Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8103/1989/3
Licence Holder	Aragon Resources Pty Ltd
ACN	114 714 662
File Number	DER2013/001965-1~6
Premises	Fortnum Gold Mine Mining Tenements: M52/6, M52/95, M52/96, M52/98, M52/99, M52/132, M52/133, M52/125, M52/5 and L52/172. MEEKATHARRA WA 6642
Date of Report	11 November 2021
Decision	Revised licence granted

Melanie Bruckberger
Digitally signed by Melanie Bruckberger
Date: 2021.11.11 09:28:44 +08'00'

Melanie Bruckberger
A/Manager – Resource Industries
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L8103/1989/3 is held by Aragon Resources Pty Ltd (Licence Holder) for the Fortnum Gold Mine located at Mining Tenements: M52/6, M52/95, M52/96, M52/98, M52/99, M52/132, M52/133 (tenements on the current licence) M52/125, M52/5 and L52/172 (tenements to be added with this amendment), Meekatharra WA 6642.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L8103/1989/3 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Amendment summary

On 1 April 2021, the Licence Holder submitted an application to the department to amend Licence L8103/1989/3 under section 59 and 59B of the Environmental Protection Act 1986 (EP Act). The following amendments are being sought:

Category 5

Proposed discharge of tailings from the existing processing plant to Eldorado pit (proposed new in-pit TSF). New capacity is required as Toms in-pit TSF reaches capacity.

Eldorado pit will have a storage capacity of approximately 619,727 tonnes. Discharge to Eldorado pit is expected to commence in October/November over a period of approximately 9 months.

Category 6

The following mine dewater discharge activities are proposed:

- Mine dewater discharge to Nathan's pit as a result of dewatering Labouchere pit. Water not needed for dust suppression is to be stored in Nathan's Pit to meet future dust suppression and mineral processing requirements across the premises. Initial dewatering volume of 211,211 kL over 1 year.
- Mine dewater discharge to Callie's South pit as a result of dewatering Callie's North pit.
- *Discharge of mine dewater / surface water runoff to Yarlarweelor Creek. Following large/extreme rain events water from Yarlarweelor Pit will be discharged to Yarlarweelor Creek as a contingency measure when the pit is being actively mined.* ***This activity has been withdrawn from the amendment – refer to Table 4 and Appendix 1. Assessment details for this activity have been removed from this report.***

The application also includes the addition of tenements M52/125, M52/5 and L52/172 to the premises boundary in order to include Labouchere Pit and associated dewatering infrastructure.

The new Category 6 activities are scheduled to commence in October/November 2021 for a period of approximately 5 years.

No change to the approved production/design capacities is proposed.

This amendment is limited only to changes to Category 5 and 6 activities from the Existing Licence. No changes to the aspects of the existing Licence relating to Category 12, and 89 have been requested by the Licence Holder.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guidance Statement: Risk Assessments* (DER 2017).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

No key emissions have been associated with the construction of the dewatering and in-pit TSF infrastructure as there are no sensitive receptors identified in the surrounding environment.

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Amendment Report are detailed in Table 1 below. Table 1 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 1: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Discharge of tailings to Eldorado in-pit TSF			
Leachate	Discharge of tailings into Pit	Seepage causing groundwater mounding and contamination	• Tailings discharged at north or south spigots to ensure decant pond is centered in the pit where a pontoon mounted decant pump will pump decant water back to the processing plant. • Metering of tailings discharge and return water to assist with managing water recovery • Inspection of tailings deposition, location of pond, pump operation • Groundwater in the vicinity of the TSF will be monitored and reported in accordance with current licence conditions • Five additional monitoring bores (E1 - E5) have been installed around Eldorado Pit to monitor for changes in groundwater levels and chemistry. • To limit the potential of storm water inflow into the pit, a 1 m high perimeter bund wall will be constructed in Eldorado Pit. These bund walls should be regularly inspected and repaired, if required. The Eldorado Pit hydrogeology report (Rockwater, 2021) advises that tailings deposition and compaction will tend to seal-up permeable zones in the walls of Eldorado pit, reducing the amount of seepage

Emission	Sources	Potential pathways	Proposed controls
Tailings	Transfer of tailings through pipeline between the processing plant and Eldorado Pit	Direct contact of tailings with soil or vegetation. Stormwater runoff.	• Tailings and return water pipelines will be fitted with leak detection, low flow and/or telemetry monitoring systems. • Pipeline infrastructure is inspected daily during operation in accordance with DWER licence conditions • Pipelines will incorporate isolation valves at appropriate intervals • Secondary containment features such as trenches, containment bunds and scour pits are constructed and maintained to capture uncontrolled release of tailings
	Overtopping of pit		• Design and construct TSF in accordance with ANCOLD/DMIRS guidelines and codes of practice, including design elements and location to withstand 100 year ARI event. • Sufficient freeboard is maintained in the TSF to allow capture of rainfall from a one in one hundred year 72 hour ARI event as per DWER licence conditions. A minimum Total Freeboard of 500mm shall be maintained on the facility after a storm event together with a minimum Operation Freeboard of 300mm. • Daily inspections of freeboard capacity • Regular survey pick-ups of TSFs • To limit the potential of storm water inflow into the pit, a 1 m high perimeter bund wall will be constructed in Eldorado Pit.
Decant water	Transfer of decant water through pipes between Eldorado Pit and the processing plant	Direct contact of water with soil or vegetation. Contamination of stormwater runoff	• Pipeline infrastructure is inspected daily during operation in accordance with DWER licence conditions • Pipelines will incorporate isolation valves at appropriate intervals • Tailings and return water pipelines will be fitted with leak detection, low flow and/or telemetry monitoring systems
	Overtopping of TSF return pond		• Daily inspections of freeboard capacity • TSF return pond water is prioritized for re-use in processing
Dust	Drying of tailings after deposition	Air dispersal	• TSF's and surrounding areas are regularly monitored for signs of dusting (i.e. signs of vegetation stress or decline). Control and impact area transects are established. • Tom's In-Pit TSF is monitored daily for dusting in accordance with the Operations, Maintenance and Surveillance Manual. • Irrigation and/or spray systems to be set up to re-wet TSF's if dusting is observed to impact vegetation.
Dewatering of Labouchere pit to Nathan's Pit			

Emission	Sources	Potential pathways	Proposed controls
Mine dewater	Leakage from dewater pipeline.	Overland flow	• The proposed pipeline to be constructed from Labouchere to Nathans will be situated within the haul road corridor • V-drains are installed to secure dewatering pipeline infrastructure and capture any accidental spills • Adherence to Groundwater Operating Strategy and monitoring and inspection commitments • Daily inspections of pipeline infrastructure
	Dewater discharge to pit	Direct discharge into Nathan's pit and infiltration to groundwater	• Modelling and analysis demonstrates pit water mixing will not result in any measurable changes in pit water quality • Cumulative water abstraction volumes are tracked monthly during operations. The water quality is considered good, saline, alkaline, and is considered to be a Na-Cl water type, with recent results showing a TDS reading of 3100 mg/L (Figure 1). Nathans pit water quality is similar to that of Labouchere and is considered to be alkaline, saline, with a Na-Cl water type. Recent TDS readings recorded a TDS of 760 mg/L (TDS ranges from 590 to 1300 mg/L, the recent lower readings are believed to be the result of fresh surface runoff after rainfall).The estimated final quality of the mixing of Labouchere Pit water with Nathans's Pit water will not significantly alter the profile of the water quality and the final TDS would be 1930 mg/L (Figure 2)
	Overtopping of pit (due to excess discharge and/or storm event)	Overland flow	• The volume of dewatering to be removed from Labouchere Pit to Nathan's Pit is 211,211 kL whilst the volume available in Nathan's Pit is estimated to be 2,87,358 kL making overtopping unlikely. • Pit freeboard is to be 1m bgl at all times as measured from the lowest point of the pit rim.
Dewatering of Callie's North Pit to South Callie's Pit			
Mine dewater	Leakage from dewater pipeline.	Overland flow	• V-drains are installed to secure dewatering pipeline infrastructure and capture any accidental spills • Adherence to Groundwater Operating Strategy and monitoring and inspection commitments • Daily inspections of pipeline infrastructure
	Dewater discharge to pit	Direct discharge into Callie's south	• The dewater from the Callie's North Pit will be preferentially used for ore processing or dust suppression so only

Emission	Sources	Potential pathways	Proposed controls
		pit and infiltration to groundwater	excess dewater will be discharged to Callie's South. • The pit water in Callie's South is estimated to rise only 1.7 m to approximately 465.7m AHD. The original water table was approximately 488 m AHD.
	Overtopping of pit (due to excess discharge and/or storm event)	Overland flow	Pit freeboard is to be 1 mbgl at all times as measured from the lowest point of the pit rim.

Analyte	Unit	Sample Date					Min	Median	Max	No. of Samples	No of DIL	Mann-Kendall Analysis				Relevant Limits			
		23/09/2016	9/07/2018	14/10/2018	10/10/2019	13/10/2020						CV	MK(S)	CF (%)	Trend	ANZECC 2000 Livestock	ANZG2018 Freshwater	NPGU	Existing Licence Limit
Calcium	mg/L	74	71	73	60	68	60	71	74	5	0		-6	88.3	S	1000			
Magnesium	mg/L	180	160	160	150	160	150	160	180	5	0	0.08	-5	82.1	S				
Sodium	mg/L	650	600	620	620	700	600	620	700	5	0	0.07	3	67.5	NT				
Potassium	mg/L	28	31	31	28	34	28	31	34	5	0	0.06	4	75.8	NT				
Bicarbonate	mg/L	170	210	210	200	230	170	210	230	5	0	0.08	5	82.1	NT				
Sulfate	mg/L	570	620	580	600	640	570	600	640	5	0	0.11	6	88.3	NT	1000		1000	
Chloride	mg/L	1200	1100	1100	1200	1200	1100	1200	1200	5	0	0.05	2	59.2	NT			250	
TDS	mg/L	2900	2900	2800	3200	3100	2800	2900	3200	5	0	0.05	3	67.5	NT	5000			4000
Conductivity	µs/cm	4400	4700	4600	5100	4900	4400	4700	5100	5	0	0.06	6	88.3	NT				
pH		8.6	8.3	8.5	8.6	8.5	8.3	8.5	8.6	5	0	0.06	0	40.8	S				6-9
Alkalinity	mg $CaCO_3$/L	170	170	190	190	-	170	180	190	4	0	0.01	4	83.3	NT				
Aluminum	mg/L	<0.01	<0.05	-	<0.005	-	<0.005	<0.005	<0.005	3	3	-	-	-	-	5	0.055	0.2	
Arsenic	mg/L	<0.001	< 0.001	<0.001	0.001	<0.001	0.001	0.001	0.001	5	4	-	-	-	-	0.5	0.024	0.1	
Cadmium	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	5	5	-	-	-	-	0.01	0.0002	0.02	
Chromium	mg/L	0.12	0.14	0.14	0.14	0.012	0.012	0.14	0.14	5	0	0.50	-1	50	S	1	0.049*		
Copper	mg/L	<0.001	<0.001	0.001	0.002	0.001	0.001	0.001	0.002	5	2	-	-	-	-	1	0.0014	20	
Lead	mg/L	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	5	5	-	-	-	-	0.1	0.0034	0.1	
Manganese	mg/L	<0.01	0.003	-	0.004	0.004	0.003	0.004	0.004	4	1	-	-	-	-	-	1.9	5	
Nickel	mg/L	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.002	5	0	0.39	-4	75.8	S	1	0.011	0.2	
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	0.008	0.008	0.008	0.008	5	4	-	-	-	-	20	0.008*	3	
Carbonate	mg/L	<5	<1	9	16	11	9	11	16	5	2	-	-	-	-				
Nitrite	mg/L	-	0.4	0.4	0.6	0.6	0.4	0.5	0.6	4	0	0.23	-4	83.3	NT	30		30	
Nitrate	mg/L	-	110	94	90	88	88	92	110	4	0	0.1	-6	95.8	D	400		500	
Silica	mg/L	-	6.3		2.9	-	2.9	4.6	6.3	2	0	-	-	-	-				
Hardness	mg $CaCO_3$/L	-	830	820	790	-	790	820	830	3	0	-	-	-	-				
Iron	mg/L	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	4	4	-	-	-	-			0.3	
Selenium	mg/L	<0.001	0.006	0.006	0.009	0.006	0.006	0.006	0.009	5	1	0.22	1	50	NT	0.02	0.011	0.1	
Mercury	mg/L	<0.00005	<0.00005	-	<0.00005	<0.00005	<0.00005	<0.005	<0.005	4	4	-	-	-	-	0.002	0.00006	0.01	
Antimony	mg/L	-	-	<0.001		<0.001	<0.001	<0.005	<0.005	2	2	-	-	-	-		0.009	0.03	
Cobalt	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	3	3	-	-	-	-	1	0.0014	N/A	
Boron	mg/L	-	-	-	-	1.2	1.2	1.2	1.2	1	0	-	-	-	-	5	0.37	40	
Thallium	mg/L	-	-	-	-	<0.001	<0.001	<0.001	<0.001	1	1	-	-	-	-		0.00003		
TRH C10 - C16	µg/L	-	-	-	-	<60	<60	<60	<60	1	1	-	-	-	-				
TRH C16 - C34	µg/L	-	-	-	-	<50	<50	<50	<50	1	1	-	-	-	-				
TRH C34 - C40	µg/L	-	-	-	-	<500	<500	<500	<500	1	1	-	-	-	-				
TRH C6 - C10 minus BTEX	µg/L	-	-	-	-	<50	<50	<50	<50	1	1	-	-	-	-				
Hexavalent Chromium	mg/L	-	-	-	-	0.12	0.12	0.12	0.12	1	0	-	-	-	-		0.001	0.5	
Fluoride	mg/L	-	-	-	1.1	-	1.1	1.1	1.1	1	0	-	-	-	-	2		15	

*Hardness algorithm used for Cr hardness value 800

Figure 1: Labouchere Pit Water Analysis and Comparison Data

Analyte	Unit	Sample Date																				Mann-Kendall Analysis				Relevant Limits			
		23/09/2016	1/04/2017	1/07/2017	24/01/2018	4/03/2018	7/09/2018	14/10/2018	19/12/2018	21/01/2019	19/02/2019	7/09/2019	24/04/2019	10/08/2019	5/04/2020	13/10/2020	13/01/2021	Mixed Labouchere & Nathans	Min	Max	No of Samples	No of DIL	Coefficient of Variation	Mann-Kendall Statistic (S)	Confidence (%)	Trend	ANZECC 2000 Livestock	ANZG 2018 Freshwater	Non-potable Groundwater	Existing Licence Limit
Calcium	mg/L	35	-	-	-	33	33	34	32	-	30	-	36	34	44	46	48	58	30	48	12	0	0.16	23	93.9	PI	1000			
Magnesium	mg/L	74	-	-	75	75	71	72	74	-	72	-	68	53	28	35	38	99	28	75	12	0	0.29	-45	100	D				
Sodium	mg/L	250	-	-	290	280	260	280	270	-	260	-	250	210	97	130	140	420	97	290	12	0	0.29	-41	99.8	D				
Potassium	mg/L	29	-	-	33	33	32	33	33	-	32	-	35	22	13	14	16	25	13	35	12	0	0.31	-23	93.3	PD				
Bicarbonate	mg/L	180	-	-	190	150	220	210	200	-	190	-	180	210	150	170	150	190	150	220	12	0	0.13	-18	87.5	S				
Sulfate	mg/L	230	-	-	230	230	220	230	230	-	230	-	240	180	120	120	130	385	120	240	12	0	0.24	-26	95.7	D	1000			
Chloride	mg/L	370	-	-	400	420	400	410	400	-	400	-	410	300	150	190	190	695	150	420	12	0	0.3	-26	95.7	D			250	
TDS	mg/L	1200	1460	1200	1300	1300	1300	1300	1400	1300	1200	1200	1200	1000	590	730	760	1930	590	1460	16	0	0.22	-60	99.7	D	5000			4000
Conductivity	µs/cm	2000	2260	2200	2100	2100	2200	2200	2200	2200	2200	2000	2100	1800	1000	1200	1300	-	1000	2260	16	0	0.21	-53	99.1	D				
pH		8.8	8.95	8.8	8.8	8.9	8.5	8.7	8.7	8.6	8.8	8.6	8.8	8.6	8.1	8.3	8.6	-	8.1	8.95	16	0	0.03	-59	99.7	D				6-9
Alkalinity	mg $CaCO_3$/L	200	-	-	210	220	200	210	210	-	200	-	200	190	-	-	-	-	190	220	9	0	0.04	-13	89	S				
Aluminium	mg/L	<0.01	-	-	<0.005	<0.005	<0.005	-	-	-	-	-	-	<0.005	-	-	-	-	<0.005	<0.005	5	5	-	-	-	-	5	0.055	0.2	
Arsenic	mg/L	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	11	11	-	-	-	-	0.5	0.024		
Cadmium	mg/L	<0.0001	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	-	0.0002	0.0002	12	11	-	-	-	-	0.01	0.0002	0.02	
Chromium	mg/L	0.004	-	-	0.003	0.003	0.003	0.003	0.003	-	-	-	0.003	0.003	<0.001	0.004	0.003	0.0075	0.003	0.004	11	1	0.13	-2	53.5	S	1	0.027*		
Copper	mg/L	<0.001	-	-	0.001	<0.001	<0.001	<0.001	0.003	-	0.008	-	0.001	0.003	0.003	0.006	0.008	0.0045	0.001	0.008	12	5	0.6	7	80.9	NT	1	0.0014	20	
Lead	mg/L	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	12	12	-	-	-	-	0.1	0.0034	0.1	
Manganese	mg/L	<0.01	-	-	<0.001	0.002	<0.001			-	-	-	<0.001	0.009	0.015	0.008	0.003	0.0035	0.002	0.015	9	4	0.71	0	40.8	S		1.9	5	
Nickel	mg/L	0.002	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.003	-	<0.001	0.001	0.003	0.005	0.003	0.002	0.001	0.005	12	6	0.47	6	81.5	NT	1	0.011	0.2	
Zinc	mg/L	<0.005	-	-	<0.005	0.005	<0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	<0.005	0.009	0.008	0.008	0.008	0.009	12	10	-	-	-	-	20	0.07*	3	
Carbonate	mg/L	15	-	-	35	58	11	23	28	-	28	-	32	11	-	1	7	9	1	58	11	0	0.71	-19	91.8	PD				
Nitrate	mg/L	-	-	-	89	52	95	67	67	-	74	-	-	75	-	84	89	44.8	52	95	9	0	0.71	-19	91.8	PD	400		500	
Nitrite	mg/L	-	-	-	0.5	0.3	3	0.4	0.6	-	0.5	-	-	0.4	-	0.9	1.7	44.85	0.3	3	9	0	0.18	10	82.1	NT	30		30	
Silicon	mg/L	-	-	-	12	12	12			-	-	-	-	4.8	-	-	-	-	4.8	12	4	0	0.96	10	82.1	NT				
Hardness	mg $CaCO_3$/L	390	-	-	400	390	370	380	390	-	370	-	370	310	-	-	-	-	310	400	9	0	0.35	-3	72.9	S				
Iron	mg/L	-	-	-	<0.005	<0.005	0.005	<0.005	<0.005	-	<0.005	-	<0.005	0.005	<0.005	<0.005	<0.005	-	0.005	0.005	11	10	-	-	-	-			0.3	
Selenium	mg/L	0.002	-	-	0.002	0.003	0.002	0.002	0.003	-	0.004	-	0.003	0.007	0.003	0.008	0.01	0.008	0.002	0.01	12	0	0.66	44	99.9	I	0.02	0.011	0.1	
Mercury	mg/L	<0.00005	-	-	<0.00005	<0.00005	<0.00005	-	-	-	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00005	<0.00005	9	9	-	-	-	-	0.002	0.00006	0.01	
Antimony	mg/L	-	-	-	-	-	-	<0.001	<0.001	-	<0.001	-	<0.001		<0.001	<0.001	<0.001	-	<0.001	<0.001	7	7	-	-	-	-	-	0.009	0.03	
Cobalt	mg/L	-	-	-	-	-	-	<0.001	<0.001	-	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	8	8	-	-	-	-	1	0.0014		
Boron	mg/L	-	-	-	-	-	-	-	-	-	-	-	1	-	0.32	0.46	0.38	0.79	0.32	1	4	0	0.58	-2	62.5	S	5	0.37	40	
Thallium	mg/L	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	4	4	-	-	-	-		0.00003		
Nitrate Nitrogen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	8.9	19	20	-	8.9	20	3	0	-	-	-	-				
TRH >C10-C16	µ	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.06	<60	<60	-	<0.06	<60	3	3	-	-	-	-				
TRH >C16-C34 (F3)		-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<500	<500	-	<0.5	<500	3	3	-	-	-	-				

Figure 2: Nathans Pit Water Analysis and Comparison Data

Licence: L8103/1989/3

3.1.2 Receptors

In accordance with the *Guidance Statement: Risk Assessment* (DER 2017), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guidance Statement: Environmental Siting* (DER 2016)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Milgun Homestead	22 km north *Based on distance a source pathway receptor linkage does not exist, and the Delegated Officer considers it unlikely a risk event to occur. This receptor is not further considered in the risk assessment below.*
Yulga Jinna Aboriginal Community	38 km south-east *Based on distance a source pathway receptor linkage does not exist, and the Delegated Officer considers it unlikely a risk event to occur. This receptor is not further considered in the risk assessment below.*
Pastoral Station/bores/wells	The Licence Holder has identified wells in the region shown on the "Milgun 1:100,000 Geological Sheet (Swager et. Al., 2000)". These are:- Duffey Well (~7kms north-east of Tom's Pit);- Kinder Bore (~8kms west of Tom's Pit); and,- Sam Well (~9kms north-north-east of Tom's Pit).
Environmental receptors	**Distance from prescribed activity**
Groundwater	Background groundwater levels in the vicinity of the Fortnum Gold Mine pits is approximately 490m AHD (10-16mbgl in the vicinity of Eldorado, Callies South, Starlight and Trev Pits). Water samples taken from production bores in July 2011 indicate that the groundwater was fresh (less than 1,000 mg/L TDS), slightly alkaline (pH 7.8 to 8.1) and had elevated nitrate (21.5 to 24.7 mg/L). Groundwater flow prior to mining was to the north away from Yarlarweelor Creek but towards the Gascoyne River 14 km to the north. Levels taken in September 2020 indicate mounding at 49m AHD around Eldorado and Toms pits as a result of water storage and tailings emplacement causing flows to the north, towards Trev and Starlight Pits and the south, towards Callies and Yarlarweelor pits. Trev, Starlight, Callies and Yarlarweelor are groundwater sinks/discharge points. Recent groundwater and pit lake salinities and changes since July 2016 indicate:

	• Brackish groundwater, up to 1,500 mg/L TDS on the western side of Toms pit, in Eldorado pit, and on the southern and north-eastern sides of the above-ground TSF. Salinities have also increased since 2016 due to seepage from tailings, or brackish water pumped from Starlight underground (Eldorado). • Low salinity water in other bores and reductions in salinity, probably due to recharge from heavy rainfalls. Also, marked decreases in salinity in Callies and Yarlarweelor pits due to surface water runoff.
Yarlarweelor Creek and tributaries	Sediments and riparian vegetation within these creeks are considered potential receptors. Aerial photography indicates vegetation density in the region is significantly higher within creek lines. **Eldorado TSF:** Yarlarweelor creek is located ~1.15km south-west of Eldorado Pit. An additional unnamed creek is located ~2.7 km north-east of Tom's Pit.
PEC (P1) Robinson range vegetation complexes	Approx 3.5 km to the west and downstream of Yarlarweelor creek discharge point. Vegetation in the region of the TSF pipelines and TSF generally appears to be sparse. Aerial photography indicates vegetation density is significantly higher in ephemeral creek lines in the region. Robinson Range vegetation complexes (banded ironstone formation) Priority Ecological Community buffer areas are located in the region. The nearest boundary of these buffer areas is located ~1.9km to the north-west of Tom's in Pit TSF, with other such boundaries located ~3.5km to the east and 4kms to the west.
Priority flora	In 2016 the following Priority species were found to be present on the premises: *Goodenia berringbinensis* (Priority 4) *Eremophila obliquisepala* (Priority 3) *Sauropus sp. Woolgorong* (Piority 3) *Thryptomene* sp. Leinster (Priority 3) *Eremophila lanata* (Priority 3) was also identified in a desk top search by the licence holder.

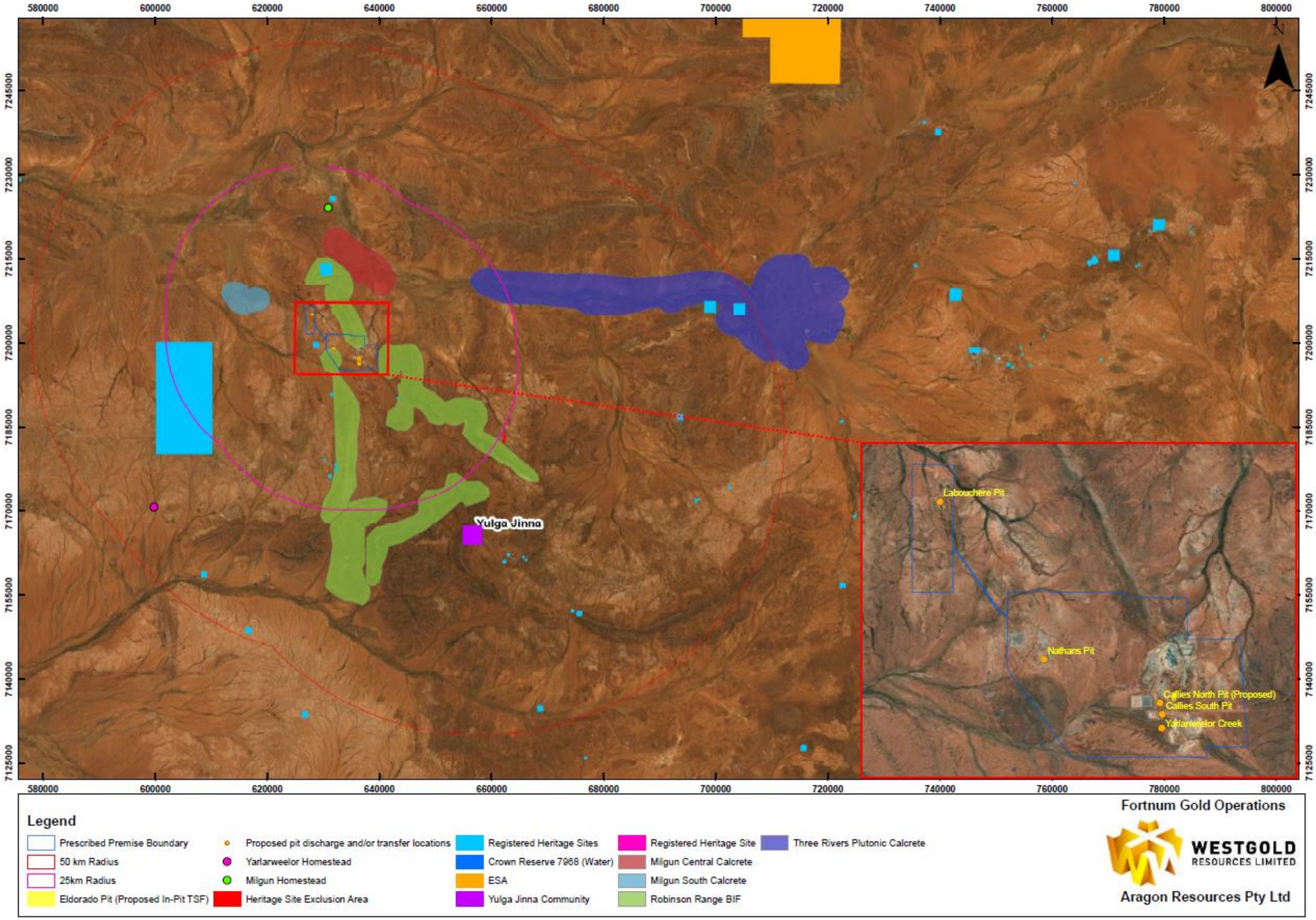

Figure 3: Sensitive receptors within 25km and 50 km radius

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guidance Statement: Risk Assessments* (DER 2017) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

The Revised Licence L8103/1989/3 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 5 and Category 6 activities.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 3. Risk assessment of potential emissions and discharges from the Premises during operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Operation Category 5 – Eldorado in-pit TSF								
Leakage from tailings slurry and/or decant return water pipelines	Tailings slurry and/or decant return water	Direct contact Overland flow	Soil	Refer to Section 3.1.1	C=Minor L= Possible **Medium**	Y	**Condition 6: Table 4** Replace references to Tom's Pit in the infrastructure requirement table with Eldorado Pit as Tom's Pit has been constructed. Eldorado Pit's infrastructure construction is to follow the same construction requirements as Tom's Pit. This table includes the requirements for pipeline construction and bunding. **Condition 10: Table 6** Include Eldorado Pit with Tom's Pit in the Infrastructure and equipment controls table. Includes inspection, monitoring and contingency action for management of tailings slurry and return water pipelines.	The discharge of tailings to Eldorado Pit will not increase the risk of tailings discharge already assessed for the Tom's In-Pit TSF. The design for Eldorado In-Pit TSF is also the same as for Tom's Pit. The conditions currently managing the operating risks from Tom's In-Pit TSF are appropriate for management of the risks from Eldorado In-Pit TSF.
Seepage from TSF	Tailings leachate	Infiltration through soil	Groundwater		C=Moderate L= Likely **High Risk**	Y	**Condition 1(a): Table 1** The Monitoring of representative water samples includes limits set for pH, TDS and cyanide. **Current condition 3** Requires a report to be provided to the CEO in writing with details of any exceedance of a limit set in Table 1. The report must include corrective actions taken or planned to mitigate any adverse environmental consequences and to prevent a recurrence of the exceedance.	Refer to Appendix 3
Overtopping of TSF	Tailings slurry and/or decant	Overland flow	Soil Native vegetation		C=Moderate L= Possible **Medium**	Y	**Condition 10: Table 6** Include Eldorado Pit with Tom's Pit in the Infrastructure and equipment controls table. Freeboard management measures are included for the in-pit TSFs.	The conditions currently managing the operating risks from Tom's In-Pit TSF are appropriate for management of the risks from Eldorado In-Pit TSF.
Operation – Category 6								
Labouchere Pit dewatering discharge to Nathan's Pit Leakage from dewater pipeline	Mine dewater	Overland flow	Soil Vegetation. Tributary of Yarlarweelor Creek	Refer to Section 3.1.1	C=Minor L= Possible **Medium**	Y	**Condition 10: Table 6** Current condition for weekly monitoring of pipeline and repair of leaks when detected.	The dewatering of Labouchere Pit to Nathan's Pit is not a greater risk than the dewatering from Nathan's Pit to the Starlight, Trev's and Callies South Pits. The use of dewatering within the mining footprint would limit the impacts to disturbed ground and is not expected to impact the wider environment.
Labouchere Pit dewatering discharge to Nathan's Pit Dewater discharge	Mine dewater	Direct discharge into Nathans pit and infiltration to groundwater causing mounding of groundwater and changes to groundwater chemistry at Nathan's Pit.	Groundwater	Refer to Section 3.1.1	C=Minor L= Possible **Medium**	Y	**Condition 1 (a): Table 1** Monitoring conditions for representative water samples. Monitoring site of water to be sampled specified as both the water discharged to the receiving pit and the water within the pit as current monitoring results are not clear as to which is being reported.	The monitoring of the water discharged to Nathan's Pit is added to the other receiving pits in the mine dewatering network. The only limit on this range of discharges is for pH to be between 6 -9. The monitoring of the water inside Nathan's Pit is also required. This will allow impacts of dewatering to each pit to be more accurately measured.
Labouchere Pit dewatering	Pit lake water	Overland flow	Soil	Refer to Section	C=Minor	N	**Condition 10: Table 6**	**This is added as the changes to the**

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
discharge to Nathan's Pit Overtopping of pit (due to excess discharge and/or storm event)			Vegetation Tributary of Yarlarweelor Creek	3.1.1	L= Possible **Medium**		**<u>An additional condition added to Table 6 to set a freeboard for the pits being discharged to: Starlight, Callie's South, Trev's and Nathan's Pit</u>**	**<u>dewatering schedule includes the requirement that the discharge of dewater to the Yarlarweelor Creek is dependent on the other pits not having available volume to take the excess from Yarlarweelor Pit.</u>**
Callies North Pit dewatering discharge to Callies South Pit Leakage from dewater pipeline	Mine dewater	Overland flow	Soil Vegetation	Refer to Section 3.1.1	C=Minor L= Possible **Medium**	Y	**Condition 10: Table 6** Current condition for weekly monitoring of pipeline and repair of leaks when detected.	The discharge to Callies South Pit from Callies North will be a minor volume of water so impact on the water quality is not expected to be significant. The current monitoring condition for Callies South will be sufficient to monitor the water quality in the pits.
Callies North Pit dewatering discharge to Callies South Pit Dewater discharge	Mine dewater	Direct discharge into Callies south pit and infiltration to groundwater	Groundwater	Refer to Section 3.1.1	C=Minor L= Possible **Medium**	Y	**Condition 1(a): Table 1** Monitoring conditions for representative water samples. Monitoring site of water to be sampled specified as both the water discharged to the receiving pit and the water within the pit as current monitoring results are not clear as to which is being reported.	The monitoring of the water inside Callies Pit is also required. This will allow impacts of dewatering to each pit to be more accurately measured
Callies North Pit dewatering discharge to Callies South Pit Overtopping of pit (due to excess discharge and/or storm event)	Pit lake water	Overland flow	Soil Vegetation Yarlarweelor Creek	Refer to Section 3.1.1	C=Minor L= Possible **Medium**	N	**<u>Condition 10: Table 6</u>** **<u>An additional condition added to Table 6 to set a freeboard for the pits being discharged to: Starlight, Callie's South, Trev's and Nathan's Pit</u>**	**<u>This is added as the changes to the dewatering schedule includes the requirement that the discharge of dewater to the Yarlarweelor Creek is dependent on the other pits not having available volume to take the excess from Yarlarweelor Pit.</u>** **<u>This condition will also make it clear what capacity remains in the pits for any future assessments of</u>**

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guidance Statement: Risk Assessments* (DER 2017).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Local Government Authority advised of proposal (1/6/2021)	No comments received	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal (1/6/2021)	DMIRS replied on 3/9/2021 advising that: • DMIRS has received a mining proposal for the Fortnum Project, including proposed expansion to the Regent-Messiah area, and Eldorado in-pit TSF. Labouchere Pit has been included in the mining proposal due to this pit being a proposed dewatering discharge point, however no mining of Labouchere Pit has been proposed. • The following report has been provided in the mining proposal; Hydrogeological Assessment of Eldorado Pit (Planned TSF) (Rockwater 2021). Based on information presented in this report, DMIRS has considered potential long term impacts (i.e. closure) of seepage from the proposed Eldorado in-pit TSF, and will be requiring groundwater models are verified over the life of mine, to confirm pit lakes will remain permanent groundwater sinks, ensuring potential contaminants or water with elevated salinity remain at the mine site. This information will be included in future revisions of the MCP. • Surface water diversion structures for Yarlarweelor Creek have been assessed by DMIRS under previous approved Fortnum project mining proposals. The potential impact to natural drainage in closure has been considered in the mine closure plan, and an environmental outcome and completion criteria developed to ensure the risk is appropriately managed. The Environmental Outcome in its current form reads; “Natural drainage is reinstated to facilitate the function of natural drainage systems or is managed to suit the post-mining land use”.	• Although mining is not currently approved the intent of the dewatering is to allow mining of the pit in the future and so triggers Category 6. • The closure requirements of the Eldorado In Pit TSF are noted. • The re-instatement of the natural drainage as a requirement of closure of the premises is noted.
DWER Regional Services - Geraldton	The restriction of dewatering to Yarlarweelor Creek to rainfall runoff accumulation in the Yarlarweelor Pit is an improvement in the quality of discharge to the creek than was previously authorised. Suggested conditions: • Groundwater samples to be taken daily for full analysis during period of pit lake water	Discharge to Yarlarweelor Creek is no longer included in this amendment.

	discharge into Yarlarweelor Creek. • Groundwater discharge volumes recorded daily during period of pit lake water discharge into Yarlarweelor Creek The changes to dewatering points does not increase risk to mine site environment. Suggested conditions: • Replacement bore for Callies Bore that will be destroyed through development of the Callies North Pit • Groundwater measurement and sampling to conform to existing operating strategy and licence conditions	
Licence Holder was provided with draft amendment on (6/10/2021). A second draft was provided on (9/11/2021)	1. Refer to Appendix 1 for comments on the draft provided on 6/10/2021. (Comments received 7/10/2021 and 26/10/2021) 2. Comment to the draft provided on 9/11/2021: *'Westgold therefore wishes to waive the consultation period and requests that the licence be issued as soon as possible, with the only change being the removal of Yarlarweelor Creek as a discharge point.'*	1. Refer to Appendix 1 for DWER response to comments on the draft provided on 6/10/2021 2. Proposed amendment conditions referencing the discharge to Yarlarweelor Creek were removed. All other amendments are included in the granted licence.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 5: Summary of licence amendments

Condition no.	Proposed amendments
Premises description	Mining tenements added to extend the prescribed premise to include the Labouchere Pit and pipeline route.
1a, Table 1	Monitoring points amended to add Nathan's Pit and remove Eldorado Pit from the dewatering monitoring points. Eldorado In-Pit TSF bores added as monitoring points
6(a), Table 4	Removal of Tom's In-Pit TSF construction conditions as this TSF construction is complete, include conditions for the construction of Eldorado In-Pit TSF. Include conditions for construction of the dewatering infrastructure between Labouchere Pit and Nathan's Pit and Callies North Pit and Callies South Pit.
Condition 10,	Inclusion of a freeboard requirement on the pits being dewatered to.

Table 6	Inclusion of the details already constructed under Table 4 but integral to emission control during operation. Eldorado In-Pit TSF added to TSF operating conditions
Condition 11, Table 7	Inclusion of Trev's Pit, Starlight Pit, Nathans Pit and Callies South Pit as dewater discharge points. Inclusion of TSF 2, Tom's In-Pit TSF and Eldorado In-Pit TSF as tailings discharge points.
Schedule 1, figures	Maps updated to meet new conditions and renumbered as inconsistent numbering had potential to cause errors in interpreting conditions.

References

1. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines
5. Westgold Group (9 Nov 2021), Request to remove Yarlarweelor Creek from assessment scope, email received (DWERDT525234)

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Condition 1, Table 1	Please add Labouchere pit to the list of pits that mine dewater can be discharged to. Request that monitoring sites in Column 1 to be updated to state: Mine dewatering to Starlight, Callies South, Trevs', Nathans and Labouchere Pit.	The addition of Labouchere as a discharge point was outside of the scope for this application and requires a risk assessment. A new application needs to be submitted to the department to assess additional discharge points. The application form stated: *An amendment to Category 6 is required for three main purposes* *1) Allow dewatering of the Labouchere open pit to ensure safe mining below the groundwater level and provide a water source for dust suppression;* *2) Allow dewatering of the Callies North open pit to ensure safe mining below the groundwater level and provide a water source for dust suppression; and* *3) Reinstate Yarlarweelor Creek as a discharge point to remove surface water that may fill mining voids following an extreme weather event* The assessment of the amendment in regards to Category 6 was restricted to the above requested changes and the information provided, including the further information requested during the assessment period, has been in support of these activities.
	Westgold can confirm that samples will be taken from the receiving pit.	The wording of this section has been amended to reflect that it is the pit lake that is tested.
	Westgold can confirm that we would like dewatering of Nathans Pit to remain on the licence	Noted

Condition	Summary of Licence Holder's comment	Department's response
Condition 6, Table 4 Dewatering pipeline from Labouchere Pit to Nathans Pit	Replace length of pipeline with "Between 8000 m to 9000 m of pipeline" or "Approximately 9000 m of pipeline" as current length is too specific. Is it necessary to list the specific make and model of the pontoon pump? Having a pontoon pump cable of pumping 21 litres per second or 77 cubic metres per hour will ensure compliance. There is no need to list the actual pump make/model.	Agreed. "Approximately 9000m" replaces specific length and 'Equipped with a pontoon pump capable of pumping 21 litres per second or 77 cubic metres per hour' has been used instead of the specific make of pump.
Condition 10, Table 6. Starlight, Callies South, Trev's and Nathans Pit	Westgold request that column 2 text be finalised to state "A freeboard of 1 m from the lowest point of each pit to be maintained at all times".	There has been no supporting information for the setting of this freeboard. Tom's Pit however has the freeboard as including allowance for a 1:100 AEP 72 hour storm and an additional 500mm contingency freeboard. There has been no ability to see the impact of this freeboard measure on the surrounding groundwater height, as the SWL in the Toms Pit bores has not been reported in the Annual Environmental Report as required by licence condition 1, Table 1. A freeboard measure of 1 m from the lowest point of each pit will be included in the licence, the licence holder should note however that compliance of this should be demonstrated whenever required to do so (including after extreme rainfall events) and reporting of the SWL is expected in every AER.
	Westgold request that the Labouchere and Callies North pit be listed in Column 1 so that Column 1 states "Starlight, Callies South, Callies North Trev's, Nathans and Labouchere Pit". Westgold would like the option of sending water between pits, as dewatering requirements may change depending on the final mining schedule.	The addition of Labouchere and Callies North as discharge points requires a further amendment application as insufficient information has been provided to assess the impacts of dewatering to these pits. The application form stated: *An amendment to Category 6 is required for three main purposes* *1) Allow dewatering of the Labouchere open pit to ensure safe mining below the groundwater level and provide a water source for dust suppression;* *2) Allow dewatering of the Callies North open pit to ensure safe mining below the groundwater level and provide a water source for dust suppression; and*
Condition 11, Table 7 Dewater	Westgold request that the Labouchere and Callies North pits be included as discharge points. Westgold would like the option of sending water between pits, as dewatering requirements may change depending on the final mining schedule.	

Condition	Summary of Licence Holder's comment	Department's response
		3) Reinstate Yarlarweelor Creek as a discharge point to remove surface water that may fill mining voids following an extreme weather event The assessment of the amendments was restricted to the above requested changes and the information provided, including the further information requested during the assessment period, has been in support of these activities.
Condition 13 (b)	Westgold would like to request that a 1 in 5 year 72 hour flood event be used as the minimum storm event that triggers the need for discharge to the creek.	The application for amendment requested that the discharge to the Yarlarweelor Creek be allowed and that the discharge was only to be required after an extreme rainfall event. A definition of an extreme rainfall event was not provided in the initial documentation however a report discussing the extreme events considered for this discharge was provided with the response to a request for further information. This report did not provide a clear supporting argument to the request for a 1 in 5 year 72 hour storm event to be considered as an extreme storm event. The report titled 'Potential for water storage, Callies South Pit; and impacts of water discharge from Yarlarweelor Pit after high rainfall events' provided a discussion of impacts of dewatering to Yarlarweelor Creek. The discussion included estimates of the flood volumes in Yarlarweelor Pit for 72 hr rainfall events at recurrence intervals of 10, 20, 50 and 100 years. The impacts of the dewatering during peak flow events appear to be based on the impacts of the dewatering given a 1 in 100 year (48hr) peak flow in Yarlarweelor Creek and the discharge volume of flooding in the Yarlarweelor Pit of a 1 in 100 year (72hr). The more extreme the flooding event the more water needs to be discharge however the discharged water will be more dilute with stormwater, presumedly reducing the contaminants that are above the Freshwater guidelines (ANZG 2018) 99% protection levels. The flooding event will also result in a longer, and more voluminous, streamflow in the creek. These two factors, increased dilution and increased streamflow, are the key mitigating factors in the impacts of discharge to the creek from the pit.

Condition	Summary of Licence Holder's comment	Department's response
		As the parameters of a 1 in 5 year 72 hour event have not been provided the applicant is requested to provide the information required or advise as to whether the discharge to the Yarlarweelor Creek is to be removed from this amendment and included in a future amendment.
Condition 13 (c)	Westgold request that this condition is removed or amended. Westgold will install a pontoon pump to ensure that only surface water is dewatered to the Yarlarweelor Creek and will monitor pit lake levels weekly during active mining to ensure that dewatering activities return the pit lake level to within 1m of the pre-storm event dewatering RL level.	Condition 13 (c) requires that there be no capacity remaining in Trev's Pit, Starlight Pit, Nathan's Pit or Callies South Pit for the discharge to Yarlarweelor Creek to occur. This is to ensure that the discharge to the Yarlarweelor Creek will only occur if there is no capacity in the preferred discharge locations so that discharge to a point that impacts a sensitive receptor (Yarlarweelor Creek) is required to ensure safe working conditions in the pit. The explanation as to why it is to be removed does not address the reason for the condition's presence on the licence. The condition will not be removed.
Condition 13(d)	Westgold requests that this condition be amended to state that "the discharge commences when water is present in the Yarlarweelor Creek as a result of rainfall.	One of the key mitigating factors of the discharge impacts to the Yarlarweelor Creek is that the streamflow during an extreme stormwater event is sufficient to make the discharge a minor increase in volume of water in the creek. The condition that the creek still be flowing as a result of a rainfall event is to remain.
Amendment Report Section 2.2	Westgold requests that a 1 in 5 year 72 hour flood event be used as the minimum storm event that triggers the need for discharge to the creek	Response to this has been addressed in the response to requested changes to Condition 13(b)
Amendment Report Section 3.1 Table 1	1. Westgold can confirm that the volume of water discharged into a pit is recorded as well as the volume of water abstracted from a pit. Abstracted pit water is recorded using flow meters. The volume of water discharged into a pit is measured via survey pick up. 2. To prevent overtopping a freeboard of 1 metre from the lowest point of each pit will be maintained at all times.	1. This is noted. The licence holder should be aware that the volume that the Category 6 is based on is the volume being discharged. It is in the licence holder's best interest that this is recorded accurately as it is expected to be less than the volume extracted when the use of the water for processing of ore or dust suppression is taken into account. 2. Response to this has been addressed in response to details provided for Condition 10, Table 6.

Condition	Summary of Licence Holder's comment	Department's response
Request for the additional discharge sources during 21 day comment period on draft.	A request was made to include the future dewatering of Regent-Messiah Pit to the licence as a dewatering discharge point.	This is outside the scope of this amendment and the licence holder is advised to submit a further amendment application with this as a proposed dewatering discharge point.

Appendix 2: Application validation summary

<table>
<tr><th colspan="6">SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)</th></tr>
<tr><td colspan="6">Application type</td></tr>
<tr><td rowspan="2">Amendment to licence</td><td rowspan="2">☒</td><td>Current licence number:</td><td colspan="3">L8103/1989/3</td></tr>
<tr><td>Relevant works approval number:</td><td></td><td>N/A</td><td>☒</td></tr>
<tr><td colspan="2">Date application received</td><td colspan="4">6 April 2021</td></tr>
<tr><td colspan="6">Applicant and Premises details</td></tr>
<tr><td colspan="2">Applicant name/s (full legal name/s)</td><td colspan="4">Aragon Resources</td></tr>
<tr><td colspan="2">Premises name</td><td colspan="4">Fortnum Mine</td></tr>
<tr><td colspan="2">Premises location</td><td colspan="4">M52/6, M52/95, M52/96, M52/98, M52/99, M52/132, M52/133, L52/172, M52/5, M52/125</td></tr>
<tr><td colspan="2">Local Government Authority</td><td colspan="4">Shire of Meekatharra</td></tr>
<tr><td colspan="6">Application documents</td></tr>
<tr><td colspan="2">HPCM file reference number:</td><td colspan="4">2013/00965-1~6</td></tr>
<tr><td colspan="2">Key application documents (additional to application form):</td><td colspan="4">• Supporting documentation (report), March 2021
• Hydrogeological assessment of Eldorado Pit (Planned TSF), Jan 2021
• Eldorado Pit TSF design, March 2021
• Fortnum Material Characterisation Report, July 2020
• Westgold Response to Schedule 1 Queries (5 July 2021) – includes:
▪ Rockwater (2021) Potential for water storage, Callies South Pit; and Impacts of water discharge from Yarlarweelor Pit after high rainfall events.</td></tr>
<tr><td colspan="6">Scope of application/assessment</td></tr>
<tr><td colspan="2">Summary of proposed activities or changes to existing operations.</td><td colspan="4">Licence amendment
Category 5
• No change to the design capacity is proposed.
• Proposed discharge of tailings from the existing processing plant to Eldorado pit (proposed new in-pit TSF). New capacity is required as Toms in-pit TSF reaches capacity.
• Eldorado pit will have a storage capacity of approximately 619,727 tonnes. Discharge to Eldorado pit will commence expected to commence in October/November over a period of approximately 9 months.
Category 6
No change to the production/design capacity is proposed.
• Mine dewater discharge to Nathan’s pit as a result of dewatering Labouchere pit.
• Addition of tenements M52/125, M52/5, L52/172 to include Labouchere Pit and associated dewatering infrastructure.
• Mine dewater discharge to Callie’s South pit as a result of</td></tr>
</table>

	dewatering Callie's North pit. • Discharge of mine dewater / surface water runoff to Yarlarweelor Creek. Following large/extreme rain events water from active/planned mine pits will be discharged to Yarlarweelor Creek as a contingency measure. • The new Category 6 activities are scheduled to commence in October/November 2021 for a period of approximately 5 years.

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic or non-metallic ore	1,100,000 tpa	N/A
Category 6: Mine dewatering	3,137,253 tpa	N/A

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	Referral decision No: Managed under Part V ☐ Assessed under Part IV ☐
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Mining lease / tenement ☒ Expiry: M52/125 – 29/12/2030 M52/5 – 19/04/2025 L52/172 – 26/04/2038
Has the applicant obtained all relevant planning approvals?	Yes ☐ No ☐ N/A ☒	If N/A explain why? Mining tenure
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☒ No ☐	Applicant notes they hold NVCP CPS 6837/2 and CPS7469/2. Clearing is to be regulated by DMIRS
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.

Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☒ No ☐	Licence/permit No: GWL159877(11) Licence issued May 2021 includes draw of 3.7GL from tenements including M52/5 and M52/132 (location of Labouchere / Callies pits) for mine dewatering..
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☒ No ☐	Name: East Murchison Type: Proclaimed Groundwater Area/ Name: Gascoyne River and Tributaries Type: Surface Water Area Has Regulatory Services (Water) been consulted? Yes ☒ No ☐ N/A ☐ Regional office: Mid-West Gascoyne
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes ☐ No ☐ N/A ☐
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	Mining Act 1978 RIWI Act 1914
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☐ No ☒	Classification: N/A Date of classification: N/A

Appendix 3: Detailed risk assessment: Impacts to groundwater from discharge of tailings to Eldorado In-Pit TSF

Summary

As the existing approved Tom's in-pit TSF reaches capacity, the Licence Holder requires additional tailings discharge management. Tailings from the existing processing plant will be discharged to the mined Eldorado pit. The characteristics of the tailings are not altered from those discharged to Tom's In-Pit TSF.

Eldorado pit is located approximately 500m south-east of the processing plant and 400m south-west of Tom's in-pit TSF. Eldorado pit covers an area of approximately 3.7 hectares and has a maximum depth of approximately 47 mbgl (pit rim level is approximately 502 m AHD). It was, until recently used as a discharge point for dewatering for the Fortnum Gold Mine operations however, in preparation for the discharge of tailings, Eldorado Pit is to be dewatered to Callies South Pit with a minimal volume of 10,000 kL to remain in the pit prior to tailings discharge. As a result of receiving tailings Eldorado Pit will not be used for dewatering in the future and is to be removed from the dewatering network as a discharge point.

Whilst being used as a discharge point for dewater the seepage from Eldorado Pit was estimated to be approximately 350 m^3/day. This is expected to be reduced by the discharged tailings material sealing the higher areas of permeability that the discharge will cover. This reduction has not been accurately estimated however and ongoing assessment after discharge to the pit is expected.

Approximately 619,727 tonnes (442,662 m^3) of tailings will be deposited into Eldorado Pit, over approximately 9 months. The slurry density will be 44% solids by mass. The geochemical characterization has found it to be non-acid forming and leachate testing found that all metals were within the ANZECC (2000) livestock drinking water limits. The ANZECC (2000) livestock drinking water limits were considered an appropriate assessment criterion for the potential impact on groundwater quality in the area when setting the current limits on the operating licence.

Tailings delivery and decant return will be via pipelines connected to the current pipelines servicing the Toms In-Pit TSF. The discharge into the pit will be via two spigots to the north and south ends with a central floating decant (Figures 1 - 3).

Tailings will be deposited over approximately 9 months.

Risk assessment

Given the Eldorado Pit is estimated to seep at approximately 350 m^3/day when clean dewatering is discharged to it, the likelihood of seepage of leachate to the groundwater has been assessed as **likely**. The consequence rating has been assessed as **moderate**, that is off site impacts to the groundwater as a result of the discharge are likely to be low scale**.** The level of risk is therefore assessed as **high** by the Department. This level of risk is consistent with the assessment of risk of the other TSFs present in the vicinity of the Fortnum Gold Mine processing plant and as managed through the licence conditions on L8103/1989/1.

Regulatory Controls

The conditions present on the licence are sufficient for management of the construction and operation of Eldorado In-Pit TSF. The following amendments are made to these conditions:

- Eldorado In-Pit monitoring bores are included in the monitoring schedule detailed in Table 1 of condition 1a).
- Table 4 is amended to add the details required for construction of the Eldorado In-Pit TSF.
- Table 6 is amended to include Eldorado Pit in the Operational conditions for In-Pit TSFs.

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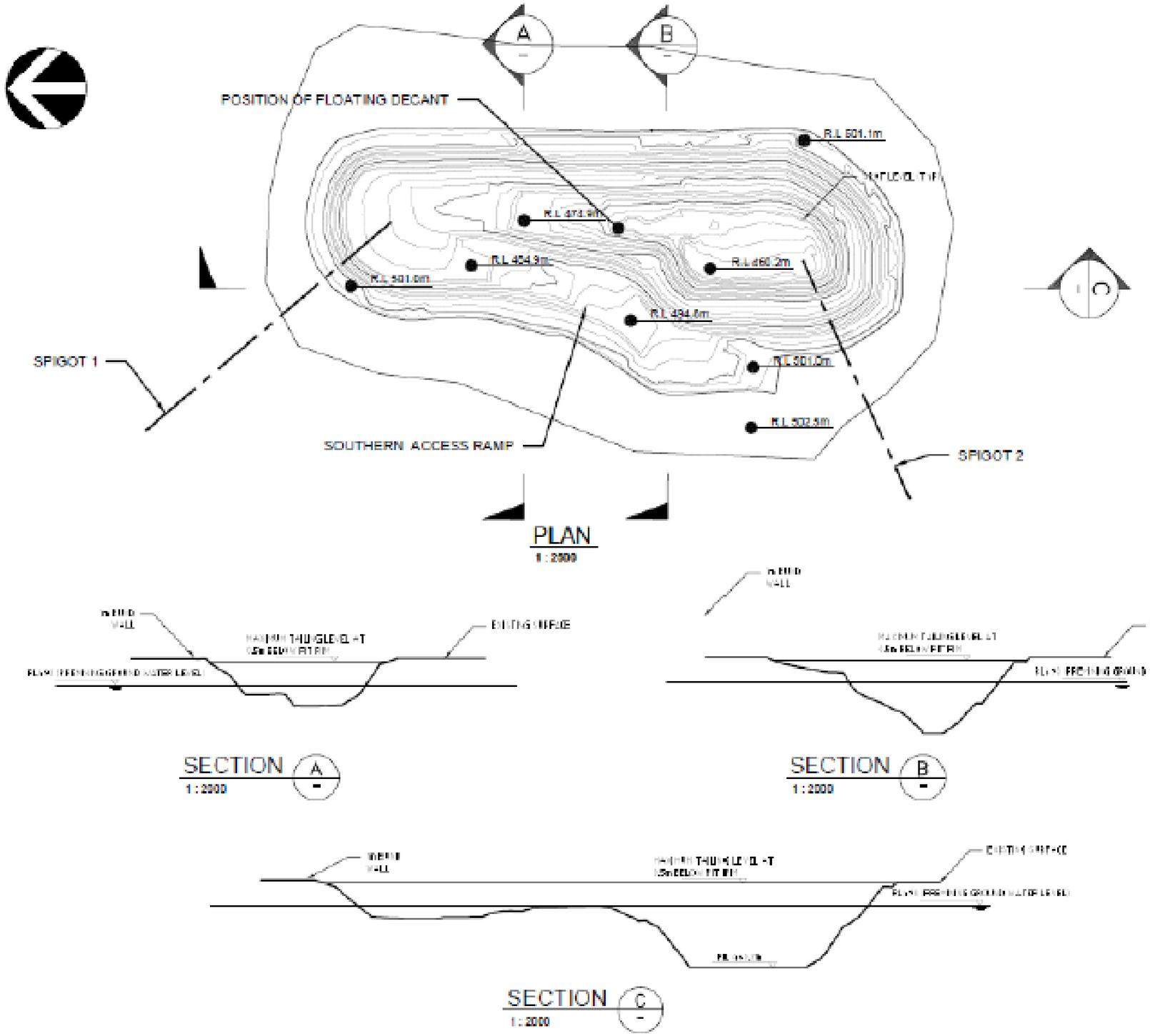
A
B
C
POSITION OF FLOATING DECANT
R.L 501.1m
R.L 494.9m
R.L 494.3m
R.L 501.0m
R.L 494.6m
R.L 501.0m
R.L 502.5m
SPIGOT 1
SPIGOT 2
SOUTHERN ACCESS RAMP
PLAN
1 : 2000
SECTION A
1 : 2000
SECTION B
1 : 2000
SECTION C
1 : 2000

Figure 4: Plan of Eldorado In-Pit TSF

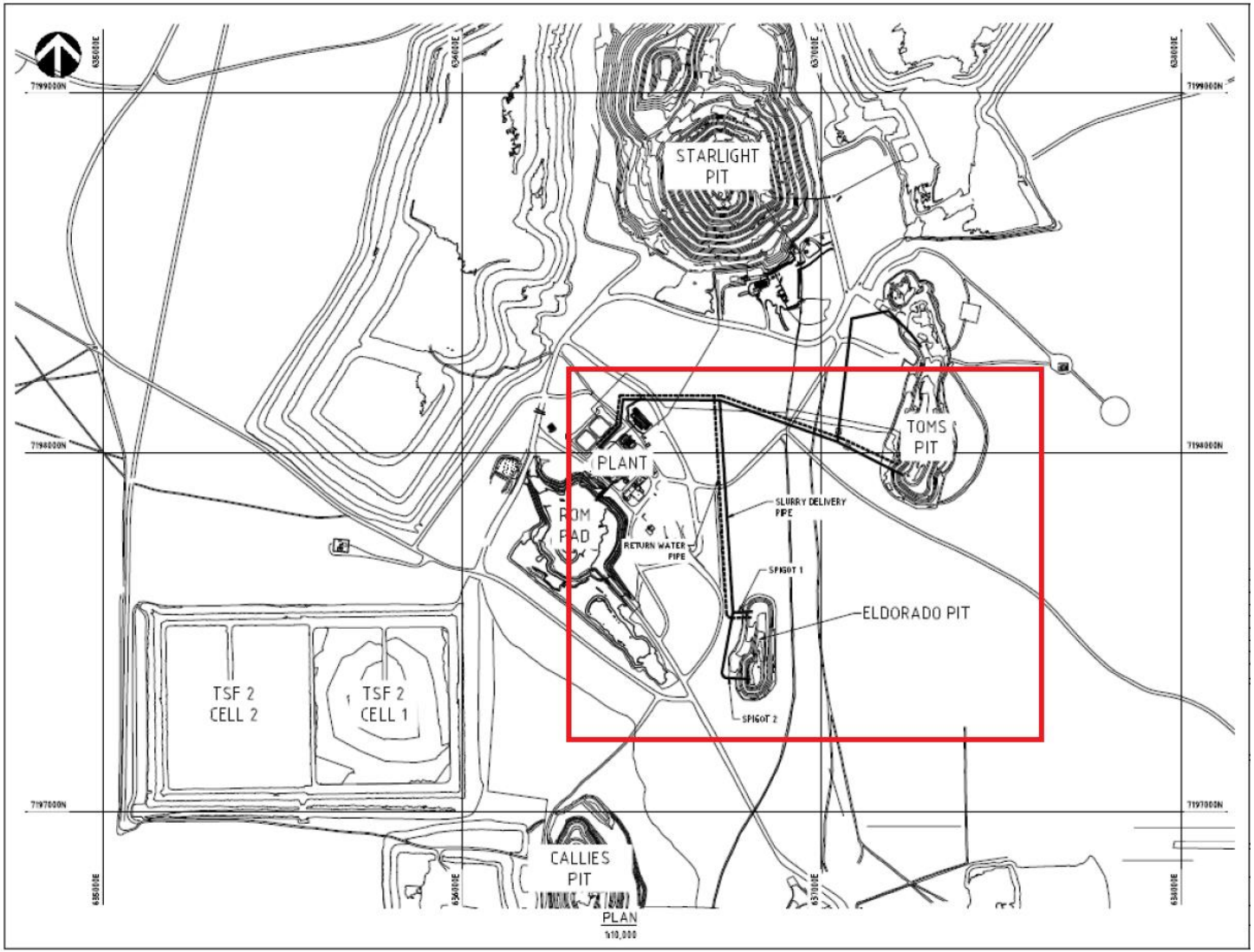

Figure 5: Location of tailings slurry pipeline and spigot points

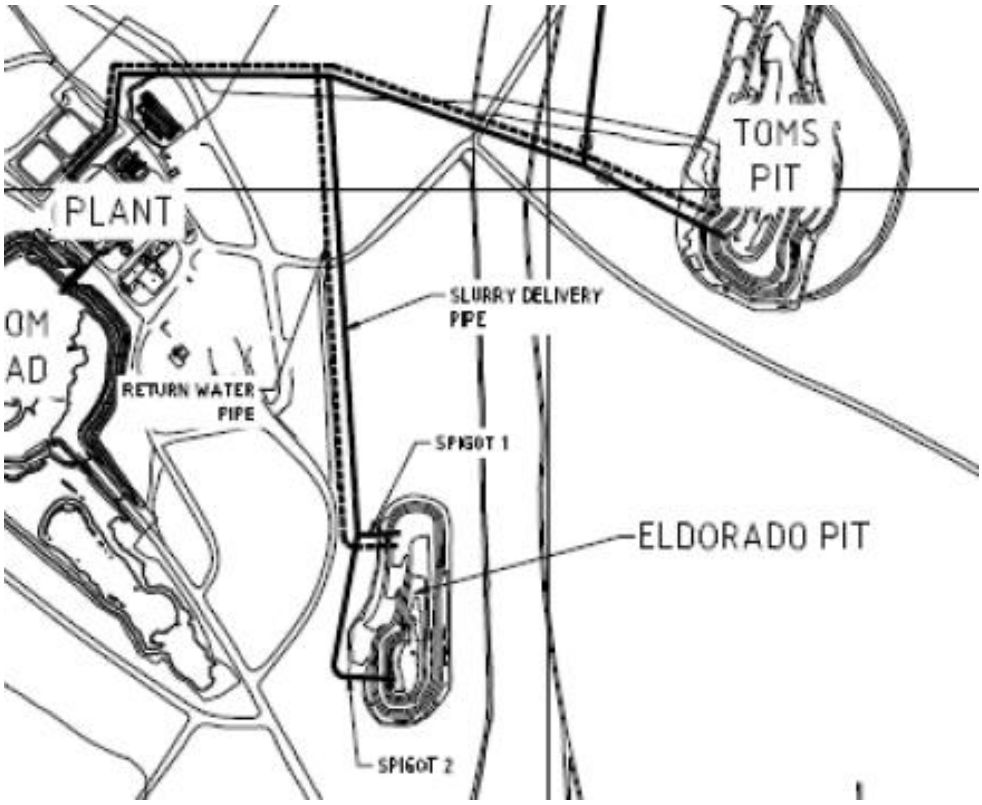

Figure 6: Enlarged pipeline positioning

Hydrogeology

Rocks at Fortnum are generally of very low hydraulic conductivity. Pressure injection tests in six geotechnical drillholes to 40 m depth by Coffey & Partners (1989) at the tailings dam No.2 site indicated very low hydraulic conductivities ranging from 1 x 10^{-8} to 1 x 10^{-6} m/s for fine grained siltstones and greywacke. However, the jasperoid units in Yarlarweelor deposit were described as very transmissive.

The groundwater level at Eldorado pit prior to mining was about 490 m AHD (10 to 16 m deep). Groundwater and pit-lake levels in September 2020 indicate that a groundwater mound has been formed at about 490 m AHD around Eldorado and Toms pits as a result of water storage and tailings placement, respectively. This causes groundwater to flow both to the north towards Trevs pit and Starlight underground, and to the south towards Callies and Yarlarweelor pits, all of which are groundwater sinks/discharge points.

The design report for Eldorado In-Pit TSF advises that the seepage from the pit during deposition will be drawn towards pits to the north and south which should remain as permanent groundwater sinks. The hydrogeological report for the Eldorado Pit estimates the seepage rate from the pit should be significantly less than 350 m^3/day, the seepage rate of clean water (dewatering from Starlight underground) from the pit as estimated in 2020.

Groundwater samples from all five recommended monitoring bores were collected and sent for laboratory analysis with all existing licence parameters tested. The results indicate that:

- Eldorado 3 (E3) and Eldorado 4 (E4) exceed NPGU (non-potable groundwater usage, DoH 2014) chloride limits;
- All bores exceed ANZG (Australian and New Zealand guidelines for fresh water) boron limits;
- E1 and E4 exceed copper NPGU limits;
- E2 exceeds ANZG chromium limits (when hardness algorithm used);
- All bores exceed ANZG hexavalent chromium limits;
- No ANZECC livestock (Australian and New Zealand guidelines for drinking water for

livestock), or existing licence limits (L8103/1989/3) are exceeded at any of the five monitoring bores;
- TDS ranges from 720 to 1000 mg/L across the monitoring bores sampled;
- pH ranges from 7.8 to 7.9;
- Conductivity ranges from 1200 to 1700 µS/cm; and
- 10 of the 16 metals analysed (62.5%) occur at levels below detection limits

Tailings characterisation

When preparing for in pit disposal of tailings in 2018 Westgold (2018) completed tailings geochemical characterisation studies. Studies were again undertaken by Westgold in 2020 to confirm findings using recently deposited tailings material.

The focus of the geochemical test work was on determining the tailings potential for generation of Acid Mine Drainage (AMD) and associated metal leaching. The AMD potential was determined using static acid-base accounting and Net Acid Generation (NAG) testing.

Key test results and analysis of tailings have indicated that:

- Total Sulphur content ranged from 0.04 to 0.68% with a median of 0.22%;
- Acid Neutralising Capacity (ANC) ranged from 1.6 to 69 kg H_2SO_4, indicating that tailings has buffering capacity;
- NAPP values were negative, indicating that tailings have sufficient buffering capacity to neutralise any acid production;
- Net Acid Generation pH (NAG pH) test results indicated that under strongly-oxidising conditions of NAG-test work, samples did not acidify;
- Total metal analysis (on the global abundance index) revealed mercury, bismuth, molybdenum and selenium to be significantly enriched;
- Total metal analysis identified chromium, iron, arsenic, cobalt, copper and lead to be slightly enriched;
- Leach testing results showed all metals to be below ANZECC (2000) livestock drinking water limits;
- When compared to National Environmental Protection Measure (NEPM) limits, only copper exceeds the Ecological Investigation Limit (EIL) but not the Health-based Investigation Limit (HIL);
- Results of the qualitative risk assessment indicate that, provided adequate design and management practices are adhered to during construction, operation and closure, geochemical attributes of tailings from Fortnum ores pose a low level of risk to the following potential receptors in the vicinity of the project:
    - Groundwater quality and beneficial users of groundwater;
    - Human health in relation to TSF flood overflow or wind deposited tailings;
    - Flora and fauna health in relation to TSF flood overflow or wind deposited tailings; and
    - Vegetation established upon the rehabilitated TSF.

Table 6: Leachate total metals: Tailings

Sample	T1L1	T2L1	T2L2	T2L3	TSF01	TSF02	TSF03	TSF04	TSF05	TSF06
HCO3	21	25	26	42						
CO3	<5	<5	<5	<5						
SO4	35	9	5	21						
Cl	7	2	3	4						
pH	9.4	9.7	9.6	9.6	5.6	5.5	5.3	5.3	5.3	5.3
EC	150	73	57	110	6300	6300	5900	5900	5800	6000
Sb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ca	9.9	2.8	3.9	4.9						
Cr	<0.005	0.009	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
As	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cd	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Co	<0.01	<0.01	<0.01	<0.01	0.04	0.03	0.07	0.08	0.06	0.03
Cu	<0.005	<0.005	<0.005	<0.005	0.027	0.065	0.03	0.053	0.055	0.019
Mn	<0.005	0.028	0.062	0.021	26	25	26	21		
Mg	2.4	0.5	0.6	1.5						
Ni	<0.005	<0.005	<0.005	<0.005	0.008	0.008	0.015	0.012	0.011	0.011
Pb	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Se	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Zn	0.10	0.07	0.05	0.02	0.50	0.63	0.52	0.61	0.27	0.33
B	0.07	0.16	0.16	0.12	0.22	0.29	0.23	0.29	0.27	0.33
Hg	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00001	<0.00001
K	1.3	0.6	0.4	0.9						
Na	12	6.9	3.7	8.6						