Government of Western Australia
Department of Environment Regulation

Amendment Notice 1

Licence Number	L8103/1989/3
Licence Holder	Aragon Resources Pty Ltd
ACN	114 714 662
Registered business address	Level 3 18-32 Parliament Place WEST PERTH WA 6005
Date of amendment	Thursday, 15 December 2016
Prescribed Premises	Category 5 – Processing or beneficiation Category 6 – Mine dewatering Category 89 – Putrescible landfill site
Premises	Fortnum Gold Mine Mining Tenements M52/95, M52/96, M52/98, M52/99, M52/132 and M52/133, MEEKATHARRA WA 6642

Amendment

The Chief Executive Officer (CEO) of the Department of Environment Regulation (DER) has amended the above licence in accordance with section 59 of the *Environmental Protection Act 1986* as set out in this Amendment Notice.

Date signed: 15 December 2016

Alana Kidd

Manager Licensing – Resource Industries

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Amendment Notice

This notice is issued under 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.

A detailed risk review of the licence will occur within 8 months to align the licence with DER's new approach towards risk-based regulation. Once finalised, this amendment will be included in the revised licence. Changes to the conditions imposed under this Amendment Notice may occur as part of the review.

Amendment Description

This Amendment Notice is the result of a Licence Holder initiated amendment and relates to increasing the height of the embankments at Cell 1 and Cell 2 at the existing tailings storage facility (TSF2), and including additional dewatering discharge locations.

Embankment lift at the TSF2

The Licence Holder is increasing the capacity of the TSF2 by lifting the height of the embankments at both of the cells. Cell 1 has a current height of Relative Level (RL) 512 metres (m) and Cell 2 a height of RL511m. The TSF2 was previously approved for an embankment lift through Works Approval W5297/2012/1 to have a final elevation of RL514m. The Licence holder has revised their works program and will now raise the entire facility to RL520m in stages using mechanically compacted tailings on the existing footprints. The existing decant towers at both of the cells will be extended during each embankment raise. There are existing tailings pipelines and spigots on Cell 2 which will be checked and repaired or replaced where necessary. New tailings pipelines and spigots will be installed at Cell 1 or alternatively the infrastructure at Cell 2 will be relocated to Cell 1 when Cell 2 is not in use. Any replacement pipelines will be laid within existing pipeline corridors.

Changes to dewatering program

Current licensed dewatering activities at the premises include the dewatering of the Toms and Yarlarweelor pits, with a maximum of 2,500,000 tonnes per annum of dewatering effluent being discharged into the Yarlarweelor Creek. To allow more flexibility in the dewatering program, the Licence Holder will now also dewater and discharge between the Starlight, Tom's, Callie's South, Eldorado and Trev's pits as well as continuing a final discharge to the Yarlarweelor Creek. The construction and installation of the dewatering infrastructure was approved through works approvals W5367/2013/1 and W5491/2013/1 which expire on the 6 March 2018 and 13 October 2018 respectively.

Risk Assessment

Table 2 and 3 below applies a basic risk assessment for the potential emissions which may arise from the amendment application. Both tables identify whether these emissions present a material risk requiring regulatory controls.

Table 2 - Risk assessment for the proposed amendments during construction

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Construction of the embankments at the TSF2	**Dust:** associated with construction activities of the TSF2 embankments.	**Nearby residents:** There are no sensitive community receptors within 45 km of the Premises. **Vegetation:** No Threatened Flora or Priority Flora recorded adjacent to the TSF2.	**Air:** Particulate matter (fugitive dust)	Elevated total suspended particulates (TSP) can impact ambient environmental quality resulting in amenity impacts and can smother vegetation.	No	Emissions of dust from the construction of the embankment lifts at the TSF2 are considered a low risk as the Licence Holder will use water carts during construction activities. The nearest sensitive premises is 45 km away. No nearby Threatened Flora or Priority Flora at the Premises that could be affected by dust. Degraded habitats adjacent to the TSF2. Fugitive dust emissions can be sufficiently regulated under Section 49 of the *Environmental Protection Act 1986.* The Delegated Officer considers the material risk for the dust emissions associated with construction of the TSF2 embankments to remain unchanged.
	Noise: associated with construction activities.	**Nearby residents:** There are no sensitive community receptors within 45 km of the Premises.	**Air:** Noise generated by the operation of the crushing plants	Amenity to nearby noise sensitive receptors	No	Noise emissions are not expected to impact sensitive premises as the Premises is isolated with the nearest sensitive premises 45 km away. The Licence Holder has an ongoing legislative requirement to comply with the Prescribed standard for noise emissions, as set out in regulation 7 of the *Environmental Protection (Noise) Regulation 1997*. The Delegated Officer considers the material risk for the noise associated with construction of the TSF2 embankments to remain unchanged.

Table 3 – Risk assessment for the proposed amendments during operation

Activity	Potential emission	Potential receptors	Potential pathway	Potential impacts	Material risk	Reasoning
Operation of the TSF2 with an increased embankment height	Increased rate of seepage from the TSF2	**Nearby groundwater users:** No groundwater user within 10 km of the Premises **Subterranean fauna:** Not likely to be impacted as geology in the area excludes Banded Iron Formation and Calcrete aquifers which provide suitable habitat	**Land:** Infiltration into underlying groundwater systems	Reduction in quality of the local groundwater	No	An existing underdrainage system is installed at both Cell 1 and Cell 2. The Licence holder has identified damage to the underdrainage collection sump and will undertake repairs before the TSF2 is commissioned. Five existing groundwater monitoring bores monitor for potential impacts of seepage from TSF2. Historical monitoring results indicate there have been no observable impacts to the groundwater from seepage at TSF2. Monitoring results have mainly remained consistent for all parameters with occasional one off elevated levels for some parameters however these levels were well below licence limits where applicable and levels set within the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Section 9.3 Livestock drinking water guidelines (2000),* which is considered an appropriate assessment criteria to assess the potential impact on groundwater quality in this area. Existing limits for pH, TDS and WAD cyanide are applied through conditions of the Licence. The requirement for notification, reporting and corrective actions for any breach of the Licence limits is applied through conditions in the Licence. Annual discharge of tailings into the TSF2 will remain the same. Existing seepage recovery trench to capture any seepage from the TSF2 walls. Spigots at 20 m spacing have been provided in Cell 2 and they will be checked and repaired/replaced when necessary. New spigots will be provided in Cell 1 when required. The Licence Holder has advised that the TSF will be inspected daily. When establishing pipework for a new cell, spigot rubber hoses will be replaced if worn or damaged; and tailings lines will be inspected and assessed by an engineer prior to the commencement of deposition of tailings. The Delegated Officer considers the material risk from seepage due to the increased height of the TSF2 to remain unchanged.
	Discharge of tailings to land due to overtopping of the newly construction embankment walls, or from ruptured pipelines	**Vegetation:** Limited and degraded vegetation adjacent to the TSF2 **Nearby surface water:** Yarlarweelor Creek is located 300 m south of the TSF2	**Land:** Discharge of tailings to land and surface waters due to overtopping of the TSF2 embankment	Contamination of surface waters Contamination of local soils Destruction of native vegetation Contamination of groundwater	No	The Licence Holder has advised *'The TSF freeboard requirements have been defined in accordance with the Guidelines on Tailings Dams outlined by the Australian National Committee on Large Dams (ANCOLD, 2012) for a Very Low environmental spill consequence category* TSF' (Metals X Limited, TSF 2 Embankment Raise Design, 2016). Average evaporation is higher than the average rainfall all year round therefore assisting in reducing the size of the supernatant pond. No distinct wet season with low yearly rainfalls for this vicinity. Decant tower located at each cell will collect water from the TSF2 for use in the process plant. Tailings pipelines are located in already disturbed areas and are bunded. The Licence Holder has advised that daily inspections of pipelines are undertaken.

						Dewatering pipelines are not bunded as the water quality is of relatively good quality (<2,000 mg/L total dissolved solids). Mine dewater pipelines will be operated under pressure during the commissioning phase to test for any construction faults. The Delegated Officer considers the material risk of the discharge of tailings from overtopping due to lifted embankments or from pipelines at the TSF2 to remain unchanged.
Operation of the altered dewatering program	Discharge of dewatering effluent between mined pits and to the Yarlarweelor Creek	**Groundwater:** Nearest groundwater user is more than 10 km away **Surface water:** Ephemeral creek that only flows during extreme rainfall events with no downstream users.	**Water:** Interaction of pit water with local groundwater aquifers and surface waters	Impacts to riparian vegetation Contamination of surface water Contamination of local groundwater	No	Dewatering of the Toms and Yarlarweelor pits and the discharge of the dewatering effluent into the Eldorado, Trev's, Starlight and Callies pits was originally assessed through Works Approval W5367/2013/1. At the time of the assessment the risks to the environment were considered low because all the pits had similar water quality. The waters were described as fresh to brackish (100 to 1,600 mg/L TDS) and neutral to alkaline (pH 7.1 to 9.2). Conditions were proposed in a Licence amendment to include quarterly monitoring of the discharge water with records to be provided in the Annual Environmental Report. Monthly recording of the volumes was also proposed as a new condition. The Licence Holder then altered their proposed dewatering operations through Works Approval W5491/2013/1 whereby all dewatering effluent from the Toms and Yarlarweelor pits would be discharged to the Yarlarweelor Creek only. The risks were determined as moderate and the Licence was amended to include conditions for quarterly monitoring for pH, TDS and TRH and annually for metals in the discharge water, with records to be provided in the Annual Environmental Report. Limits were set for pH, TDS and TRH. The Licence Holder now plans through this amendment notice to discharge dewatering effluent between all the pits to meet onsite operations with a final discharge of the dewatering effluent to the Yarlarweelor Creek. Dewatering effluent from the Starlight, Trev's, Callie's South, and Eldorado pits is of better quality than the current dewatering effluent from the Toms and Yarlarweelor pits and discharged to the Yarlarweelor Creek. The Licence Holder has established 8 vegetation transects at the Yarlarweelor Creek to undertake an annual vegetation condition assessment. There will be no increase to the rate or volume of discharge to the Yarlarweelor Creek. The Licence Holder has undertaken a comprehensive water balance and this will be used to manage risk accordingly. The Delegated Officer considers the material risk of discharging dewatering effluent between the pits and a final discharge to the Yarlarweelor Creek to remain unchanged.
	Discharge of pit water to land and surface waters due to overtopping of the pit embankments	**Vegetation:** Native vegetation at the Premises degraded due to historical mining and pastoral grazing. **Nearby surface**	**Land:** due to overtopping of the pit embankments	Destruction of native vegetation Contamination of soils and surface waters	No	The quality of the dewatering effluent is fresh to brackish and is not expected to have any impact on vegetation if overtopping occurred. The nearest surface water is an ephemeral creek with no permanent water bodies and only flows during extreme rainfall events. Dewatering effluent from the Toms and Yarlarweelor pits to the Yarlarweelor Creek is already authorised as a discharge location through the Licence. The Licence Holder has undertaken a water balance and has determined there is

		water: Yarlarweelor Creek is located about 400 m south of the closest pit (Callies pit)				sufficient capacity within the pits. Pipelines are all to be located within already disturbed areas and discharges will be managed in accordance with the water balance. The Delegated Officer considers the material risk of overtopping of pit embankments as a result of discharging dewatering effluent between the pits has remained unchanged.

Decision

Embankment lift at the TSF2

The Delegated Officer has determined that the key emissions associated with the construction of the Cell 1 and Cell 2 embankments at the TSF2 relate to fugitive dust and noise emissions.

The Delegated Officer has determined that fugitive dust and noise emissions from construction activities will not result in a material increase in emissions from the Premises due to the distance to nearby receptors, the onsite vegetation is degraded, no nearby Threatened Flora or Priority Flora and the use of water carts to reduce dust emissions.

The Delegated Officer has determined that the key emissions during operation is the potential increase of seepage from the base and walls of the TSF2 and overtopping of the newly constructed embankments.

The risks of increased seepage are mitigated by:

- operation of an existing underdrainage seepage recovery system at the TSF2. Any seepage from the TSF2 base is collected and discharges to a high-density polyethylene (HDPE) lined recovery pond where it is then pumped back to the TSF2. Repairs will be made to the liner at the recovery pond which has fallen into disrepair since the Premises was placed into care and maintenance in 2009;
- the ongoing monitoring of five groundwater monitoring bores as required by condition 1(a) of the licence;
- the assessment of monitoring results presented in the Annual Environmental report as required by condition 4 of the licence. The assessment includes comparing results with historical results, limits in the licence, background levels and accepted standards and guidelines;
- limits for groundwater pH, total dissolved solids (TDS) and Weak Acid Dissociable (WAD-CN) being applied through condition 3(a) of the Licence and a demonstrated history of meeting these limits;
- limit exceedance reporting as required by condition 3(b) of the Licence; and
- discharge rates of tailings will remain the same.

The Delegated Officer considers these control measures are adequate to manage the risks of increased seepage associated with an increase in height of the embankments of Cell 1 and Cell 2 at the TSF2.

The risks of overtopping are mitigated by:

- the TSF2 embankment freeboard being built in accordance with the requirements set out in the guidelines on tailings dams outlined by ANCOLD, 2012;
- the design of the TSF2 is regulated by the Department of Mines and Petroleum (DMP), who require an annual audit and assessment of the TSF2;
- the Licence Holder committing to undertaking daily inspections of the TSF2 and all associated infrastructure; and

- operation of the decant towers to reduce the size of the supernatant ponds.

The Delegated Officer considers these control measures are adequate to manage the risks from overtopping of Cell 1 and Cell 2 embankments at the TSF2.

Structural integrity of the TSF2 is regulated by the DMP who require an annual audit and assessment of the structural stability of the TSF2.

The Delegated Officer has imposed conditions to authorise the construction of the embankment lifts of Cell 1 and Cell 2 at the TSF2 with the works to be certified by a suitably qualified engineer following completion and prior to operation.

Changes to dewatering program

The Delegated Officer has determined that the key emissions associated with the discharge of dewatering effluent to disused mine pits are contamination of groundwater through interaction of pit water and the surrounding aquifer, vegetation loss/damage due to increased groundwater levels or damage to vegetation and contamination of surface waters due to overtopping of the pit walls or pipeline failure.

The Delegated Officer considers the risks to the environment from dewatering pipeline failure is low as the water quality is fresh to brackish and all pipelines are located within the highly disturbed mining footprint.

The Delegated Officer has determined that the discharge of dewatering effluent into the Starlight, Tom's, Callie's South, Eldorado and Trev's pits with a final discharge to the Yarlarweelor Creek will not result in a material increase in emissions from the Premises.

Recent water quality sampling at the pits determined that the quality is fresh to brackish and satisfies the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Section 9.3 Livestock drinking water guidelines (2000),* which is considered an appropriate assessment criteria to assess the potential impact on groundwater quality.

Salinity levels within the pits and the local groundwater are low and is unlikely to have any impact on potential groundwater depended vegetation.

Salinity levels within the pits are similar with a TDS range from 100mg/L to 1,600 mg/L with the higher range being located within the Tom's pit. All other pits have a TDS of less than 900 mg/L which is considered fresh and transferring the water between the pits is not expected to have any impacts on groundwater quality.

Discharge from the Tom's and Yarlarweelor pits to the Yarlarweelor Creek has been assessed through works approval W5491/2013/1 with the discharge authorised through the licence. At the time of the assessment it was determined that conditions would be imposed in the licence for quarterly monitoring for TDS, TRH and pH with limits being set. The requirement for annual monitoring for metals was also included in the licence however the setting of limits was not considered necessary. Previous annual environmental reports prepared for Fortnum indicated that the concentrations of metals (including arsenic, copper and lead), nitrates, sulfates and WAD cyanide in the pit lakes have typically remained below guideline values when assessed against the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (October 2000) for aquatic ecosystems and livestock watering and drinking criteria.

Discharge of dewatering effluent between the Starlight, Tom's, Callie's South, Eldorado and Trev's pits with a final discharge to the Yarlarweelor Creek is not

expected to increase the risk as the water quality has been assessed as better quality than current dewatering discharge effluent.

The construction and installation of the dewatering infrastructure was approved through works approvals W5367/2013/1 and W5491/2013/1 which expire on the 6 March 2018 and 13 October 2018 respectively.

The Delegated Officer has imposed conditions for the monitoring of the dewatering discharge effluent to the Starlight, Tom's, Callie's South, Eldorado and Trev's pits and updated the map in Attachment 4 to indicate the discharge locations.

Amendment History

Instrument	Issued	Amendment
L8103/1989/3	19/05/2016	Licence amended to authorise dewatering discharge to the Yarlarweelor Creek and administrative correction of the throughput amount in the Licence.
L8103/1989/3	15/12/2016	Amendment Notice 1 Licence amended to include construction requirements for the embankment lifts to the TSF2 and the new dewatering discharge locations.

Amendment

1. The licence is amended by the addition of the following definitions below:

   'Annual Audit Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website'

   'Department' means the department established under section 35 of the Public Sector Management Act 1994 and designated as responsible for the administration of Division 3 Part V of the EP Act'

2. Table 1 of the licence is amended by the insertion of the text shown in bold underline below:

Table 1: Monitoring of Representative Water Samples.

Column 1	***Column 2***	***Column 3***	***Column 4***
Monitoring sites	***Frequency***	***Parameters***	***Units***
FTR246D Junction Bore, FTR266D Creek Bore, M1, M2, M3, M4 and M5 (as depicted in Attachment 1)	*Quarterly (January, April, July, October)*	*Standing Water Level (SWL)[1]*	*mAHD*
		pH[2]	*pH units*
		Arsenic (As)	*mg/L*
		Antimony (Sb)	
		Cadmium (Cd)	
		Cobalt (Co)	
		Copper (Cu)	
		Iron (Fe)	
		Lead (Pb)	
		Nickel (Ni)	
		Selenium (Se)	
		Thallium (Ti)	
		Total Dissolved Solids (TDS)	
		Weak Acid Dissociable Cyanide (WAD-CN)	
		Zinc (Zn)	
Mine dewatering discharge to ***the Starlight, Tom's, Callie's South, Eldorado and Trev's pits and the*** *Yarlarweelor Creek (as depicted in Attachment 4)*	*Quarterly (January, April, July, October)*	*pH[2]*	*pH units*
		Total Dissolved Solids (TDS)	*mg/L*
		Total Recoverable Hydrocarbons (TRH)	
	Annually	*Arsenic (As)*	
		Cadmium (Cd)	
		Chromium (Cr)	
		Copper (Cu)	
		Lead (Pb)	
		Nitrate-nitrogen (NO_3-N)	
		Selenium (Se)	
		Sulphate (SO_4)	

Note 1: SWL shall be determined prior to collection of other water samples
Note 2: In-field non-NATA accredited analysis permitted.

3. Condition 1(d) of the licence is amended by the insertion of the bold text shown in underline below:

   The Licensee shall maintain a flow meter to ensure the continuous and accurate recording of the cumulative quantity of dewatering discharge to the ***Starlight, Tom's, Callie's South, Eldorado and Trev's pits and the*** *Yarlarweelor Creek.*

4. Condition 5 of the licence is amended to the following:

   The licensee shall by 1 October in each year, provide to the CEO an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the condition in this Licence for the period beginning 1 July the previous year and ending on 30 June in that year.

5. The licence is amended by the insertion of the following section 'Works' and the inclusion of Table 5 and conditions 6(a) to 6(d):

6 Works

6(a) The Licensee must construct the infrastructure listed in Column 1 in accordance with the requirements set out in Column 2 of Table 5.

<table>
<tr><th colspan="2">Table 5: Infrastructure Requirement Table</th></tr>
<tr><td>Column 1</td><td>Column 2</td></tr>
<tr><td>Infrastructure</td><td>Specifications (design and construction)</td></tr>
<tr><td>Embankment lifts to Cell 1 and Cell 2 at the TSF2</td><td>

The TSF2 is upstream lifted on the existing footprint using mechanically compacted tailings in stages set out below to a final elevation of RL520m:

<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>1</td><td>Raise Cell 2 by 3m to RL514m</td></tr>
<tr><td>2</td><td>Raise Cell 1 by 2m to RL514m (can be constructed in parallel with Stage 1 lift)</td></tr>
<tr><td>3</td><td>Raise Cell 2 by 3m to RL517m</td></tr>
<tr><td>4</td><td>Raise Cell 1 by 3m to RL517m</td></tr>
<tr><td>5</td><td>Raise Cell 2 by 3m to RL520m</td></tr>
<tr><td>6</td><td>Raise Cell 1 by 3m to RL520m</td></tr>
</table>

Foundation preparation (on tailings) – remove vegetation and organic matters followed by ripping, moisture condition and compaction;
Foundation preparation (on existing embankment) – remove vegetation and organic matters and remove and stockpile wearing course followed by ripping, moisture condition and compaction;
Raise perimeter embankment by borrowing tailings from beach, moisture condition, place and spread, and compact to maximum 300 mm layers;
Raise decant causeway by borrowing tailings or waste rock;
Raise decant tower slotted concrete rings and place waste rock around;
Repair or replace tailings piping and spigots;
Repair or replace return water pump and piping;
Minimum freeboard for each stage a combined total of the contingency storage allowance (minimum of 500mm) plus extreme storage allowance (1:100 AEP 72 storm of 221 mm);
Corresponding central concrete decant tower is extended during each stage; and
Repair or replace the lining at the underdrainage collection sump to achieve an impervious barrier for retaining collected seepage water from the TSF2.

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</table>

6(b) The Licensee must not depart from the requirements specified in the Infrastructure Requirements Table except:

(a) where such departure is minor in nature and does not materially change or affect the infrastructure; or

(b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment.

6(c) The Licensee must upon completion of the works and prior to operation as per condition 6(a) provide to the CEO an engineering certification from a suitably qualified professional confirming each item of infrastructure as specified in Table 6(a) has been constructed with no material defects.

6(d) The Licensee must ensure that the equipment and infrastructure in Table 5 are maintained in good working order.

6. Attachment 4 of the licence is amended by including the *Starlight, Tom's, Callie's South, Eldorado and Trev's pits as discharge locations*.

ATTACHMENT 4: DEWATERING DISCHARGE POINTS INTO THE STARLIGHT, TOM'S, CALLIE'S SOUTH, ELDORADO AND TREV'S PITS AND THE YARLARWEELOR CREEK