



MSP ENGINEERING PTY LTD

WHITE WELL GOLD PROJECT
PROCESS PLANT
PRE-FEASIBILITY STUDY REPORT

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1. SUMMARY

The White Well Gold Project (WWGP) deposit is located approximately 30 km east of Cue in the Murchison district of WA. MSP Engineering (MSP) and other parties are considering the potential development of this open pit gold mineral resource.

The gold mineralisation at WWGP is free gold hosted in quartz veins. The quartz veins are contained within a non mineralised kaolin clay. Due to this type of deposit, the recovery of the quartz and the rejection of the kaolin waste is the initial key processing step in the overall process flowsheet.

Based on recent testwork performed by MSP and historical work by previous owners, the total process flowsheet consists of drum scrubbing, desliming (clay removal) via screening, hydrocyclones and gravity concentration to recover the quartz and liberated free gold. This quartz product is then processed via conventional ball milling and a CIL circuit.

Previous testwork indicates that the quartz fraction down to a particle size of 212 microns varies between 15 to 30% of the ore. The process plant throughput for the grinding and CIL circuit has been constrained to a maximum throughput rate of 30 tph (244,000 tpa at 93% utilisation) due to the strategy of applying a modular design, with the majority of fabrication performed off-site

The drum scrubber/deslime circuit ore supply via front end loader (FEL) from ROM stockpiles will operate at a targetted throughput rate of 100 tph (815,000 tpa at 93% utilisation) and provides an average feed rate of 30 tph of quartz rich material to the grinding/CIL circuit.

The capital cost for the deslime and grinding/CIL circuit with carbon processing off-site (elution/reactivation by an off-site custom facility) has been estimated at AUD \$22.22M. The accuracy of this estimate is $\pm 20-25\%$ as at Q4, 2019. The capital cost estimate for the drum scrubber circuit, tailings storage facility (TSF), bore water supply and offices/maintenance/stores facilities, camp and power plant are the responsibility of MSP.

An operating cost for the proposed total process plant, excluding borewater supply, TSF, the feed loader and contract crushing of a portion of the quartz product has been estimated at AUD \$16.98/tonne to an estimated accuracy of $\pm 20-25\%$ as at Q4, 2019. This estimate is based on the feed rate to the drum scrubber circuit.

A project schedule for the process plant facility incorporating the design, procurement, fabrication, construct and commission to first gold pour has been estimated at 9 months duration. The key assumptions are that the ball mill and other long lead items can be procured and delivered to site within 22 weeks. This schedule precludes the design and construct for the borefield, TSF, power supply, all site buildings and the camp facility.

2. PROCESS DESCRIPTION & DESIGN CRITERIA

The pictorial flowsheet and the site layout drawing for the proposed WWGP process facility is presented in Figure 2-2 and Figure 2-3 respectively.

The process flow diagrams and the associated design criteria for the WWGP process facility is presented in Appendix A

Open pit ore that provides feed to the process plant is described in the summary section of this report. ROM ore is fed by FEL into a ROM bin, whereby it is withdrawn via an apron feeder at a controlled rate. The apron feeder discharges onto a conveyor that feeds a vibrating grizzly which has an average aperture of 100 mm. Grizzly oversize material (O/S) will initially discharge via a conveyor onto a small stockpile. At a later date an impact crusher may be installed to crush the O/S and return to the drum scrubber feed conveyor.

Grizzly undersize material (U/S) is conveyed to a drum scrubber (3 m diam x 4.5 m length, tyre drive with a 315 kW motor). Oversize material (+12 mm) discharges by a trommel screen fitted to the end of the scrubber. This material is conveyed to a small stockpile which will be periodically removed by FE loader onto a larger capacity stockpile (2,500 tonne capacity). The intent is to contract crush this material to approximately 100 % passing 10 mm on a campaign basis every 2 weeks. This crushed material will be stockpiled (2,500 tonne capacity) and then fed by FEL into a reclaim bin, which will feed the grinding circuit.

Trommel U/S slurry exiting the scrubbing circuit is pumped to a vibrating screen fitted with 2mm urethane screen panels. The O/S material discharges onto the feed conveyor to the grinding circuit and the U/S slurry from the vibrating screen is pumped to the deslime circuit for removal of the fine kaolin material. The scrubbing circuit inclusive to the ROM bin as described above has been sourced as second hand equipment and will be re-conditioned and installed by MSP.

The deslime circuit consists of two stages of hydrocyclones with the first stage (400 mm diam – 4 of 3 operating) cyclone overflow reporting to the second stage cyclones (250 mm diam – 6 of 4 operating). The second stage deslime cyclone overflow (estimated at P80 @ -38 microns) reports to the final tails pumps for delivery to the TSF.

Both stages of the deslime cyclone underflow product reports to a StackSizer vibrating screen consisting of 5 screen decks fitted with urethane screen panels. The StackSizer U/S (-212 micron slurry) reports via a slurry pump to a hydrocyclone whereby the underflow stream reports to a Knelson gravity concentrator (KC-CVD20) which will recover free gold as a continuous concentrate stream. The StackSizer O/S material will combine with the Knelson concentrate stream and be transferred via a slurry pump to the grinding circuit. The hydrocyclone (2 x 250 mm diam – 1 operating) prior to the Knelson gravity concentrator dewateres and provides further removal of clay material, with the resultant overflow product reporting to the final tails pumps.

The grinding circuit consists of a ball mill (3.8 m diam x 5m EGL fitted with a 800 kW motor) in closed circuit with hydrocyclones (5 of 250 mm diam – 3 operating). Cyclone overflow gravitates to a trash vibrating screen prior to reporting the leach/CIL circuit. Cyclone U/F gravitates back to the ball mill feed chute.

The leach/CIL circuit consists of 1 leach and 6 CIL tanks (4.5 m diam x 5.9 m height – 100 m³ capacity) with the CIL tanks fitted with Kemix interstage screens (MPS 100). Loaded carbon will be removed daily and carbon advance through the tanks will be via airlifts. Loaded carbon (in bulka-bags) will be transported to a custom stripping facility for the recovery of gold, with the barren carbon reactivated before returning to site.

The trash, loaded carbon and safety screens (0.9 m x 2.4 m length) are all the same equipment size and are fitted with 0.8mm aperture urethane screen panels.

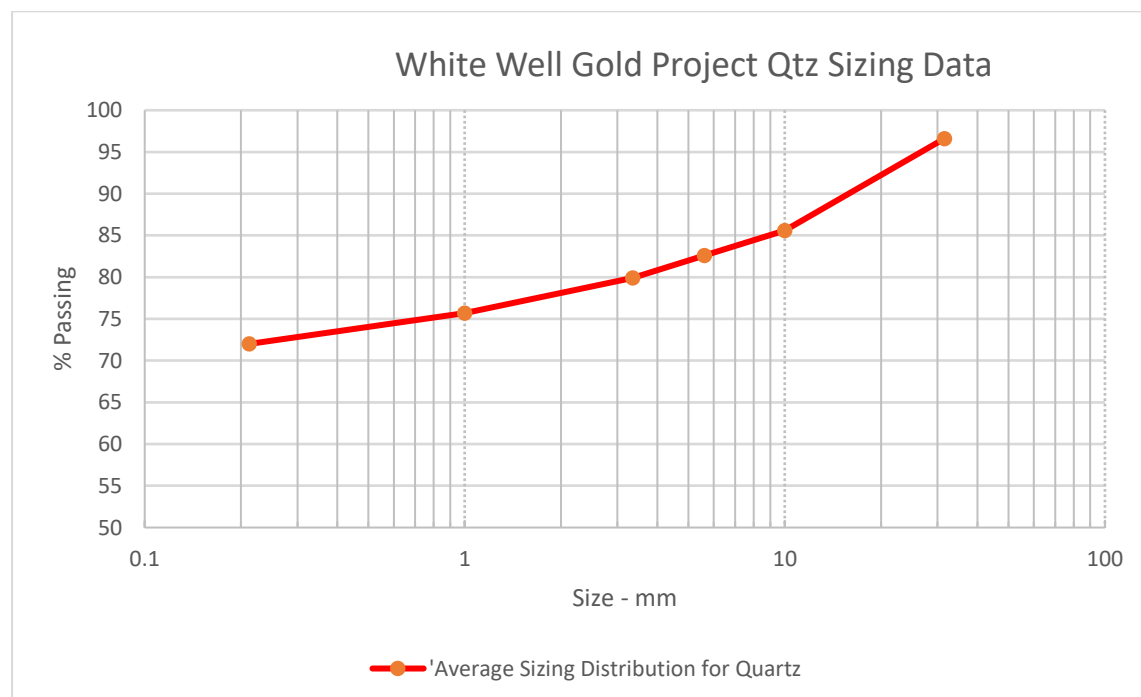
The supply/storage of reagents/consumables and dosage are based on the following criteria:

- Quicklime in 1 tonne bulka-bags will be transferred into a 1 tonne capacity silo fitted with a rotary valve. This silo straddles the grinding circuit feed conveyor with lime addition controlled via a VSD drive on the rotary valve onto the conveyor to meet the target operating pH in the leach tank.
- Grinding media will be transported in 200 steel drums to site. The drums will be lifted via an electric hoist to a cradle adjacent to the ball mill feed chute. Media addition will be made to maintain the target power draw of the ball mill.
- Liquid cyanide via Isotainers will be delivered to site and directly connected to the dosing pump inlet piping manifold. Positive displacement pumps with VSD control will meter the cyanide solution direct to the leach tank to maintain the target cyanide concentration.
- Liquid oxygen (LOX) will be delivered to site and stored in a liquid oxygen vessel fitted with a vaporiser. The oxygen gas via SS piping will be metered and sparged down the agitator shafts into the slurry.

The key design criteria applied to the process plant facility are as follows:

- The estimated average sizing distribution of the quartz content within the ore is presented in Figure 2-1. This sizing distribution was used to predict the quantity of quartz material that reported from the drum scrubber oversize, +2 mm material from the vibrating screen and the +212 micron material from the StackSizer screen. All of these streams plus the Knelson gravity concentrate reports to the grinding/CIL circuit.

Figure 2-1 Average Sizing Distribution for Quartz Content in Ore.



- A Bond Ball Work Index (BBWi) of 18 kW/h was assumed for the quartz material. A grind liberation size of P_{80} 106 microns was the assumed leach feed sizing.
- A leach/CIL retention time of 12 hours was assumed to be sufficient for maximum gold recovery at a slurry density at 40% (w/w).
- A loaded carbon Au grade of 3000 g/t can be achieved from an estimated gold leach feed head grade 2 g/t.

Figure 2-2 Process Flow Diagram

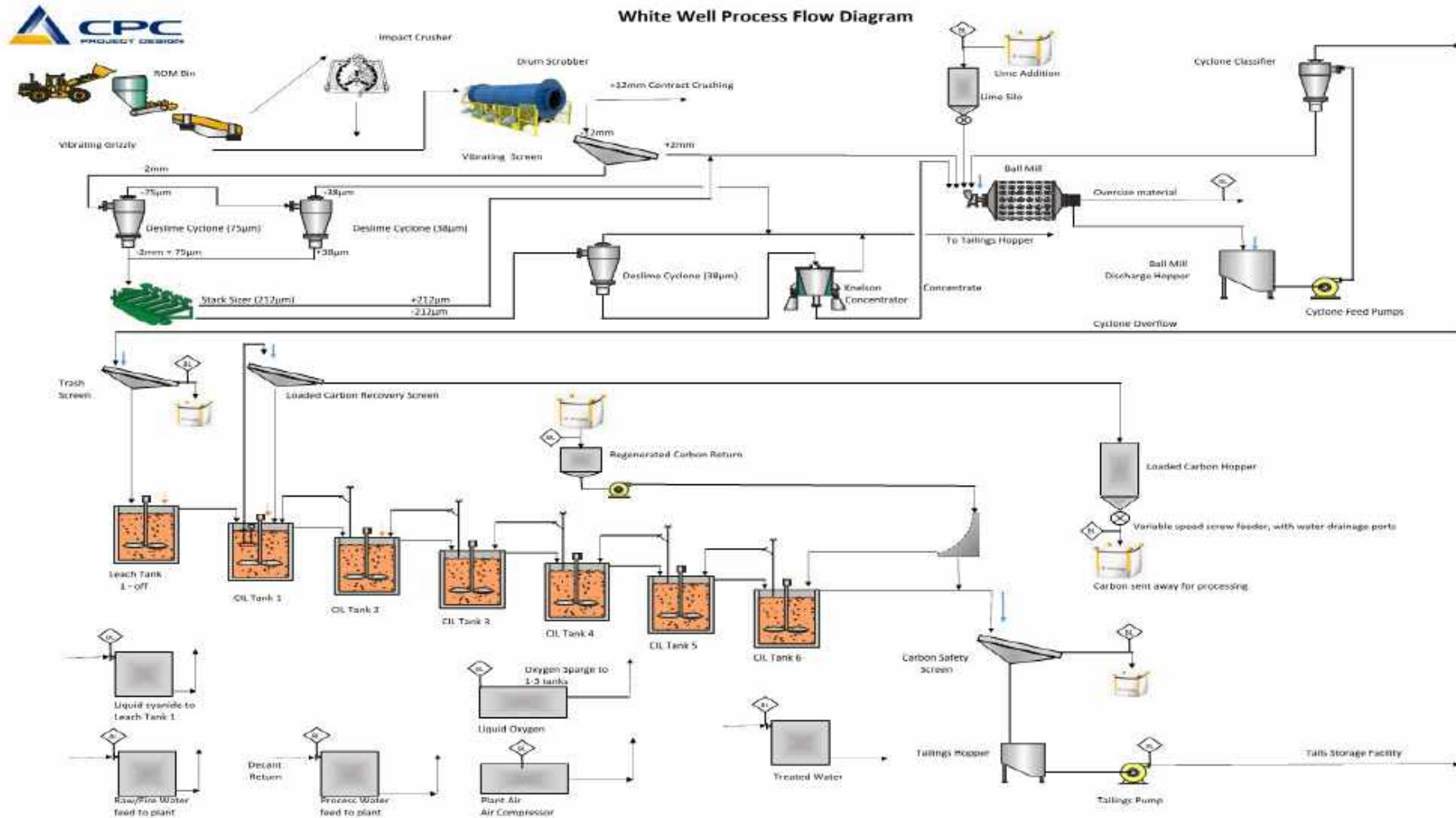
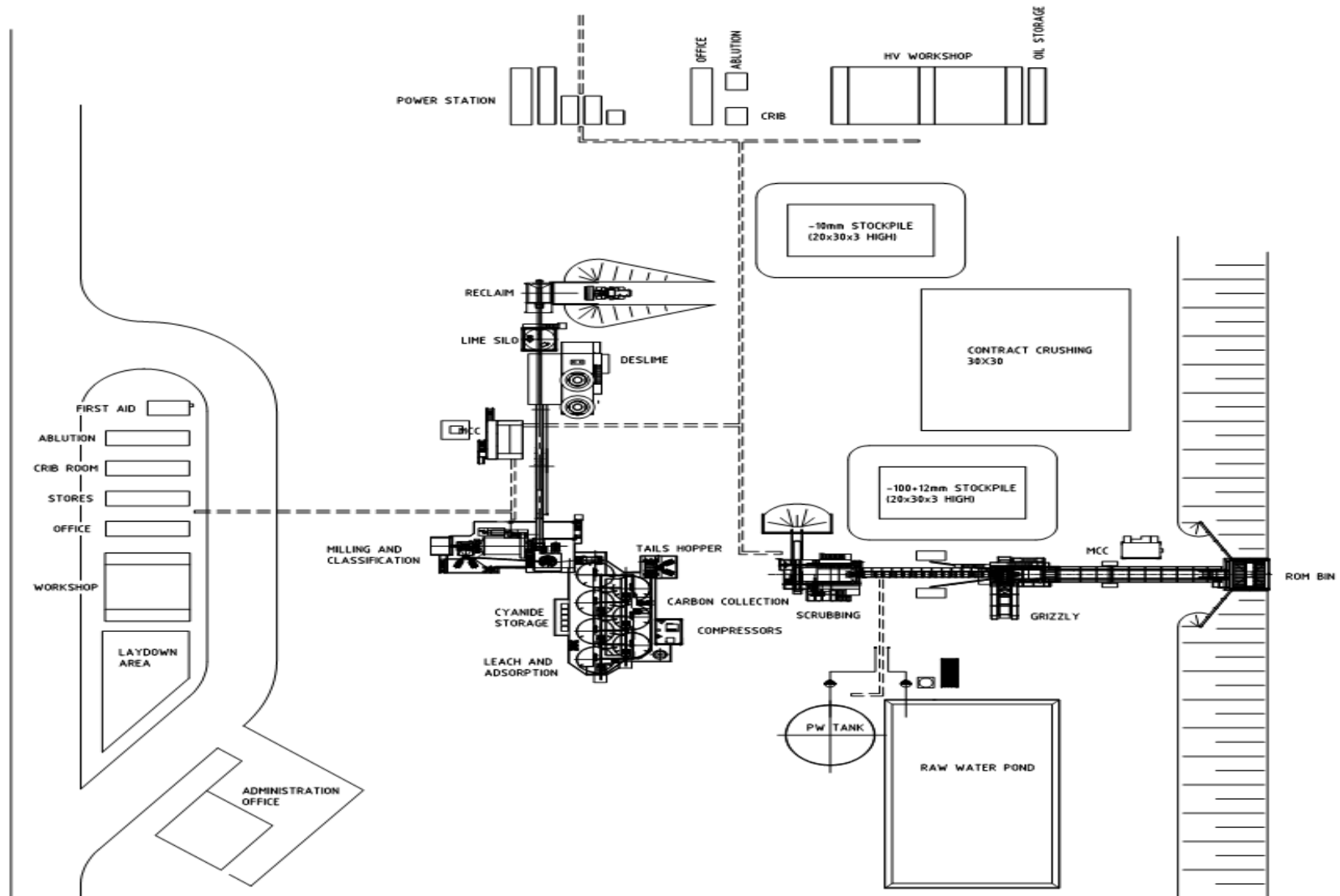
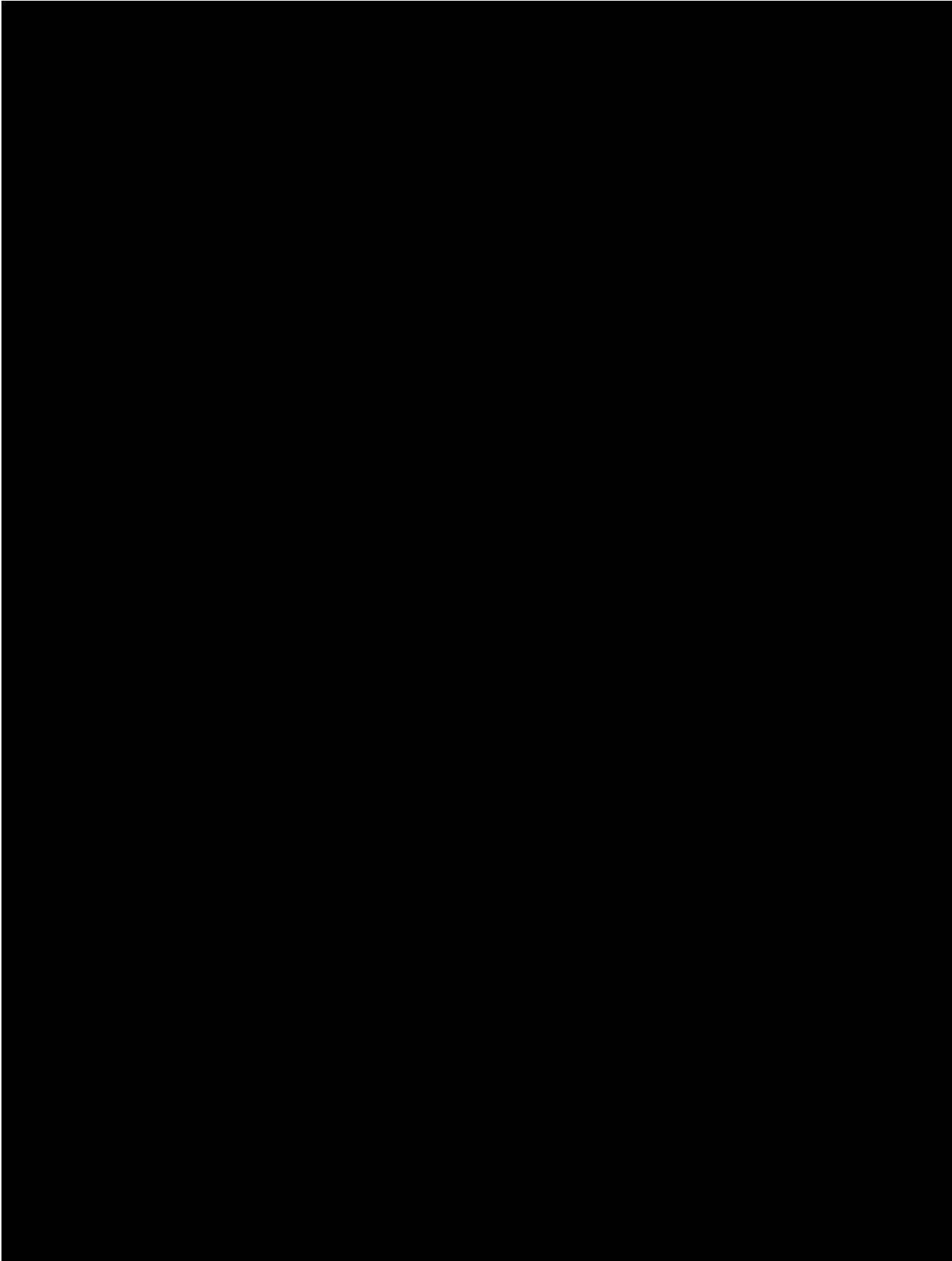


Figure 2-3 Site Layout Drawing





3.1 Estimate Structure

The structure of the estimate was based on the following major categories:

- Direct costs
- Indirect costs
- EPCM costs
- Contingency.

3.1.1 Estimation Methodology and Accuracy

The capital estimation methodology was based on:

- Estimates based on Australian dollars
- EPCM factored from the direct cost estimate
- Mechanical and electrical equipment pricing obtained by recent historical cost data and escalated if required
- Preliminary engineering designs to enable Bill of Material schedules for concrete, structural steel, platework
- Development of instrument list, cable schedule to enable estimation of costs
- Piping material supply and installation has been factored against mechanical equipment
- Pricing for structural steel and platework fabrication rates obtained from recent project purchase orders
- Pricing for onsite concrete construction rates obtained from recent project purchase orders
- Labour and construction equipment rates based on recent project purchase orders
- Freight and spares have been factored against mechanical equipment supply

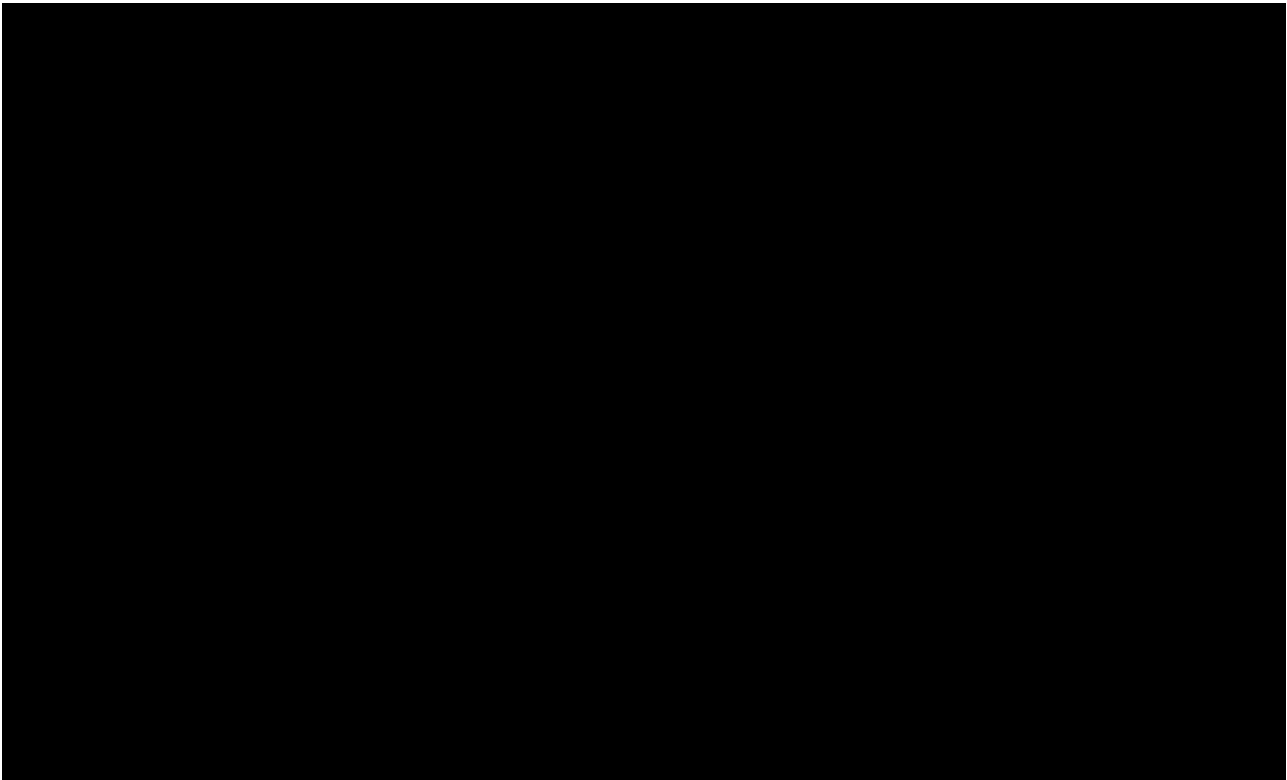
Based on the level of engineering a 20% contingency has been included, whereby the expected accuracy of the capital cost estimate is within the range of $\pm 20\text{-}25\%$ as at Q 4, 2019.

4. OPERATING COST ESTIMATE

The summarised operating costs for the total process plant facility (ROM bin, drum scrubber, deslime, grinding, and CIL circuits) are presented in Table 4-1.

The operating cost is estimated in Australian dollars as at Q4, 2019 and contains a [REDACTED] contingency. The estimated accuracy of the operating cost is [REDACTED]

The data in support of the operating cost estimate is presented in Appendix C.



The operating cost estimate excludes the following items:

- First fill consumables which form part of the capital cost estimate
- Sustaining capital costs associated with the replacement of depreciated equipment
- Costs associated with maintenance or ongoing construction of the tailings storage facility
- Costs for FEL to feed ROM ore or manage the grizzly and drum scrubber O/S material
- Costs for borefield raw water supply, TSF decant return water
- Recruitment, relocation and HR costs
- Health safety and environmental personnel and costs.

5. PROJECT IMPLEMENTATION

5.1 Project Schedule

A 38 week project schedule from project approval and award of an EPCM contract is estimated to complete the CPC assigned scope of work to the first gold pour. It is assumed that the MSP activities (supply/install/construct drum scrubber circuit, TSF, bore water supply and offices/maintenance/stores facilities, camp and power plant) can be completed within this estimated schedule.

It is also assumed that all statutory approvals from the Department of Mines, Industry Regulation and Safety (DMIRS) as well as the Environmental Protection Authority (EPA) are completed prior to project approval.

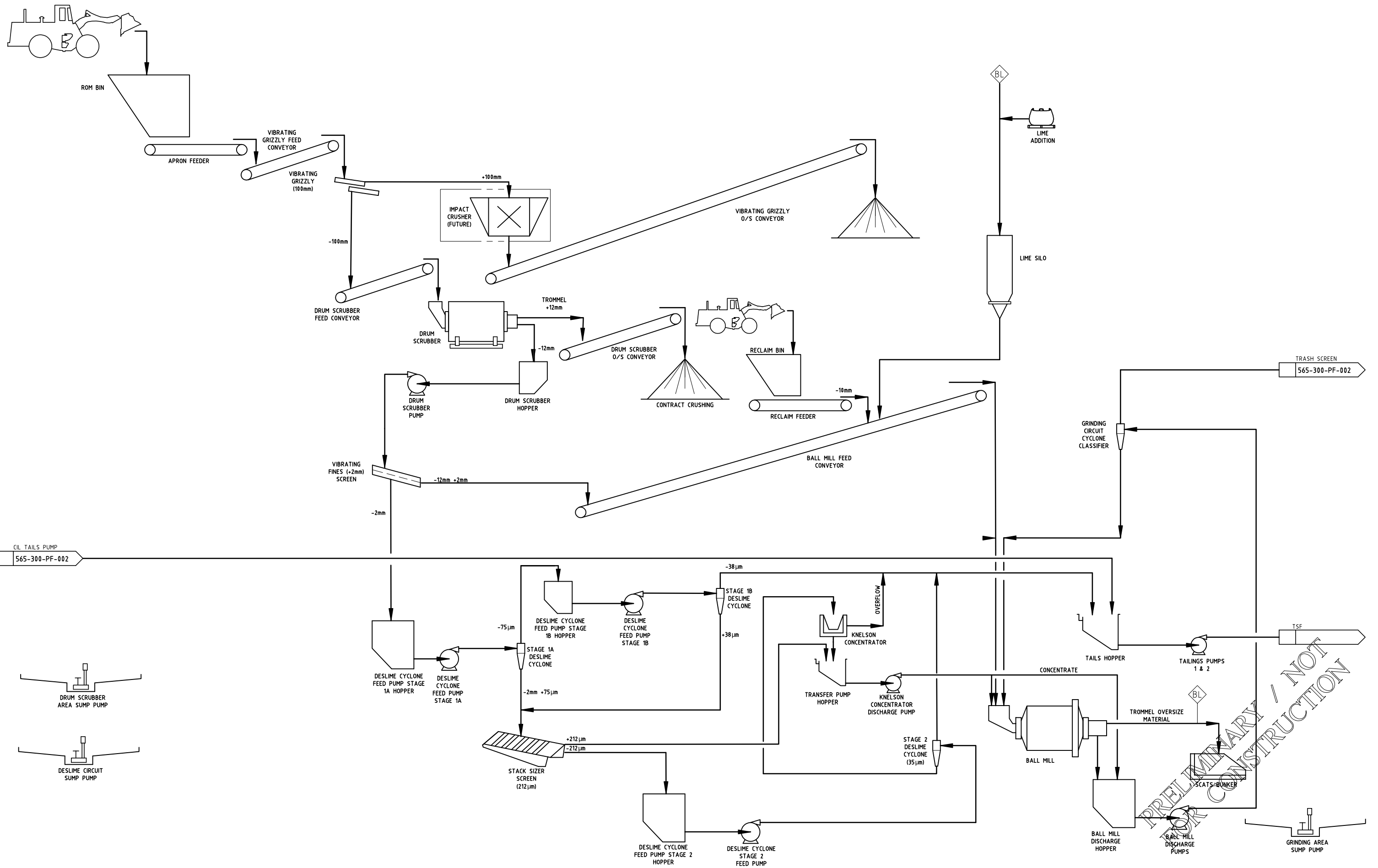
Critical primary activities which were identified as those that determine the overall Project Schedule are as follows:

- A 7 week duration has been assumed to complete the tender, procurement of the long lead items re: Ball mill, Hydrocyclones, Stacksizer and Knelson concentrator
- A delivery duration to
- site of 22 weeks has been assumed for the long lead items
- An estimated total duration of 24 weeks has been estimated for the construction site works
- Site works will start within 8 weeks from project approval
- A commissioning period of 6 weeks has been allowed, from the commencement of ore feed to first gold pour.

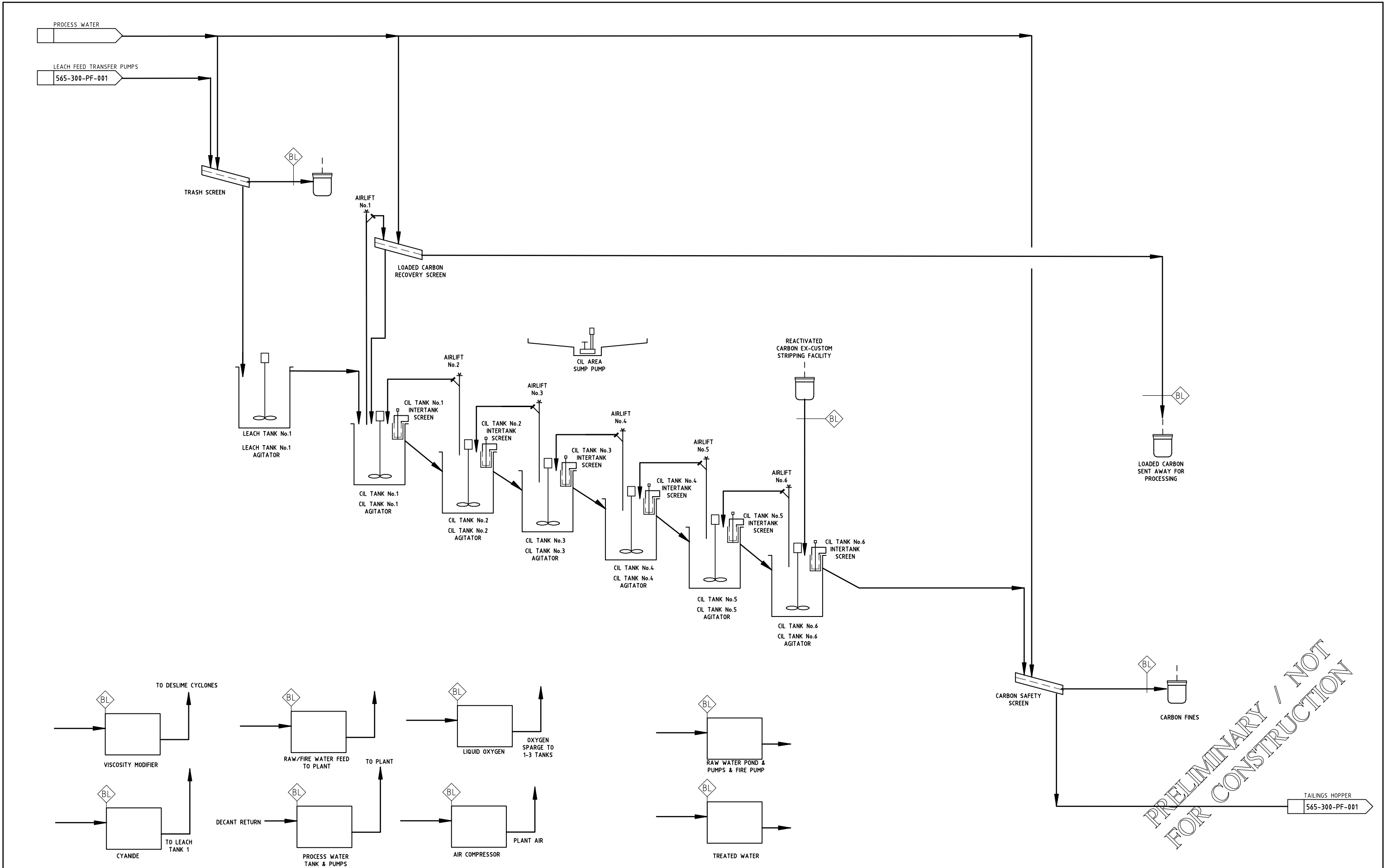
The WWGP project schedule is presented in Appendix D.

APPENDIX A

PROCESS FLOW DIAGRAMS AND DESIGN CRITERIA

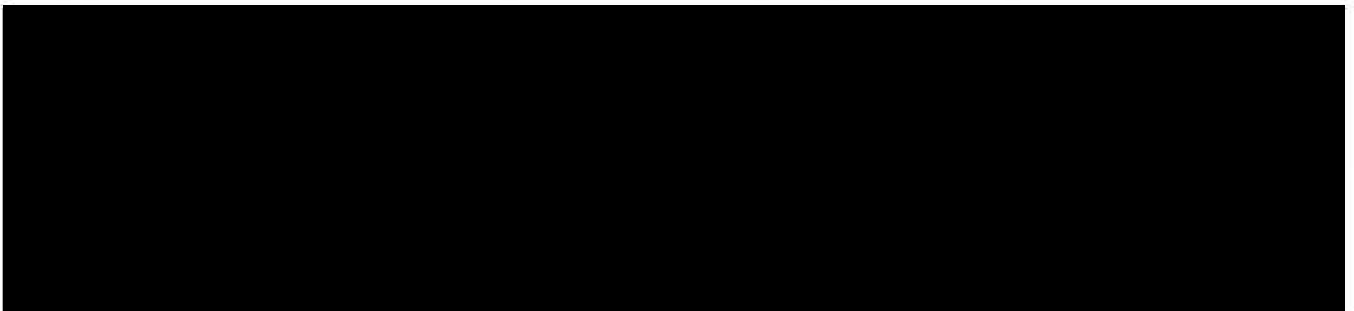


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Client:	MSP ENGINEERING
Project:	WHITE WELL GOLD PROJECT
Document Name:	Process Design Criteria / Mass Balances
Document Code:	56501-DC-R-001



PROCESS DESIGN CRITERIA

Client:	Lake Austin Mining Pty Ltd	By:	John Fodor
Project:	White Well Gold Project	Reviewed:	
Project No:	56501	Revision:	C

The design criteria presented below is based on the following sources:

Reference	Description
A	Testwork reports
B	Data Base / Experience
C	Client reference documents
D	Client Advice
E	Calculated
F	Assumption requiring verification
G	Vendor specification
H	To be determined (To be Supplied)
I	Tender documents
J	Public domain
K	Industry standard

Parameter	Units	Design Value	Design Value	Ref	Source	Notes	Rev
1.0 SITE CHARACTERISTICS							
Location		Cue, Western Australia		C	Client reference documents		A
Altitude	mAMSL	453		J	Public domain	BOM	A
Ambient temperatures							A
Monthly max mean (dry bulb, in shade)	°C (Jan)	37.8		J	Public domain	BOM	A
	°C (July)	18.4		J	Public domain	BOM	A
Monthly min mean (dry bulb, in shade)	°C (Jan)	22.8		J	Public domain	BOM	A
	°C (July)	6.9		J	Public domain	BOM	A
Site wind classification (from AS1170 Part 2)		TBC		H	To be determined (To be Supplied)		A
Seismic acceleration coefficient (a)		TBC		H	To be determined (To be Supplied)		A
Seismic site factor (s)		TBC		H	To be determined (To be Supplied)		A
Mean annual rainfall	mm/y	284.1		J	Public domain	BOM	A
2.0 ORE CHARACTERISTICS							
2.1 Typical Particle Size Distribution (% Retained)							
+31.5mm	%	2.1 - 3.4		A	Testwork reports	Pimple Bulk Ore Composites (BOC) - Mutiny and MPS - 3 off	A
+10.0mm	%	2.3 - 11		A	Testwork reports		A
+3.35mm	%	4.5 - 7.3		A	Testwork reports		A
+0.212mm	%	7.1 - 11.7		A	Testwork reports		A
-0.212mm	%	72.0 - 83.5		A	Testwork reports		A
2.2 Ore Composition							
Kaolin	%	22.6		A	Testwork reports	Mutiny Gold. (2008). <i>White Wells Kaolin</i>	A
Muscovite	%	28.0		A	Testwork reports		A
Quartz	%	47.6		A	Testwork reports		A
Other	%	1.8		A	Testwork reports		A
2.3 Ore Properties							
Kaolin SG	t/m ³	2.60		B	Data Base / Experience		A
Quartz SG	t/m ³	2.60		B	Data Base / Experience		A
Gold SG	t/m ³	19.00		B	Data Base / Experience		A
Oxide ore stockpile grade	g/t Au	1.31		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Oxide ore mined grade	g/t Au	0.65		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Transitional ore grade	g/t Au	0.64		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Average mined ore grade	g/t Au	0.66		E	Calculated		A
Feed solids SG	t/m ³	2.70		F	Assumption requiring verification		A
Ore bulk density	t/m ³	1.30		F	Assumption requiring verification		A
Feed ore moisture content	%	13.00		F	Assumption requiring verification		A
Angle of repose / fill angle	deg	30		F	Assumption requiring verification		A
Angle of surcharge	deg	TBC		F	Assumption requiring verification		A
Bond crushing work index, CWi - Whole of ore	kWh/t	10.00		F	Assumption requiring verification		A
Bond crushing work index, CWi - Quartz only	kWh/t	15.00		F	Assumption requiring verification		A
Bond ball mill work index, BWi - Quartz only	kWh/t	18.00		F	Assumption requiring verification		A
Abrasion index	g	0.30		F	Assumption requiring verification		A
3.0 MINING SCHEDULE							
3.1 Operating Schedule							
Total BCM mined	bcm	7,732,000		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Waste : Ore ratio	-	1.9		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Existing oxide ore stockpile	kt	81		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Tonnes oxide ore mined to ROM	kt	3,784		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Tonnes transitional ore mined to ROM	kt	890		D	Client Advice	Jon Lily via email - Exec Summary Comparison_20170402.xlsx	A
Total ROM ore mined	kt	4,755		E	Calculated		A
Tonnes waste mined	t	9,034		E	Calculated		A
Total tonnes mined	t	13,789		E	Calculated		A
Au ounces mined	oz	100,949		E	Calculated		A

Parameter	Units	Design Value	Design Value	Ref	Source	Notes	Rev
4.0 WASHPLANT OPERATING SCHEDULE							
4.1 Operating Schedule							
Total ore processed	kt	4,755		E	Calculated		A
Processing Rate	dt/h	100		D	Client Advice		A
Plant utilisation and availability	%	93.0		D	Client Advice		A
Operating hours - annual run time	h/y	8,147		E	Calculated	Based on 365d/y & 24h/d	A
Total operating period	months	70		E	Calculated		A
5.0 COARSE ORE CIRCUIT							
5.1 Vibrating Grizzly							
Grizzly feed rate	dt/h	111		E	Calculated		A
Aperture	mm	100		B	Data Base / Experience		A
Mass yield to O/S	%	10.00		F	Assumption requiring verification	LAM to advise	A
Mass yield to U/S	%	90.00		E	Calculated		A
5.2 Crusher							
Crusher type		Impact Crusher/Sizer		B	Data Base / Experience	Trailer mounted hire unit	A
Crusher feed rate	t/h	11.11		E	Calculated		A
5.3 Drum Scrubber with Trommel							
		Max +212 µm	Min -212 µm				
Scrubber							
Scrubber feed rate	dt/h	100	100	E	Calculated		A
Scrubber feed pulp density	m ³ /h	187	187	E	Calculated		A
Scrubber diameter	%(w/w)	40	40	B	Data Base / Experience		A
Scrubber length	m	3.00	3.00	C	Client reference documents	10601-J-RP-003_F Eneabba Equipment Assessment	A
Scrubber live volume	m	4.50	4.50	C	Client reference documents	10601-J-RP-003_F Eneabba Equipment Assessment	A
Scrubber live volume	m ³	7.4	7.4	F	Assumption requiring verification	0000-P-DC-001 White Wells Scrubber Trommel	A
Scrubber residence time	s	142.7	142.7	F	Assumption requiring verification		A
Scrubber residence time	min	2.4	2.4	F	Assumption requiring verification		A
Trommel							
Screen aperture	mm	12mm square	12mm square	C	Client reference documents		A
Mass yield to O/S	%	15	5	A	Testwork reports	Max -12mm from BOC 2 - Mutiny testwork, overall range 5-15% of feed	B
Mass yield to U/S	%	85	95	E	Calculated		B
O/S pulp density	%(w/w)	90	90	B	Data Base / Experience		B
U/S pulp density	%(w/w)	34	36	E	Calculated		B
Trommel spray water requirements	m ³ /h	20	20	F	Assumption requiring verification		A
5.4 Drum Scrubber O/S Stockpile (+12.0mm)							
Production rate	t/h	15	5	E	Calculated		B
Number of stockpiles	#	1	1	B	Data Base / Experience		B
Stockpile retention time	days	2	2	B	Data Base / Experience		B
Stockpile volume	m ³	400	133	E	Calculated		B
Stockpile diameter	m	17	12	E	Calculated		B
Stockpile height	m	5	5	E	Calculated		B
6.0 WET SCREEN & DESLIME CIRCUIT							
6.1 Vibrating Screen @ 2mm aperture							
Feed rate	t/h	85	95	E	Calculated		B
Deck aperture	mm	2.00	2.00	B	Data Base / Experience	Urethane Slot for maximising open area	B
Mass yield to O/S	%	7.00	8.00	A	Testwork reports	Approx. 7% of feed -10mm to +2mm re: BOC sizing data	B
Mass yield to U/S	%	93.00	92.00	E	Calculated		B
O/S pulp density	%(w/w)	85.00	85.00	B	Data Base / Experience		B
Spray water requirement	m ³ /h	10.00	10.00	F	Assumption requiring verification		B
6.2 Deslime Cyclone Cluster 1A - target split @ P80 75 microns							
Cyclone feed rate	t/h	77	87	E	Calculated		B
Cyclone feed pulp density	m ³ /h	196	293	E	Calculated		B
Cyclone feed pulp density	%(w/w)	25	25	A	Testwork reports		B
Cut point	µm	75	75	A	Testwork reports		B
Arrangement		Manifold	Manifold	B	Data Base / Experience		B
Mass yield to O/F	%	80.00	80	A	Testwork reports	MSP BOC - BV Testwork programme	B
Mass yield to U/F	%	20.00	20	A	Testwork reports		B
U/F pulp density	%	65.00	65	A	Testwork reports		B
6.3 Cyclone Cluster 1B - Target split at 38 microns							
Cyclone feed rate	t/h	62	70	E	Calculated		B
Cyclone feed pulp density	m ³ /h	246	304	E	Calculated		B
Cyclone feed pulp density	%(w/w)	20	20	A	Testwork reports		B
Cut point	µm	38	38	B	Data Base / Experience		B
Arrangement		Manifold	Manifold	B	Data Base / Experience		B
Mass yield to O/F	%	90	90	A	Testwork reports	MSP BOC - BV Testwork programme	B
Mass yield to U/F	%	10	10	A	Testwork reports		B
U/F pulp density	%	55	55	A	Testwork reports		B

Parameter	Units	Design Value	Design Value	Ref	Source	Notes	Rev
6.4 StackSizer							
StackSizer feed rate	t/h	22	24	E	Calculated		B
StackSizer feed pulp density	%(w/w)	40.00	40.00	B	Data Base / Experience		B
Deck aperture	µm	240.00	240.00	B	Data Base / Experience		B
Mass yield to O/S	%	36.7	8.2	A	Testwork reports	MSP BOC - BV Testwork programme	B
Mass yield to U/S	%	63.3	91.8	E	Calculated		B
O/S pulp density	%(w/w)	85.00	85.00	B	Data Base / Experience		B
Spray water requirement	m³/h	5.00	5.00	F	Assumption requiring verification		B
6.5 Knelson Concentrator							
Knelson concentrator feed rate	t/h	14	22	E	Calculated		B
Knelson concentrator feed pulp density	%	28	35	E	Calculated		B
Mass yield to concentrate	t/h	1.00	1.00	F	Assumption requiring verification		B
Concentrate pulp density	%(w/w)	30	30	F	Assumption requiring verification		B
Fluidising water rate	m³/h	5	5	F	Assumption requiring verification		B
7.0 GRINDING CIRCUIT							
7.1 Ball Mill							
Ball Mill Configuration		Single stage ball mill with cyclones		E	Calculated		A
Ball Mill Feed rate	tph	30		E	Calculated		A
	tpa	244,400		E	Calculated		A
Mill D/C Density	%(w/w)	75		E	Calculated		A
Ball Mill feed F80	mm	8		B	Data Base / Experience		A
Target Grind Size P80	microns	106		A	Testwork reports		A
Recirculating load	%	300		B	Data Base / Experience		A
7.2 Cyclone Classifier							
Cyclone feed rate	tph	95		E	Calculated		A
Cyclone O/F slurry density	%(w/w)	40		B	Data Base / Experience		A
Cyclone U/F slurry density	%(w/w)	75		B	Data Base / Experience		A
Target Cyclone O/F P80	microns	106		A	Testwork reports		A
8.0 LEACH CIL CIRCUIT							
8.1 Trash Screen							
Feed rate	tph	30		E	Calculated		A
Feed Density	%(w/w)	40		E	Calculated		A
Slurry Flowrate	m3/h	59		E	Calculated		A
Screen aperture	mm	0.80		B	Data Base / Experience		A
8.2 Leach/CIL							
Configuration		1 Leach / 6 CIL		B	Data Base / Experience		A
Retention Design Slurry Flow	m3/h	66		E	Calculated		A
Feed Density	%(w/w)	40		B	Data Base / Experience		A
Discharge Density	%(w/w)	37		B	Data Base / Experience		A
Overall retention time	hrs	12		A	Testwork reports		A
Effective Leach/CIL Volume	m3	799		E	Calculated		A
Au Feed Grade	g/t	2.0		A	Calculated		A
Estimated Au Recovery	%	95		A	Testwork reports		A
Loaded Carbon Grade	g/t	3000		B	Data Base / Experience		A
Barren Carbon Grade	g/t	50		B	Data Base / Experience		A
Carbon Concentration	g/t	15		B	Data Base / Experience		A
Carbon Inventory - Leach/CIL Tanks Only	t	10.1		E	Calculated		A
Loaded Carbon Transfer	hrs	4.0		E	Calculated		A
Loaded Carbon Transfer Slurry Flowrate	m3/h	10		E	Calculated		A
Loaded Carbon Transfer	t/d	0.50		E	Calculated		A
8.3 Carbon Safety Screen							
Feed rate	tph	30		E	Calculated		A
Feed Density	%(w/w)	37		B	Data Base / Experience		A
Slurry Flowrate	m3/h	66		E	Calculated		A
Screen aperture	mm	0.80		B	Data Base / Experience		A
8.4 Loaded Carbon Screen							
Feed rate	m3/h	10		E	Calculated		A
Feed Density	%(w/w)	37		B	Data Base / Experience		A
Slurry Flowrate	m3/h	10		E	Calculated		A
Screen aperture	mm	1.00		B	Data Base / Experience		A
9.0 REAGENTS/CONSUMABLES - STORAGE and DOSAGE							
Grinding Media - 200 L drums	kg/t	0.75		B	Data Base / Experience		A
	tpa	183		E	Calculated		A
Quicklime - 1 t bulka-bags	kg/t	2.00		B	Data Base / Experience		A
	tpa	489		E	Calculated		A
Liquid Oxygen (LOX)	m3/t	0.30		B	Data Base / Experience		
	tpa	105		E	Calculated		
Sodium Cyanide - Solid	kg/t	0.40		B	Data Base / Experience		A
	tpa	98		E	Calculated		
Sodium Cyanide - Liquid at 30% wt/wt	tpa	326		E	Calculated		C
10.0 SERVICES							

MASS BALANCE 30% +212 Microns

STREAM		2	4	6	8	10	12	14	16	18	20	22	24
DESCRIPTION	Units	ROM Feed	Vibrating Grizzly Feed	Vibrating Grizzly O/S (+100mm)	Vibrating Grizzly U/S (-100mm)	Drum Scrubber Feed	Drum Scrubber Trommel O/S (+12.0mm)	Drum Scrubber Trommel U/S (-12.0mm)	Vibrating Screen O/S	Vibrating Screen U/S	Deslime Cyclone 1A Feed	Deslime Cyclone 1A O/F	Deslime Cyclone 1A U/F
SOLIDS	dt/h	111.1	111.1	11.1	100.0	100.0	15.0	85.0	7.8	77.2	77.2	61.8	15.4
PD SOLIDS	w/w	87.0	87.0	87.0	87.0	40.0	90.0	33.6	85.0	31.6	25.0	21.7	65.0
SG SOLIDS	t/m3	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
WATER	t/h	16.6	16.6	1.7	14.9	150.0	1.7	166.3	1.4	166.9	231.6	223.3	8.3
FLOW	Q(m3/hr)	57.7	57.7	5.8	52.0	187.0	7.2	199.8	4.3	195.5	260.2	246.2	14.0
FLOW	l/sec	16.0	16.0	1.6	14.4	51.9	2.0	55.5	1.2	54.3	72.3	68.4	3.9
SLURRY	t/h	127.7	127.7	12.8	114.9	250.0	16.7	253.3	9.1	244.2	308.9	285.1	23.8
SG SLURRY	t/m3	2.2	2.2	2.2	2.2	1.3	2.3	1.3	2.2	1.2	1.2	1.2	1.7

STREAM		26	28	30	32	34	36	38	40	42	44	46	48	50	52
DESCRIPTION	Units	Deslime Cyclone 1B Feed	Cyclone 1B O/F	Cyclone 1B U/F	StackSizer Feed	StackSizer U/S (-212µm)	StackSizer O/S (+212µm)	Knelson Concentrator Feed	Knelson Concentrator Concentrate	Knelson Concentrator Tailings	Ball Mill New Feed	Ball Mill D/C	Cyclone Classifier Feed	Cyclone Classifier O/F	Cyclone Classifier U/F
SOLIDS	t/h	61.8	55.6	6.2	21.6	13.7	7.9	13.7	1.0	12.7	31.7	95.1	95.1	31.7	63.4
PD SOLIDS	w/w	20.0	18.7	55.0	40.0	27.5	85.0	27.5	30.0	23.6	75.0	75.0	58	40.0	75.0
SG SOLIDS	t/m3	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
WATER	t/h	247.1	242.0	5.1	32.4	36.0	1.4	36.0	2.3	41.0	10.6	31.7	68.7	47.6	21.1
FLOW	Q(m3/hr)	270.0	262.6	7.3	40.4	41.1	4.3	41.1	2.7	45.7	22.3	66.9	103.9	59.3	44.6
FLOW	l/sec	75.0	73.0	2.0	11.2	11.4	1.2	11.4	0.8	12.7	6.2	18.6	28.9	16.5	12.4
SLURRY	t/h	308.9	297.6	11.2	54.1	49.7	9.3	49.7	3.3	53.7	42.3	126.8	163.8	79.3	84.6
SG SLURRY	t/m3	1.1	1.1	1.5	1.3	1.2	2.2	1.2	1.2	1.2	1.9	1.9	1.6	1.3	1.9

STREAM		54	56	58	60	62	64	66	68	70	72	74	76	78	80
DESCRIPTION	Units	Trash Screen Feed	Carbon Safety Screen Feed	Tailings to TSF											
SOLIDS	t/h	31.7	31.7	100.0											
PD SOLIDS	w/w	40.0	37.0	20.5											
SG SOLIDS	t/m3	2.7	2.7	2.7											
WATER	t/h	47.6	54.0	337.1											
FLOW	Q(m3/hr)	59.3	65.7	374.1											
FLOW	l/sec	16.5	18.3	103.9											
SLURRY	t/h	79.3	85.7	487.7											
SG SLURRY	t/m3	1.3	1.3	1.3											

PROCESS WATER

STREAM		300	314	316	317	320	321	321	322	326	328	330
DESCRIPTION	Units	Process Water Requirement	Drum Scrubber Feed Dilution Water	Drum Scrubber Trommel Spray Water	Drum Scrubber Trommel U/S Hopper Makeup Water	Deslime Cyclone 1A Feed Water	Deslime Cyclone 1B Feed Water	StackSizer Feed Dilution Water	StackSizer Spray Water	Knelson Concentrator Fluidising Water	Ball Mill Feed Water	Cyclone Classifier Feed Dilution Water
SOLIDS	t/h											
PD SOLIDS	w/w											
SG SOLIDS	t/m3											
WATER	t/h	315	135	20	0	65	24	19	5	5	5	37
FLOW	Q(m3/hr)	315	135	20	0	65	24	19	5	5	5	37
FLOW	l/sec	88	38	6	0	18	7	5	1	1	2	10

MASS BALANCE 15% +212 microns

STREAM		2	4	6	8	10	12	14	16	18	20	22	24
DESCRIPTION	Units	ROM Feed	Vibrating Grizzly Feed	Vibrating Grizzly O/S (+100mm)	Vibrating Grizzly U/S (-100mm)	Drum Scrubber Feed	Drum Scrubber Trommel O/S (+12.0mm)	Drum Scrubber Trommel U/S (-12.0mm)	Vibrating Screen O/S	Vibrating Screen U/S	Deslime Cyclone 1A Feed	Deslime Cyclone 1A O/F	Deslime Cyclone 1A U/F
SOLIDS	dt/h	111.1	111.1	11.1	100.0	100.0	5.0	95.0	8.0	87.0	87.0	69.6	17.4
PD SOLIDS	w/w	87.0	87.0	87.0	40.0	40.0	90.0	35.9	90.0	34.0	25.0	21.7	65.0
SG SOLIDS	t/m3	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
WATER	t/h	16.6	16.6	1.7	14.9	150.0	0.6	169.4	0.9	168.5	261.0	251.6	9.4
FLOW	Q(m3/hr)	57.7	57.7	5.8	52.0	187.0	2.4	204.6	3.9	200.8	293.2	277.4	15.8
FLOW	l/sec	16.0	16.0	1.6	14.4	51.9	0.7	56.8	1.1	55.8	81.4	77.1	4.4
SLURRY	t/h	127.7	127.7	12.8	114.9	250.0	5.6	264.4	8.9	255.5	348.0	321.2	26.8
SG SLURRY	t/m3	2.2	2.2	2.2	2.2	1.3	2.3	1.3	2.3	1.3	1.2	1.2	1.7

STREAM		26	28	30	32	34	36	38	40	42	44	46	48	50	52
DESCRIPTION	Units	Deslime Cyclone 1B Feed	Cyclone 1B O/F	Cyclone 1B U/F	StackSizer Feed	StackSizer U/S (-212µm)	StackSizer O/S (+212µm)	Knelson Concentrator Feed	Knelson Concentrator Concentrate	Knelson Concentrator Tailings	Ball Mill New Feed	Ball Mill D/C	Cyclone Classifier Feed	Cyclone Classifier O/F	Cyclone Classifier U/F
SOLIDS	t/h	69.6	62.6	7.0	24.4	22.4	2.0	22.4	1.0	21.4	16.0	48.0	48.0	16.0	32.0
PD SOLIDS	w/w	20.0	18.7	55.0	40.0	35.2	85.0	35.2	30.0	31.6	75.0	75.0	58	40.0	75.0
SG SOLIDS	t/m3	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
WATER	t/h	278.4	272.7	5.7	36.5	41.2	0.4	41.2	2.3	46.2	5.3	16.0	34.7	24.0	10.7
FLOW	Q(m3/hr)	304.1	295.9	8.3	45.6	49.5	1.1	49.5	2.7	54.1	11.3	33.8	52.4	29.9	22.5
FLOW	l/sec	84.5	82.2	2.3	12.7	13.7	0.3	13.7	0.8	15.0	3.1	9.4	14.6	8.3	6.3
SLURRY	t/h	348.0	335.3	12.7	60.9	63.5	2.3	63.5	3.3	67.5	21.3	64.0	82.6	40.0	42.7
SG SLURRY	t/m3	1.1	1.1	1.5	1.3	1.3	2.2	1.3	1.2	1.2	1.9	1.9	1.6	1.3	1.9

STREAM		54	56	58	60	62	64	66	68	70	72	74	76	78	80
DESCRIPTION	Units	Trash Screen Feed	Carbon Safety Screen Feed	Tailings to TSF											
SOLIDS	t/h	16.0	16.0	100.0											
PD SOLIDS	w/w	40.0	37.0	20.0											
SG SOLIDS	t/m3	2.7	2.7	2.7											
WATER	t/h	24.0	27.2	346.1											
FLOW	Q(m3/hr)	29.9	33.2	383.1											
FLOW	l/sec	8.3	9.2	106.4											
SLURRY	t/h	40.0	43.2	499.5											
SG SLURRY	t/m3	1.3	1.3	1.3											

PROCESS WATER

STREAM		300	314	316	317	320	321	322	326	328	330	331
DESCRIPTION	Units	Process Water Requirement	Drum Scrubber Feed Dilution Water	Drum Scrubber Trommel Spray Water	Drum Scrubber Trommel U/S Hopper Makeup Water	Deslime Cyclone 1A Feed Water	Deslime Cyclone 1B Feed Water	StackSizer Feed Dilution Water	StackSizer Spray Water	Knelson Concentrator Fluidising Water	Ball Mill Feed Water	Cyclone Classifier Feed Dilution Water
SOLIDS	t/h											
PD SOLIDS	w/w											
SG SOLIDS	t/m3											
WATER	t/h	326	135	20	0	92	27	5	5	21	19	2
FLOW	Q(m3/hr)	326	135	20	0	92	27	5	5	21	19	2
FLOW	l/sec	91	38	6	0	26	7	1	1	6	5	0

APPENDIX B



Client: MSP Engineering

Project: White Well Gold Project

Document Name: Mechanical Equipment List

Document Code: 0565-LS-M-001



Certified kW	-
Total kW	1,994
% of kW Certified (including futures)	
Total number of drives that are certified (including futures): 0%	

MSP Engineering
White Well Gold Project
Mechanical Equipment List
0565-LS-M-001
Revision E

EQUIP NUMBER			EQUIPMENT NUMBER	OTHER EQUIPMENT NUMBER	TITLE	PACKAGE NUMBER	SUPPLIER	MODEL	SPECIFICATION	ELECTRICAL						REMARKS	REV
AREA	EQUIPMENT IDENTIFIER	SEQUENTIAL NUMBER								DUTY / STANDBY / INTERMITTENT	DRIVE TYPE	POWER STATUS	MOTOR COUNT	INSTALLED KW TOTAL	EMERGENCY POWER		
310			310		BENEFICIATION CIRCUIT												
310	BN	101	310-BN-101		ROM Bin	MSP	LAM	2nd hand	Vol. = 50 m3, drive over feed bin								
310	FD	101	310-FD-101		Apron Feeder	MSP	LAM	2nd hand	Motorac motor: 22kW, 1470rpm, D180L Feeder width: 1500mm. Gearbox: bonfiglioli P180	Duty	VVVF	Prelim	1	22			
310	CR	101	310-CR-101		Impact Crusher	MSP	TBC		Future Installation								
310	CH	101	310-CH-101		Apron Feeder Transfer Chute	MSP	LAM	2nd hand	C/S Rubber lined								
310	GR	101	310-GR-101		Vibrating Grizzly	MSP	LAM	2nd hand	Motorac motor: 55kW, 1450rpm, D250S				1	55		Iluka ref: MU05-S01-025	A
310	CH	102	310-CH-102		Vibrating Grizzly Feed Conveyor Head Chute	MSP	LAM	2nd hand	C/S Rubber lined								
310	CH	103	310-CH-103		Vibrating Grizzly Feed Chute	MSP	LAM	2nd hand	C/S Rubber lined								
310	CH	104	310-CH-104		Vibrating Grizzly O/S Chute	MSP	LAM	MSP Design	C/S Rubber lined								
310	CH	105	310-CH-105		Vibrating Grizzly U/S Chute	MSP	LAM	2nd hand	C/S Rubber lined								
310	CH	106	310-CH-106		Vibrating Grizzly O/S Conveyor Head Chute	MSP	LAM	MSP Design	C/S Rubber lined								
310	CH	107	310-CH-107		Scrubber Conveyor Head Chute	MSP	LAM	MSP Design	Carbon steel, partially lined 400BHN wear plate								
310	CV	101	310-CV-101		Vibrating Grizzly Feed Conveyor	MSP	LAM	2nd hand	Motorac motor: 55kW, 1450rpm, D250S Gearbox: fenner M20 20:1 Conveyor belt: 60000 X 1500mm wide	Duty	DOL	Prelim	1	55			
310	CV	102	310-CV-102		Vibrating Grizzly O/S Conveyor	MSP	LAM	2nd hand	Gec Motor, Ac: 7.5kw, 1450rpm, 4p, D132m, Foot Gearbox: Renold 8/0 50:1 Conveyor belt: 28000 X 1400mm Wide					7.5			
310	SC	101	310-SC-101		Scrubber	MSP	LAM	2nd hand	Motorac motor: 315kW, 960rpm, Foot Mount Gearbox: Hansen D821ct 16:21:1 Diameter: 3037mm					315		Iluka ref: MU05-S01-031	A
310	CV	103	310-CV-103		Drum Scrubber Feed Conveyor	MSP	LAM	2nd hand	Pope Motor, Ac: 45kW, 1460rpm, 4p, D225m, Foot Gearbox: Reynold Smh8 13:1 Conveyor belt: 55500 X 1000mm Wide					45			
310	CV	104	310-CV-104		Drum Scrubber O/S Conveyor	MSP	LAM	2nd hand	Gec motor: 22kw, 1450rpm, Foot, **Replaced** Gearbox: Benzier Tv122 19.44:1 Conveyor belt: 34000 X 1200mm Wide					22			
310	CH	108	310-CH-108		Drum Scrubber Feed Chute	MSP	LAM	2nd hand	C/S Rubber lined								
310	CH	109	310-CH-109		Drum Scrubber O/S Chute	MSP	LAM	MSP Design	C/S Rubber lined								
310	CH	110	310-CH-110		Drum Scrubber O/S Conveyor Head Chute	MSP	LAM	2nd hand	C/S Rubber lined								
310	HP	101	310-HP-101		Drum Scrubber Discharge Hopper	MSP	LAM	2nd hand	C/S Rubber lined								
310	PP	101	310-PP-101		Drum Scrubber Discharge Pump		Keto Pumps	100 K-VS	365mm SVC U38 Impeller	Duty	DOL	Prelim	1	15			
310	PP	102	310-PP-102		Drum Scrubber Area Sump Pump		Keto Pumps	65 K-VS	Vertical spindle sump pump	Intermittent	DOL	Prelim	1	5.5			
310	XM	101	310-XM-101		Drum Scrubber Area Sump Pump Frame												
320			320		GRINDING AND DESLIME CIRCUIT												
320	BX	201	320-BX-201		Vibrating Fines Screen Feed Box				Carbon Steel rubber lined								
320	SC	201	320-SC-201		Vibrating Fines (+2mm) Screen		Minspec (Oreflow)	MIN-HS 1500/3600	Vibrating Screen	Duty	VVVF	Prelim	2	2.2			
320	CH	201	320-CH-201		Vibrating Fines Screen U/S Chute				Carbon Steel rubber lined								
320	CH	208	320-CH-208		Vibrating Fines Screen O/S Chute				Carbon steel, partially lined 400BHN wear plate								
320	HP	201	320-HP-201		Deslime Cyclone Feed Pump Stage 1A Hopper			2m3 LV	Carbon steel, rubber lined, 1.475m dia x 2.2m H, 950kg mass								
320	PP	201	320-PP-201		Deslime Cyclone Feed Pump Stage 1A		Keto Pumps	100 K-VS	C/S Rubber lined. Centrifugal horizontal slurry pump	Duty	VVVF	Prelim	1	55			
320	CY	201	320-CY-201		Deslime Cyclones Stage 1A		Weir	400CVX10	4 x 400mm CAVEX cyclones, 3 operating, 1 spare								
320	HP	202	320-HP-202		Deslime Cyclone Feed Pump Stage 1B Hopper			2m3 LV	Carbon steel, rubber lined, 1.475m dia x 2.2m H, 950kg mass								
320	PP	202	320-PP-202		Deslime Cyclone Feed Pump Stage 1B		Keto Pumps	100 K-VS	C/S Rubber lined. Centrifugal horizontal slurry pump	Duty	VVVF	Prelim	1	55			
320	CY	202	320-CY-202		Deslime Cyclones Stage 1B		Weir	250CVX10	6x 250mm CAVEX cyclones, 4 operating, 2spare								
320	SC	202	320-SC-202		Stacksizer Screen		Landsky		Landsky Screen - 5 Deck, c/w O/S cute, U/S chute and 5-way feed distributor	Duty	DOL	Prelim	2	2		Includes feed and discharge boxes	
320	HP	203	320-HP-203		Deslime Cyclone Feed Pump Stage 2 Hopper			2m3 LV	Carbon steel, rubber lined, 1.475m dia x 2.2m H, 950kg mass								
320	PP	203	320-PP-203		Deslime Cyclone Feed Pump Stage 2		Keto Pumps	100 K-VS	C/S Rubber lined. Centrifugal horizontal slurry pump	Duty	VVVF	Prelim	1	30			
320	CY	203	320-CY-203		Deslime Cyclones Stage 2		Weir	250CVX10	2x 250mm CAVEX cyclones, 1 operating, 1spare								
320	BX	202	320-BX-202		Knelson Concentrator Bypass Box				Carbon Steel rubber lined								
320	GC	201	320-GC-201		Knelson Concentrator		Consep	KC-CVD20	Knelson Concentrator	Duty	VVVF	Prelim	1	11			
320	HP	206	320-HP-206		Knelson Concentrator Discharge Hopper			2m3 LV	Carbon steel, rubber lined, 1.475m dia x 2.2m H, 950kg mass								
320	PP	205	320-PP-205		Knelson Concentrator Discharge Pump		Keto Pumps	1.5/1	Centrifugal horizontal slurry pump	Duty	DOL	Prelim	1	5			
320	BN	201	320-BN-201		Reclaim Bin				Carbon steel, partially lined 400BHN wear plate, 20m3 (30t ore)								
320	CH	202	320-CH-202		Reclaim Bin Feeder Feed Chute				Carbon steel, partially lined 400BHN wear plate								
320	CH	203	320-CH-203		Reclaim Bin Feeder Discharge Chute				Carbon steel, partially lined 400BHN wear plate								

EQUIP NUMBER			EQUIPMENT NUMBER	OTHER EQUIPMENT NUMBER	TITLE	PACKAGE NUMBER	SUPPLIER	MODEL	SPECIFICATION	ELECTRICAL						REMARKS	REV
AREA	EQUIPMENT IDENTIFIER	SEQUENTIAL NUMBER								DUTY / STANDBY / INTERMITTENT	DRIVE TYPE	POWER STATUS	MOTOR COUNT	INSTALLED KW TOTAL	EMERGENCY POWER		
320	CH	204	320-CH-204		Ball Mill Feed Conveyor Head Chute				Carbon steel, partially lined 400BHN wear plate								
320	CH	205	320-CH-205		Ball Mill Feed Chute				Retractable feed chute							Included with ball mill supply	
320	CH	206	320-CH-206		Ball Mill Scats Chute				Carbon steel								
320	CH	207	320-CH-207		Ball Mill Discharge Chute				Carbon steel, rubber lined								
320	CV	201	320-CV-201		Ball Mill Feed Conveyor				600m wide, 30t/h	Duty	DOL	Prelim	1	7.5			
320	CY	204	320-CY-204		Grinding Circuit Cyclone Cluster		Weir	250CVX10	5x 250mm CAVEX cyclones, 3 operating, 2 spare								
320	FE	201	320-FE-201		Reclaim Bin Feeder				Pan Feeder	Duty	VVVF	Prelim	2	4.5			
320	ML	201	320-ML-201		Ball Mill		Ersel		3.2m dia x 5.8m EGL	Duty	SOFT	Prelim	1	800		Includes PLC and control cabinet	
320	HP	205	320-HP-205		Ball Mill Discharge Pump Hopper			2m3 LV	Carbon steel, rubber lined, 1.475m dia x 2.2m H, 950kg mass								
320	PP	206	320-PP-206		Ball Mill Discharge Pump No.1		Keto Pumps	100 K-VS	Centrifugal horizontal slurry pump	Duty	VVVF	Prelim	1	37			
320	PP	207	320-PP-207		Ball Mill Discharge Pump No.2		Keto Pumps	100 K-VS	Centrifugal horizontal slurry pump	Standby	VVVF	Prelim	1	37			
320	PP	208	320-PP-208		Grinding Circuit Sump Pump		Keto Pumps	65 K-VS	Vertical spindle sump pump	Intermittent	DOL	Prelim	1	5.5			
320	XM	201	320-XM-201		Grinding Circuit Sump Pump Frame												
320	PP	209	320-PP-209		Deslime Circuit Sump Pump		Keto Pumps	65 K-VS	Vertical spindle sump pump	Intermittent	DOL	Prelim	1	5.5			
320	XM	202	320-XM-202		Deslime Circuit Sump Pump Frame												
320	SS	201	320-SS-201		Mill Area Safety Shower 1		Ashley	ASE 680	Combination safety shower & eyewash, c/w light and anti scald valve								
320	SS	202	320-SS-202		Mill Area Safety Shower 2		Ashley	ASE 680	Combination safety shower & eyewash, c/w light and anti scald valve								
320	SS	203	320-SS-203		Deslime Area Safety Shower		Ashley	ASE 680	Combination safety shower & eyewash, c/w light and anti scald valve								
340			340		LEACH & CIL												
340	AG	401	340-AG-401		Leach Tank No.1 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AG	402	340-AG-402		CIL Tank No.1 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AG	403	340-AG-403		CIL Tank No.2 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AG	404	340-AG-404		CIL Tank No.3 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AG	405	340-AG-405		CIL Tank No.4 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AG	406	340-AG-406		CIL Tank No.5 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AG	407	340-AG-407		CIL Tank No.6 Agitator		Mixtec	1147		Duty	DOL	Prelim	1	15			
340	AL	401	340-AL-401		Airlift No.1		CPC		DN25 pipe with DN15 air inlet							Loaded carbon recovery airlift	
340	AL	402	340-AL-402		Airlift No.2		CPC		DN25 pipe with DN15 air inlet								
340	AL	403	340-AL-403		Airlift No.3		CPC		DN25 pipe with DN15 air inlet								
340	AL	404	340-AL-404		Airlift No.4		CPC		DN25 pipe with DN15 air inlet								
340	AL	405	340-AL-405		Airlift No.5		CPC		DN25 pipe with DN15 air inlet								
340	AL	406	340-AL-406		Airlift No.6		CPC		DN25 pipe with DN15 air inlet								
340	HP	401	340-HP-401		Tailing Hopper			2m3 LV	Carbon steel, rubber lined, 1.475m dia x 2.2m H, 950kg mass								
340	PP	401	340-PP-401		Tailing Pump No.1		Keto Pumps	100 K-VS	Centrifugal horizontal slurry pump	Duty	VVVF	Prelim	1	30			
340	PP	402	340-PP-402		Tailing Pump No.2		Keto Pumps	100 K-VS	Centrifugal horizontal slurry pump	Standby	VVVF	Prelim	1	30			
340	PP	403	340-PP-403		CIL Area Sump Pump No. 1		Keto Pumps	65 K-VS	Vertical spindle sump pump	Intermittent	DOL	Prelim	1	5.5			
340	XM	401	340-XM-401		CIL Area Sump No. 1 Pump Frame												
340	PP	404	340-PP-404		CIL Area Sump Pump No. 2		Keto Pumps	65 K-VS	Vertical spindle sump pump	Intermittent	DOL	Prelim	1	5.5			
340	XM	402	340-XM-402		CIL Area Sump No. 2 Pump Frame												
340	SC	401	340-SC-401		Trash Screen		Sepro Australia	HB38	Single deck screen, 0.9m x 2.4m, c/w feed box, OS chute, US chute	Duty	DOL	Prelim	2	5		2-off 2.5kW vibratory motors	
340	SC	402	340-SC-402		Loaded Carbon Recovery Screen		Sepro Australia	HB38	Single deck screen, 0.9m x 2.4m, c/w feed box, OS chute, US chute	Duty	DOL	Prelim	2	5		2-off 2.5kW vibratory motors	
340	SC	403	340-SC-403		Carbon Safety Screen		Sepro Australia	HB38	Single deck screen, 0.9m x 2.4m, c/w feed box, OS chute, US chute	Duty	DOL	Prelim	2	5		2-off 2.5kW vibratory motors	
340	SC	405	340-SC-405		CIL Tank No.1 Interstage Screen		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture	Duty	DOL	Prelim	1	3			
340	SC	406	340-SC-406		CIL Tank No.2 Interstage Screen		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture	Duty	DOL	Prelim	1	3			
340	SC	407	340-SC-407		CIL Tank No.3 Interstage Screen		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture	Duty	DOL	Prelim	1	3			
340	SC	408	340-SC-408		CIL Tank No.4 Interstage Screen		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture	Duty	DOL	Prelim	1	3			
340	SC	409	340-SC-409		CIL Tank No.5 Interstage Screen		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture	Duty	DOL	Prelim	1	3			
340	SC	410	340-SC-410		CIL Tank No.6 Interstage Screen		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture	Duty	DOL	Prelim	1	3			
340	SC	411	340-SC-411		Interstage Screen - Spare		Kemix	MPS 100 (P)	Pumping style screen, 316s/s wedge wire, 1m ² screen area, 0.8mm aperture								
340	SS	401	340-SS-401		Leach Area Safety Shower		Ashley	ASE 680	Combination safety shower & eyewash, c/w light and anti scald valve								

EQUIP NUMBER			EQUIPMENT NUMBER	OTHER EQUIPMENT NUMBER	TITLE	PACKAGE NUMBER	SUPPLIER	MODEL	SPECIFICATION	ELECTRICAL						REMARKS	REV
AREA	EQUIPMENT IDENTIFIER	SEQUENTIAL NUMBER								DUTY / STANDBY / INTERMITTENT	DRIVE TYPE	POWER STATUS	MOTOR COUNT	INSTALLED kW TOTAL	EMERGENCY POWER		
340	SS	402	340-SS-402		CIL Area Safety Shower		Ashley	ASE 680	Combination safety shower & eyewash, c/w light and anti scald valve								
340	TK	401	340-TK-401		Leach Tank No.1		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
340	TK	402	340-TK-402		CIL Tank No.1		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
340	TK	403	340-TK-403		CIL Tank No.2		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
340	TK	404	340-TK-404		CIL Tank No.3		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
340	TK	405	340-TK-405		CIL Tank No.4		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
340	TK	406	340-TK-406		CIL Tank No.5		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
340	TK	407	340-TK-407		CIL Tank No.6		Fremantle Steel		5.2m dia x 5.8m H, 113m ³							Approx. 7.8t total mass	
350			350		CARBON HANDLING												
350	XM	501	350-XM-501		Loaded Carbon Frame for Bulka Bag												
370			370		REAGENTS												
370	PP	701	370-PP-701		Cyanide Dosing Pump 1		Dynapumps		Positive displacement dosing pump	Duty	DOL	Prelim	1	0.75		Mechanical variator for speed control	
370	PP	702	370-PP-702		Cyanide Dosing Pump 2		Dynapumps		Positive displacement dosing pump	Duty	DOL	Prelim	1	0.75		Mechanical variator for speed control	
370	PP	703	370-PP-703		Cyanide Dosing Pump 3		Dynapumps		Positive displacement dosing pump	Duty	DOL	Prelim	1	0.75		Mechanical variator for speed control	
370	AT	701	370-AT-701		Lime Bin Activator				Quicklime	Duty	DOL	Prelim	1	0.75			
370	BN	701	370-BN-701		Lime Bin				1000 kg quicklime storage								
370	FE	701	370-FE-701		Lime Rotary Valve				30 kg/h	Duty	VVVF	Prelim	1	0.3			
370	XM	701	370-XM-701		NaCN bulki container holding frame												
380			380		SERVICES												
380	AR	801	380-AR-801		Air Receiver		Atlas Copco	VAR 1000	1000L air receiver								
380	CP	801	380-CP-801		Plant Air Compressor 1		Atlas Copco	GA 30P-8.5	300 m3/h FAD @ 850kPag	Duty	FDR	Prelim	1	30			
380	CP	802	380-CP-802		Plant Air Compressor 2		Atlas Copco	GA 30P-8.5	300 m3/h FAD @ 850kPag	Standby	FDR	Prelim	1	30			
380	DR	801	380-DR-801		Plant Air Compressor 1 Dryer		Atlas Copco	CD 90	Dessicant dryer								
380	DR	802	380-DR-802		Plant Air Compressor 2 Dryer		Atlas Copco	CD 90	Dessicant dryer								
380	PP	801	380-PP-801		Process Water Pump 1		Pentair - Southern Cross		88 LPS @ 40m TDH	Duty	DOL	Prelim	1	55			
380	PP	802	380-PP-802		Process Water Pump 2		Pentair - Southern Cross		88 LPS @ 40m TDH	Standby	DOL	Prelim	1	55			
380	PP	803	380-PP-803		Raw Water Pump 1		Dynapumps			Duty	DOL	Prelim	1	4		Included in fire water skid	
380	PP	804	380-PP-804		Raw Water Pump 2		Dynapumps			Standby	DOL	Prelim	1	4		Included in fire water skid	
380	PP	805	380-PP-805		Fire Water Skid		Dynapumps		Includes duty/standby electric pumps plus diesel pump							Supplying water for pump glands & fire water low demand. Skid mounted	
380	PP	806	380-PP-806		Treated Water Pump 1		Dynapumps		Centrifugal diesel pump	Standby	DOL	Prelim	1			Supplying water for safety showers. Skid mounted	
380	PP	807	380-PP-807		Treated Water Pump 2		Dynapumps		Centrifugal electric pump	Duty	DOL	Prelim	1	4		Supplying water for safety showers. Skid mounted	
380	TK	801	380-TK-801		Process Water Tank		Pioneer Water Tanks	640 kL	24 hr, 12.7m dia x 5.31m H, 673kL total								
380	TK	803	380-TK-803		Treated Water Tank			9000 L	9000L MDPE tank								

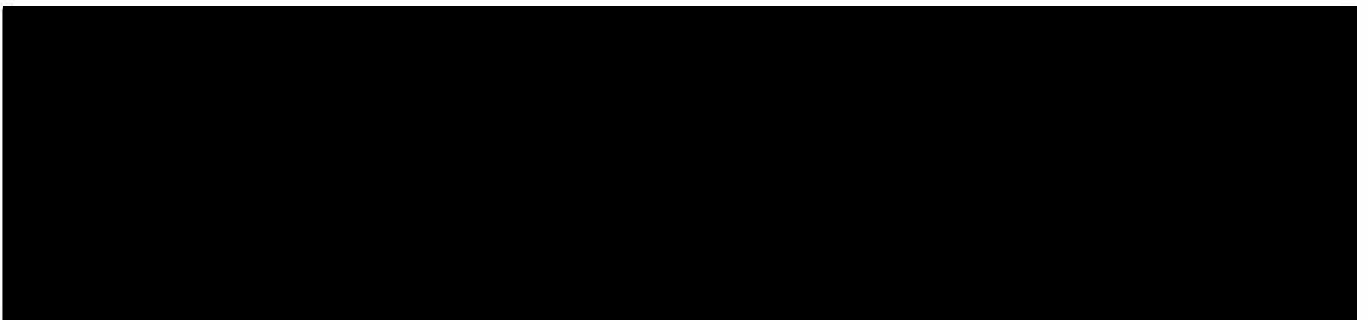


DOCUMENT STATUS

Document Title: WHITE WELL GOLD PROJECT

Document Type: [REDACTED]

Document Code: 56501-EC-G-001_C



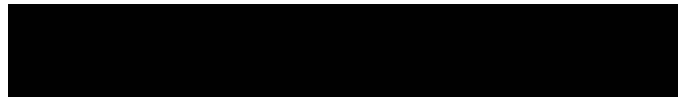
Page 2 of 2

302	Direct	Mechanical Equipment	Q.S.B.O. Services	M.A. Process Equipment	Services	0385	75	000	380.75.000	Process Water Tank	9000 L	9000L M201 tank	1	EACH	\$1,000	\$1,000	24	0	24	000	\$2,400	0%	\$240	0%	\$0	\$4,400		
303		Mechanical Equipment Sub Total															\$10,174				80		\$2,400	0%	\$240	0%	\$0	\$9,934
304																												
305																												
306																												
307																												
308	Direct	Earthworks	S.O.S.O - Earthworks		Earthworks	5000		5000		Earthworks			1	EACH	\$333,333.33	\$333,333										\$333,333		
309	Direct	Electrical	S.O.S.O - Electrical		Electrical	5000		5000		Electrical			1	EACH	\$2,200,000.00	\$2,200,000										\$2,200,000		
310	Direct	Piping	S.O.S.O - Piping		Piping	5000		5000		Piping			1	EACH	\$995,000.00	\$995,000										\$995,000		
311																												
312																												
313																												
314																												
315																												
316	No Costs																											
317	Indirect	Trawl & Accommodation			Flights	9000		9000		Flights			160	EACH	\$500	\$80,000										\$80,000		
318	Indirect	Trawl & Accommodation			Accommodation & Messing	9000		9000		Accommodation & Messing			3400	EACH	\$70	\$238,000										\$238,000		
319	Indirect	Commissioning			Vendor Representation	9000		9000		Vendor Representation			14	EACH	\$1,000	\$14,000										\$14,000		
320	Indirect	Commissioning			Commissioning	9000		9000		Commissioning			1	EACH	\$0	\$0										\$0		
321	Indirect	Post Commissioning Indirects			Post Commissioning Indirects	9000		9000		Post Commissioning Indirects			1	EACH	\$0	\$0										\$0		
322	Indirect	Modification & Demobilisation			Contractor Mobilisation & Demobilisation	9000		9000		Contractor Mobilisation & Demobilisation			1	EACH	\$0	\$0										\$0		
323	Indirect	Modification & Demobilisation			Contractor Mobilisation & Demobilisation	9000		9000		Contractor Mobilisation & Demobilisation			1	EACH	\$0	\$0										\$0		
324	Indirect	Modification & Demobilisation			Contractor Mobilisation & Demobilisation	9000		9000		Contractor Mobilisation & Demobilisation			1	EACH	\$0	\$0										\$0		
325	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			100	crane	\$100	\$10,000										\$10,000		
326	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			1176	crane	\$100	\$117,600										\$117,600		
327	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			36	crane	\$5,000	\$180,000										\$180,000		
328	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			144	crane	\$100	\$14,400										\$14,400		
329	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			30	crane	\$1,000	\$30,000										\$30,000		
330	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			30	crane	\$1,000	\$30,000										\$30,000		
331	Indirect	Heavy LIFT Construction Equipment			Heavy LIFT Construction Equipment	9000		9000		Heavy LIFT Construction Equipment			180	crane	\$100	\$18,000										\$18,000		
332	Indirect	Concrete Batch Plant			Contractor Mobilisation & Demobilisation	9000		9000		Contractor Mobilisation & Demobilisation			1	EACH	\$70,000	\$70,000										\$70,000		
333	Indirect	Concrete Batch Plant			Concrete Training and Test Mile Allowance	9000		9000		Concrete Batch Plant Training and Test Mile Allowance			1	EACH	\$15,000	\$15,000										\$15,000		
334	Indirect	Concrete Batch Plant			Batch Plant and Aggrator Truck Hire	9000		9000		Concrete Batch Plant and Aggrator Truck Hire			10	EACH	\$20,000	\$20,000										\$20,000		
335	Indirect	Soilfield			Soilfield	9000		9000		Soilfield			1	EACH	\$10,000	\$10,000										\$10,000		
336	No Costs	Survey & Geotechnical			Survey & Geotechnical	9000		9000		Survey & Geotechnical			1	EACH	\$0	\$0										\$0		
337	Indirect	DCM			DCM	9000		9000		DCM			1	EACH	\$1,000,000.00	\$1,000,000										\$1,000,000		
338	Indirect	Post-Commissioning			Post-Commissioning	9000		9000		Post-Commissioning			1	EACH	\$1,000,000.00	\$1,000,000										\$1,000,000		
339	Indirect	Commissioning			Commissioning	9000		9000		Commissioning			1	EACH	\$1,000,000.00	\$1,000,000										\$1,000,000		
340	Indirect	Commissioning			Commissioning	9000		9000		Commissioning			1	EACH	\$1,000,000.00	\$1,000,000										\$1,000,000		
341																												
342																												
343																												
344																												
345																												

PROJECT: WHITE WELL GOLD PROJECT
DOCUMENT NUMBER: 55501-01-G-001
DOCUMENT EXTENT: TABLE FORMAT FOR MSP
REVISION: C
DATE: 24-10-18
BY: GH

TABLE FORMAT FOR MSP		SUB TOTAL (R\$)		CONTINGENCY	TOTAL
INDIRECTS				20%	
Mobilisation & Demobilisation	Mobilisation & Demobilisation	\$	150,000.00	\$	30,000.00
Project Insurance		\$	121,545.45	\$	24,309.14
Capital Spares Reserve - Commissioning	Commissioning Spares	\$			
Capital Spares Reserve - Critical	Critical Spares	\$	612,738.45	\$	122,547.69
Survey & Geotechnical	Survey & Geotechnical	\$			
Tower & Accommodation	Tower & Accommodation	\$	338,000.00	\$	67,600.00
Permits	Permits	\$	165,000.00	\$	33,000.00
Permits & Fees	Permits & Fees	\$	-	\$	-
Incidentals, Printing and Defects Liability Costs	Incidentals, Printing and Defects Liability Costs	\$	-	\$	-
Post Commissioning Indirects	Post Commissioning Indirects	\$	171,000.00	\$	34,200.00
Construction Plant	Construction Plant	\$	300,000.00	\$	60,000.00
Capital	Capital	\$	50,000.00	\$	10,000.00
Heavy Lift Construction Equipment	Heavy Lift Construction Equipment	\$	892,240.00	\$	178,448.00
Sub Total Indirects		\$	2,896,782.92	\$	579,356.55
STRUCTURE					
Equipment Supply & Installation	Mechanical Equipment	\$	4,159,630.38	\$	831,926.08
Infrastructure		\$			
Earthworks	Earthworks	\$	332,302.08	\$	66,460.42
Concrete Works	Concrete	\$	3,235,322.00	\$	647,064.40
Structural Steelwork	Structural Steel	\$	1,802,532.38	\$	360,506.48
Pipe Work	Pipework	\$	1,496,596.12	\$	299,319.22
Pipe Work	Piping	\$	989,006.04	\$	197,801.21
Electrical	Electrical	\$	2,300,000.00	\$	460,000.00
Sub Total Structure		\$	12,264,486.90	\$	2,452,913.79
Sub Total Indirects & STRUCTURE		\$	15,160,969.82	\$	3,032,270.34
OPFCM					
Project Management & Procurement	OPFCM	\$	3,063,640.34	\$	612,728.08
Engineering Design & Drafting		\$	-	\$	-
Construction		\$	-	\$	-
Sub Total OPFCM		\$	3,063,640.34	\$	612,728.08
TOTAL PROJECT		\$	18,224,616.85		
CONTINGENCY	20%	\$	3,724,923.37		
Grand Total Estimate				\$	21,949,540.22

APPENDIX C





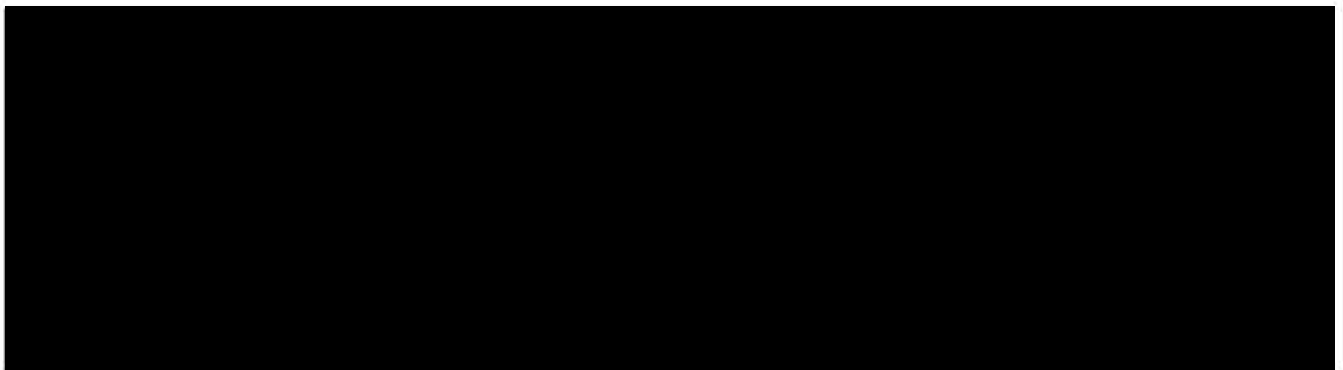
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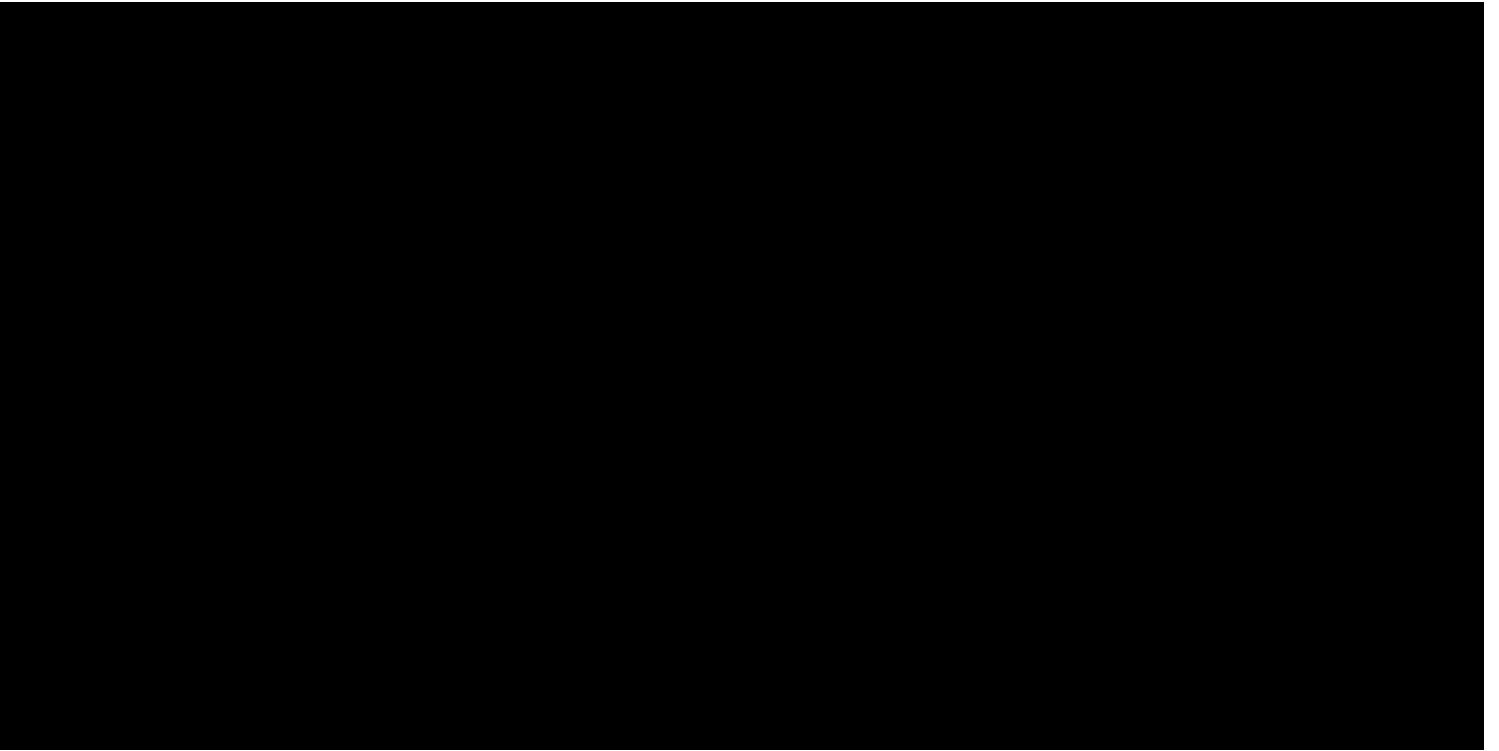
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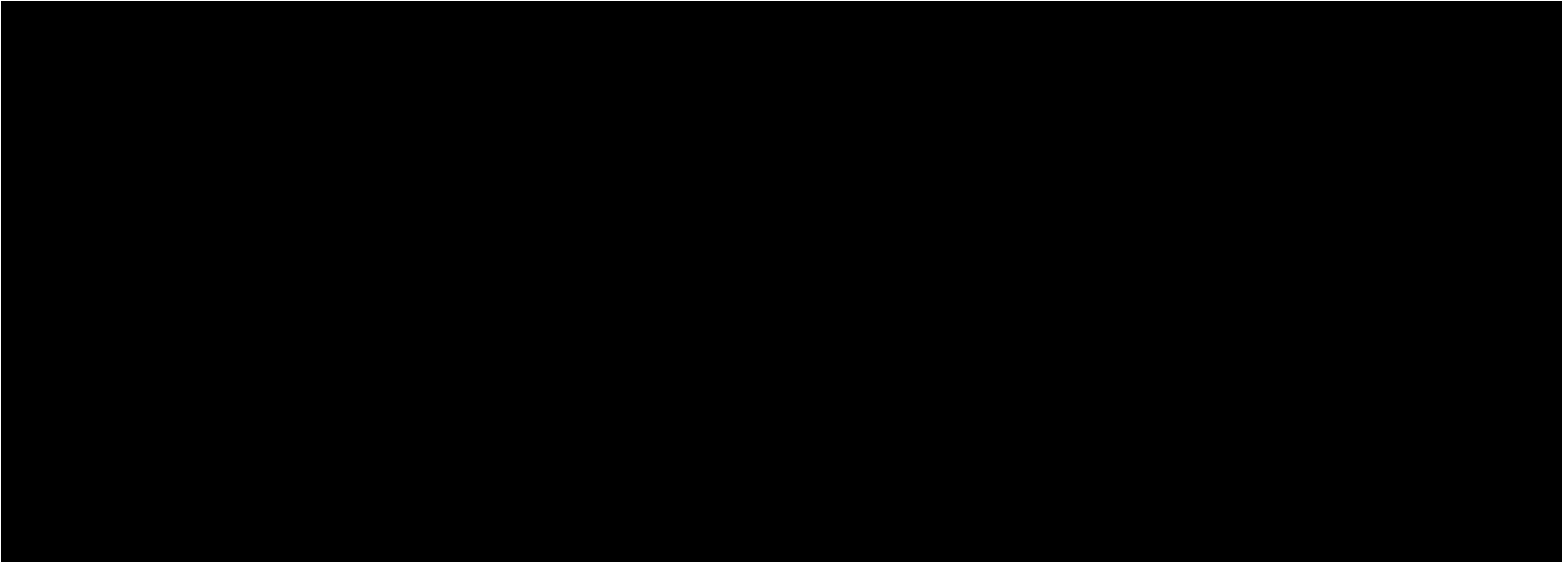
Project: White Well Gold Project

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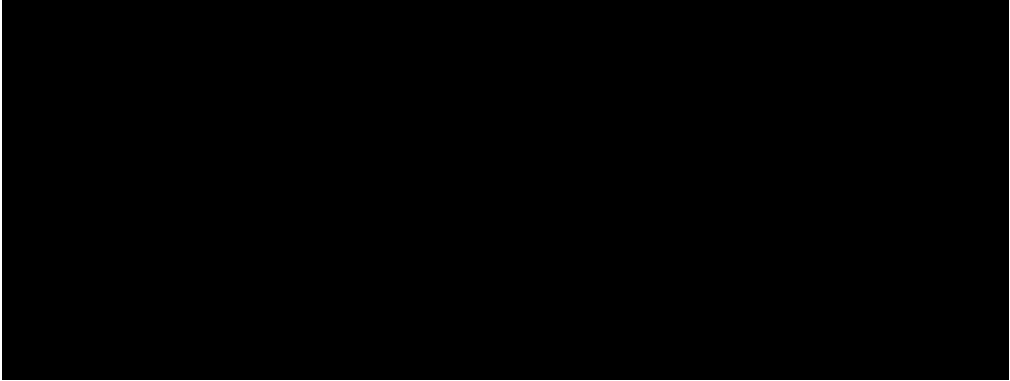
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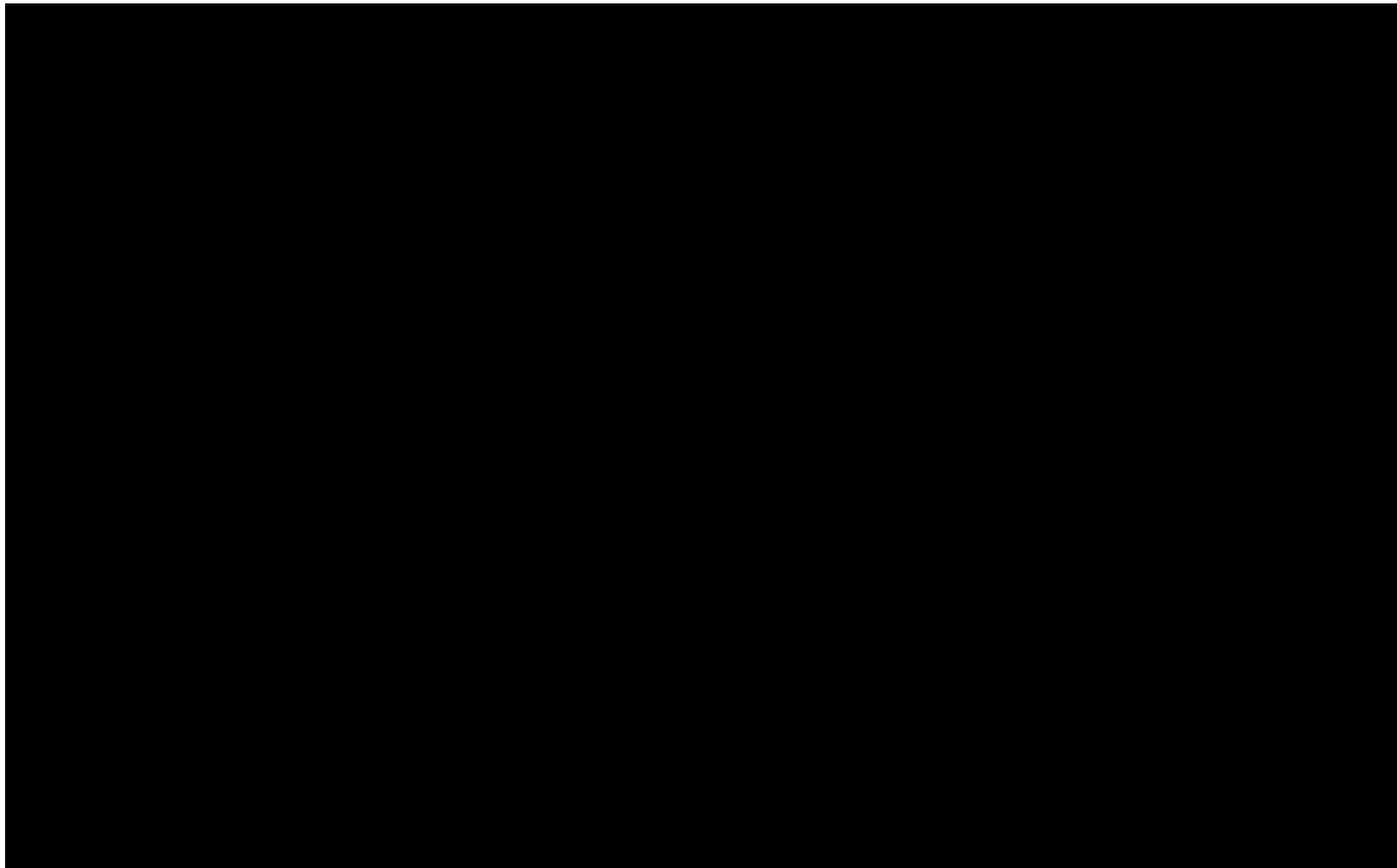




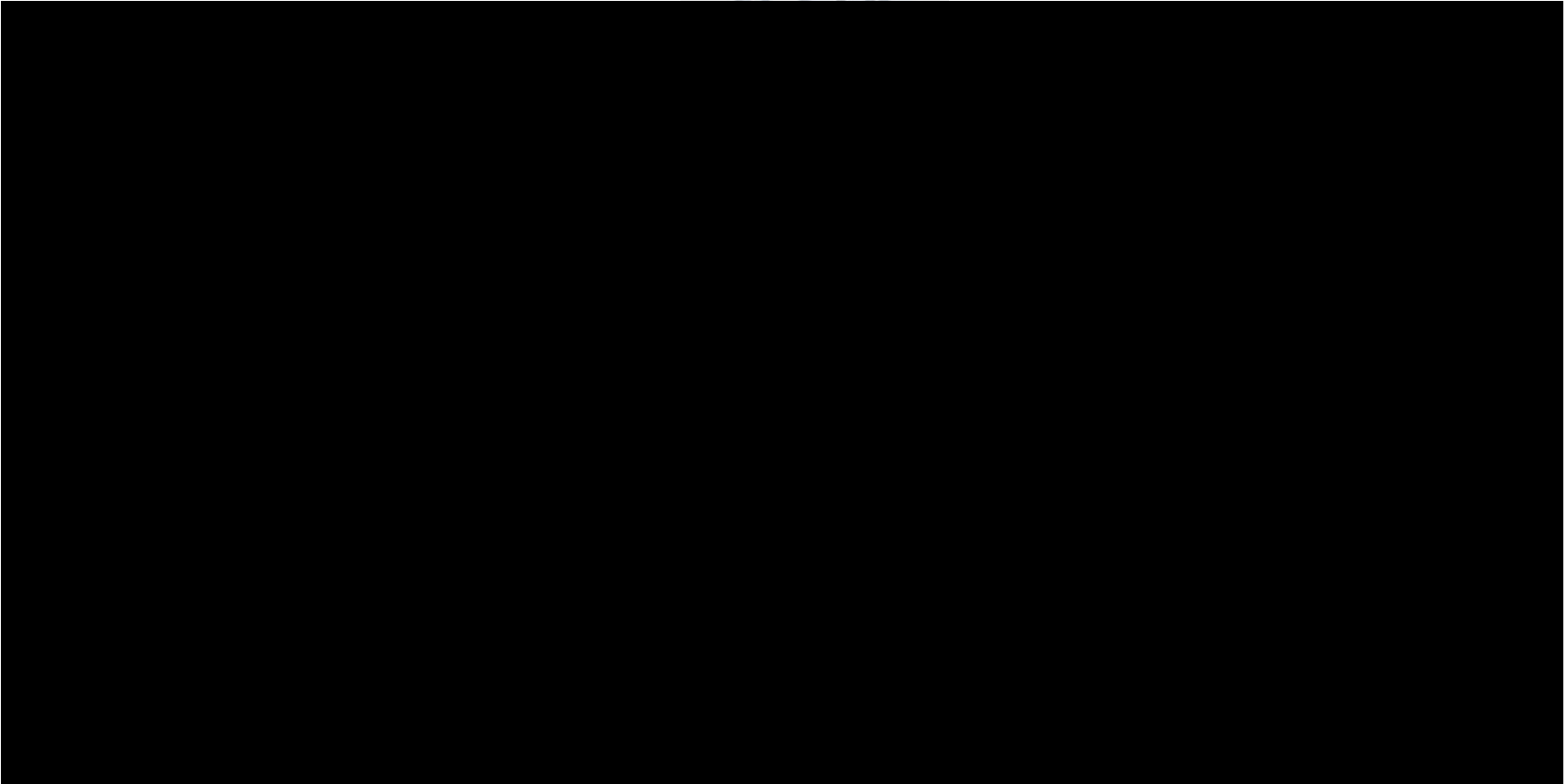


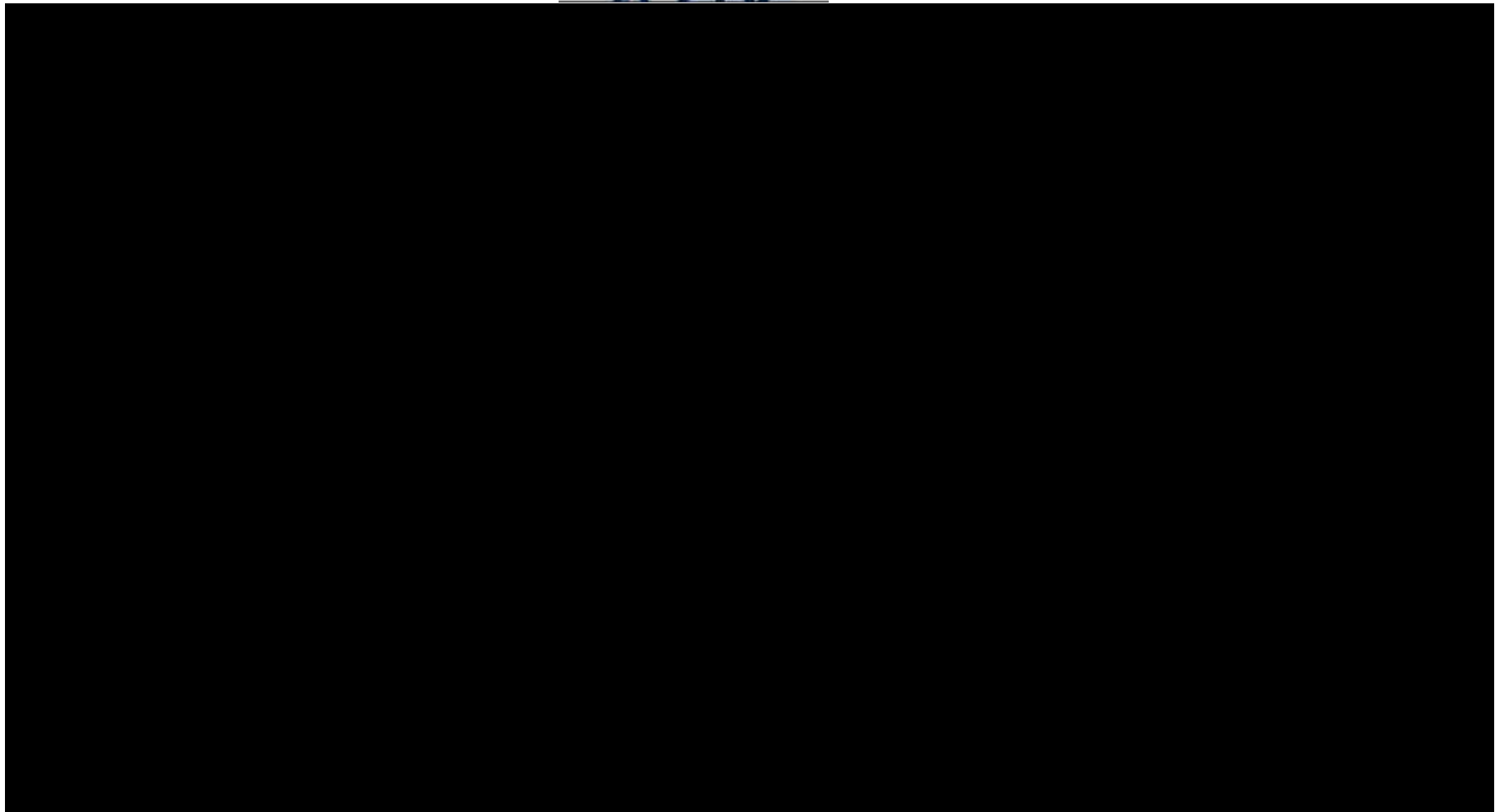
	White Well Gold Project





3. Maintenance contractor support FIFO & Camp charges.





General & Administration (Process)

MSP

White Well Gold Project

565-ES-R-001_B

Item	Unit		Assumptions / Comments
General & Administration			
Consumables	Allowance		Allowance
Community Sponsorship			Excluded
Performance Bonus			Excluded
Cleaning			Excluded
Postage & Couriers			Excluded
Printing & Stationery			Excluded
Telephones & Communications			Excluded
Roads / Bunds Maintenance			Excluded
PPE Clothing & Equipment			Excluded
Staff Amenities			Excluded
Security			Excluded
Insurance			Excluded
Tenement Fees & Rates			Excluded
FBT			Excluded
Labour & Services			
ROM rehandle			Excluded - mining
Contract Labour			Excluded
Contract Services - Crusher Relines			Included in Mtce Wear/Spare Consumables
Contract Services - Mill Relines			Included in Mtce Wear/Spare Consumables
Contract Services - General Plant Maintenance			Included in Mtce Wear/Spare Consumables
Consultants - Technical	Allowance		TSF, Hydrology, Mtce NDT
Process Vehicles			
Light Vehicles hire and fuel			4WD Hire vehicle
Mobile Equipment hire and fuel			Forklift/Bobcat/EWP/25t Franna
Supply			
Consumables			Excluded
Equipment Hire			Excluded
Freight/Transport			Quote MacMahon Burnett
IT Services			
Consumables			Excluded
Equipment Hire			Excluded
Consultants			Excluded
Software			Excluded
Hardware			Excluded
Training			
Travel & Accommodation			Excluded
Training /Courses /Conferences			Excluded
Human Resources			
Recruitment			Included in salary on-costs
Consultants			Included in salary on-costs
Pre-Employment & Other Medicals			Included in salary on-costs
Mine Security Clearance			Included in salary on-costs
OH & S General			
Consumables			Excluded
Equipment Hire			Excluded
Sampling & Analysis			Excluded
First Aid & Safety Supply			Excluded
Safety Signage & Publications			Excluded
Fitness for Work (D&A Testing)			Included in salary on-costs
Safety Levy			Excluded
Mines Rescue			
Consumables			Excluded
Consultants			Excluded
First Aid & Safety Supply			Excluded
Training /Courses /Conferences			Excluded
Environment			
Consumables			Excluded
Survey / Reports			Excluded
Operations Compliance			Excluded
Monitoring			Excluded
Sampling & Analysis			Excluded
Cyanide box disposal			Excluded
Indigenous			
Travel Expenses			Excluded
Native Title Claimant Scholarships			Excluded
Cultural Awareness Training			Excluded
Consultants General			Excluded
Refining and Transportation			
Refining	\$/oz of bullion		Costs allocated in general admin
Bullion transportation/insurance	Per weekly Collection		
Water			
Raw water supply pump hire			Excluded
Decant water pump hire			Excluded
Potable water supply			Excluded
FIFO			
FIFO accomodation			Included in Labour Cost
FIFO flights			Included in Labour Cost
Processing & Mine Grade Control Laboratory Costs			
Assays provided by Tuckabianna			
Contingency	% Allowance		
Total			

Assays

MSP

White Well Gold Project

565-ES-R-001_B

PROCESS PLANT - Site Laboratory Assays

Item	Sample type	Sample Frequency	No of Samples	Weekly Samples	Au (Fire Assay & AAS)	Au/Ag - Carbon (AR & AAS)	Au - Soln (AAS)	Carbon Activity	Assumptions / Comments
Wash Plant Feed	Solids	Shift	1	14	2				
Trommel O/S	Solids	Shift	1	14	2				
Deslime O/F Tails	Solids	Shift	1	14	2				
Knelson Tails	Solids	Shift	1	14	2				
Ball Mill Cyclone O/F - CIL Feed	Solids	Shift	1	14	2				
CIL Tails	Solids	Shift	1	14	2				
Final Tails	Solids	Shift	1	14	2				
GIC - LeachTank 1	Solids	Weekly	1	1	2				
GIC - CIL Tank 1	Solids	Weekly	1	1	2				
GIC - CIL Tank 2	Solids	Weekly	1	1	2				
GIC - CIL Tank 3	Solids	Weekly	1	1	2				
GIC - CIL Tank 4	Solids	Weekly	1	1	2				
GIC - CIL Tank 5	Solids	Weekly	1	1	2				
GIC - CIL Tank 6	Solids	Weekly	1	1	2				
Total Solid Samples			13	104	210				
CIL Residue	Solution	Shift	1	14			1		
Final Residue	Solution	Shift	1	14			1		
Pregnant solution	Solution	Daily	1	7			1		
Barren solution	Solution	Daily	1	7			1		
GIC - LeachTank 1	Solution	Weekly	1	1			1		
GIC - CIL Tank 1	Solution	Weekly	1	1			1		
GIC - CIL Tank 2	Solution	Weekly	1	1			1		
GIC - CIL Tank 3	Solution	Weekly	1	1			1		
GIC - CIL Tank 4	Solution	Weekly	1	1			1		
GIC - CIL Tank 5	Solution	Weekly	1	1			1		
GIC - CIL Tank 6	Solution	Weekly	1	1			1		
Total Solution Samples			11	49			49		
Carbons									
Loaded Carbon	Solids	Daily	1	7		1			
Barren Carbon	Solids	Daily	1	7		1			
GIC - CIL Tank 1	Solids	Weekly	1	1		1			
GIC - CIL Tank 2	Solids	Weekly	1	1		1			
GIC - CIL Tank 3	Solids	Weekly	1	1		1			
GIC - CIL Tank 4	Solids	Weekly	1	1		1			
GIC - CIL Tank 5	Solids	Weekly	1	1		1			
GIC - CIL Tank 6	Solids	Weekly	1	1		1			
Total Carbon Samples			8	20		20			
Loaded Carbon Activity	Activity	Weekly	1	1				1	
Barren Carbon Activity	Activity	Daily	1	7				1	
Regenerated Carbon Activity	Activity	Daily	1	7				1	
Total Solution Samples			3	15				15	
Total Weekly Assays Required			35	188	210	20	49	15	

Mining/Grade Control

Samples/day 50 FA 50

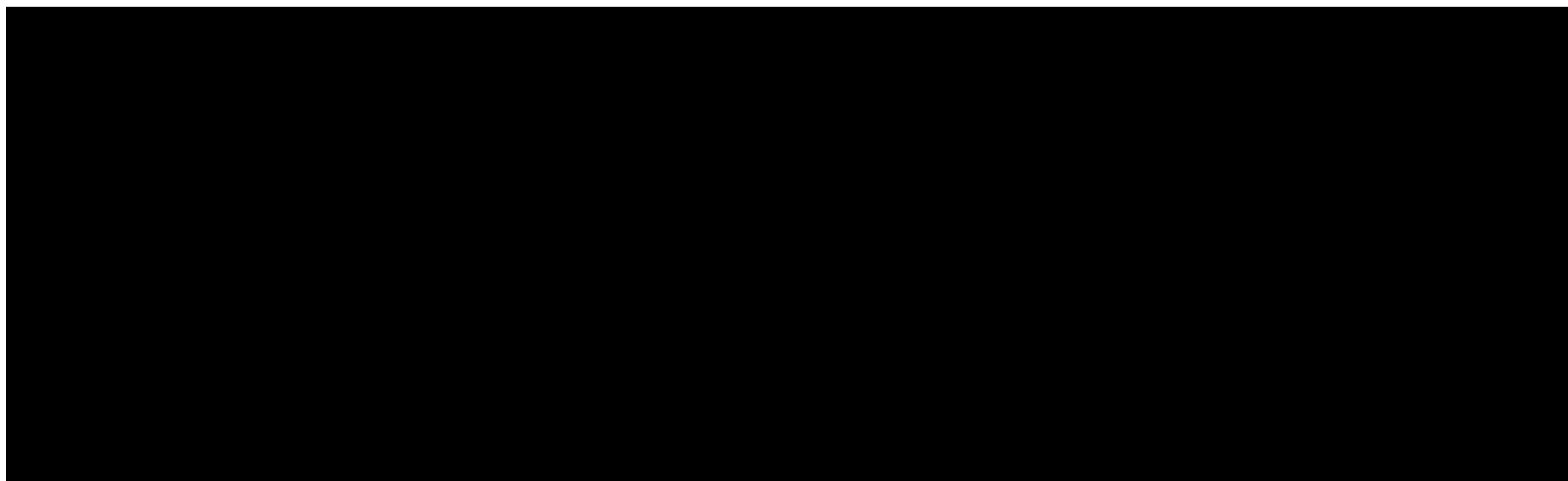
Samples/week 350 350

Total Assays

Total Weekly Assays Required				538	560	20	49	15	644
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Allow \$/sample 10

Annual Cost 334,880

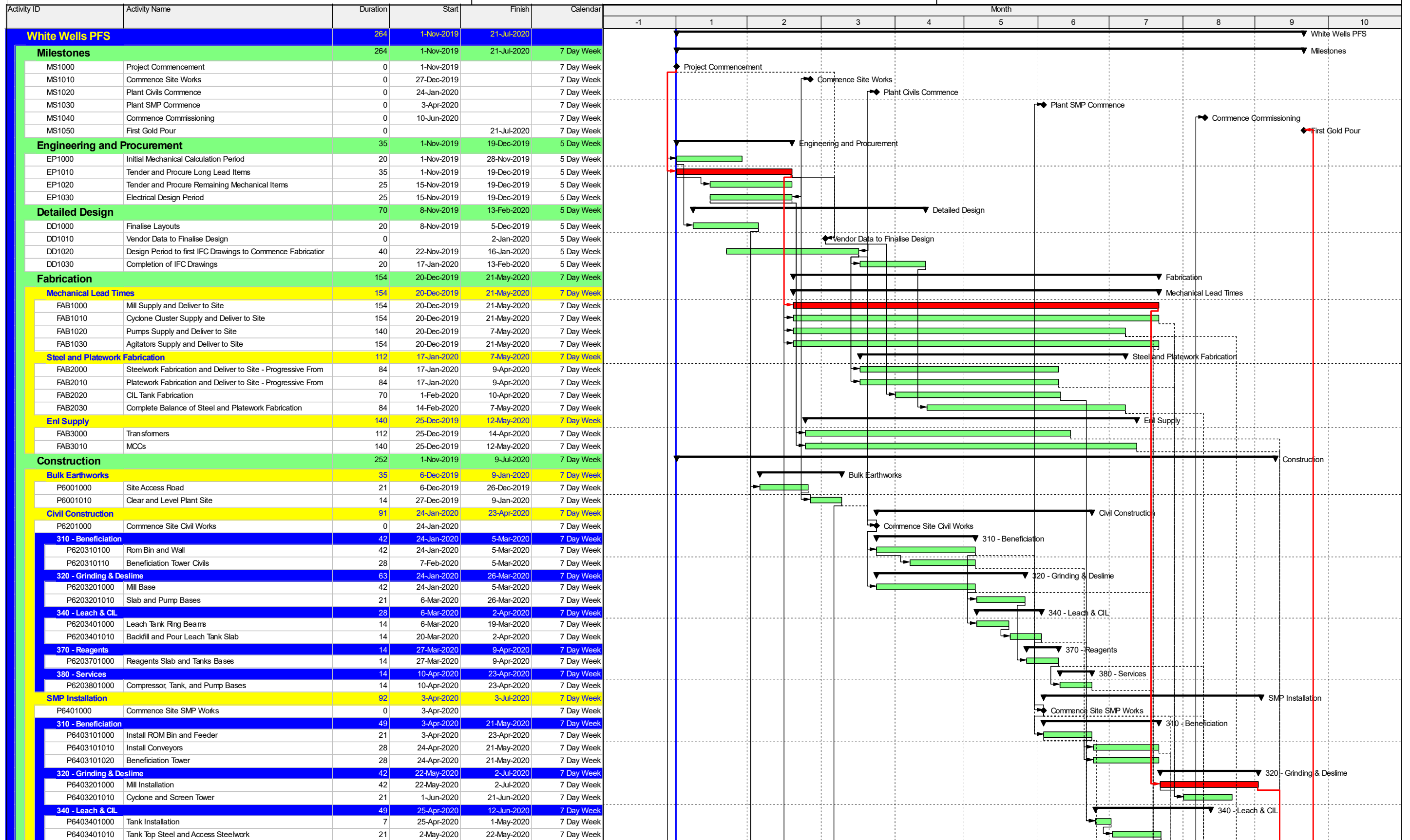




APPENDIX D PROJECT SCHEDULE



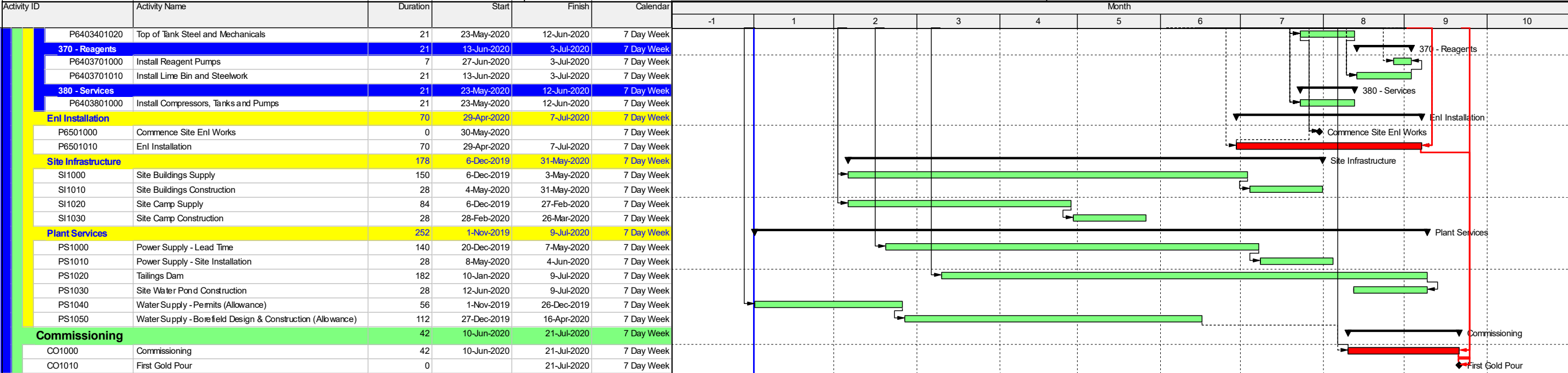
D56501 White Wells 30tph Gold Plant
PFS Schedule



CurrentBar % Complete Summary
Critical Remaining Work Milestone



D56501 White Wells 30tph Gold Plant
PFS Schedule



Current Bar % Complete Summary
Critical Remaining Work Milestone