,1	1,0	1,1
% Solids	%w/w	4,4	12,7	4,6	9,2
Tungsten	WO_3%	0,00	0,06	0,07	0,06
Tungsten Mass	kg/h (WO_3)	0,0	27,2	4,3	31,5

105969-0000-F-011

Stream Information		S_087	S_088	S_089	S_090	S_091	S_092	S_093	S_094	S_095	S_096	S_097	S_098	S_099	S_100	S_101	S_102	S_103
Description	Units	Coarse Cleaner Table Product	Fine Cleaner Table Product	Grinding Classifier Feed	PW to Grinding Classifier Feed	Grinding Mill Feed	PW to Grinding Mill	Grinding Mill Discharge	Classifier Feed Pump	Grinding Product	Jameson Cell Feed	Jameson Cell Concentrate	PW to Jameson Cell Wash	Jameson Cell Tailings	Jameson Cell Recycle	Tungsten Product	Dewatered Tungsten Product	Dewatering Cone Overflow
Solids	t/h	0.4	0.1	1.3	0.0	0.8	0.0	0.8	0.8	0.5	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0
Liquids	t/h	2.7	1.9	5.0	0.0	0.1	0.2	0.3	0.3	4.9	4.9	0.2	0.3	5.0	0.0	5.0	0.2	4.8
Slurry	t/h	3.1	2.0	6.3	0.0	0.9	0.2	1.1	1.1	5.4	5.4	0.2	0.3	5.5	0.0	5.5	0.7	4.8
Solids	m^3/h	0.1	0.0	0.3	0.0	0.2	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0
Liquids	m^3/h	2.7	1.9	5.0	0.0	0.1	0.2	0.3	0.3	4.9	4.9	0.2	0.3	5.0	0.0	5.0	0.2	4.8
Slurry	m^3/h	2.8	1.9	5.3	0.0	0.3	0.2	0.5	0.5	5.0	5.0	0.2	0.3	5.1	0.0	5.1	0.3	4.8
Solids SG		4.1	4.1	4.1	0.0	4.1	0.0	4.1	4.1	4.1	4.1	3.1	0.0	4.2	0.0	4.2	4.2	0.0
Liquids SG		1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.1	1.0	1.2	0.0	3.1	1.0	2.1	2.1	1.1	1.1	1.2	1.0	1.1	0.0	1.1	2.1	1.0
% Solids	%w/w	12.9	5.9	20.8	0.0	90.0	0.0	70.0	70.0	9.7	9.7	20.0	0.0	8.8	0.0	8.8	70.0	0.0
Tungsten	WO_3%	50.00	50.00	50.00	0.00	50.00	0.00	50.00	50.00	50.00	50.00	13.64	0.00	53.51	0.00	53.51	53.51	0.00
Tungsten Mass	kg/h (WO_3)	201.7	59.9	654.1	0.0	392.5	0.0	392.5	392.5	261.6	261.6	6.3	0.0	255.4	0.0	255.4	255.4	0.0

105969-0000-F-012

Stream Information		S_104	S_105	S_106	S_107	S_108	S_109	S_110
Description	Units	Dewatered Tungsten Product	Tungsten Dryer Feed	Dryer Steam	Dried Tungsten Product	Tungsten HMS Feed	Tungsten Non-magnetic Concentrate (Scheelite)	Tungsten Magnetic Concentrate (Wolframite)
Solids	t/h	0.5	0.5	0.0	0.5	0.5	0.2	0.3
Liquids	t/h	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Slurry	t/h	0.7	0.7	0.2	0.5	0.5	0.2	0.3
Solids	m^3/h	0.1	0.1	0.0	0.1	0.1	0.0	0.1
Liquids	m^3/h	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Slurry	m^3/h	0.3	0.3	303.2	0.1	0.1	0.1	0.1
Solids SG		4.2	4.2	4.2	4.2	4.2	3.7	4.7
Liquids SG		1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	2.1	2.1	0.0	4.2	4.2	3.6	4.6
% Solids	%w/w	70.0	70.0	0.0	99.5	99.5	99.5	99.5
Tungsten	WO_3%	53.51	53.51	53.51	53.51	53.51	35.20	64.73
Tungsten Mass	kg/h (WO_3)	255.4	255.4	0.0	255.4	255.4	63.8	191.5

105969-0000-F-013

Stream Information		P_104	P_106	P_112	P_117	P_118	P_119	P_120	P_121	P_123	P_125	P_128
Description	Units	Total PW Demand	PW from Dewatering Cone	PW to Feed Prep Area	PW to Coarse Jig	PW to Fine Jig	PW to Jig Tailings Scavening	PW to Scavengers	PW to Table Feed Prep	PW to Coarse Tables	PW to Fine Tables	PW to Arsenic Removal
Solids	t/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liquids	t/h	533.0	4.8	75.2	127.7	205.1	22.0	61.8	13.3	17.0	15.0	0.5
Slurry	t/h	533.0	4.8	75.2	127.7	205.1	22.0	61.8	13.3	17.0	15.0	0.5
Solids	m^3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liquids	m^3/h	534.6	4.8	75.5	128.1	205.7	22.1	62.0	13.4	17.1	15.0	0.5
Slurry	m^3/h	534.6	4.8	75.5	128.1	205.7	22.1	62.0	13.4	17.1	15.0	0.5
Solids SG		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
% Solids	%w/w	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tungsten	WO_3%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tungsten Mass	kg/h (WO_3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

105969-0000-F-003

Stream Information		S_001	S_002	S_003	S_004	S_005	S_006	S_007	S_008	S_009
Description	Units	Plant Feed	PW to Vibrating Screen Feed Dilution	Vibrating Screen Feed	PW to Vibrating Screen Sprays	Vibrating Screen Midsize to SU-002B	Vibrating Screen Underpan to SU-002A	Combined Rougher Table Tailings	Midsize to Coarse Jig	Undersize to Fine Jig
Solids	t/h	60.0	0.0	60.0	0.0	19.7	40.3	18.0	19.7	58.3
Liquids	t/h	0.6	62.1	62.7	2.0	4.9	59.8	148.7	16.1	208.4
Slurry	t/h	60.6	62.1	122.7	2.0	24.6	100.1	166.6	35.7	266.7
Solids	m^3/h	20.7	0.0	20.7	0.0	6.8	13.9	6.2	6.8	20.2
Liquids	m^3/h	0.6	62.3	62.9	2.0	4.9	59.9	149.1	16.1	209.0
Slurry	m^3/h	21.4	62.3	83.6	2.0	11.7	73.9	155.3	22.9	229.2
Solids SG		2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	2.8	1.0	1.5	1.0	2.1	1.4	1.1	1.6	1.2
% Solids	%w/w	99.0	0.0	48.9	0.0	80.0	40.3	10.8	55.0	21.9
Tungsten	WO_3%	0.14	0.00	0.14	0.00	0.13	0.14	0.02	0.13	0.10
Tungsten Mass	kg/h (WO_3)	82.8	0.0	82.8	0.0	26.0	56.8	3.1	26.0	59.9

105969-0000-F-003

Stream Information		S_010	S_011		S_013		S_015	S_016
Description	Units	Midsize to Coarse Jig	PW to Coarse Jig Feed	Coarse Jig Feed	Hutch Water	PW to Coarse Jig Hutch Water	Coarse Jig Concentrate	Coarse Jig Tailings
Solids	t/h	19.7	0.0	19.7	0.0	0.0	1.2	18.5
Liquids	t/h	16.1	107.7	123.8	5.0	20.0	18.4	125.4
Slurry	t/h	35.7	107.7	143.5	5.0	20.0	19.6	143.9
Solids	m^3/h	6.8	0.0	6.8	0.0	0.0	0.4	6.4
Liquids	m^3/h	16.1	108.1	124.2	5.0	20.1	18.4	125.8
Slurry	m^3/h	22.9	108.1	131.0	5.0	20.1	18.9	132.2
Solids SG		2.9	0.0	0.0	0.0	0.0	2.9	2.9
Liquids SG		1.0	1.0	2.9	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.6	1.0	1.0	1.0	1.0	1.0	1.1
% Solids	%w/w	55.0	0.0	13.7	0.0	0.0	6.0	12.8
Tungsten	WO_3%	0.13	0.00	0.13	0.00	0.00	1.93	0.02
Tungsten Mass	kg/h (WO_3)	26.0	0.0	26.0	0.0	0.0	22.6	3.3

105969-0000-F-004

Stream Information		S_017	S_018		S_020		S_022	S_023
Description	Units	Undersize to Fine Jig	PW to Fine Jig Feed	Fine Jig Feed	Hutch Water	PW to Fine Jig Hutch Water	Fine Jig Concentrate	Fine Jig Tailings
Solids	t/h	58.3	0.0	58.3	0.0	0.0	11.5	46.8
Liquids	t/h	208.4	185.2	393.6	5.0	20.0	180.0	233.6
Slurry	t/h	266.7	185.2	452.0	5.0	20.0	191.5	280.5
Solids	m^3/h	20.2	0.0	20.2	0.0	0.0	4.0	16.2
Liquids	m^3/h	209.0	185.8	0.0	5.0	20.1	180.5	234.3
Slurry	m^3/h	229.2	185.8	0.0	5.0	20.1	184.5	250.5
Solids SG		2.9	0.0	0.0	0.0	0.0	2.9	2.9
Liquids SG		1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m^3	1.2	1.0	0.0	1.0	1.0	1.0	1.1
% Solids	%w/w	21.9	0.0	21.9	0.0	0.0	6.0	16.7
Tungsten	WO_3%	0.10	0.00	0.10	0.00	0.00	0.43	0.02
Tungsten Mass	kg/h (WO_3)	59.9	0.0	0.0	0.0	0.0	49.4	10.5

105969-0000-F-005

Stream Information		S_024	S_025	S_026	S_027	S_028	S_029	S_030	S_031
Description	Units	Jig Overflow Screen Feed	PW to Jig Overflow Screen	Jig Overflow Screen Oversize	Fine Jig Overflow to Crusher Discharge	Jig Overflow Screen Midsize	Jig Overflow Screen Undersize	PW to Crusher Discharge Hopper	Fines to Scavenging Circuit
Solids	t/h	18.5	0.0	6.9	46.8	5.6	6.0	0.0	53.7
Liquids	t/h	125.4	2.0	0.8	233.6	1.4	125.3	20.0	254.4
Slurry	t/h	143.9	2.0	7.7	280.5	7.0	131.3	20.0	308.1
Solids	m³/h	6.4	0.0	2.4	16.2	1.9	2.1	0.0	18.6
Liquids	m³/h	125.8	2.0	0.8	234.3	1.4	125.6	20.1	255.2
Slurry	m³/h	132.2	2.0	3.2	250.5	3.3	127.7	20.1	273.7
Solids SG		2.9	0.0	2.9	2.9	2.9	2.9	0.0	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m³	1.1	1.0	2.4	1.1	2.1	1.0	1.0	1.1
% Solids	%w/w	12.8	0.0	90.0	16.7	80.0	4.6	0.0	17.4
Tungsten	WO_3%	0.02	0.00	0.00	0.02	0.03	0.02	0.00	0.02
Tungsten Mass	kg/h (WO_3)	3.3	0.0	0.3	10.5	1.9	1.2	0.0	10.7

105969-0000-F-006

Stream Information		S_032	S_033	S_034	S_035	S_036	S_037	S_038	S_039	S_040	S_041	S_042
Description	Units	Scavenging Feed Screen Feed	Scavenging Feed Screen Undersize	Reflux Classifier Concentrate	Reflux Classifier Tailings	PW to Spiral Feed	Spiral Feed	PW to Spiral Wash	Spiral Concentrate	Spiral Tailings	Combined Scavenging Concentrate	Combined Scavenging Tailings
Solids	t/h	53.7	19.1	3.8	15.3	0.0	34.6	0.0	6.9	27.7	10.7	43.0
Liquids	t/h	254.4	235.7	7.1	228.7	62.2	80.8	0.0	12.9	68.0	20.0	296.6
Slurry	t/h	308.1	254.8	10.9	243.9	62.2	115.5	0.0	19.8	95.7	30.7	339.6
Solids	m³/h	18.6	6.6	1.3	5.3	0.0	12.0	0.0	2.4	9.6	3.7	14.9
Liquids	m³/h	255.2	236.4	7.1	229.3	62.4	81.1	0.0	12.9	68.2	20.0	297.5
Slurry	m³/h	273.7	243.0	8.4	234.6	62.4	93.1	0.0	15.3	77.8	23.7	312.4
Solids SG		2.9	2.9	2.9	2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0
Slurry Density	t/m³	1.1	1.0	1.3	1.0	1.0	1.2	0.0	1.3	1.2	1.3	1.1
% Solids	%w/w	17.4	7.5	35.0	6.3	0.0	30.0	0.0	35.0	29.0	35.0	12.7
Tungsten	WO_3%	0.02	0.04	0.06	0.03	0.00	0.01	0.00	0.01	0.01	0.03	0.02
Tungsten Mass	kg/h (WO_3)	10.7	7.6	2.3	5.3	0.0	3.1	0.0	0.9	2.2	3.2	7.5

105969-0000-F-007

Stream Information		S_043	S_044	S_045		S_047	S_048	S_049	S_050	S_051	S_052	S_053	S_054	S_055	S_056	S_057	S_058
Description	Units	Combined Scavenger Concentrate	Fine Jig Product	Coarse Jig Product	Jig Concentrate Screen Fresh Feed	Jig Concentrate Screen Feed	PW to Screen Sprays	Concentrate Screen Oversize to Crushers	Concentrate Screen Undersize	PW to Concentrate O/S Crusher Discharge Dilution	Diluted Concentrate O/S Crusher Discharge	Coarse Cleaner Tailings	Dewatering Cyclone Feed	Dewatering Cyclone Overflow	Dewatering Cyclone Underflow	Table Feed Screen Oversize	Table Feed Screen Undersize
Solids	t/h	10.7	11.5	1.2	23.4	29.9	0.0	6.5	23.4	0.0	6.5	0.6	24.3	5.3	19.1	13.2	5.9
Liquids	t/h	20.0	180.0	18.4	218.3	233.0	3.0	4.4	231.7	10.3	14.7	23.7	272.9	112.3	160.5	137.0	23.6
Slurry	t/h	30.7	191.5	19.6	241.8	263.0	3.0	10.9	255.1	10.3	21.2	24.3	297.2	117.6	179.6	150.2	29.4
Solids	m³/h	3.7	4.0	0.4	8.1	10.3	0.0	2.3	8.1	0.0	2.3	0.2	8.4	1.8	6.6	4.5	2.0
Liquids	m³/h	20.0	180.5	18.4	219.0	233.7	3.0	4.4	232.4	10.4	14.7	23.8	273.7	112.7	161.0	137.4	23.6
Slurry	m³/h	23.7	184.5	18.9	227.1	244.1	3.0	6.6	240.5	10.4	17.0	24.0	282.1	114.5	167.6	141.9	25.7
Solids SG		2.9	2.9	2.9	0.0	2.9	0.0	2.9	2.9	0.0	2.9	3.0	2.9	2.9	2.9	2.9	2.9
Liquids SG		1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Slurry Density	t/m³	1.3	1.0	1.0	0.0	1.1	1.0	1.6	1.1	1.0	1.2	1.0	1.1	1.0	1.1	1.1	1.1
% Solids	%w/w	35.0	6.0	6.0	9.7	11.4	0.0	60.0	9.2	0.0	30.8	2.3	8.2	4.5	10.6	8.8	20.0
Tungsten	WO_3%	0.03	0.43	1.93	0.32	0.37	0.00	0.52	0.32	0.00	0.52	6.63	0.51	0.00	0.65	0.72	0.48
Tungsten Mass	kg/h (WO_3)	3.2	49.4	22.6	75.3	109.6	0.0	34.3	75.3	0.0	34.3	37.1	123.4	0.0	123.4	95.2	28.3

105969-0000-F-008

Stream Information		S_057	S_060	S_061	S_062		S_064	S_065	S_066	S_067	S_068	S_069	S_070	S_071
Description	Units	Table Feed Screen Oversize	PW to Coase Rougher Table Feed	Coase Rougher Table Feed	PW Coarse Rougher Table Wash (Per Deck)	PW Coarse Rougher Table Wash	Coarse Rougher Table Concentrate	Coarse Rougher Table Tailings	Fine Rougher Tailings	Combined Rougher Table Tailings	Coarse Cleaner Table Feed	PW Coarse Cleaner Table Wash	Coarse Cleaner Table Concentrate	Coarse Cleaner Table Tailing
Solids	t/h	13,2	0,0	13,2	0,0	0,0	0,7	12,5	5,5	18,0	0,7	0,0	0,1	0,6
Liquids	t/h	137,0	0,0	137,0	2,5	15,0	22,5	129,5	19,1	148,7	22,5	2,0	0,8	23,7
Slurry	t/h	150,2	0,0	150,2	2,5	15,0	23,2	142,0	24,6	166,6	23,2	2,0	0,9	24,3
Solids	m^3/h	4,5	0,0	4,5	0,0	0,0	0,2	4,3	1,9	6,2	0,2	0,0	0,0	0,2
Liquids	m^3/h	137,4	0,0	137,4	2,5	15,0	22,6	129,9	19,2	149,1	22,6	2,0	0,8	23,8
Slurry	m^3/h	141,9	0,0	141,9	2,5	15,0	22,8	134,2	21,1	155,3	22,8	2,0	0,8	24,0
Solids SG		2,9	0,0	2,9	0,0	0,0	3,1	2,9	2,9	2,9	3,1	0,0	4,1	3,0
Liquids SG		1,0	0,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Slurry Density	t/m^3	1,1	0,0	1,1	1,0	0,0	1,0	1,1	1,2	1,1	1,0	1,0	1,1	1,0
% Solids	%w/w	8,8	0,0	8,8	0,0	0,0	2,9	8,8	22,3	10,8	2,9	0,0	12,9	2,3
Tungsten	WO_3%	0,72	0,00	0,72	0,00	0,00	13,82	0,02	0,01	0,02	13,82	0,00	50,00	6,63
Tungsten Mass	kg/h (WO_3)	95,2	0,0	95,2	0,0	0,0	92,8	2,4	0,7	3,1	92,8	0,0	55,7	37,1

105969-0000-F-009

Stream Information		S_058	S_073	S_074	S_075		S_077	S_078	S_079	S_080	S_081	S_082
Description	Units	Table Feed Screen Undersize	PW to Fine Rougher Table Feed	Fine Rougher Table Feed	PW Fine Rougher Table Wash (Per Deck)	PW Fine Rougher Table Wash	Fine Rougher Table Concentrate	Fine Rougher Table Tailings	Fine Cleaner Table Feed	PW Fine Cleaner Table Wash	Fine Cleaner Table Concentrate	Fine Cleaner Table Tailing
Solids	t/h	5,9	0,0	5,9	0,0	0,0	0,4	5,5	0,4	0,0	0,0	0,4
Liquids	t/h	23,6	0,0	23,6	4,5	9,0	15,4	19,1	15,4	4,0	1,9	17,5
Slurry	t/h	29,4	0,0	29,4	4,5	9,0	15,8	24,6	15,8	4,0	2,0	17,8
Solids	m^3/h	2,0	0,0	2,0	0,0	0,0	0,1	1,9	0,1	0,0	0,0	0,1
Liquids	m^3/h	23,6	0,0	23,6	4,5	9,0	15,5	19,2	15,5	4,0	1,9	17,5
Slurry	m^3/h	25,7	0,0	25,7	4,5	9,0	15,6	21,1	15,6	4,0	2,0	17,6
Solids SG		2,9	0,0	2,9	0,0	0,0	3,0	2,9	3,0	0,0	4,1	2,9
Liquids SG		1,0	0,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0	1,0	1,0
Slurry Density	t/m^3	1,1	0,0	1,1	1,0	0,0	1,0	1,2	1,0	1,0	1,0	1,0
% Solids	%w/w	20,0	0,0	20,0	0,0	0,0	2,5	22,3	2,5	0,0	1,7	2,1
Tungsten	WO_3%	0,48	0,00	0,48	0,00	0,00	6,88	0,01	6,88	0,00	50,00	3,00
Tungsten Mass	kg/h (WO_3)	28,3	0,0	28,3	0,0	0,0	27,6	0,7	27,6	0,0	16,5	11,0

105969-0000-F-010

Stream Information		S_083	S_084	S_085	S_086
Description	Units	Cyclone Overflow	Scavenger Tailings	Jig Scavenging Screen Undersize	Fine Tailings
Solids	t/h	5,3	43,0	6,0	54,3
Liquids	t/h	112,3	296,6	125,3	534,2
Slurry	t/h	117,6	339,6	131,3	588,5
Solids	m^3/h	1,8	14,9	2,1	18,8
Liquids	m^3/h	112,7	297,5	125,6	535,8
Slurry	m^3/h	114,5	312,4	127,7	554,6
Solids SG		2,9	2,9	2,9	2,9
Liquids SG		1,0	1,0	1,0	1,0
Slurry Density	t/m^3	1,0	1,1	1,0	1,1
% Solids	%w/w	4,5	12,7	4,6	9,2
Tungsten	WO_3%	0,00	0,02	0,02	0,02
Tungsten Mass	kg/h (WO_3)	0,0	7,5	1,2	8,7

105969-0000-F-011

Stream Information		S_087	S_088	S_089	S_090	S_091	S_092	S_093	S_094	S_095	S_096	S_097	S_098	S_099	S_100	S_101	S_102	S_103
Description	Units	Coarse Cleaner Table Product	Fine Cleaner Table Product	Grinding Classifier Feed	PW to Grinding Classifier Feed	Grinding Mill Feed	PW to Grinding Mill	Grinding Mill Discharge	Classifier Feed Pump	Grinding Product	Jameson Cell Feed	Jameson Cell Concentrate	PW to Jameson Cell Wash	Jameson Cell Tailings	Jameson Cell Recycle	Tungsten Product	Dewatered Tungsten Product	Dewatering Cone Overflow
Solids	t/h	0,1	0,0	0,4	0,0	0,2	0,0	0,2	0,2	0,1	0,2	0,0	0,0	0,2	0,1	0,1	0,1	0,0
Liquids	t/h	0,8	1,9	2,8	0,0	0,0	0,1	0,1	0,1	2,8	4,9	0,1	0,1	5,0	2,2	2,8	0,1	2,7
Slurry	t/h	0,9	2,0	3,1	0,0	0,2	0,1	0,3	0,3	2,9	5,2	0,1	0,1	5,2	2,3	2,9	0,2	2,7
Solids	m³/h	0,0	0,0	0,1	0,0	0,1	0,0	0,1	0,1	0,0	0,1	0,0	0,0	0,1	0,0	0,0	0,0	0,0
Liquids	m³/h	0,8	1,9	2,8	0,0	0,0	0,1	0,1	0,1	2,8	4,9	0,1	0,1	5,0	2,2	2,8	0,1	2,7
Slurry	m³/h	0,8	2,0	2,9	0,0	0,1	0,1	0,1	0,1	2,8	5,0	0,1	0,1	5,0	2,2	2,8	0,1	2,7
Solids SG		4,1	4,1	4,1	0,0	4,1	0,0	4,1	4,1	4,1	4,2	3,1	0,0	4,2	4,2	4,2	4,2	0,0
Liquids SG		1,0	1,0	1,0	0,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Slurry Density	t/m³	1,1	1,0	1,1	0,0	1,1	1,0	2,1	2,1	1,0	1,0	1,2	1,0	1,0	1,0	1,0	2,1	1,0
% Solids	%w/w	12,9	1,7	11,5	0,0	90,0	0,0	70,0	70,0	5,0	4,8	20,0	0,0	4,5	4,5	4,5	70,0	0,0
Tungsten	WO_3%	50,00	50,00	50,00	0,00	50,00	0,00	50,00	50,00	50,00	51,46	13,64	0,00	53,51	53,51	53,51	53,51	0,00
Tungsten Mass	kg/h (WO_3)	55,7	16,5	180,5	0,0	108,3	0,0	108,3	108,3	72,2	127,0	1,7	0,0	125,2	54,8	70,5	70,5	0,0

105969-0000-F-012

Stream Information		S_104	S_105	S_106	S_107	S_108	S_109	S_110
Description	Units	Dewatered Tungsten Product	Tungsten Dryer Feed	Dryer Steam	Dried Tungsten Product	Tungsten HIMS Feed	Tungsten Non-magnetic Concentrate (Scheelite)	Tungsten Magnetic Concentrate (Wolframite)
Solids	t/h	0,1	0,1	0,0	0,1	0,1	0,1	0,1
Liquids	t/h	0,1	0,1	0,0	0,0	0,0	0,0	0,0
Slurry	t/h	0,2	0,2	0,1	0,1	0,1	0,1	0,1
Solids	m³/h	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Liquids	m³/h	0,1	0,1	0,0	0,0	0,0	0,0	0,0
Slurry	m³/h	0,1	0,1	83,7	0,0	0,0	0,0	0,0
Solids SG		4,2	4,2	4,2	4,2	4,2	3,7	4,7
Liquids SG		1,0	1,0	0,0	1,0	1,0	1,0	1,0
Slurry Density	t/m³	2,1	2,1	0,0	4,2	4,2	3,6	4,6
% Solids	%w/w	70,0	70,0	0,0	99,5	99,5	99,5	99,5
Tungsten	WO_3%	53,51	53,51	53,51	53,51	53,51	35,20	64,73
Tungsten Mass	kg/h (WO_3)	70,5	70,5	0,0	70,5	70,5	17,6	52,9

105969-0000-F-013

Stream Information		P_104	P_106	P_112	P_117	P_118	P_119	P_120	P_121	P_123	P_125	P_128
Description	Units	Total PW Demand	PW from Dewatering Cone	PW to Feed Prep Area	PW to Coarse Jig	PW to Fine Jig	PW to Jig Tailings Scavening	PW to Scavengers	PW to Table Feed Prep	PW to Coarse Tables	PW to Fine Tables	PW to Arsenic Removal
Solids	t/h	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Liquids	t/h	535,1	2,7	75,2	127,7	205,2	22,0	62,2	13,3	17,0	15,0	0,1
Slurry	t/h	535,1	2,7	75,2	127,7	205,2	22,0	62,2	13,3	17,0	15,0	0,1
Solids	m³/h	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Liquids	m³/h	536,7	2,7	75,5	128,1	205,8	22,1	62,4	13,4	17,1	15,0	0,1
Slurry	m³/h	536,7	2,7	75,5	128,1	205,8	22,1	62,4	13,4	17,1	15,0	0,1
Solids SG		0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Liquids SG		1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Slurry Density	t/m³	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
% Solids	%w/w	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Tungsten	WO_3%	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Tungsten Mass	kg/h (WO_3)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

Appendix G Process Plant Equipment List

Ausenco

Mt Carbine Tungsten Project
Mount Carbine Feasbility Study

Mechanical Equipment List

Document No.	Revision
105969-LST-001	B

Rev	Date	Description	Prepared	Checked	Approved
A	22/10/2021	Preliminary Issue	DP	AH	AH
B	16/11/2021	Issued for Study	AH	DP	AH
C	18/11/2021	Updated for ore sorter to HP008	AH	AH	AH

Ausenco

Mechanical Equipment List

Project: Mt Carbine
Client: EQ Resources
Revision: B

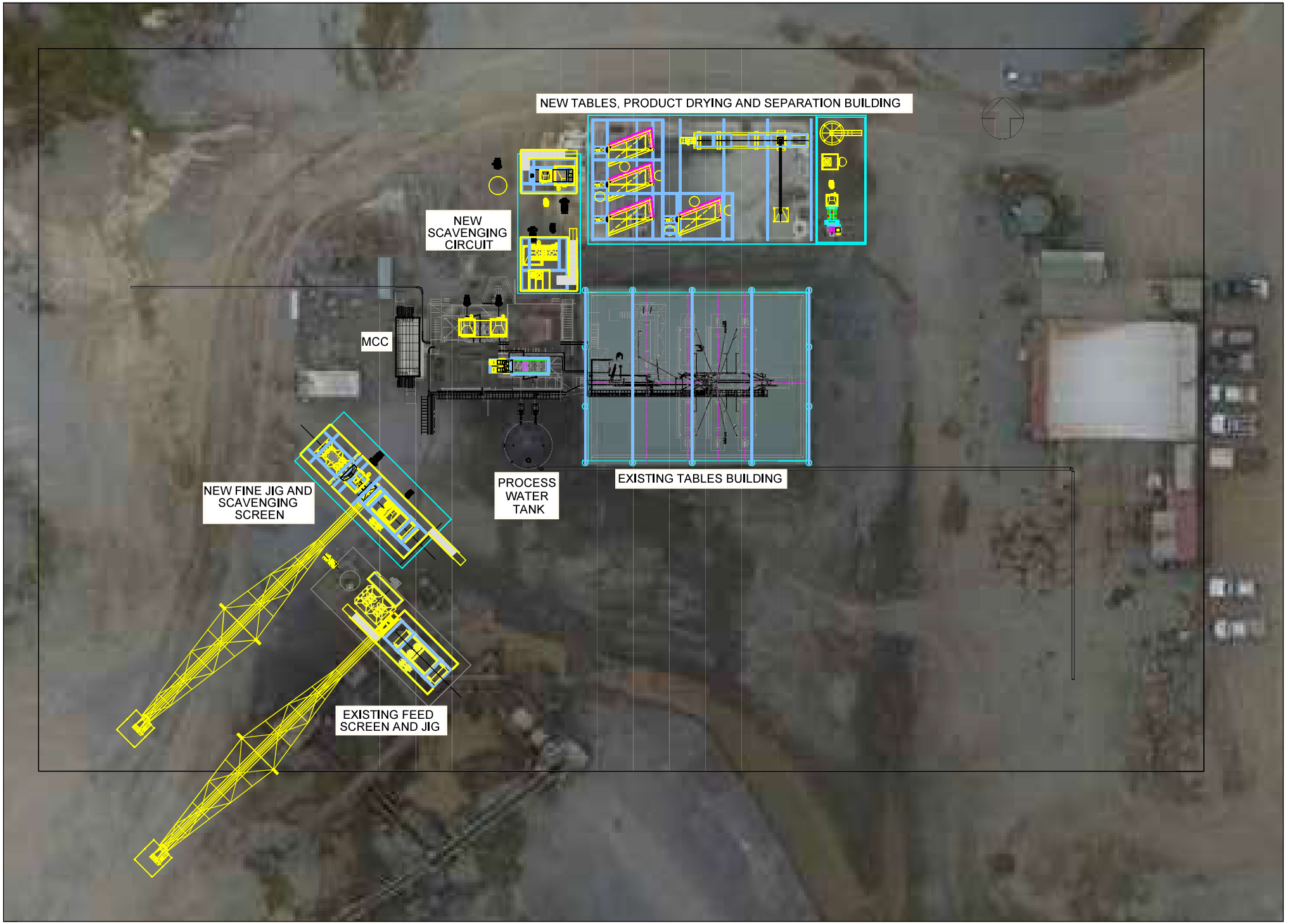
Document No: 105969-LST-001

Report Date: 16-Nov-21

Equip Tag	Area	Prefix	Num	Description	New Equipment	PFD	MRT	MRP	Vendor Name	Model	Specifications	Vendor Status	Duty / Standby	Drive Type	Power Status	Mot No	Total Installed (kW)	Load Factor	Supplied By	Installed By	Utilisation (% per Annum)	Emergency Load (Y/N)	Rev
2100-CV-004	2100	CV	004	SCREEN OVERSIZE CONVEYOR	NO	105969-F-002					Existing Equipment - Grasshopper Belt Conveyor Xm Xmm belt		Duty			1	5,5						B
2100-CV-003	2100	CV	003	SCREEN FEED CONVEYOR	NO	105969-F-002					Existing Equipment - Grasshopper Belt Conveyor 15m 600mm belt		Duty			1	5,5						B
2100-HF-001	2100	HF	001	HOPPER FEEDER	NO	105969-F-002					Existing Equipment		Duty	VSD		1	7,5						B
2100-PU-002A	2100	PU	002A	VIBRATING SCREEN UNDERSIZE PUMP	UPGRADE	105969-F-002				8/6E-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	DOL		1	30						B
2100-PU-002B	2100	PU	002B	VIBRATING SCREEN BOTTOM DECK OVERSIZE PUMP	NO	105969-F-002				4/3C-AH	Existing Equipment - Centrifugal Pump		Duty	VSD		1	7,5						B
2100-SC-002	2100	SC	002	VIBRATING SCREEN	NO	105969-F-002					Double deck, 1500 x 3610; 300 x 300 mm panels		Duty	DOL		2	7,6						B
2100-SU-002B	2100	SU	002B	VIBRATING SCREEN BOTTOM DECK OVERSIZE SUMP	NO	105969-F-002					Existing Equipment		N/A	N/A		0	0						B
2200-JG-001/2	2200	JG	001/2	COARSE MINERAL JIG (+2mm)	NO	105969-F-003			AMTAS	Russell Jig J2/70 HT	4 cell, 1200 x 1400 (WxL), 2 cells in series, 2 in parallel, 1480 x 1190 Primary, 1435 x 1990 secondary, 200mm bed, 100mm ragging, camshaft		Duty	DOL		1	4						B
2200-JG-003/4	2200	JG	003/4	FINE MINERAL JIG (<2mm)	YES	105969-F-004			AMTAS	Russell Jig J2/70 HT	4 cell, 1200 x 1400 (WxL), 2 cells in series, 2 in parallel, 1480 x 1190 Primary, 1435 x 1990 secondary, 200mm bed, 100mm ragging, camshaft		Duty	DOL		1	4						B
2200-PU-003	2200	PU	003	COARSE MINERAL JIG OVERFLOW PUMP	NO	105969-F-003			Austral Pump	6/4 AH	Existing Equipment - Centrifugal Pump		Duty	VSD		1	45						B
2200-PU -033	2200	PU	033	FINE MINERAL JIG UNDERFLOW PUMP	YES	105969-F-004				100 GPS	Vertical spindle pump, Weir Minerals		Duty	DOL		1	22						B
2200-PU -004	2200	PU	004	COARSE MINERAL JIG UNDERFLOW PUMP	NO	105969-F-003			Weir Warman	QV 004 1021	Vertical Spindle Pump, QV 004 1021		Duty	DOL		1	3						B
2200-SU-003	2200	SU	003	COARSE MINERAL JIG OVERFLOW SUMP	NO	105969-F-003					Existing Equipment		N/A	N/A		0	0						B
2300-CV-006	2300	CV	006	JIG AGGREGATE STACKER	RELOCATE	105969-F-005					Existing Equipment - Grasshopper Belt Conveyor 15m 600mm belt		Duty			1	5,5						B
2300-DI-005	2300	DI	005	SCAVENGER SPIRAL DISTRIBUTOR	YES	105969-F-006			Mineral Technologies		Distributor, Supplied with spirals		Duty	N/A		0	0						B
2300-PU-021	2300	PU	021	JIG WATER RECOVERY PUMP	YES	105969-F-005				4/3C-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	15						B
2300-PU-022	2300	PU	022	SCAVENGER CONCENTRATE PUMP	YES	105969-F-006				4/3C-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	7,5						B
2300-PU-038	2300	PU	038	CRUSHED JIG OVERFLOW PUMP	YES	105969-F-005				8/6E-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	30						B
2300-PU-039	2300	PU	039	REFLUX FEED PUMP	YES	105969-F-006				8/6E-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	30						B
2300-PU-040	2300	PU	040	SPIRALS FEED PUMP	YES	105969-F-006				8/6E-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	22						B
2300-PU-041	2300	PU	041	SCAVENGER TAILINGS PUMP	YES	105969-F-006				8/6E-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	30						B
2300-RC-004	2300	RC	004	JIG OVERFLOW CRUSHER	YES	105969-F-005					Rolls Crusher		Duty	DOL		2	30						B
2300-SC-004	2300	SC	004	JIG OVERFLOW DEWATERING SCREEN	YES	105969-F-005			M:O Group	LH1848-2	Single deck vibrating screen, 1mm top deck,		Duty			1	37						B
2300-SC-005	2300	SC	005	SCAVENGER CIRCUIT FEED SCREEN	REFURBISH	105969-F-006			Derrick	2SG48-60R-4STK	4 stack, stacksizer, 0,5mm deck		Duty	VSD		2	3,7						B
2300-SR-001	2300	SR	001	SCAVENGER SPIRAL	YES	105969-F-006			Mineral Technologies	MG6,3	3 start spiral, 8 spirals per bank, 1,8 t/h/start		Duty	N/A		0	0						B
2300-SU-021	2300	SU	021	JIG WATER RECOVERY SUMP	YES	105969-F-005			Fabrication	2m3 sump	fabrication, 760 kg platework, 11m2 6mm rubber lining		N/A	N/A		0	0						B
2300-SU-022	2300	SU	022	SCAVENGER CONCENTRATE SUMP	YES	105969-F-006			Fabrication	2m3 sump	fabrication, 760 kg platework, 11m2 6mm rubber lining		N/A	N/A		0	0						B
2300-SU-038	2300	SU	038	CRUSHED JIG OVERFLOW SUMP	YES	105969-F-005			Fabrication	6m3 sump	fabrication, 1460 kg platework, 22m2 6mm rubber lining		N/A	N/A		0	0						B
2300-SU-039	2300	SU	039	REFLUX FEED SUMP	NO	105969-F-006							Duty	N/A		0	0						B
2300-SU-040	2300	SU	040	SPIRALS FEED SUMP	NO	105969-F-006							Duty	N/A		0	0						B
2300-SU-041	2300	SU	041	SCAVENGER TAILINGS SUMP	YES	105969-F-006			Fabrication	6m3 sump	fabrication, 1460 kg platework, 22m2 6mm rubber lining		N/A	N/A		0	0						B
2300-XM-001	2300	XM	1	SCAVENGER REFLUX CLASSIFIER	YES	105969-F-006					Client supply, requires refurbishment		Duty	N/A		0	0						dp
2400-CY-003	2400	CY	003	DEWATERING CYCLONE	RELOCATE	105969-F-007					50MM SPIGOT, 75 MM O/F Existing equipment		Duty	N/A		0	0						B
2400-PU-005	2400	PU	005	DERRICK SCREEN PUMP	UPGRADE	105969-F-007				8/6E-AH	Centrifugal Pump, Weir Minerals ZV drive base		Duty	VSD		1	55						B
2400-PU-008	2400	PU	008	MINERAL JIG UF PUMP	UPGRADE	105969-F-007				3/2C-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	7,5						C
2400-RC-002	2400	RC	002	JIG CONCENTRATE O/S CRUSHER 1	NO	105969-F-007					Existing Rolls crusher		Duty	DOL		1	5,5						B
2400-RC-003	2400	RC	003	JIG CONCENTRATE O/S CRUSHER 2	YES	105969-F-007					Same as existing crusher		Duty	DOL		1	5,5						B
2400-SC-003	2400	SC	003	JIG CONCENTRATE SCREEN	YES	105969-F-007			M:O Group	LH1230-1 (U)	Single deck vibrating screen, 1mm top deck,		Duty	DOL		2	4,6						B
2400-SC-006	2400	SC	006	TABLE FEED SCREEN	YES	105969-F-007			M:O Group	LH1230-1 (U)	Single deck vibrating screen, 1mm top deck,		Duty			2	4,6						B
2400-SU-005	2400	SU	005	DERRICK SCREEN SUMP	NO	105969-F-007			Fabrication	6m3 sump	fabrication, 1460 kg platework, 22m2 6mm rubber lining		N/A	N/A		0	0						B
2400-SU-008	2400	SU	008	MINERAL JIG UF SUMP	NO	105969-F-007			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2500-DI-001	2500	DI	001	COARSE ROUGHER GRAVITY DISTRIBUTER	NO	105969-F-008							Duty	N/A		0	0						B
2500-DI-002	2500	DI	002	COARSE CLEANER GRAVITY DISTRIBUTER	NO	105969-F-008							Duty	N/A		0	0						B
2500-PU-009	2500	PU	009	COARSE CLEANER TABLES TAILS PUMP	UPGRADE	105969-F-008				3/2C-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	7,5						C
2500-PU-010	2500	PU	010	COARSE ROUGHER TABLES FEED PUMP	UPGRADE	105969-F-008				8/6E-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	22						B
2500-PU-015	2500	PU	015	COARSE ROUGHER TABLES CONC PUMP A	NO	105969-F-008			PumpEng	Scat 5,5	Submersible ScatPump		Duty	DOL		1	7,5						B
2500-PU-017	2500	PU	017	COARSE ROUGHER TABLES TAILS PUMP A	NO	105969-F-008			PumpEng	Scat 7,5	Submersible ScatPump		Duty	DOL		1	22						B
2500-PU-018	2500	PU	018	TABLE CIRCUIT TAILINGS RETURN PUMP	NO	105969-F-008			jiangxi ganzhong mining equipment	65QV	Vertical spindle pump		Duty	DOL		1	22						B
2500-SU-009	2500	SU	009	COARSE CLEANER TABLES TAILS SUMP	NO	105969-F-008			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2500-SU-010	2500	SU	010	COARSE ROUGHER TABLES FEED SUMP	NO	105969-F-008			Fabrication	6m3 sump	fabrication, 1460 kg platework, 22m2 6mm rubber lining		N/A	N/A		0	0						B
2500-SU-015	2500	SU	015	COARSE ROUGHER TABLES CONC SUMP A	NO	105969-F-008			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2500-SU-017	2500	SU	017	COARSE ROUGHER TABLES TAILS SUMP A	NO	105969-F-008			Fabrication	6m3 sump	fabrication, 1460 kg platework, 22m2 6mm rubber lining		N/A	N/A		0	0						B
2500-TA-001	2500	TA	001	COARSE ROUGHER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	1 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						C
2500-TA-002	2500	TA	002	COARSE ROUGHER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	1 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						C
2500-TA-003	2500	TA	003	COARSE ROUGHER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	1 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						C
2500-TA-004	2500	TA	004	COARSE ROUGHER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	1 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						C
2500-TA-005	2500	TA	005	COARSE ROUGHER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	1 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						C
2500-TA-006	2500	TA	006	COARSE ROUGHER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	1 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						C
2500-TA-007	2500	TA	007	COARSE CLEANER SHAKING TABLE	UPGRADE	105969-F-008			Jiangxi Wall-tech International Mining	2 Deck	Single deck concentrator table, bolt on double deck (upgrade)		Duty	DOL		1	2,2						B

Equip Tag	Area	Prefix	Num	Description	New Equipment	PFD	MRT	MRP	Vendor Name	Model	Specifications	Vendor Status	Duty / Standby	Drive Type	Power Status	Mot No	Total Installed (kW)	Load Factor	Supplied By	Installed By	Utilisation (% per Annum)	Emergency Load (Y/N)	Rev
2600-DI-003	2600	DI	003	FINE ROUGHER GRAVITY DISTRIBUTER	YES	105969-F-009					Table Distributor, Supplied with tables		Duty	N/A		0	0						B
2600-DI-004	2600	DI	004	FINE CLEANER GRAVITY DISTRIBUTER	YES	105969-F-009					Table Distributor, Supplied with tables		Duty	N/A		0	0						B
2600-PU-025	2600	PU	025	FINE ROUGHER TABLES FEED PUMP	YES	105969-F-009				3/2C-AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	7,5						C
2600-PU-026	2600	PU	026	FINE ROUGHER TABLES CONC PUMP	YES	105969-F-009			PumpEng	Scat 5,5	Submersible ScatPump		Duty	DOL		1	5,5						C
2600-PU-027	2600	PU	027	FINE ROUGHER TABLES TAILS SUMP	YES	105969-F-009			PumpEng	Scat 7,5	Submersible ScatPump		Duty	DOL		1	7,5						C
2600-PU-030	2600	PU	030	FINE CLEANER TABLES TAILS PUMP	YES	105969-F-009			PumpEng	Scat 5,5	Submersible ScatPump		Duty	DOL		1	5,5						B
2600-SU-025	2600	SU	025	FINE ROUGHER TABLES FEED SUMP	YES	105969-F-009			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2600-SU-026	2600	SU	026	FINE ROUGHER TABLES CONC SUMP	YES	105969-F-009			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2600-SU-027	2600	SU	027	FINE ROUGHER TABLES TAILS SUMP A	YES	105969-F-009			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2600-SU-030	2600	SU	030	FINE CLEANER TABLES TAILS SUMP	YES	105969-F-009			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2600-TA-008	2600	TA	008	FINE ROUGHER SHAKING TABLE	YES	105969-F-009			Deister	3 Deck	Triple deck concentrator table		Duty	DOL		1	2,2						B
2600-TA-009	2600	TA	009	FINE ROUGHER SHAKING TABLE	YES	105969-F-009			Deister	3 Deck	Triple deck concentrator table		Duty	DOL		1	2,2						B
2600-TA-010	2600	TA	010	FINE CLEANER SHAKING TABLE	YES	105969-F-009			Deister	2 Deck	Double deck concentrator table		Duty	DOL		1	2,2						B
2600-TA-011	2600	TA	011	FINE ROUGHER SHAKING TABLE	YES	105969-F-009			Deister	3 Deck	Triple deck concentrator table		Duty	DOL		1	2,2						C
2700-FC-001	2700	FC	001	ROUGHER FLOTATION CELL	YES	105969-F-011			Glencore Technology	L500	L500 Jameson Cell (Self Contained Pilot Unit)		Duty	N/A		0	0						B
2700-PU-031	2700	PU	031	ROUGHER FEED PUMP	YES	105969-F-011				1.5/1 AH	Centrifugal Pump, Weir Minerals CV drive base		Duty	VSD		1	7,5						B
2700-PU-035	2700	PU	035	COLLECTOR DOSING PUMP	YES	tba					Peristaltic Dosing Pump		Duty	FDR		1	0,03						B
2700-PU-036	2700	PU	036	FROTHER DOSING PUMP	YES	tba					Peristaltic Dosing Pump		Duty	FDR		1	0,03						B
2700-PU-037	2700	PU	037	SPARE DOSING PUMP	YES	tba					Peristaltic Dosing Pump		Standby	FDR		1	0,03						B
2700-PU-042	2700	PU	042	DEWATERING CONE WATER RETURN PUMP	YES	105969-F-011				4 x 3	Centrifugal Pump		Duty	DOL		1	5,5						C
2700-SU-031	2700	SU	031	ROUGHER FEED SUMP	YES	105969-F-011			Fabrication	0,7m3 sump	fabrication, 410 kg platework, 5m2 6mm rubber lining		N/A	N/A		0	0						B
2700-SU-042	2700	SU	042	DEWATERING CONE WATER RETURN STANDPIPE	YES	105969-F-011			Fabrication														C
2700-TH-001	2700	TH	001	TUNGSTEN PRODUCT DEWATERING CONE	YES	105969-F-011			Fabrication		2m Diameter Dewatering Cone, 3800kg platework, 50m2 6mm rubber lining		Duty	N/A		0	0						B
2700-XM-002	2700	XM	002	BALL MILL VENDOR PACKAGE	YES	105969-F-011							Duty			1	7						B
2700-XM-003	2700	XM	003	ROUGHER RECYCLE MECHANISM	YES	105969-F-011			Glencore Technology		Inc in Jameson Cell Package		Duty	N/A		0	0						B
2800-DR-001	2800	DR	001	TUNGSTEN DRYER	REFURBISH	105969-F-012					Existing equipment to be refurbished		Duty			TBA	TBA						B
2800-HF-002	2800	HF	002	TUNGSTEN DRYER HOPPER FEEDER	NO	105969-F-012					Existing Equipment, Hopper and screw feeder, capacity TBC		Duty			1	5,5						B
2800-HF-003	2800	HF	003	MANGETIC SEPARATION HOPPER FEEDER	YES	105969-F-012							Duty			0	0,37						B
2800-MG-001	2800	MG	001	TUNGSTEN DRY HIMS PACKAGE	YES	105969-F-012			Eriez		1 pass, 305mm Dia Lab RE, high intensity dry magnetic separator		Duty			1	1,1						B
2900-PU-020	2900	PU	020	PROCESS WATER PUMP	NO	105969-F-013			Ajax	50-125-315A	Centrifugal 150X125-315		Duty	DOL		1	22						B
2900-TK-001	2900	TK	001	PROCESS WATER TANK	NO	105969-F-013					Existing Poly tank, with level sensor		Duty			0	0						B
2900-PU-023	2900	PU	023	HIGH PRESSURE WATER PUMP	NO	105969-F-013			Ajax	25-400 A10B2X	Centrifugal 150X125-400		Duty	DOL		1	45						B
2100-SU-2A	2100	SU	2A	VIBRATING SCREEN UNDERSIZE SUMP	NO	105969-F-002					Existing Equipment		N/A	N/A		0	0						B
3000-PU-024A	3000	PU	024A	FINAL TAILS PUMP	RELOCATE	105969-F-010				6/4-AH	Existing Equipment - Centrifugal Pump		Duty	DOL		1	55						B
3000-SU-024	3000	SU	024	FINAL TAILS SUMP	YES	105969-F-010			Fabrication	6m3 sump	fabrication, 1460 kg platework, 22m2 6mm rubber lining		N/A	N/A		0	0						B

Appendix H Process Plant Layout


NEW TABLES, PRODUCT DRYING AND SEPARATION BUILDING
NEW SCAVENGING CIRCUIT
MCC
NEW FINE JIG AND SCAVENGING SCREEN
PROCESS WATER TANK
EXISTING TABLES BUILDING
EXISTING FEED SCREEN AND JIG

Appendix I Crushing Plant Capital Estimate

655 MT CARBINE PROJECT
Speciality Metals International Limited

CAPITAL COST - PHASE 1 & 2

B	25/11/2021	Issued for Client Review	AO	AY	CB	CB	
A	14/09/2021	Issued for Client Review	AO	AY	CB	CB	
Rev	**Date**	**Description**	**Prepared**	**Reviewed**	**Func/Fac Appr'd**	**Project Auth'd**	**Client Appr'd**

Project No: 655
Project : MOUNT CARBINE - CAPEX SUMMARY
Date: Nov 2021

MT CARBINE SCOPE - PHASE 1	Installation Hours	Equip & Materials	Installation Cost	Total Cost
SCREENING 21100	1,372	510,894	240,418	751,312
SECONDARY CRUSHING 21300	472	199,319	78,021	277,340
TERTIARY CRUSHING 21400 - Refer Note 1	1,209	506,459	208,580	715,039
PRODUCT HANDLING, STORAGE AND TRANSPORTATION 25000	102	48,027	17,775	65,802
PRODUCT HANDLING, STORAGE AND TRANSPORTATION 25100	709	352,386	94,748	447,134
AIR SERVICES 32300	78	33,450	14,625	48,075
MAIN SUBSTATION 32110	260	146,475	39,000	185,475
POWER SUPPLY & DISTRIBUTION (SITE DISTRIBUTION) 32120	691	145,936	103,650	249,586
CONTROL SYSTEM 32120		206,635	127,500	334,135
SURFACE SERVICES & UTILITIES (WATER)	311	79,800	58,350	138,150
TOTAL DIRECT COST	**5,205**	**2,229,381**	**982,666**	**3,212,047**
INDIRECTS			204,335	204,335
CONTINGENCY (15%)			512,457	512,457
TOTAL ESTIMATE	**5,205**	**2,229,381**	**1,699,458**	**3,928,840**

Note 1 : Includes sunk costs for Techroq screen & VSI crusher

MT CARBINE SCOPE - PHASE 2	Installation Hours	Equip & Materials	Installation Cost	Total Cost
SCREENING 21100	2,189	909,937	368,971	1,278,908
SECONDARY CRUSHING 21300	480	690,281	90,000	780,281
TERTIARY CRUSHING 21400	240	437,418	45,000	482,418
ORE SORTING 22000	3,849	1,510,901	618,264	2,129,165
PRODUCT HANDLING, STORAGE AND TRANSPORTATION 25000	7,000	90,027	17,775	107,802
PRODUCT HANDLING, STORAGE AND TRANSPORTATION 26100	390	291,527	73,148	364,675
MAIN SUBSTATION 32110	40	80,325	6,000	86,325
POWER SUPPLY & DISTRIBUTION (SITE DISTRIBUTION) 32120	1,657	371,951	248,550	620,501
CONTROL SYSTEM 32120		36,465	22,500	58,965
TOTAL DIRECT COST	**15,845**	**4,418,833**	**1,490,208**	**5,909,041**
INDIRECTS			551,376	551,376
CONTINGENCY (15%)			969,062	969,062
TOTAL ESTIMATE	**15,845**	**4,418,833**	**3,010,646**	**7,429,479**

Project No: 655
Project : MOUNT CARBINE - PHASE 1
Date: Nov 2021

WBS	Description	Basis of Pricing	Equip No	Quantity	Unit	Unit Cost	Direct Manhours			Permanent Plant Equipment	Vendor Reps	Bulk Materials	Freight	Direct Labour	Subcontract Distributables	Total Cost (AUD)	Unit Rate
							Unit (PF=1)	Total (PF= 1.2)	$/mhr								
SCREENING - 21100																	
21100	Mobile Rock Screen (Big Kev)	Existing	21100-SN-01	1.0	ea				75.0	0		0	0	0	0	0	0
21100	Rock Screen O/S Conveyor - 112tph, length 24m, lift 8m, 800mm belt, 11kW	Existing	21100-CV-01	1.0	ea				75.0	0			0	0	0	0	0
21100	Rock Screen U/S Conveyor - 238tph, length 24m, lift 8m, 800mm belt, 11kW	Existing	21100-CV-02	1.0	ea				75.0	0			0	0	0	0	0
21100	Fixed Screen Feed Conveyor - 445tph, length 28m, lift 8m, 900mm belt, 15kW	RAMS	21100-CV-03	28.0	m	1,050	2	67	75.0	29,400		29,400	2940	5,040	7,560	74,340	2,655
21100	Triple Deck Wet Screen Support Slab		21100-SN-02	12.6	m3	748	6	76	75.0	0		9,425	471	5,670	5,670	21,236	1,685
21100	Weightometer on Conveyor Feed - 5kW		21100-WT-01	1.0	ea	35,000	8	10	75.0	35,000			1750	720	1,080	38,550	38,550
21100	Cleaning Magnet - 2.2kW		21100-MG-01	1.0	ea	30,000	8	10	75.0	30,000		0	1500	720	1,080	33,300	33,300
21100	Triple Deck Wet Screen Feed Conveyor Chute		21100-CH-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
21100	Triple Deck Wet Screen - 445tph, 30kW - Client Supplied	Sandvick	21100-SN-02	1.0	ea	145,000		100	75.0	145,000			11990	7,500	11,250	175,740	175,740
21100	Triple Deck Screen Underpan		21100-SN-02	1.0	ea	5,000	6.0	7	75.0	0		5,000	250	540	810	6,600	6,600
21100	Triple Deck Screen Support (light < 30kg/m)		21100-SN-02	2.0	t	7,500	25.0	60	75.0	0		15,000	750	4,500	6,750	27,000	13,500
21100	Triple Deck Screen Support (med 30-60kg/m)		21100-SN-02	1.0	t	5,500	20.0	24	75.0	0		5,500	275	1,800	2,700	10,275	10,275
21100	Triple Deck Screen Handrails		21100-SN-02	35.0	m	200	1.2	48	75.0	0		7,000	350	3,623	5,434	16,406	469
21100	Triple Deck Screen Grating		21100-SN-02	23.0	m2	250	0.9	25	75.0	0		5,750	288	1,863	2,795	10,695	465
21100	Triple Deck Screen Product Pump - 60m3/hr, Warman 8/6F, 75kW		21100-PP-01	1.0	ea	25,000	50	60	75.0	25,000			1250	4,500	6,750	37,500	37,500
21100	Trenching for Pipeline Containment			800.0	m	0	0.1	48	75.0	0		0	0	3,600	3,600	7,200	9
21100	Beddind Sand for Pipeline Trench			80.0	m3	25	0.1	5	75.0	0		2,000	100	360	360	2,820	35
21100	Pipeline to Wet Plant - 200DN, PN20 ,HDPE			800.0	m	50	0.5	432	75.0	0		40,000	2000	32,400	48,600	123,000	154
21100	Oversize Stockpile Feed Conveyor - 185tph, length 24m, 6,5m lift, 900mm belt, 15kW	RAMS	21100-CV-04	24.0	m	25,220	2	58	75.0	25,220		25,220	2522	4,320	6,480	63,762	2,657
21100	Oversize Feed Stockpile Conveyor Chute		21100-CH-02	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
21100	Conveyor Foundations		CV01/02/03/04	24.5	m3	748	6	176	75.0	0		18,326	916	13,230	13,230	45,702	1,865
21100	Triple Deck Screen Foundations		21100-SN-02	19.8	m3	748	6	143	75.0	0		14,810	741	10,692	10,692	36,935	1,865
	Subtotal							**1,372**		**289,620**	**0**	**192,431**	**28,843**	**102,878**	**137,540**	**751,312**	
SECONDARY CRUSHING - 21300																	
21300	Cone Crusher Feed Conveyor - 207tph, length 24m, 6.5m lift, 900mm belt, 15kW	RAMS	21300-CV-01	24.0	m	25,220	2	58	75.0	25,220		25,220	2522	4,320	6,480	63,762	2,657
21300	Cone Crusher Feed Conveyor Chute		21300-CH-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
21300	Cone Crusher - 207tph, CSS 40mm - Symons 2 1/4 Cone Crusher	Existing	21300-CR-01	1.0	ea		0	0	75.0	0			0	0	0	0	0
21300	Cone Crusher Mods - Structural Steelwork (light < 30kg/m)		21300-CR-01	1.0	t	7,500	25.0	30	75.0	0		7,500	375	2,250	3,375	13,500	13,500
21300	Cone Crusher Feed Conveyor Metal Detector - 2kW		21300-MD-01	1.0	ea	30,000	10	12	75.0	30,000			1500	900	1,350	33,750	33,750
21300	Cone Crusher Discharge Conveyor - 207tph, length 24m, 6.5m lift, 900mm belt, 15kW	RAMS	21300-CV-02	24.0	m	25,220	2	58	75.0	25,220		25,220	2522	4,320	6,480	63,762	2,657
21300	Conveyor Foundations		CV01/02	18.6	m3	748	6	134	75.0	0		13,913	696	10,044	10,044	34,696	1,865
21300	Crusher Foundations		21300-CR-01	20.1	m3	748	6	145	75.0	0		15,035	752	10,854	10,854	37,495	1,865
21300	Cone Crusher Discharge Conveyor Head Chute		21300-CH-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
21300	Cone Crusher Discharge Conveyor Chute		21300-CH-02	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
	Subtotal							**472**		**80,440**	**0**	**109,388**	**9,491**	**35,388**	**42,633**	**277,340**	
TERTIARY CRUSHING / REHANDLING CIRCUIT - 21400																	
21400	Feed VSI Bin - 10m3		21400-BN-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
21400	Bin Foundations		21400-BN-01	3.0	m3	748	6	22	75.0	0		2,244	112	1,620	1,620	5,596	1,865
21400	Vibrating Feeder - Model SP0818, 2.4kW	Sandvik	21400-FE-01	1.0	ea	16,918	50	60	75.0	16,918		0	846	4,500	6,750	29,014	29,014
21400	Screen Feed Conveyor - 30tph, 35.3m length, 9.5m lift, 600mm belt, 11kW		21400-CV-02	35.3	m	1,000	2	85	75.0	35,300		35,300	3530	6,354	9,531	90,015	2,550
21400	Double Deck Wet Screen - linear motion, 12mm/6mm separation, 13kW - Client Supplied	Techroq - Existing	21400-SN-01	1.0	ea	43,596	100	120	75.0	43,596		0	2180	9,000	13,500	68,276	68,276
21400	Double Deck Screen Underpan		21400-SN-01	1.0	ea	5,000	6.0	7	75.0	0		5,000	250	540	810	6,600	6,600
21400	Double Deck Screen Support (light < 30kg/m)		21400-SN-01	2.0	t	7,500	25.0	60	75.0	0		15,000	750	4,500	6,750	27,000	13,500
21400	Double Deck Screen Support (med 30-60kg/m)		21400-SN-01	1.0	t	5,500	20.0	24	75.0	0		5,500	275	1,800	2,700	10,275	10,275
21400	Double Deck Screen Handrails		21400-SN-01	30.0	m	200	1.2	41	75.0	0		6,000	300	3,105	4,658	14,063	469
21400	Double Deck Screen Grating		21400-SN-01	20.0	m2	250	0.9	22	75.0	0		5,000	250	1,620	2,430	9,300	465
21400	Screen Product Conveyor - 10tph, 18m length, 4.7m lift, 600mm belt, 11kW		21400-CV-03	18.0	m	1,000	2	43	75.0	18,000		18,000	1800	3,240	4,860	45,900	2,550
21400	VSI Crusher Feed Conveyor - 30tph, 22m length, 6m lift, 600mm belt, 11kW		21400-CV-01	22.0	m	1,000	2	53	75.0	22,000		22,000	2200	3,960	5,940	56,100	2,550
21400	VSI Crusher - 45kW - Existing	Techroq - Existing	21400-CR-01	1.0	ea	34,912	0	0	75.0	34,912		0	1746	0	0	36,658	36,658
21400	VSI Crusher Discharge Conveyor - 36tph, 37.2m length, 9.5m lift, 600mm belt, 11kW		21400-CV-04	37.2	m	1,000	2	89	75.0	37,200		37,200	3720	6,696	10,044	94,860	2,550
21400	Conveyor Foundations		CV01/02/03/04	24.5	m3	748	6	176	75.0	0		18,326	916	13,230	13,230	45,702	1,865
21400	Double Deck Screen Foundations		21400-SN-01	19.8	m3	748	6	143	75.0	0		14,810	741	10,692	10,692	36,935	1,865
21400	Crusher Foundations		21400-CR-01	20.1	m3	748	6	145	75.0	0		15,035	752	10,854	10,854	37,495	1,865
21400	VSI Crusher Diverter Chute		21400-CH-01	2.0	t	7,500	10	24	75.0	0		15,000	750	1,800	2,700	20,250	10,125
21400	VSI Crusher Feed Conveyor Feed Chute		21400-CV-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
21400	Screen Feed Conveyor Head & Tail Chutes		21400-CV-02	2.0	t	7,500	10	24	75.0	0		15,000	750	1,800	2,700	20,250	10,125
21400	Screen Product Conveyor Head & Tail Chutes		21400-CV-03	2.0	t	7,500	10	24	75.0	0		15,000	750	1,800	2,700	20,250	10,125
21400	VSI Feed Bin Conveyor Head & Tail Chutes		21400-CV-04	2.0	t	7,500	10	24	75.0	0		15,000	750	1,800	2,700	20,250	10,125
	Subtotal Rehandling Circuit Phase 1							**1,209**		**207,927**	**0**	**274,415**	**24,117**	**90,711**	**117,869**	**715,039**	
PRODUCT HANDLING, STORAGE AND TRANSPORTATION - 25000																	
25000	Surge Tank - 20m3, CSRL		25100-TK-01	1.0	ea	10,000	20	24	75.0	0		10,000	500	1,800	2,700	15,000	15,000
25000	Surge Tank Agitator - 30kW		25100-AG-01	1.0	ea	25,000	5	6	75.0	0		25,000	1250	450	675	27,375	27,375
25000	Tank Foundations		21400-TK-01	5.0	m3	748	6	36	75.0	0		3,740	187	2,700	2,700	9,327	1,865
25000	Surge Tank Pump - 179m3/hr, Warman 6/4, 30kW		25100-PP-01	1.0	ea	7,000	30	36	75.0	7,000			350	2,700	4,050	14,100	14,100
	Subtotal Rehandling Circuit Phase 1							**102**		**7,000**	**0**	**38,740**	**2,287**	**7,650**	**10,125**	**65,802**	
PRODUCT DEWATERING CIRCUIT - 25100																	
25100	Single Deck Vibratory Dewatering Screen - 69tph, 8kW		25100-SN-01	1.0	ea	140,000	60	72	75.0	140,000		7,000	7350	5,400	8,100	167,850	167,850
25100	Single Deck Screen Support (light < 30kg/m)		25100-SN-01	1.3	t	7,500	25.0	39	75.0	0		9,750	488	2,925	4,388	17,550	13,500
25100	Single Deck Screen Support (med 30-60kg/m)		25100-SN-01	1.0	t	5,500	20.0	24	75.0	0		5,500	275	1,800	2,700	10,275	10,275
25100	Single Deck Screen Handrails		25100-SN-01	20.0	m	200	1.2	28	75.0	0		4,000	200	2,070	3,105	9,375	469
25100	Single Deck Screen Grating		25100-SN-01	14.0	m2	250	0.9	15	75.0	0		3,500	175	1,134	1,701	6,510	465
25100	Raw Water Pump - 179m3/hr, Warman 6/4, 30kW		25100-PP-02	1.0	ea	10,000	30	36	75.0	10,000			500	2,700	4,050	17,250	17,250
25100	Cyclone Feed Pump - 185m3/hr, Warman 3/2 AH, 30kW		25100-PP-03	1.0	ea	20,000	40	48	75.0	20,000			1000	3,600	5,400	30,000	30,000
25100	Dewatering Cyclone - 250CVX	Weir	25100-CY-01	1.0	ea	15,000	20	24	75.0	15,000			750	1,800	2,700	20,250	20,250
25100	Stockpile Feed Conveyor - 70tph, length 24m, 8m lift, 600mm belt, 11kW	RAMS	25100-CV-01	24.0	m	23,498	2	58	75.0	23,498		23,498	2350	4,320	6,480	60,146	2,506
25100	Stockpile Feed Conveyor Head Chute		25100-CH-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
25100	Conveyor Structural Steelwork (light < 30kg/m)		25100-CV-01	3.6	t	7,500	0	0	75.0	0		27,000	1350	0	0	28,350	7,875
25100	Allow for Process Piping, Valves & Fittings @ 15% Total			1.0	Lot	0	125	150	75.0	0		39,360	1968	11,250	16,875	69,453	

	Subtotal							709		208,498	0	127,108	16,780	37,899	56,849	447,134	
	AIR SERVICES 32300																
32300	Air Compressor Package c/w filters -Oil- Free Rotary screw, 30kW		32300-CP-01	1.0	ea	25,000	60	72	75.0	25,000	3,000	1,000	1300	5,400	8,100	43,800	43,800
32300	Compressed air reciever			1.0	ea	2,000	5	6	75.0	2,000		1,000	150	450	675	4,275	4,275
	Subtotal							78		27,000	3,000	2,000	1,450	5,850	8,775	48,075	
	POWER SUPPLY & DISTRIBUTION (MAIN SUBSTATION) 32110																
32110	Containerised - 415V Switchboard 50Hz, 3PH, 630A, 50kA 1 Sec, 1 incomer, 20 feeders + Spares (Wet Plant)			1.0	ea	94,500		200	75.0			94,500	4725	15,000	15,000	129,225	129,225
32110	415V Main Switchboard adjacent to new 500kVa Transformer to feed ore sorters (Dry Plant)			1.0	ea	45,000		60	75.0			45,000	2250	4,500	4,500	56,250	56,250
	Subtotal							260		0	0	139,500	6,975	19,500	19,500	185,475	
	POWER SUPPLY & DISTRIBUTION (SITE DISTRIBUTION) 32120																
32120	Distribution Cables - PVC/XLPE 0.6/ 1kV 1/C - 500 mm²			480.0	m	90.0		144	75.0			43,200	2160	10,800	10,800	66,960	140
32120	Distribution Cables - G/Y PVC/PVC 0.6/1kV 1/C - 120 mm²			80.0	m	15.0		24	75.0			1,200	60	1,800	1,800	4,860	61
32120	Distribution Cables - G/Y PVC/PVC 0.6/1kV 1/C - 70 mm²			80.0	m	15.0		24	75.0			1,200	60	1,800	1,800	4,860	61
32120	Power & Control Cables			1800.0	m	4.9		180	75.0			8,892	445	13,500	13,500	36,337	20
32120	Lighting Cables			500.0	m	1.9		18	75.0			950	48	1,350	1,350	3,698	7
32120	Instrumentation, Signal Cables			1000.0	m	0.8		50	75.0			750	38	3,750	3,750	8,288	8
32120	Cable ladder, 300mm			60.0	m	42		20	75.0			2,500	125	1,500	1,500	5,625	94
32120	150mm HD orange underground conduit			500.0	m	16		32	75.0			8,125	406	2,400	2,400	13,331	27
32120	LCS			5.0	ea	1,800		20	75.0			9,000	450	1,500	1,500	12,450	2,490
32120	Field Marshalling Box			3.0	ea	1,500		12	75.0			4,500	225	900	900	6,525	2,175
32120	415V 250A Distribution Board			1.0	ea	6,500		16	75.0			6,500	325	1,200	1,200	9,225	9,225
32120	3m handrail mounted, safe swivel light pole. All parts hot dipped galvanised.			4.0	ea	280		20	75.0			1,120	56	1,500	1,500	4,176	1,044
32120	MK2 u-bolt to handrail support stanchion complete with 4xM12 u bolts.			4.0	ea	77		20	75.0			308	15	1,500	1,500	3,323	831
32120	2x18W LED luminaire fittings - Emergency			4.0	ea	125		4	75.0			500	25	300	300	1,125	281
32120	400W LED Floodlight			3.0	ea	500		6	75.0			1,500	75	450	450	2,475	825
32120	32A 3ph GPO, all GPO's shall have integral earth leakage			5.0	ea	180		5	75.0			900	45	375	375	1,695	339
32120	15A 1ph GPO, all GPO's shall have integral earth leakage			5.0	ea	100		5	75.0			500	25	375	375	1,275	255
32120	Warning Siren			2.0	ea	250		3	75.0			500	25	225	225	975	488
32120	Belt Drift Switches			12.0	ea	506		18	75.0			6,072	304	1,350	1,350	9,076	756
32120	Pull Wire Switches			6.0	ea	645		9	75.0			3,870	194	675	675	5,414	902
32120	Underspeed Switches			6.0	ea	250		9	75.0			1,500	75	675	675	2,925	488
32120	PLC Control System - Wireless			1.0	lot	82,110		0	75.0			82,110	0	0	0	82,110	
32120	PLC Control System - Hardware			1.0	lot	102,850		0	75.0			102,850	0	0	0	102,850	
32120	PLC Control System - Software			1.0	lot	21,675		0	75.0			21,675	0	0	0	21,675	
32120	PLC Control System - Programming			1.0	lot	42,500		0	75.0			0	0	0	42,500	42,500	
32120	PLC Control System - Site Commissioning			1.0	lot	85,000		0	75.0			0	0	0	85,000	85,000	
32120	VSD's - Cyclone Feed UF/OF Pump -21100 PP-02 VSD - 30kw			7.0	ea	3,200		28	75.0			22,400	1120	2,100	2,100	27,720	3,960
32120	VSD - CV-04 - 11kw			1.0	ea	3,000		8	75.0			3,000	150	600	600	4,350	4,350
32120	VSI crusher soft starters			2.0	ea	5,000		16	75.0			10,000	500	1,200	1,200	12,900	6,450
	Subtotal							691		0	0	345,622	6,949	51,825	179,325	583,721	
	WATER SERVICES 32200																
32200	Process Water Tank 1 - 25kL		32200-TK-01	1.0	ea	15,000	8	10	75.0	0		15,000	750	720	1,080	17,550	17,550
32200	Process Water Tank 2 - 25kL		32200-TK-02	1.0	ea	15,000	8	10	75.0	0		15,000	750	720	1,080	17,550	17,550
32200	Process Water tank Feed Pump 1 - 60m3/hr, Warman 3/2 AH, 30kW		32200-PP-01	1.0	ea	5,000	40	48	75.0	5,000		0	250	3,600	5,400	14,250	14,250
32200	Process Water tank Feed Pump 2 standby - 60m3/hr, Warman 3/2 AH, 30kW		32200-PP-02	1.0	ea	5,000	40	48	75.0	5,000		0	250	3,600	5,400	14,250	14,250
32200	Process Plant Process Water Tank	Existing	32200-TK-03	1.0	ea		0	0	75.0	0		0	0	0	0	0	
32200	Process Water tank Feed Pump 3 - Warman 6/4 AH, 30kW		32200-PP-03	1.0	ea	7,000	40	48	75.0	7,000		0	350	3,600	5,400	16,350	16,350
32200	Process Water tank Feed Pump 3 standby - Warman 6/4 AH, 30kW		32200-PP-04	1.0	ea	7,000	40	48	75.0	7,000		0	350	3,600	5,400	16,350	16,350
32200	Allow for process piping, fittings & valves @ 5% Installed ME			1.0	lot			100	75.0	0		22,000	1100	7,500	11,250	41,850	
	Subtotal							311		24,000	0	52,000	3,800	23,340	35,010	138,150	
	Subtotal Direct Cost							5,205		844,485	3,000	1,281,204	100,693	375,041	607,625	3,212,047	
	INDIRECT COSTS																
	Spares & First Fills @ 5% Mech Equipment	By Owner		1.0	lot					42,224			2111			44,335	
	Engineering & Design Services			1.0	Lot										160,000	160,000	
	Procurement & Logistics	By Owner		1.0	Lot												
	Construction Supervision	By Owner		1.0	Lot												
	Subtotal Indirect Cost									42,224	0	0	2,111	0	160,000	204,335	
	Total Estimated Cost							5,205		886,709	3,000	1,281,204	102,804	375,041	767,625	3,416,383	
	Contingency @ 15%														512,457	512,457	
	Total Cost							5,205		886,709	3,000	1,281,204	102,804	375,041	1,280,083	3,928,840	

Project No: 655
Project : MOUNT CARBINE FS - PHASE 2
Date: Sept 2021

WBS	Description	Basis of Pricing	Equip No	Quantity	Unit	Unit Cost	Direct Manhours			Permanent Plant Equipment	Vendor Reps	Bulk Materials	Freight	Direct Labour	Subcontract Distributables	Total Cost (AUD)	Unit Rate
							Unit (PF=1)	Total (PF= 1.2)	$/mhr								
SCREENING - 21100																	
21100	Excavator Platform - base slab for containers			14.4	m3	748	7.0	121	75.0	0		10,771	539	9,072	9,072	29,454	2,045
21100	Excavator Platform - cement stabilised sand for container footing			70.0	m3	200	1.0	84	75.0	0		14,000	700	6,300	6,300	27,300	390
21100	40' containers for excavator platform			2.0	ea	6,000	4.0	10	75.0			12,000	600	720	1,080	14,400	
21100	Triple Deck Screen Support Slab			12.6	m3	748	7.0	106	75.0	0		9,425	471	7,938	7,938	25,772	2,045
21100	Miscellaneous Concrete			2.0	m3	935	7.5	18	75.0	0		1,870	94	1,350	1,350	4,664	2,332
21100	Primary Jaw Crusher - 132kW, CJ 412 CSS: 100mm	Sandvik	21100-CR-01	1.0	ea	380,655	150	180	75.0	380,655	5,000	0	19033	13,500	20,250	438,438	438,438
21100	Primary Crusher concrete			40.8	m3	748	7.0	343	75.0	0		30,518	1526	25,704	25,704	83,452	2,045
21100	Grizzly Screen - 700mm, 30kW		21100-SN-01	1.0	ea	30,000	50	60	75.0	0		30,000	1500	4,500	6,750	42,750	42,750
21100	ROM Bin - 40m3		21100-BN-01	1.0	ea	40,000	50	60	75.0	0		40,000	2000	4,500	6,750	53,250	53,250
21200	ROM Tie Back concrete			10.1	m3	935	7.4	90	75.0	0		9,444	472	6,727	6,727	23,369	2,314
21100	Vibrating Pan Feeder- Model SP0818, 2kW	Sandvik	21100-FE-01	1.0	ea	16,918	50.0	60	75.0	16,918		0	846	4,500	6,750	29,014	29,014
21100	Triple Deck Wet Screen Feed Conveyor - 550tph, 35.1m length, 8.1m lift, 900mm belt, 22kW		21100-CV-01	39.0	m		2	94	75.0	37,670		37,670	3767	7,020	10,530	96,657	2,478
21100	Triple Deck Screen Product Pump - 60m3/hr, Warman 8/6F, 75kW		21100-PP-02	1.0	ea	25,000	50	60	75.0	25,000			1250	4,500	6,750	37,500	37,500
21200	Weightometer on Conveyor Feed - 5kW		21100-WT-01	1.0	ea	35,000	8	10	75.0	35,000			1750	720	1,080	38,550	38,550
21100	Cleaning Magnet - 2.2kW		21100-MG-01	1.0	ea	30,000	8	10	75.0	30,000		0	1500	720	1,080	33,300	33,300
21100	Structural Steelwork (light < 30kg/m)			11.0	t	7,500	25.0	330	75.0	0		82,500	4125	24,750	37,125	148,500	13,500
21100	Relocate Primary Triple Deck Wet screen- linear motion, 55mm/30mm separation, 11kW - Client Supplied	Sandvik	21100-SN-01	1.0	ea	0	100	120	75.0	0		0	0	9,000	13,500	22,500	22,500
21100	Conveyor Foundations		CV01/02/03	27.9	m3	748	6	201	75.0	0		20,869	1043	15,066	15,066	52,045	1,865
21100	Crusher Foundations		21300-CR-01	20.1	m3	748	6	145	75.0	0		15,035	752	10,854	10,854	37,495	1,865
21100	Cone Crusher Support Structure (light < 30kg/m)		21300-CR-01	3.0	t	7,500	25.0	90	75.0	0		22,500	1125	6,750	10,125	40,500	13,500
	Subtotal							**2,189**		**525,243**	**5,000**	**336,602**	**43,092**	**164,191**	**204,781**	**1,278,908**	
SECONDARY CRUSHING - 21300																	
21300	Secondary Cone Crusher Feed Bin Conveyor - 200tph, 38.6m length, 10.3m lift, 900mm belt, 11kW		21300-CV-01	38.0	m		2	91	75.0	41,426		41,426	4143	6,840	10,260	104,095	2,739
21300	Self Cleaning Magnet - 2.2kW		21300-MG-01	1.0	ea	30,000	8	10	75.0	30,000		0	1500	720	1,080	33,300	33,300
21300	Secondary Cone Crusher Feed Bin - 24m3		21300-BN-01	1.0	ea	20,000	40	48	75.0	0		20,000	1000	3,600	5,400	30,000	30,000
21300	Vibrating Feeder - Model SP0818, 11kW	Sandvik	21300-FE-01	1.0	ea	16,918	50	60	75.0	16,918		0	846	4,500	6,750	29,014	29,014
21300	Cone Crusher - 90kW, 200tph, CH830i	Sandvik	21300-CR-01	1.0	ea	426,879	150	180	75.0	426,879	5,000	0	21344	13,500	20,250	486,973	486,973
21300	Secondary Triple Deck Wet Screen Feed Conveyor - 350tph, 43.8m length, 9.3m lift, 600mm belt, 11kW		21300-CV-02	38.0	m		2	91	75.0	38,000		38,000	3800	6,840	10,260	96,900	2,550
	Subtotal							**480**		**553,223**	**5,000**	**99,426**	**32,632**	**36,000**	**54,000**	**780,281**	
TERTIARY CRUSHING / REHANDLING CIRCUIT - 21400																	
21400	Feed VSI Bin -10m3	Phase 1	21400-BN-01	1.0	t	0	0	0	75.0	0		0	0	0	0	0	0
21400	Bin Foundations	Phase 1	21400-BN-01	3.0	m3	0	0	0	75.0	0		0	0	0	0	0	0
21400	Vibrating Feeder - Model SP0818, 11kW	Phase 1	21400-FE-01	1.0	ea	0	0	0	75.0	0		0	0	0	0	0	0
21400	Screen Feed Conveyor - 96tph, 35.3m length, 9.5m lift, 600mm belt, 11kW	Phase 1	21400-CV-02	35.3	m	0	0	0	75.0	0		0	0	0	0	0	0
21400	VSI Crusher Discharge Conveyor - 72tph, 40m length, 7.9m lift, 600mm belt, 11kW	Phase 1	21400-CV-04	40.0	m	0	0	0	75.0	0		0	0	0	0	0	0
21400	VSI Crusher Feed Conveyor - 72tph, 37.2m length, 7.9m lift, 600mm belt, 11kW	Phase 1	21400-CV-01	37.2	m	0	0	0	75.0	0		0	0	0	0	0	0
21400	VSI Crusher 1 - Techroq Existing	Phase 1	21400-CR-01	1.0	ea	0	0	0	75.0	0		0	0	0	0	0	0
21400	VSI Crusher 2 - 185kW	Sandvik	21400-CR-02	1.0	ea	180,760	100	120	75.0	180,760		0	9038	9,000	13,500	212,298	212,298
21400	Double Deck Wet screen - linear motion, 12mm/6mm separation, 30kW	Sandvik	21400-SN-01	1.0	ea	235,829	100	120	75.0	235,829		0	11791	9,000	13,500	270,120	270,120
	Subtotal							**240**		**416,589**	**0**	**0**	**20,829**	**18,000**	**27,000**	**482,418**	
ORE SORTING - 22000																	
22000	Reclaim tunnel excavation		22000-RE-01	300.0	m3	0	0.1	36	75.0	0		0	0	2,700	5,400	8,100	27
22000	Reclaim tunnel blinding concrete		22000-RE-01	20.0	m3	150	3	72	75.0	0		3,000	150	5,400	5,400	13,950	698
22000	Reclaim tunnel roof and walls (20m tunnel length)		22000-RE-01	134.5	m3	1,210	11.4	1,840	75.0	0		162,745	8137	137,997	137,997	446,876	3,323
22000	Reclaim tunnel floor slab		22000-RE-01	38.4	m3	748	7.0	323	75.0	0		28,723	1436	24,192	24,192	78,543	2,045
22000	Multiplate tunnel floor slab (2ea x 15m)		22000-RE-01	28.1	m3	748	7.0	236	75.0	0		21,019	1051	17,703	17,703	57,476	2,045
22000	Multiplate Tunnel - 2 x 15m x 3.5m diam, 8.4t	Roundel	22000-RE-01	30.0	m	2800	9	324	75.0	0		84,000	4,200	24,300	24,300	136,800	4,560
22000	Tunnel Sump Pump		22000-PP-01	1.0	ea	3,000	10	12	75.0	3,000			150	900	1,350	5,400	5,400
22000	Vibratory Pan Feeder 1 - 5kW	Sandvik	22000-FE-01	1.0	ea	16,129	30	36	75.0	16,129		0	806	2,700	4,050	23,685	23,685
22000	Vibratory Pan Feeder 2 - 5kW	Sandvik	22000-FE-02	1.0	ea	16,129	30	36	75.0	16,129		0	806	2,700	4,050	23,685	23,685
22000	Pan Feeder Support Structure (light < 30kg/m)		22000-FE-01/02	2.0	t	7,500	25.0	60	75.0	0		15,000	750	4,500	6,750	27,000	13,500
22000	Pan feeder feed chutes		22000-FE-01/02	2.0	t	6,000	12.0	29	75.0	0		12,000	600	2,160	3,240	18,000	9,000
22000	Pan feeder discharge chutes		22000-FE-01/02	2.0	t	6,000	10.0	24	75.0	0		12,000	600	1,800	2,700	17,100	8,550
22000	Ore Sorting Feed Reclaim Stockpile Conveyor - 160tph, 68m length, lift 18m, 800mm belt, 11kW		22000-CV-01	68.0	m		2	163	75.0	68,000		68,000	6800	12,240	18,360	173,400	2,550
22000	Ore Sorting Reject Conveyor - 160tph, 9m length, 900mm belt, 11kW		22000-CV-02	9.0	m		2	22	75.0	9,000		9,000	900	1,620	2,430	22,950	2,550
22000	Ore Sorting Product Conveyor - 24tph, 24m length, 800mm belt, 11kW		22000-CV-03	24.0	m		2	58	75.0	24,000		24,000	2400	4,320	6,480	61,200	2,550
22000	Ore Sorting Stockpile Feed Conveyor Head Chute		22000-CH-01	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
22000	Ore Sorting Feed Reclaim Conveyor Head Chute		22000-CH-02	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
22000	Diverter Chute - Ore Sorter Feed		22000-CH-01	0.3	t	7,500	10	4	75.0	0		2,250	113	270	405	3,038	10,125
22000	Ore Sorting Feed Bin - 8m3, 2m x 2m x 2m		22000-BN-01	1.0	ea	10,000	20	24	75.0	0		10,000	500	1,800	2,700	15,000	15,000
22000	Ore Sorting Feed Bin - 8m3, 2m x 2m x 2m		22000-BN-02	1.0	ea	10,000	20	24	75.0	0		10,000	500	1,800	2,700	15,000	15,000
22000	Vibratory Pan Feeder 1 - 5kW	Sandvik	22000-FE-03	1.0	ea	16,129	30	36	75.0	16,129		0	806	2,700	4,050	23,685	23,685
22000	Vibratory Pan Feeder 2 - 5kW	Sandvik	22000-FE-04	1.0	ea	16,129	30	36	75.0	16,129		0	806	2,700	4,050	23,685	23,685
22000	Pan Feeder Support Structure (light < 30kg/m)		22000-FE-03/04	3.0	t	7,500	25.0	90	75.0	0		22,500	1125	6,750	10,125	40,500	13,500
22000	Ore Sorter 1 - 30kW - Client Supplied	Tomra	22000-OS-01	1.0	ea	0	0	0	75.0	0		0	0	0	0	0	0
22000	Ore Sorter 2 - 30kW (Secondhand)	Tomra	22000-OS-02	1.0	ea	650,000	200	240	75.0	650,000		0	32500	18,000	27,000	727,500	727,500
22000	Ore Sorting Discharge Conveyor Head Chute		22000-CH-02	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
22000	Sampling Point		22000-SP-01	1.0	ea	1,500	4	5	75.0	0		1,500	75	360	540	2,475	2,475
22000	Sampling Point		22000-SP-02	1.0	ea	1,500	4	5	75.0	0		1,500	75	360	540	2,475	2,475
22000	Radial Stacker - 240tph, 24.4m length, 7.5m lift, 800mm belt, 22kW		22000-CVR-01	24.4	m		2	59	75.0	36,600		36,600	3660	4,392	6,588	87,840	3,600
22000	Radial Stacker Head Chute		22000-CH-03	1.0	t	7,500	10	12	75.0	0		7,500	375	900	1,350	10,125	10,125
22000	Cleaning Magnet - 2.2kW		22000-MG-01	1.0	ea	30,000	8	10	75.0	30,000		0	1500	720	1,080	33,300	33,300
	Subtotal							**3,849**		**885,116**	**0**	**553,837**	**71,948**	**288,684**	**329,580**	**2,129,165**	
PRODUCT HANDLING, STORAGE AND TRANSPORTATION - 25000																	
25000	Blunger Tank - 20m3, CSRL		25100-TK-01	1.0	ea	50,000	20	24	75.0	0		50,000	2500	1,800	2,700	57,000	57,000

25000	Blunger Tank Agitators - 30kW		25100-AG-02	1.0	ea	25,000	5	6	75.0	0		25,000	1250	450	675	27,375	27,375
25000	Tank Foundations		21400-BN-01	5.0	m3	748	6	36	75.0	0		3,740	187	2,700	2,700	9,327	1,865
25000	Surge Tank Pump - 179m3/hr, Warman 6/4, 175kW		25100-PP-01	1.0	ea	7,000	30	36	75.0	7,000			350	2,700	4,050	14,100	14,100
	Subtotal							**102**		**7,000**	**0**	**78,740**	**4,287**	**7,650**	**10,125**	**107,802**	
TAILS DEWATERING CIRCUIT - 26100																	
26100	Strainer - 1mm		26100-ST-01	1.0	ea	1,500	2	2	75.0	1,500			75	180	270	2,025	2,025
26100	Single Deck Vibratory Dewatering Screen - 69tph, 8kW		26100-SN-01	1.0	ea	140,000	60	72	75.0	140,000		7,000	7350	5,400	8,100	167,850	167,850
26100	Single Deck Screen Support (light < 30kg/m)		26100-SN-01	1.3	t	7,500	25.0	39	75.0	0		9,750	488	2,925	4,388	17,550	13,500
26100	Single Deck Screen Support (med 30-60kg/m)		26100-SN-01	1.0	t	5,500	20.0	24	75.0	0		5,500	275	1,800	2,700	10,275	10,275
26100	Single Deck Screen Handrails		26100-SN-01	20.0	m	200	1.2	28	75.0	0		4,000	200	2,070	3,105	9,375	469
26100	Single Deck Screen Grating		26100-SN-01	14.0	m2	250	0.9	15	75.0	0		3,500	175	1,134	1,701	6,510	465
26100	Screen Underflow Pump - 55m3/hr, Warman 3/2 AH, 30kW - Module 1		26100-PP-01	1.0	ea	20,000	40	48	75.0	20,000			1000	3,600	5,400	30,000	30,000
26100	Cyclone, Hopper & Pump Module 2		26100-PK-01	1.0	ea	75,000	100	120	75.0	75,000			3750	9,000	13,500	101,250	101,250
26100	Allow for Process Piping, Valves & Fittings @ 15% Total			1.0	Lot	0	35	42	75.0	0		11,395	570	3,150	4,725	19,840	
	Subtotal							**390**		**236,500**	**0**	**41,145**	**13,882**	**29,259**	**43,889**	**364,675**	
POWER SUPPLY & DISTRIBUTION (MAIN SUBSTATION) 32110																	
32110	Prefab Building - Crushing Substation Switchroom with Control Room combined			1.0	ea	76,500		40	75.0			76,500	3825	3,000	3,000	86,325	86,325
	Subtotal							**40**		**0**	**0**	**76,500**	**3,825**	**3,000**	**3,000**	**86,325**	
POWER SUPPLY & DISTRIBUTION																	
32120	Allowance included at 15% direct cost pending further design information			1.0	Lot			1657	75.0	0		354,239	17712	124,275	124,275	620,501	
32120	PLC Control System - Wireless			1.0	lot	14,490		0	75.0			14,490	0	0	0	14,490	
32120	PLC Control System - Hardware			1.0	lot	18,150		0	75.0			18,150	0	0	0	18,150	
32120	PLC Control System - Software			1.0	lot	3,825		0	75.0			3,825	0	0	0	3,825	
32120	PLC Control System - Programming			1.0	lot	7,500		0	75.0			0	0	0	7,500	7,500	
32120	PLC Control System - Site Commissioning			1.0	lot	15,000		0	75.0			0	0	0	15,000	15,000	
	Subtotal							**1,657**		**0**	**0**	**390,704**	**17,712**	**124,275**	**146,775**	**679,466**	
	Subtotal Direct Cost							**8,947**		**2,623,671**	**10,000**	**1,576,954**	**208,208**	**671,059**	**819,149**	**5,909,041**	
INDIRECT COSTS																	
	Spares & First Fills @ 5% Mech Equipment	By Owner		1.0	Lot					131,184			6559			137,743	
	Engineering & Design Services			1.0	Lot										413,633	413,633	
	Procurement & Logistics			1.0	Lot												
	Construction Supervision			1.0	Lot												
	Subtotal Indirect Cost									131,184	0	0	6,559	0	413,633	551,376	
	Total Estimated Cost							**8,947**		**2,754,855**	**10,000**	**1,576,954**	**214,767**	**671,059**	**1,232,782**	**6,460,416**	
	Contingency @ 15%														**969,062**	**969,062**	
	Total Cost							**8,947**		**2,754,855**	**10,000**	**1,576,954**	**214,767**	**671,059**	**2,201,844**	**7,429,479**	

Appendix J Process Plant Capital Estimate

Job No:	105969-02
Job Title:	Mt Carbine
Client	EQ Resources
Date:	Thursday, 25 November 2021
Rev:	B
Currency:	AUD

WBS1	WBS1 Name	Total
2000	PROCESS PLANT	5,226,669
3000	TAILINGS	135,813
6000	CONSTRUCTION INDIRECTS	151,501
7000	PROJECT DELIVERY	536,248
8000	OWNER'S COSTS	0
9000	PROVISIONS	907,535
Grand Total		6,957,766

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