Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 4

Licence Number	L4496/1988/11
Licence Holder	Big Bell Gold Operations Pty Ltd
ACN	090 642 809
File Number:	2010/003418-1
Premises	Blue Bird Gold Mine Mining Tenements; G51/9, L20/75, L51/18, L51/78, M20/12, M20/45, M20/68, M20/70, M20/71, M20/73, M20/77, M20/107, M20/214, M20/219, M20/249, M20/421, M51/6, M51/12, M51/31, M51/33, M51/35, M51/39, M51/62, M51/75, M51/92, M51/96, M51/132, M51/190, M51/199, M51/200, M51/203, M51/209; M51/211, M51/233, M51/236, M51/237, M51/254, M51/321, M51/393, M51/437, M51/438, M51/439, M51/440,M51/455 M51/459, M51/462, M51/463, M51/483, M51/485, M51/486, M51/491, M51/492, M51/493, M51/494, M51/495, M51/523, M51/539, M51/569, M51/572, M51/581, M51/564, M51/666, M51/671, M51/672, M51/757, M51/762, M51/781; M51/784, M51/788, M51/793, M51/794, M51/795, M51/800, M51/801, M51/820, M51/824, M51/834; E51/1484 MEEKATHARRA WA 6642
Date of Amendment	24 July 2019

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Alana Kidd

Digitally signed by Alana Kidd
Date: 2019.07.24 11:12:43 +08'00'

Alana Kidd

MANAGER, RESOURCES INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Definitions and interpretation

Definitions

In this Amendment Notice, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
AER	Annual Environment Report
ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Paper No. 4, Volume 3) Primary Industries – Rationale and Background Information (available at http://www.waterquality.gov.au).
Amendment Notice	refers to this document
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 10 JOONDALUP DC WA 6919 info@dwer.wa.gov.au
DBCA	Department of Biodiversity, Conservation and Attractions
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this amendment
Licence Holder Licensee	Big Bell Gold Operations Pty Ltd

m^3	cubic metres
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Notice applies, as specified at the front of this Amendment Notice.
Risk Event	as described in *Guidance Statement: Risk Assessment*
TDS	means total dissolved solids
tpa	means tonnes per annum

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only for an amendment to include the dewatering of the Boomerang, Kurara and Kurara Central pit voids, the inclusion of an additional tyre disposal location within the Paddy's Flat Project Area, and the addition of two new mining tenements. No changes to any other aspects of the licence have been requested by the Licence Holder.

The following guidance statements have informed the decision made on this amendment

- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment background

The Licence Holder operates the Bluebird Gold Mine (Premises) through Licence L4496/1988/11. The Premises is located in a 60 km stretch along the Great Northern Highway, with the processing facilities and tailings storage facilities located 12 km south of Meekatharra.

The processing facility at the Premises is a traditional crush-grind carbon-in-leach (CIL) circuit. Chemicals associated with the processing operations include cyanide, hydrochloric acid, sodium hydroxide (caustic) and lime.

Tailings produced at the Premises are currently deposited into the Bassett's West In-pit TSF and the Bluebird East in-pit TSF.

Table 2 below presents the prescribed activities at the Premises.

Table 2: Prescribed activities at the Premises

Category	Current throughput capacity	Current throughput capacity	Proposed throughput capacity
5	Processing or beneficiation of metallic or non-metallic ore	2,500,000 tonnes per annual period	2,500,000 tonnes per annual period
6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore	3,056,000 tonnes per annual period	5,823,000 tonnes per annual period
85	Sewage facility	99 cubic metres per day	99 cubic metres per day
63	Class I inert landfill site	500 tonnes per annual period	3000 tonnes per annual period

Amendment Description

The Licence Holder submitted an application to amend Licence L4496/1988/11 on 14 January 2019. The Licence Holder's proposed changes are described below.

Category 6 – Dewatering of the Kurara and Boomerang Open Cut pits and the Boomerang Underground mine workings

The Licence Holder proposes to mine the northern region of the Reedy's Project area which is known as the Boomerang resource. To allow access to the previously mined Boomerang/Kurara gold deposits to facilitate further resource analysis, the Licence Holder proposes to dewater

three pit voids (Boomerang, Kurara and Kurara Central) with the dewatered effluent to be discharged to Lake Annean located 5.5 km away (see Figure 1).

The Licence Holder estimates a total of 2,767,000 kilolitres (kL) of dewatering effluent will require abstraction from the pits, and at an estimated flow rate of 120 – 160 litres per second (L/s), the dewatering program is expected to take up to 364 days to complete.

At the completion of the dewatering program, the Licence Holder will undertake drilling and mine development which will enable further resource development and if successful, the Licence Holder proposes to apply for additional approvals to re-commence mining operations in this area.

The Licence Holder proposes the use of a single pass In Pit (diesel or electric) pontoon pump to simplify circuit and increase pump efficiency. Telemetry will be installed along the pipeline path to detect leaks. The Licence Holder proposes to lay the dewatering pipework within existing pipeline transport corridors which have been previously cleared and are highly disturbed. The pipeline will be placed within a 'v drain' to limit movement. Monitoring will include visual inspection of pipes, other infrastructure and the vegetation near to the proposed pipeline route once per 12 hour shift.

The dewatering discharge outlet will be located within the playa of Lake Annean, avoiding the lake edges and surrounding creek lines, to minimise impacts on riparian vegetation, shallow and fringing habitats, and potential drought refuge areas for biota. The dewatering discharge outlet will have multiple outlet holes cut in to the side of the pipe to allow a diffuse flow out of the pipe which will assist in minimising scouring or erosion of the lake bed.

The discharge of dewatering effluent to Lake Annean has occurred on a number of occasions from the dewatering of pit lakes and underground workings at the Premises. The most recent was the dewatering of the Aladdin pit lake at the Premises which was approved on 23 May 2017 through an amendment to the Licence. The amendment allowed for the discharge of 273,780 kilolitres (kL) to Lake Annean, however the discharge point is located approximately 11 km away in a NNE direction from the proposed discharge point in this amendment, and therefore there is no interaction between the two discharge outlets into Lake Annean. The previous dewatering discharge to Lake Annean commenced in June 2017. The dewatering of the Aladdin pit lake has now been completed, with only an ongoing dewatering rate of 5,000 tonnes a month (60,000 tpa) occurring to facility mining of the pit. This dewatered effluent is still discharged to the Aladdin discharge point as described in the Licence.

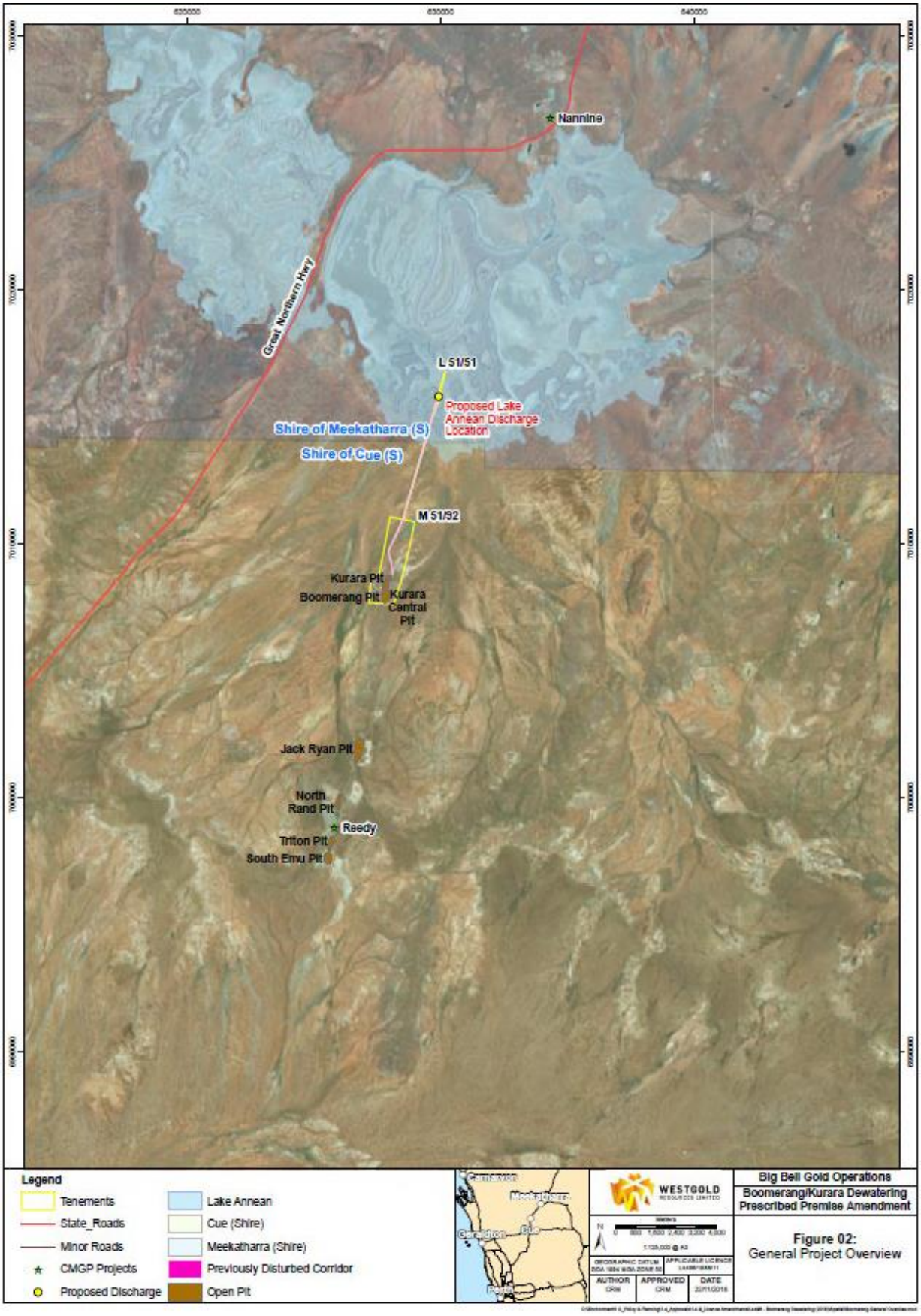


Figure 1: Boomerang, Kurara and Kurara Central Open pit dewatering to Lake Annean

Category 63 – Additional Tyre Disposal area

The Existing Licence currently allows for the burial of used tyres in locations set out in Schedule 1 of the licence. The Licence Holder is seeking approval to add an additional new tyre burial location within the Paddys Flat Project Area at the Premises.

The location of the new tyre burial location is shown in Schedule 1 of the amended licence.

Management of this new area will replicate the current used tyre storage and disposal practises at the premises.

Premises boundary

As part of this amendment application the Licence Holder is seeking to add the following mining tenements to the prescribed premises boundary; L51/51 and M51/92.

Mining tenement M51/92 has already been included as part of the Premises boundary description at the time of the last Licence amendment dated 11 December 2018. Mining tenement L51/51 is included as part of this Licence amendment.

Amendment history

Table 3 provides the amendment history for L4496/1988/11.

Table 3: Licence amendments

Instrument	Issued	Amendment
L4496/1988/11	21/01/2016	Dewatering of the Reedy mining area with discharge to Lake Annean (Category 6) and a new Class I landfill (Category 63)
L4496/1988/11	12/05/2016	Include Bluebird East as an Inpit tailings storage area
L4496/1988/11	23/05/2017	Amendment Notice 1 to include dewatering of the pit lake and groundwater at the Aladdin Pit with the dewatering effluent being discharged to Lake Annean, and the inclusion of additional mining tenements to the Premises description to identify the additional prescribed activities.
L4496/1988/11	28/03/2018	Amendment Notice 2 to include the Surprise Pit as an in-pit tailings storage facility, construction of a new Class II landfill to replace the existing landfill and dewater the Five Mile Well pit.
L4496/1988/11	11/12/2018	Amendment Notice 3 – amend to include the construction of two new landfills, additional Tyre disposal areas, addition of new mining tenements to the Premises description and the removal of surrendered tenements.
L4496/1988/11	24/07/2019	Amendment Notice 4 – this amendment

Location and receptors

Table 4 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 4: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Meekatharra Town	47 km from the Boomerang/Kurara Dewatering Project. Additional tyre disposal area at Paddy's Flat Landfill is approximately 1.5 km away from the Town.
Great Northern Highway (Highway) Major inland highway frequently used by tourists, local mining companies and for transportation of goods and services.	The upper reaches of the ponding on the lake surface (at the highest pumping rate) are expected to be within approximately 400 m of the Highway. Additional tyre disposal area at Paddy's Flat Landfill is approximately 1.2km away from the Highway.

Table 5 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 5: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Surface water	Lake Annean is a large inland salt lake system located in the Mid-West region of Western Australia. Lake Annean is listed as an Environmentally Sensitive Area (ESA) and is listed as a Directory of Important Wetlands in Australia because it supports foraging and breeding habitat for a high number of the migratory, marine and waterbirds after periods of inundation. The lake covers an area of 120 km^2 and is situated about 40 kilometres southwest of Meekatharra. See Risk Event 1 below for further details.
Groundwater	Groundwater depth varies across the premises. In some areas it is 6 to 18 metres below ground level (mbgl) (DWER WIR GIS database) and in others 20-60 mbgl. According to the Groundwater Dependent Ecosystem (GDE) Atlas managed by the Bureau of Meteorology, Lake Annean is considered to be an ecosystem that relies on the surface expression of groundwater. Groundwater in this area is considered hypersaline due to the high salinity of the lake surface.
Vegetation	The lake bed of Lake Annean is devoid of native vegetation, including samphire vegetation (common salt tolerate species that occurs in salt lakes). The samphire communities occurring along the margins and along the small rises within Lake Annean are considered to be groundwater dependent ecosystems. A Level 1 Flora and Fauna assessment over a portion of the Lake Annean area (Study Area) was conducted in September 2015, with the outcomes of that assessment used to assess the risks associated with the previous discharge to Lake Annean in 2017 by the Licence Holder. A total of 29 non-systematic flora sampling points were sampled throughout the Study Area. The flora diversity recorded from the Study Area was considered to be representative of salt lake ecosystems in the Murchison bioregion. The lower portion of the previous Flora assessment undertaken in 2015 captures the upper area of Lake Annean which is expected to be influenced

	from the dewatering discharge in this Licence amendment. The results of the survey are typical within salt lake systems of this region, with salt tolerant species *Tecticornia* and *Maireana* dominant across the landscape. The areas adjacent to Lake Annean are consistent with the flora of the Murchison bioregion, with Mulga (*Acacia aneura* and related species) and member of the *Fabaceae* family (Acacia and Senna) mid-story over herbs and grasses. No Threatened Flora species or Priority Flora species were recorded during the on-ground 2015 survey. Database searches at that time identified 41 flora taxa of conservation significance as potentially occurring in the Study Area, none of which were threatened flora. DWER's Threatened and Priority Flora GIS database indicates no threatened flora species or priority species have been recorded within the premises boundary area.
Fauna	No conservation significant fauna were recorded during the 2015 survey. However, seven species of conservation significance are considered likely or possible to occur on the basis of habitat present in the Study Area and the location of previous records. Two fauna considered 'Likely' to occur in the Study Area comprised: • Rainbow Bee-eater (*Merops ornatus*), which is listed as Migratory (EPBC Act) and Schedule 3 (WC Act); and • *Lerista eupoda*, which is listed as Priority 1 Fauna (DBCA). Five fauna considered 'Possible' to occur in the Study Area comprised: • Fork-tailed Swift (*Apus pacificus*), Eastern Great Egret (*Ardea modesta*), Glossy Ibis (*Plegadis falcinellus*), which are listed as Migratory (EPBC Act) and Schedule 3 (WC Act); • Grey Falcon (*Falco hypoleucos*), which is listed as Schedule 1 (WC Act); and • Peregrine Falcon (*Falco peregrinus*), which is listed as Schedule 4 (WC Act). However these broad fauna habitats were not considered regionally significant to vertebrate fauna as they are all widespread, well-connected and typical of this region.

Risk assessment

Tables 6 and 7 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 6: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Category 63 Class I Inert landfill	Earthworks and construction of new tyre burial location	Dust	Additional tyre disposal area at Paddy's Flat Landfill is approximately 1.2km away from the Highway.	Air / wind dispersion	Amenity	Slight	Unlikely	Low	No receptor present. Minor fugitive dust is likely to be generated from light vehicle movements and during earthworks. A water cart will be used when required. The distance to sensitive receptors is considered to be too great for dust impacts from construction of the landfill to occur. Any potential dust emissions can be regulated by section 49 of the EP Act.
		Noise							No receptor present Construction works are minimal. The distance to the nearest receptors is considered to be too great for noise impacts from construction to occur. The provisions of the *Environmental Protection (Noise) Regulations 1997* are applicable.
Category 6 Dewatering	Construction of dewatering infrastructure	Dust	Surrounding native vegetation along the pipeline corridor	Air / wind dispersion	Decline in health of vegetation due to smoothing	Slight	Rare	Low	Minor fugitive dust is likely to be generated from light vehicle movements during installation of dewatering pipelines. Fugitive dust emissions generated during construction activities including traffic movements can impact on the health of vegetation. However, this risk is considered low due to the vegetation in this area being highly degraded as a result of mining and historical grazing activities, short construction period, and the use of a water cart when required.

									No additional regulatory controls are required to mitigate this risk. Any potential dust emissions can be regulated by section 49 of the EP Act.
		Noise	No nearby receptors		No impacts expected	Not applicable	Not applicable	Not applicable	No receptor present. No additional regulatory controls are required to mitigate this risk. The provisions of the *Environmental Protection (Noise) Regulations 1997* are applicable.

Table 7: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Category 63 Class I Inert landfill	Acceptance of used tyres for burial at a new location at Paddy Flat Landfill area	Dust: Earthmoving activities when used tyres are covered and dust lift off from cover stockpiles and from vehicle movements on unsealed roads	Tyre disposal area is approximately 1.2km away from the Highway. Nearby vegetation	Air / wind dispersion	Amenity Decline in health of vegetation due to smoothing	Slight	Possible	Low	Earthmoving activities for burial of used tyres and vehicle movement will occur in short intervals minimizing emissions. The Licence Holder has stated that a water cart will also be used to suppress dust as required. The surrounding vegetation is highly degraded due to historical mining and grazing activities. Dust emissions from the burial of used tyres are expected to be minimal, and due to the highly degraded surrounding vegetation and the distance to the highway considered too far, the risks associated with dust emissions impacting the environment has been determined to be 'low'.

		Noise: Operation of earthmoving equipment and movement of vehicles	Tyre disposal area is approximately 1.2km away from the Highway.	Air / wind dispersion	Amenity	Slight	Rare	Low	Operation of earthmoving equipment and vehicle movement activities will occur on an intermittent basis and will occur within a large mining operation. The risk of noise emissions generated from landfilling activities impacting the offsite environment is considered to be low. No additional regulatory controls are required to mitigate this risk. The provisions of the *Environmental Protection (Noise) Regulations 1997* are applicable.
Category 6 **Dewatering**	Discharge of dewatering effluent into Lake Annean	Discharge of mine dewatering effluent to surface water	Lake and riparian ecosystems Groundwater	Direct discharge Seepage	Disruption of normal ecosystem function Impacts to riparian vegetation Eutrophication Contamination of local groundwater Scouring of lake bed	Minor	Unlikely	Medium	1. Refer to detailed risk assessment (Risk Event 1) below.
	Dewatering pipeline rupture	Discharge of mine dewatering effluent to land	Vegetation Soils Groundwater	Direct discharge to soils Seepage through soils to groundwater	Contamination of surrounding land and groundwater with hypersaline water affecting soil and groundwater quality and causing vegetation stress or death.	Minor	Possible	Medium	The Licence Holder has committed to: - installing the pipeline within a previously cleared transport corridor; - conducting 12 hourly inspections of the pipeline, including other infrastructure and vegetation near the pipeline; - installing telemetry systems and pressure sensors along the pipeline

									to detect leaks and pipeline failures; and - locating the pipeline within a v-notch drain to limit movement. The location, alignment and gradient of the previously cleared pipeline corridor will assist in minimising the discharge of dewatering effluent to the environment through pipeline failure. The vegetation near the pipeline corridor has previously been cleared or is highly degraded. Existing licence conditions require routine monitoring of the pipeline and the pipelines are to be fitted with automatic cut-outs, secondary containment or telemetry systems and pressure sensors to detect leaks and failures.

Detailed Risk Assessment

1. Risk Event: Discharge of dewatering effluent into Lake Annean

Description of Risk Event

The discharge of approximately 2,767,000 tonnes per year of highly saline dewatering effluent to Lake Annean over a 12 month period.

Identification and general characterisation of emission

The quality of the water contained within the Boomerang, Kurara and Kurara Central pit voids is presented in Table 8 below.

Table 8: Boomerang, Kurara and Kurara Central Water Quality Data

Parameter	Units	Boomerang	Kurara	Kurara Central	Lake Annean
Tenement		M51/92	M51/92	M51/92	Various
Date Range		1999-2018	2011-2018	2017 - 2018	2013-2016
Depth	m	110	75	48	NA
Mining		No	No	No	NA
Water type		Na-Cl	Na-Cl	Na-Cl	Na-Cl
pH	pH units	7.4-7.7	7.8-8.2	7.7	8.1
EC	mg/L	190000-287200	130000-256400	190000	160000-190000
TDS	mg/L	71280-200000	110000-160000	230000	150000-170000
Alkalinity	mg $CaCO_3$/L	150-160	170-280	160–210	210-230
Aluminum (mg/L)	mg/L	0.24	0.05-1.4	<0.5	<0.5
Arsenic (As)	mg/L	0.05	0.001	<0.1	<0.4-<0.5
Bicarbonate (HCO3)	mg/L	90-210	170-340	200–250	260-290
Cadmium (Cd)	mg/L	0.012-0.017	0.004-0.006	<0.01	<0.01-<0.02
Calcium (Ca)	mg/L	385-710	490-660	510-530	930-1200
Carbonate (CO3)	mg/L	<1	11-36	<5	<1
Chloride (Cl)	mg/L	78800-110000	58000-75000	99000 – 120000	84000-110000
Chromium (Cr)	mg/L	0.017	0.009-0.063	<0.1	<0.1
Cobalt (Co)	mg/L	0.02	0.009-0.016	<0.1	<0.1
Copper (Cu)	mg/L	0.011-0.33	0.006-0.013	<0.1	<0.1
Fluoride (F)	mg/L	1.6	<0.1	<0.1	<0.1
Hardness	mg $CaCO_3$/L	19900-32000	15000-19000	34000 – 36000	25000-28000
Iron (Fe)	mg/L	0.89-4.3	0.006-2.7	<0.5	<0.4-<0.5
Lead (Pb)	mg/L	<0.001	<0.001	<0.1	<0.1-<0.4
Magnesium (Mg)	mg/L	4600-7400	3500-4100	8000–8400	5300-6300
Manganese (Mn)	mg/L	0.12-1.5	0.13-0.36	<0.1	0.87-1.1
Mercury (Hg)	mg/L	<0.00005	0.0001	<0.00005	<0.00005
Nickel (Ni)	mg/L	0.11	0.022-0.063	<0.1	<0.1-0.13
Nitrate (NO3)	mg/L	28-54	11-150	67–77	<0.2-0.68
Nitrite (NO2)	mg/L	0.3	3.9	0.2	<0.2-0.68
Potassium (K)	mg/L	1400-2300	700-1400	1100–1200	1900-2600
Selenium (Se)	mg/L	0.017	0.047-0.35	<0.1	<0.1
Silicon (Si)	mg/L	6.7-90	15-16	4.3-5.2	
Sodium (Na)	mg/L	48750-60000	28000-38000	64000-67000	53000-65000
Sulphate (SO4)	mg/L	18000-23000	13000-19000	27000	76000-18000
Zinc (Zn)	mg/L	0.05	0.02-0.08	<0.5	<0.2-<0.5

The water from the pits are classified as sodium-chloride type water and are highly saline with a TDS range of 110,00 to 230,000 mg/L (230,000 mg/L sampling result for Kurara Central). The pit waters range from neutral to slightly alkaline.

The Licence Holder used AqQA (RockWare, 2006) program to calculate the composition of the

mixture of the Boomerang, Kurara and Kurara Central pit water with the receiving environment of Lake Annean. The results showed the ionic concentrations to be extremely consistent. The TDS is slightly higher in two of the three pits, however the mixed sample for discharge is relatively consistent with TDS levels observed within Lake Annean. Modelling indicates the mixed samples are not expected to exceed the ANZECC default guideline values for marine water at the 95% protection level.

Table 9: Mixed Water composition

	Units	Boomerang Pit	Kurara Pit	Kurara Central Pit	Lake Annean	Mixed	ANZECC 95% protection marine species
pH		7.7	8.1	7.7	8.1		
Conductivity	µS/cm	99000.0	140000	99000.0	190000		
TDS	mg/L	210000	110000	230000	170000		
Alkalinity	mg/L	170	280	210	230		
Aluminium	mg/L	< 0.5	< 0.25	< 0.5	< 0.5		
Arsenic	mg/L	< 0.1	< 0.05	< 0.1	< 0.5		
Bicarbonate	mg/L	210	340	250	290	272.5	
Cadmium	mg/L	< 0.01	< 0.005	< 0.01	< 0.01		0.0055
Calcium	mg/L	620	500	510	930	640	
Carbonate	mg/L	< 1	< 1	< 1	< 1		
Chloride	mg/L	100000	58000.0	120000	110000	97000	
Chromium	mg/L	< 0.1	< 0.05	< 0.1	< 0.1		0.0274
Cobalt	mg/L	< 0.1	< 0.05	< 0.1	< 0.1		0.001
Copper	mg/L	< 0.1	< 0.05	< 0.1	< 0.1		0.0013
Fluoride	mg/L	< 0.1	< 0.1	< 0.1	< 0.1		
Hardness	mg/L	32000.0	17000.0	36000.0	28000.0	28250	
Iron	mg/L	< 0.5	< 0.25	< 0.5	< 0.5		
Lead	mg/L	< 0.1	< 0.05	< 0.1	< 0.1		0.0044
Magnesium	mg/L	7400	3800	8400	6300	6475	
Manganese	mg/L	0.11	< 0.05	< 0.1	0.87	0.49	
Mercury	mg/L	<0.00005	<0.00005	<0.00005	<0.00005		0.0004
Nickel	mg/L	< 0.1	< 0.05	< 0.1	< 0.1		0.07
Nitrate	mg/L	71	150	77	< 0.2	99.33	
Nitrite	mg/L	0.6	3.9	< 0.2	< 0.2	2.25	
Potassium	mg/L	1400	700	1200	2600	1475	
Selenium	mg/L	< 0.1	< 0.05	< 0.1	< 0.1		
Silica	mg/L	6.5	15	4.3	3.9	7.425	
Sodium	mg/L	60000.0	34000.0	67000.0	65000.0	56500	
Sulfate	mg/L	22000.0	13000.0	27000.0	18000.0	20000	
Zinc	mg/L	< 0.5	< 0.25	< 0.5	< 0.5		0.015

Nitrate concentrations measured in the pit waters were high (up to 150 mg/L) however this is more commonly of natural origin in internally-draining (*i.e*. in regions where surface water flows into salt-lakes) semi-arid regions in Australia. In these regions, nitrate is derived from cyanobacterial crusts on soil surfaces and from leaching from termite mounds, and these sources can give rise to nitrate concentrations in groundwater that often exceed 100 mg/L (Barnes *et al*., 1992).

Figure 2 below shows the expected extent of the ponding from the discharge of dewatering effluent into Lake Annean. A total area of up to 200 hectares, at a maximum discharge rate of 13,800 m^3 per day, is expected which makes up approximately 1.7 percent of Lake Annean's total surface area.

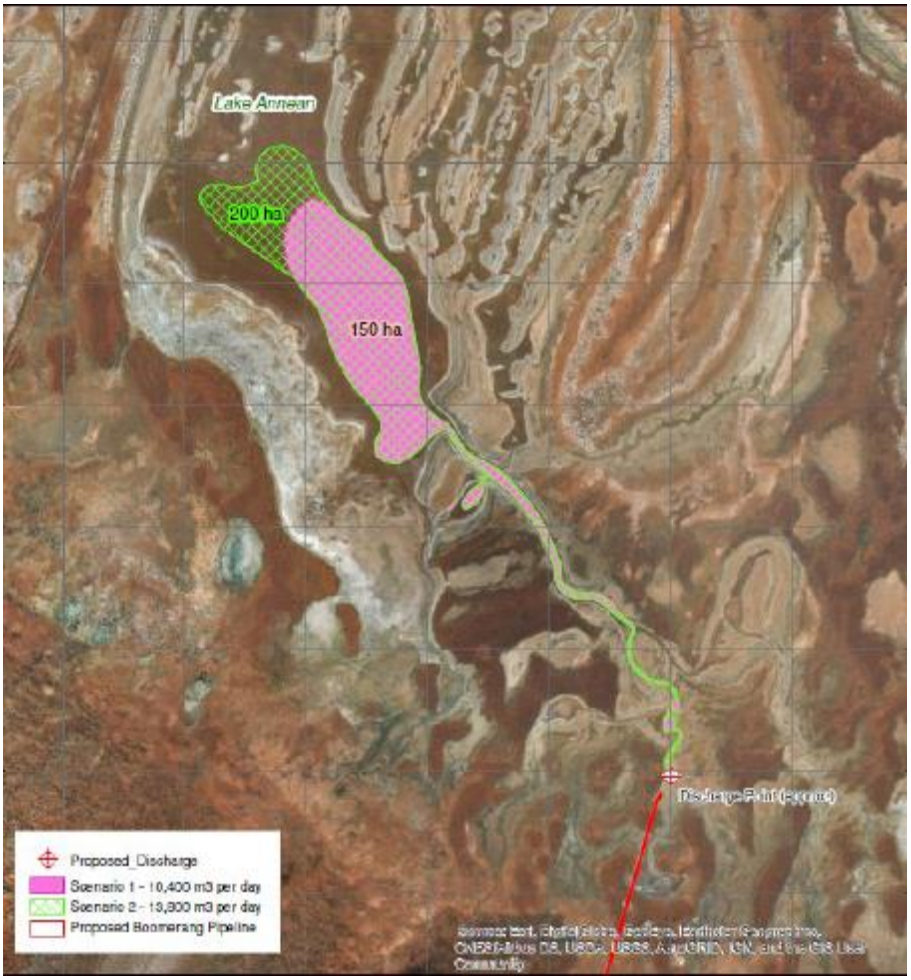


Figure 2: Dewatering discharge extent of ponding

Description of the receiving environment

Lake Annean is a large inland salt lake system located in the Mid-West region of Western Australia. The lake covers an area of 120 km^2 and is situated about 40 kilometres southwest of Meekatharra.

DWER describes Lake Annean as a good example of a seasonal/intermittent saline/brackish lake and marsh system. The lake plays an important ecological and hydrological role in the landscape and provides habitat and refuge for significant invertebrate and vertebrate fauna (DoE, 2015b).

Lake Annean is listed as a Directory of Important Wetlands in Australia because it supports foraging and breeding habitat for a number of Federally-listed migratory and marine bird species as well as various other water bird species.

Salinity levels within Lake Annean when water is present are considered hypersaline with TDS readings normally greater than 150,000 mg/L (see Table 8 above).

Lake Annean is a mega scale irregular sumpland, with numerous microscale and macroscale elongate islands and peninsulas, while a natural peninsula (ridge) almost separates the wetland into two lakes. An anastomosing creek system enters the north-east corner of the lake with a catchment extending 30 km north to near Meekatharra. Additional minor creeks flow from the

landscape into the west and north sides of the lake. The catchments are all moderately disturbed from pastoral and mining related activities (DoE, 2015b).

Surface water held in the lake drains northwards via Hope River into the Murchison River. Inundation over parts of the lake occurs periodically in most years, while the whole lake occasionally fills from episodic flooding (probably every five to ten years) caused by large summer-autumn rain events associated with tropical storms moving from the north-west. At its deepest point, the depth of the surface water can reach up to a metre after large flooding events.

Sediment samples were collected from locations within the lake bed where impacts are likely to occur from dewatering discharge to the lake (shown in Figure 3 below).

Figure 3: Sediment sampling locations at Lake Annean

Results from the sediment sampling are provided in Table 10 below. The first round of sediment sampling indicates four elements exceeded the ANZECC Low and High sediment guidelines for Antimony (Sb), Chromium (Cr), Copper (Cu) and Nickel (Ni).

Table 10: Sediment sampling results for Lake Annean

	Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR	**3.0**	**1**	**0.3**	**0.5**	**0.5**	**1**	**0.05**	**0.5**	**1**	**2**
LA11	4	6	0.5	240	74	4	<0.05	180	<1	84
LA12	<3	3	<0.3	100	18	7	<0.05	24	<1	22
LA13	<3	1	<0.3	42	2.1	1	<0.05	3.1	<1	3
LA14	<3	1	<0.3	33	2.2	1	<0.05	2.8	<1	3
LA15	<3	2	<0.3	270	36	7	<0.05	110	<1	60
LA16	<3	2	<0.3	59	9.1	3	<0.05	12	<1	11
LA17	<3	<1	<0.3	34	2	<1	<0.05	2.2	<1	2
LA18	<3	<1	<0.3	30	2.3	1	<0.05	2.9	<1	3
LA19	<3	<1	<0.3	57	6.4	2	<0.05	7.5	<1	9
LA20	<3	<1	<0.3	35	2.2	1	<0.05	3.1	<1	4
LA21	<3	4	<0.3	52	13	3	<0.05	17	<1	17
LA22	<3	<1	<0.3	25	2.6	<1	<0.05	3.0	<1	3
LA23	4	1	<0.3	38	12	3	<0.05	12	<1	15
LA24	<3	3	<0.3	78	20	5	<0.05	29	<1	26
LA25	<3	2	<0.3	48	14	3	<0.05	12	<1	14
LA26	<3	5	<0.3	83	20	4	<0.05	24	<1	25
LA27	<3	2	<0.3	28	6.8	2	<0.05	7.2	<1	8
LA28	<3	3	<0.3	43	6.1	1	<0.05	7.9	<1	8
LA29	<3	5	<0.3	83	22	6	<0.05	26	<1	28
LA30	<3	4	<0.3	62	15	2	<0.05	19	<1	21
LA31	<3	6	<0.3	95	25	4	<0.05	27	<1	30
LA32	<3	3	<0.3	44	11	1	<0.05	14	<1	15
LA33	<3	4	<0.3	42	10	2	<0.05	14	<1	15
LA34	<3	10	<0.3	77	21	4	<0.05	28	<1	26
LA35	<3	5	<0.3	63	20	3	<0.05	21	<1	24
LA36	<3	3	<0.3	45	11	2	<0.05	15	<1	16
LA37	<3	11	<0.3	87	21	5	<0.05	31	<1	28
LA38	<3	4	<0.3	78	21	4	<0.05	25	<1	26
LA39	<3	3	<0.3	37	9.1	1	<0.05	13	<1	13
ISQG low	**2**	**20**	**1.5**	**80**	**65**	**50**	**0.15**	**21**	**1**	**200**
ISQG high	**25**	**70**	**10**	**370**	**270**	**220**	**1**	**52**	**4.0**	**410**

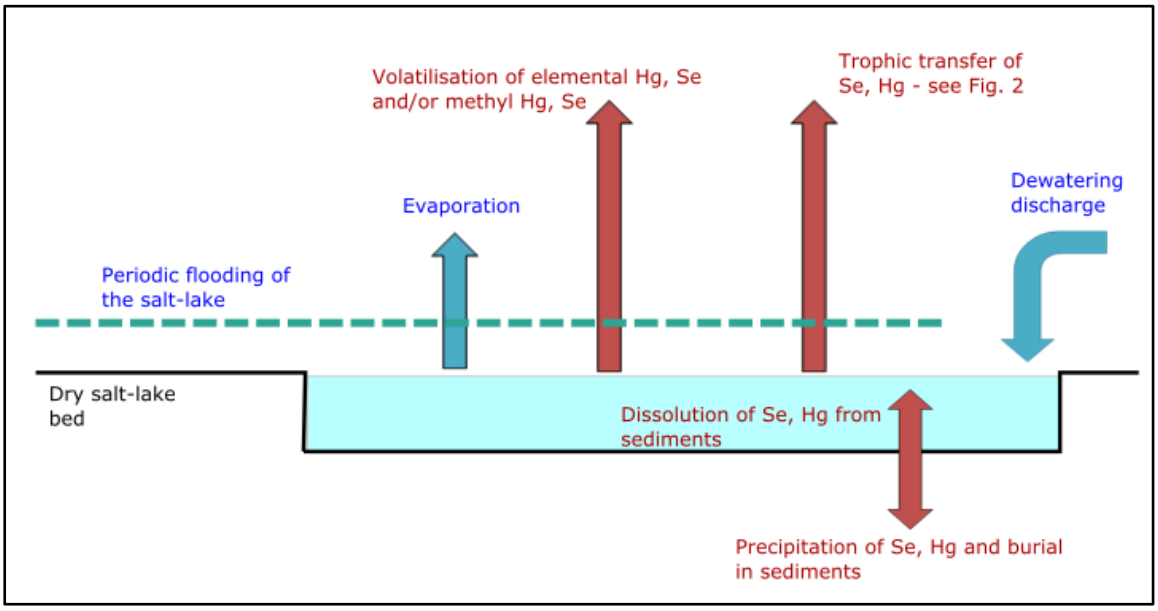
Description of potential impacts from the emission

Research on both artificial (*e.g*. Tanner *et al*., 1999) and natural (*e.g*. Wurtsbaugh *et al*., 2011) closed saline-water systems indicates that selenium and mercury are the contaminants of principal concern in these systems due to the ability of these elements to be biomagnified in food webs that typically develop under conditions where there are high evaporation rates.

This is shown schematically in Figure 4 in a situation where these elements are constantly introduced into an artificial wetland with dewatering discharge. Figure 4 shows that the principal sinks for the removal of selenium and mercury from the water column (shown with red arrows) are:

- through co-precipitation with iron oxides and other minerals and burial in the underlying sediment profile (although periodically conditions may occur where these elements are released again into the water column);
- through volatilisation of either elemental selenium and mercury and/or methyl compounds of the elements; and
- through trophic transfer in local food webs and removal in biomass (such as in insects and birds).

Figure 4. Sinks for selenium and mercury in a closed saline water ecosystem



The magnitude of these sinks has not been determined at Lake Annean.

Another potential sink for the removal of these elements from the pond occurs during infrequent heavy rainfall events when Lake Annean becomes flooded (Figure 4). Under these circumstances, water and sediment from the ponded area is dispersed over a much larger area of the lake bed, and conditions within the pond are 'reset' for the next dry spell. However, these events occur infrequently and cannot be relied upon as a management option for ensuring that mercury and selenium inputs do not cause environmental harm.

Closed saline-water systems such as the discharge area in Lake Annean generally contain algae, brine shrimp, aquatic insects and insect larvae which form a food source for various bird species. The trophic transfer of selenium and mercury in this food web has the potential to affect bird populations through impacts on developing embryos in eggs. The principal environmental receptors for these elements are therefore birds rather than toxicity to organisms in the water column (which is assumed in the ANZECC guidelines).

This means that criteria for mercury and selenium levels in water and in biomass in the water body must be developed at a sufficiently low level to ensure bird populations are protected, even if the concentrations in the water column appear to be harmless to aquatic organisms.

Results from analysing water samples taken from each of the pits indicate the concentration levels for Mercury are comparable with water samples taken from Lake Annean. The highest recording for Mercury was 0.0001 mg/L in the Kurara pit (all other pits were below a level of detection), which is equivalent to the ANZECC guideline value for marine waters at the 99% protection level for species. This concentration level is also expected to drop further when the water from the Kurara pit is combined with the other pits prior to discharge to Lake Annean. Consequently, the concentration levels of Mercury in the dewatering discharge waters are considered low.

Current standards do not provide data to derive a reliable trigger value for Selenium, however results from analysing water samples taken from each of the pits (March 2018 sampling results), indicate the concentration levels for Selenium are comparable with water samples taken from Lake Annean which were shown to be below 0.1 mg/L and are considered low.

Recent water sampling results for nitrates in the Boomerang, Kurara and Kurara Central pits indicate the concentrations are high, however elevated nitrate levels in the mine discharge to Lake Annean are unlikely to cause significant eutrophication problems. This is because the productivity of the ephemeral aquatic ecosystem in this lake is probably limited by the availability of phosphorus rather than nitrogen, and cyanobacteria in the lake are probably able to produce all of the nitrogen they require for growth by the fixation of atmospheric nitrogen.

Recent sediment sampling from within the expected dewatering discharge ponding area, indicates four elements exceeded the ANZECC Low and High sediment guidelines for Antimony (Sb), Chromium (Cr), Copper (Cu) and Nickel (Ni). Table 8 above presents historical and recent water sampling data from the sampling of the Boomerang, Kurara and Kurara Central pits. The results show the concentrations of Chromium (Cr), Copper (Cu) and Nickel (Ni) are presented at levels below the limit of detection and are therefore not expected to have any impact on the concentration of the Lake Annean sediments. No water data was available for Antimony and although the levels in the sediment were found to be only slightly exceeding sediment guidelines, the requirement to sample for Antimony in the dewatering discharge will be included in the Licence.

Other potential impacts from dewatering highly saline dewatering effluent into a lake system are:

- scouring of the lake bed;
- impacts on riparian vegetation; and
- contamination of the groundwater

Criteria for assessment

Department of Water, *Western Australian water in mining guidelines*, Report no. 12, May 2013.

Relevant water quality criteria for comparison include ANZECC guidelines for marine water quality.

Relevant sediment quality criteria for comparison include ANZECC sediment quality guidelines.

Licensee controls

Dewatering discharge outlet will be located in the playa, avoiding the lake edges and creeklines to minimise impacts on riparian vegetation, shallow and fringing habitats and potential drought refuge areas for biota.

The dewatering discharge outlet will be located and designed with energy diffusion devices (i.e. perforated pipe work) to minimise scouring of the lake bed.

The dewatering discharge outlet is located so as to direct flows to deeper parts of the basin and prevent backflow of saline water into creeks and tributaries.

The Licence Holder proposes the following monitoring program after the commencement of dewatering activities:

- Monthly visual monitoring of sediment at the discharge point;
- Monthly sediment sampling at each of the baseline locations for laboratory analysis of major components;
- Daily visual inspections of the dewatering pipelines include vegetation health near the dewatering pipeline;
- Record the volumes of water drawn from the Boomerang, Kurara and Kurara Central pits on a monthly basis;
- Continuous monitoring of the volumes of dewatering effluent discharged to Lake Annean on a monthly basis;
- Quarterly comprehensive analysis of the dewatering discharge to Lake Annean;

Consequence

The consequence of discharging dewatering effluent into Lake Annean is considered **minor** as the onsite and offsite impacts are expected to be minimal due to the dewatering occurring for 12 months only, the quality of the dewatering discharge water being of similar ionic composition to the water sampled at Lake Annean, the concentration levels for Mercury and Selenium are low in the discharge water, and the lakebeds are highly saline and unvegetated with the dewatering effluent not expected to impact on any riparian vegetation due to the riparian vegetation being dominated by salt tolerant species and the discharge is into the playa, avoiding the lake edges.

Likelihood of Risk Event

The likelihood of an occurrence is **unlikely,** even though the current dewatering discharge water quality is comparable to water quality at Lake Annean, as the concentrations of some metals could increase at depth in the water column contained within the pits.

Overall rating of Risk Event

The risk rating for the discharge of dewatering effluent to Lake Annean is therefore considered **moderate.**

Decision

Category 63 – New tyre disposal area

Based on the application supporting documentation, the Delegated Officer has determined that the burial of tyres at an additional new tyre disposal area within the premises waste rock landform (WRL) presents a low risk to the environment.

The Existing Licence already contains conditions (1.3.5 and 1.3.8) relating to the management

of tyre disposal within the premises WRLs. No additional conditions are required to mitigate risk.

Schedule 1 tyre burial location maps has been amended by the removal of the Paddy Flat Project Area (Micky Doolan Tyre Disposal & Landfill) map and insertion of the map outlining the location of the additional new tyre burial location.

Category 6 - Discharge of dewatering effluent into Lake Annean

The Delegated Officer has determined the key emissions associated with dewatering discharge to Lake Annean from the dewatering of the Boomerang, Kurara and Kurara Central pits. Based on the application supporting documentation, the Delegated Officer has determined that the dewatering discharge to Lake Annean presents a medium risk to the environment as a result of the dewatering effluent discharge and accidental discharge of dewatering effluent to land from pipeline failure. However, these risks may be acceptable subject to the commitments made by the Licensee and the additional regulatory controls outlined below.

The approved premises production or design capacity for Category 6 has been amended to 5,823,000 tonnes per year. This volume is a combination of the previously Licenced throughput for Cat 6 of 3,056,000 tpa plus the additional discharge of 2,767,000 tpa proposed in this amendment.

Mining tenement L51/51 for the dewatering discharge to Lake Annean has been included into the Premises address.

Table 1.3.6 of existing condition 1.3.10 is amended to increase the throughput for category 6.

Table 1.3.7 of existing condition 1.3.11 has been amended to include the construction requirements for the additional used tyre disposal area and installation of dewatering pipelines.

Table 2.3.1 of existing condition 2.3.1 has been amended to include Lake Annean Discharge Point 2 as an emission point to surface water.

Table 2.3.2 of existing condition 2.3.2 has been amended to include the Lake Annean Discharge Point 2 and the frequency of sampling changed from monthly to quarterly.

Table 3.2.1 of existing condition 3.2.1 has been amended to include the requirements for the monitoring of dewatering effluent volumes discharged to the Lake Annean Discharge Point 2.

Table 3.5.1 of condition 3.5.1 is amended to include monitoring requirements for dewatering effluent discharged to Lake Annean Discharge Point 2. This condition has also been amended by changing the monitoring requirement from monthly to quarterly at the Aladdin discharge point, and to include the element Antimony which was shown to be slightly elevated in the sediments near the proposed discharge outlet.

The inclusion of new condition 3.6.1 that requires the License Holder to monitor sediment at various locations at Lake Annean. No sediment monitoring is currently required preventing detection of changes to the substrate. An initial round of sampling at each location was undertaken by the Licence Holder to establish background data. The License Holder originally proposed monthly sediment sampling at each baseline location as part of their monitoring program, however they have now requested this is changed to quarterly so it corresponds with their quarterly water monitoring program. The Delegated Officer considers quarterly sediment monitoring at each monitoring site is acceptable, and therefore has included this requirement as part of the Licence.

Table 4.2.1 has been amended to include the AER reporting requirements for table 3.6.1.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 8 July 2019. The Licence Holder provided a comment on the 22 July 2019 requesting the requirement for sediment sampling is changed from monthly to quarterly.

Amendment

1. The Premises address has been amended by the insertion of the bold text shown in underline below.

Bluebird Gold Mine
Mining Tenements; G51/9, L20/75, L51/18, **L51/51**, L51/78, M20/12, M20/45, M20/68, M20/70, M20/71, M20/73, M20/77,, M20/107, M20/214, M20/219, M20/249, M20/421, M51/6, M51/12, M51/31, M51/33, M51/35, M51/39, M51/62, M51/75, M51/92, M51/96, M51/132, M51/190, M51/199, M51/200, M51/203, M51/211, M51/233, M51/236, M51/237, M51/254, M51/321, M51/393, M51/437, M51/438, M51/439, M51/440, M51/459, M51/462, M51/463, M51/483, M51/485, M51/486, M51/491, M51/492, M51/493, M51/494, M51/495, M51/523, M51/539, M51/569, M51/572, M51/581, M51/564, M51/666, M51/671, M51/672, M51/757, M51/762, M51/784, M51/788, M51/793, M51/794, M51/795, M51/800, M51/801, M51/820, M51/824, M51/834; MEEKATHARRA WA 6642

2. Table 1.3.6 of condition 1.3.10 is amended by deleting the text shown in strikethrough and replacing with the text shown in underline and bold below:

Table 1.3.6 Production or design capacity limits		
Category[1]	**Category description[1]**	**Premises production or design capacity limit**
5	Processing or beneficiation of metallic or non-metallic ore	2,500,000 tonnes per annual period
6	Mine dewatering	~~3 056 000~~ **5,823,000** tonnes per annual period
63	Class I inert landfill site	3000 tonnes per annual period
85	Sewage facility	99 cubic metres per day

3. Table 1.3.7 of Condition 1.3.11 is amended by the insertion of the bold text shown in underline below:

Table 1.3.7: Construction Requirements	
Column 1	Column 2
Infrastructure/Equipment	Requirements (design and construction)
Surprise in-pit TSF	Tailings discharge and return pipelines are located within earthen bunded areas; and The decant infrastructure is positioned at the truncated end of the porphyry unit within the pit.
Five Mile Well Pit evaporation pond	Pond is constructed to provide a minimum freeboard of 0.5 m to allow for a 1 in 100 year 72 hour rainfall event; The in-situ clays used for the pond wall construction are conditioned to achieve a permeability of 10-9 m/s or better; and Discharge pipeline is located within an earthen bunded area.
Class I inert landfill	To be constructed at the Surprise Waste Rock Dump; Each trench (cell) is constructed so the separation distance between the base of the landfill and the highest groundwater level shall not be less than 3 m; and Earthen bunds are constructed around the facility to divert stormwater away from the waste.

Paddy's Flat Class I inert landfill	To be constructed at the location specified on the landfill map Schedule 1; Each trench (cell) is constructed so the separation distance between the base of the landfill and the highest groundwater level shall not be less than 3 m; and Earthen bunds are constructed around the facility to divert stormwater away from the waste.
Reedy Project Area Class 1 landfill	To be constructed at the location specified on the landfill map in Schedule 1. Each trench (cell) is constructed so the separation distance between the base of the landfill and the highest groundwater level shall not be less than 3 m; and Earthen bunds are constructed around the facility to divert stormwater away from the waste.
Dewatering pipelines from the Boomerang, Kurara and Kurara Central pits to Lake Annean	• **Built with butt welded polyvinylchloride;** • **Located within previously cleared transport corridors;** • **Located within a V-notch drain to minimise movement of the pipeline;** • **Discharge outlet into Lake Annean includes an energy diffusion device/s to minimise scouring and erosion of the lake bed; and** • **The dewatering discharge outlet is located so as to direct flows to deeper parts of the lake basin to prevent backflow of saline water into creeks and tributaries.**
New tyre disposal area	**To be constructed at the location outlined in Schedule 1 Maps of tyre disposal locations.**

4. Table 2.3.1 of condition 2.3.1 is amended by the insertion of the bold text shown in underline below:

Table 2.3.1: Emission points to surface water		
Emission point reference and location on Map of emission points	Description	Requirements
Aladdin discharge point	Dewatering effluent from the Aladdin Pit and discharged to Lake Annean	Discharged in a manner which does not cause erosion and scouring impacts, and avoids lake edges
Lake Annean Discharge Point 2	**Dewatering effluent from the Boomerang, Kurara and Kurara Central Pits**	

5. Table 2.3.2 of condition 2.3.2 is amended by the insertion of the bold text shown in underline below:

Table 2.3.2: Point source emission limits to surface water				
Emission point reference	Parameter	Limit (including units)	Averaging period	Frequency
Aladdin discharge point	**Total Recoverable** Hydrocarbon**s**	15 mg/L	Spot sample	~~Monthly~~ **Quarterly**
Lake Annean Discharge Point 2				

6. Table 3.2.1 of condition 3.2.1 is amended by the insertion of the bold text shown in underline below:

Table 3.2.1: Monitoring of inputs and outputs				
Input/Output	**Parameter**	**Units**	**Averaging period**	**Frequency**
Mine dewater discharged to North of Reedy Drainage Channel	Volume	m^3	Monthly	Cumulative monthly total
Mine dewater discharged to South of Reedy Drainage Channel				
Mine dewater discharged to Lake Annean **(Aladdin discharge point)**				
Mine dewater discharged to Lake Annean Discharge Point 2				

7. Table 3.5.1 of condition 3.5.1 is amended by deleting the text shown in strikethrough and replacing with the text shown in underline and bold below:

Table 3.5.1: Monitoring of point source emissions to surface water				
Emission point reference	Parameter	Units	Averaging period	Frequency
Aladdin discharge point **Lake Annean Discharge Point 2**	pH[1]	None specified	Spot sample	~~Monthly~~ **Quarterly**
	Aluminium	mg/L		
	Antimony			
	Arsenic			
	Cadmium			
	Chromium			
	Copper			
	Lead			
	Manganese			
	Mercury			
	Nickel			
	Nitrate (as NO_3)			
	Selenium			
	Sulphate			
	Total Recoverable Hydrocarbons			
	Total suspended solids			
	Total dissolved solids			
	Zinc			

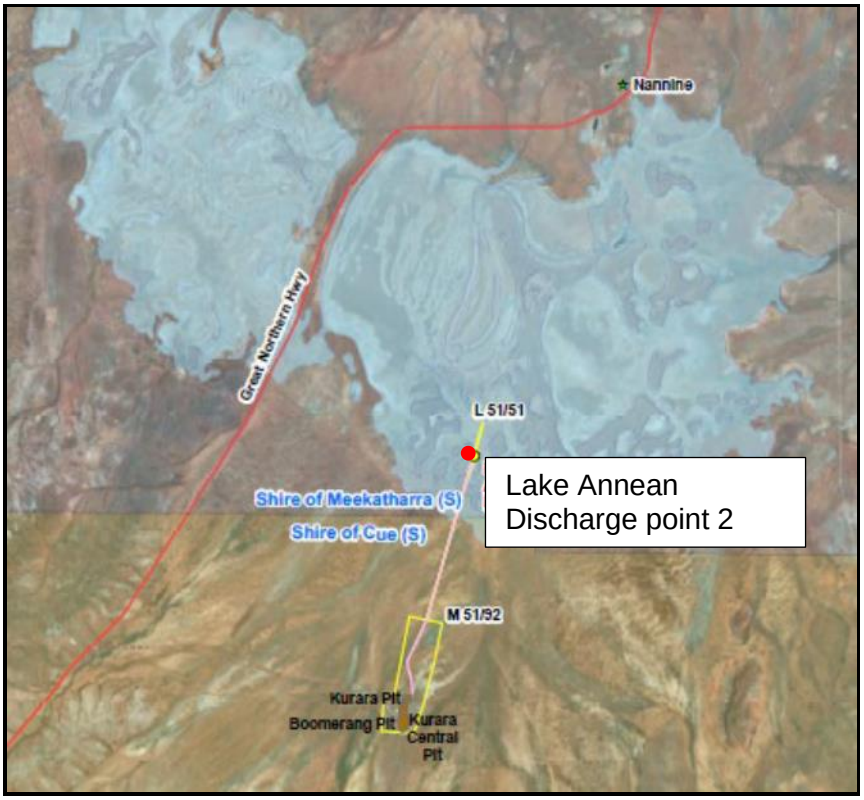
Note 1: in-field non NATA accredited analysis permitted

8. The Licence is amended by the inclusion of new condition 3.6.1 and is shown in bold and underline below:

3.6.1 The Licensee shall undertake the monitoring in Table 3.6.1 according to the specifications in that table.

Table 3.6.1: Monitoring of ambient soil quality at Lake Annean				
Emission point reference	**Parameter**	**Units**	**Averaging period**	**Frequency**
Lake Annean sediment monitoring locations LA11 to LA39 as shown in Schedule 1 Maps	**pH[1]**	**None specified**	**Spot sample**	**Quarterly**
	Aluminium	**mg/kg**		
	Arsenic			
	Cadmium			
	Chromium			
	Copper			
	Cobalt			
	Lead			
	Manganese			
	Mercury			
	Nickel			
	Selenium			
	Sulfate			
	Zinc			
	Total phosphorus			
	Total Nitrogen			

9. The Licence is amended by the insertion of the map below into Schedule 1 Map of emission points:



10. The Licence is amended by the insertion of the map below into Schedule 1 Map of sediment monitoring locations:

11. The Licence is amended by the removal of the 'Paddy Flat Project Area (Mickey Doolan Tyre Disposal & Landfill)' map in Schedule 1 and the insertion of the map below into Schedule 1 Map of tyre disposal locations:

12. Table 4.2.1 of the Licence is amended by the insertion of the bold text shown in underline below:

Table 4.2.1: Annual Environmental Report		
Condition or table (if relevant)	***Parameter***	***Format or form[1]***
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken.	None specified
Table 1.3.6	Summary of authorised activities including comparison of the approved production and design capacities and actual production/throughput for the Annual period.	None specified
3.2.1	Monitoring of dewater outputs.	None specified
3.3.1	Monitoring of point source emissions to land and comparison against the ANZECC Livestock Drinking Water Guidelines.	LR1
3.4.1	Monitoring of ambient groundwater quality and comparison against the ANZECC Livestock Drinking Water Guidelines.	GR1
3.5.1	Monitoring of emissions to surface water.	~~WR1~~ **None specified**
3.6.1	**Monitoring of sediments in Lake Annean**	
-	An assessment of the information contained within the report against previous monitoring results and any Licence limits.	None specified
4.1.2	Compliance	Annual Audit Compliance Report (AACR)
4.1.3	Complaints summary	None specified

Appendix 1: Key documents

	Document title	Availability
1	Licence amendment application form and supporting documentation received 14 January 2019	DWER record A1755587
2	Licence Holder email and attachment requesting additional used tyre disposal area at the Paddy's Flat Project Area, received 20 March 2019.	DWER record DWERDT144842
3	Licence Holder response to request for further information letter dated 15 February 2019, received 8 March 2019.	DWER records DWERDT141613
4	DoE, Department of the Environment. (2015b) *Directory of Important Wetlands in Australia - Information Sheet.*	www.environment.gov.au/cgibin/wetlands/report.pl?smode=DOIW;doiw_refcodelist=WA056
5	DWER, February 2017. *Guidance Statement: Risk Assessments.* Department of Environment Regulation, Perth.	Accessed at; www.dwer.wa.gov.au
6	DWER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	
7	DWER, February 2017. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	
8	Barnes, C.J., Jacobson, G. and Smith, G.D., 1992. The origin of high-nitrate ground waters in the Australian arid zone. Journal of Hydrology, 137, 181-197.	Paper is available from website
9	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Paper No. 4, Volume 3) Primary Industries – Rationale and Background Information.	Accessed at www.waterquality.gov.au
10	Licence Holder response to request for further information email dated 21 June 2019, received 22 June 2019.	DWER record A1799413