



Application for Licence Amendment

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

Licence Number	L4597/1988/14
Licence Holder	Barto Gold Mining Pty Ltd
ACN	161 566 490
File Number	DER2014/000887-1~8
Premises	Southern Cross Operations MARVEL LOCH WA 6426 Mining Leases M77/7, M77/8, M77/10, M77/26, M77/31, M77/6 M77/86, M77/109, M77/112, M77/113, M77/114, M77/137, M77/138, M77/175, M77/193, M77/197, M77/224, M77/225, M77/239, M77/251, M77/347, M77/352, M77/380, M77/408, M77/424, M77/431, M77/525, M77/554, M77/555, M77/593, M77/631, M77/638, M77/640, M77/660, M77/655, M77/668, M77/702, M77/745, M77/721, M77/746, M77/747, M77/775, M77/790, M77/792, M77/793, M77/811, M77/969, M77/977, M77/1036, and M77/1275, Miscellaneous Licences L77/51, L77/87, L77/112, L77/113, L77/114, L77/126, L77/128, L77/16: L77/167, L77/173, L77/281, L77/290, P77/3792 and General Purpose Leases G77/1-3 As defined by the Premises maps attached to the Revised Licence
Date of Report	27 January 2023
Decision	Revised licence granted

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Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Application summary	1
2.3 Mining Act	3
2.4 Incidents and Complaints	3
3. Risk assessment	4
3.1 Source-pathways and receptors	4
3.1.1 Emissions and controls	4
3.1.2 Receptors	6
3.2 Risk ratings	10
3.3 Detailed risk assessment for seepage impacts to adjacent native vegetation	14
3.3.1 Context	14
3.3.1 Source	14
3.3.1 Pathway	15
3.3.2 Applicant proposed controls	15
3.3.3 DWER assessment	15
4. Consultation	16
5. Conclusion	16
5.1 Summary of amendments	16
References	17
Appendix 2: Application validation summary	18
Table 1 Relevant ICMS incidents	3
Table 2: Licence Holder controls	5
Table 3: Sensitive human and environmental receptors and distance from prescribed activity	7
Table 4. Risk assessment of potential emissions and discharges from the Premises during construction and operation	11
Table 5. Groundwater quality between Yilgarn and Nevoria	14
Table 6: Consultation	16
Table 7: Summary of licence amendments	16
Figure 1: Yilgarn Star – Nevoria pipeline route	2
Figure 2: Distance to Sensitive Receptors	9
Figure 3: Distance of second pipeline to Aboriginal heritage site #4937	9

1. Decision summary

Licence L4597/1988/14 is held by Barto Gold Mining Pty Ltd (Licence Holder, the applicant) for the Southern Cross Operations (the Premises), Marvel Loch, Western Australia. Only mining tenements M77/431, M77/640, L77/173, M77/792, M77/793 and M77/31 and miscellaneous licence L77/51 are relevant for the purposes of this amendment. Marvel Loch is the closest town, located 10 km northwest from the premises boundary.

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 construction and operation of the Premises. As a result of this assessment, Revised Licence L4597/1988/14 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 Application summary

On 24 October 2022, the Licence Holder submitted an application to the department to amend Licence L4597/1988/14 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Construction and operation of an additional pipeline from Yilgarn Star underground mine to Nevorita pit; and
- Addition of mining tenements M77/792 and M77/793 to the premises boundary.

The Licence Holder intends to recommence mining at the Yilgarn Star pit in early 2023 which requires dewatering prior to recommencing mining¹. The applicant consequently seeks to add an additional pipeline from Yilgarn Star to Nevorita within the existing pipeline corridor, to increase the dewatering rates from the Yilgarn Star Pit and subsequent discharge rates at Nevorita Pit. The original pipeline, operational since 2005, is not currently reflected in the licence.²

L4597/1988/14 currently authorises “mine dewater” to be discharged to Nevorita Pit (and other pits on-site). During previous operations, mine dewater was moved from Yilgarn Star to Nevorita, and in more recent times from Nevorita back to Yilgarn Star (to allow for mining operations at Nevorita). Mining ceased at Nevorita in September 2022.

¹ There is 7.6GL of hypersaline water stored in the Yilgarn Star underground pit. Underground mining ceased in 2003 with dewatering continuing to maintain infrastructure. A new pipeline was approved by DWER and Department of Mines, Industry Regulation and Safety (DMIRS) in 2005 to discharge the Yilgarn Star underground to the Nevorita complex. This was deactivated 9 months later. In 2007 Directional flow of the existing Yilgarn Star-Nevorita pipeline was reversed to enable Nevorita dewatering.

² As per correspondence with the Department of Environment in 2005 (Notice of Intent) the original pipeline has not been licenced (DoE, 2005).

This amendment is limited only to changes to Category 6 activities from the existing Licence. No changes to the aspects of the existing Licence relating to Category 5, 57 and 64 have been requested by the Licence Holder.

Whilst the rate of dewatering to Nevoria pit is proposed to increase³, the overall premises throughput for category 6 will remain unchanged.

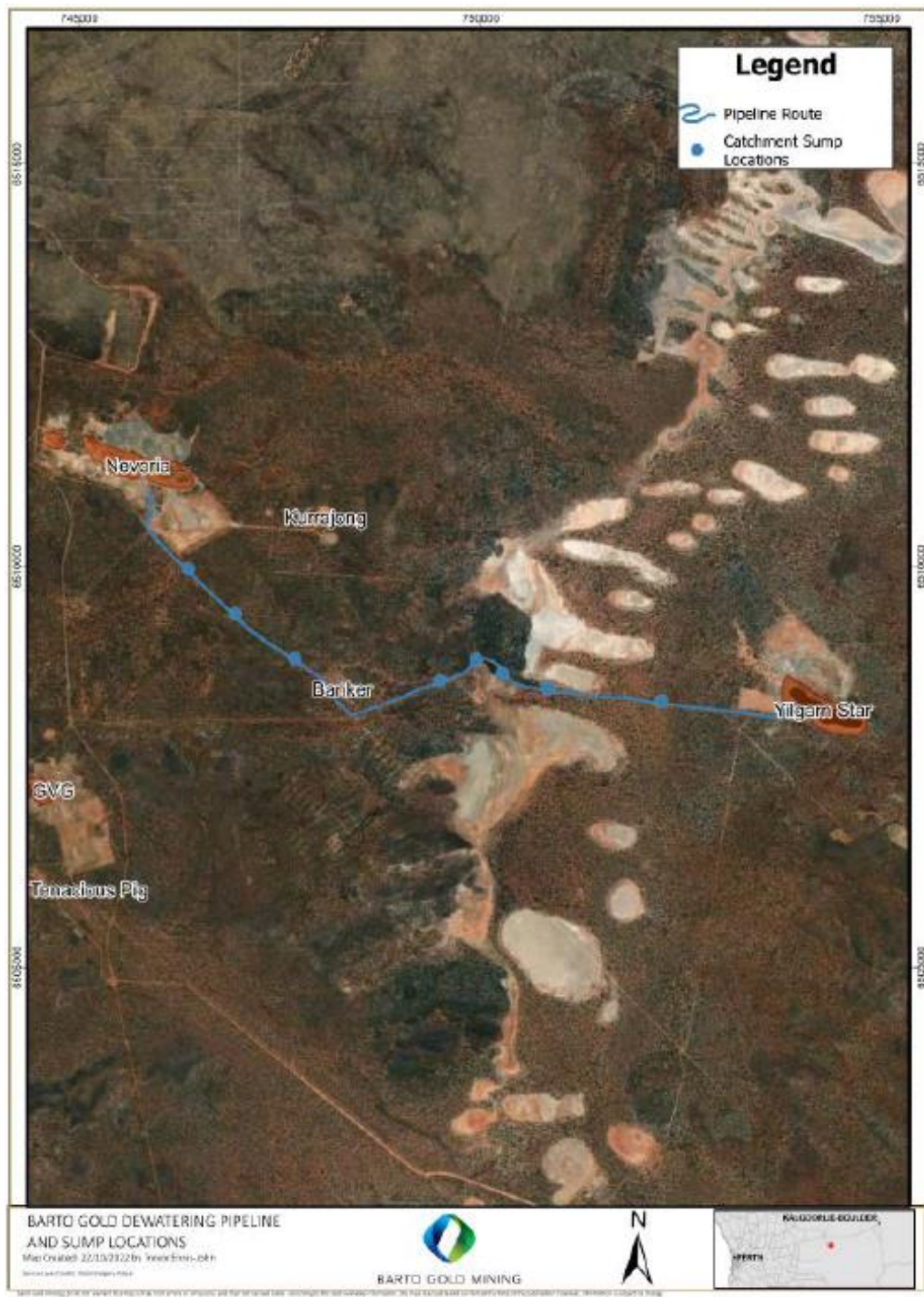


Figure 1: Yilgarn Star – Nevoria pipeline route

³ The existing approved dewatering pipeline from the Yilgarn Star to Nevoria is capable of dewatering at a rate of 140L/s. In order to meet mine planning timeframes, a flow rate of up to 400L/s is required.

2.3 Mining Act

Pipeline infrastructure and mine dewatering is approved under Notice of Intent (NOI) #5192 under the *Mining Act 1978*, approved on the 30th of November 2005. This document covers the construction of dewatering pipeline infrastructure from Yilgarn Star turkey's nest to Nevoria mine area.

2.4 Incidents and Complaints

Table 1 below illustrates the reported environmental incidents reported to the department regarding Yilgarn underground and Nevoria open pit and associated infrastructure.

Table 1 Relevant Incident and Complaints Management System (ICMS) recordings

ICMS Number	Summary
63365	<ul style="list-style-type: none"> • November 2021 • Burst pipeline between Nevoria and Yilgarn Star. • Mostly captured in the associated v-drain catchment area and scour pit. Some localized flooding onto the road and into vegetation at rainwater drainage point of the road. • Approximately 30,000-50,000L of hypersaline (~200,000mg/L) water was released when the flange in the pipeline burst. • Steps taken by Licence Holder to rectify the pipeline involved: <ul style="list-style-type: none"> - re-welding the flange; - v-drain catchment area was dug out to allow for full containment of released water and to reduce stress on each pipe joint. (Barto Gold, 2021a) • Steps taken by the department following notification: <ul style="list-style-type: none"> - recorded for intelligence purposes; - identified issues to be raised at next Compliance Inspection; and - Licensee informed of licence obligations.
62970	<ul style="list-style-type: none"> • November 2021 • Silver pit pump not shut off resulting in Nevoria Turkey nest overflow • Approximately 10,000 liters of hypersaline water was released. • Steps taken by Licence Holder to rectify the overflow include: <ul style="list-style-type: none"> - a flashing light installed as warning device - level controls installed to automate the system. - telemetry system installed between Silver Pit pumps, Nevoria Turkeys Nest and Processing Plant (Barto Gold, 2021b).

	<ul style="list-style-type: none"> • Steps taken by the department following notification: <ul style="list-style-type: none"> - recorded for intelligence purposes
62698	<ul style="list-style-type: none"> • September 2021 • Silver pit pumps not switched off causing Nevorvia Turkey Nest dam to overflow • ~20,000L of hypersaline water pooled in a cleared area between dam and waste dump. • Steps taken by Licence Holder to rectify overflow; <ul style="list-style-type: none"> - Silver and Norton pit pumps were turned off immediately. • Steps taken by the department following notification: <ul style="list-style-type: none"> - recorded for intelligence purposes; - identified issues to be raised at next Compliance Inspection; and - Licensee informed of licence obligations.

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 *Guideline: Risk assessments* (DWER 2020).

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

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary. As there are no nearby human receptors, noise has been discounted as an emission for risk assessment.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Pipeline Construction	Air/windborne pathway	<p><u>Existing licence controls:</u></p> <ul style="list-style-type: none"> • Use of watering truck to prevent dust emissions; • Earth works to stop during high wind periods; • Use of existing v-drains; <p><u>Proposed controls:</u></p> <ul style="list-style-type: none"> • Short construction period of ~ 2 months; and • New pipeline will be constructed in the existing pipeline corridor, above the ground and in existing v-drain.
Hydrocarbon spills	Machinery spills during construction of pipeline	Directly to soil	<p><u>Existing licence controls:</u></p> <ul style="list-style-type: none"> • Servicing and refueling vehicles and equipment off-site; • Keep spill kits on machinery; and • Prompt clean-up of spills.
Operation			
Hypersaline mine dewater	Transfer of dewater along pipeline	Pipeline leak/rupture resulting in direct discharge to environment	<p><u>Existing licence controls:</u></p> <ul style="list-style-type: none"> • High density polyethylene (HDPE) lined and includes a pump and booster pumps at required intervals along the pipeline; • Flow meters will be installed; • Pipeline installed to contain spillage in the event of a leak; • Pipeline to have monitoring stations, communicating via radio telemetry – if leaks are detected, the transfer pumps will shut off automatically; • Pipeline installed in v-drains; • Existing sumps will be utilised for spill containment; • Leaks and spills will discharge into

Emission	Sources	Potential pathways	Proposed controls
			<p>appropriately sized catchment ponds/sumps; and</p> <ul style="list-style-type: none"> Twice daily inspections of the pipeline and discharge point. <p><u>Proposed controls</u></p> <ul style="list-style-type: none"> Pipeline constructed using existing pipeline from disassembled Axehandle-Triad dewatering pipeline.
	Deposition and storage of mine dewater in Nevoria complex	Overtopping of pit	<p><u>Existing licence controls:</u></p> <ul style="list-style-type: none"> Infrastructure made of bedrock; Turkeys nest dewater transfer dams (including Victoria's turkey's nest, Nevoria, Yilgarn Star, Cornishman and Windmills); and Daily visual inspection of pit and turkeys nest <p><u>Proposed controls:</u></p> <p>Maintaining a minimum freeboard of 10m.</p>
Hydrocarbon spills/leaks	Spills from pumps from dewatering	Directly to soil	<p><u>Existing licence controls:</u></p> <ul style="list-style-type: none"> Check pumps daily; Prompt clean-up of spills; and Servicing and refueling vehicles and equipment off site.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), 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 3 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 (*Guideline: Environmental siting* (DWER 2020)). The closest residential town is Marvel Loch located approximately 9 km northwest of the Nevoria complex. Given the large distance to the nearest human receptors, impacts to these receptors have not been considered in this risk assessment.

Table 3: Sensitive human and environmental receptors and distance from prescribed activity.

Human receptors	Distance from prescribed activity
Aboriginal and other heritage sites	<p>ID: 4937 (Mining tenements M77/31 and M77/431) – The Department’s Geocortex mapping software (Geocortex) indicates that pipelines will pass through this heritage area. However, the applicant and coordinates on Department of Planning, Land and Heritage’s (DPLH) Aboriginal Heritage Inquiry System states that the structure is located 170 m south-west of the Yilgarn Star – Nevorla haul road and on the opposite side to the existing pipeline. The total distance from the site is ~195 m from the proposed secondary pipeline.</p> <p>The site is recorded at a higher elevation than the haul road and both the existing and proposed pipeline.</p> <p>Despite the proximity to the haul road, all activities in the construction of the secondary pipeline will remain within the existing disturbance envelope and no interaction will occur.</p> <p>Shown in Figure 3 below.</p>
Environmental receptors	Distance from prescribed activity
Threatened Ecological Communities (TEC)	Plant assemblages of the Parker Range system – Priority 3 - Proposed pipeline intersects TEC.
Threatened and priority fauna	<ul style="list-style-type: none"> • Malleefowl (<i>Leipoa ocellata</i>) – closest recorded occurrence approximately 105 m north-northeast of Yilgarn Star in 2018. All Malleefowl recorded on the Department of Biodiversity Conservation and Attractions (DBCA) database are historical. • Chuditch (<i>Dasyurus geoffroii</i>) – recorded within the premises boundary by applicant. DBCA database has no recorded sightings >5km from the pipeline. • Tree-stem Trapdoor spider (<i>Againippe Castellum</i>) - recorded within the Parker Range System TEC and may occur near the pipeline. Closest recording ~4.2 km from pipeline.
Threatened and priority flora	<p>Recorded on Geocortex less than 2km from the proposed works:</p> <ul style="list-style-type: none"> • <i>Eremophila inflata</i> (Priority 4); • <i>Acacia asepala</i> (Priority 2); • <i>Goodenia heatheriana</i> (Priority 1); • <i>Millotia newbeyi</i> (Priority 1); • <i>Microcorys sp. Forrestania</i> (Priority 4); and • <i>Hydrocotyle corynophora</i> (Priority 1). <p>Others recorded by applicant within the premises boundary include:</p>

	<ul style="list-style-type: none"> • <i>Hakea pendens</i> (Priority 3) – 120 m; • <i>Rinzia fimbriolata</i> (Priority 1) – 500 m from proposed works; and • <i>Stenanthemum bremerense</i> (Priority 4) – 500 m
Native vegetation	The remnant vegetation surrounding the areas of activities and construction are characterised as healthy ('Good' to 'Very Good') populations of <i>Eucalyptus</i> and <i>Acacia</i> dominated woodlands
Surface Water Bodies and Lines	<ul style="list-style-type: none"> • There are no permanent water bodies at the site, only ephemeral flow occurs during periods of heavy rainfall; • The nearest non perennial body of is intersected by the proposed pipeline; • Due to the topography of this area, surface water has potential to run towards these water bodies; • Surface water runoff from the ephemeral surface water drainage system (Polaris paleodrainages system) intercepts the proposed location of the pipeline; and • SXO located in Lake Julia sub-catchment which forms part of the regional Yilgarn River Catchment in the western extent of the Avon River Catchment.
Goldfields Groundwater Management Area <i>Rights in Water Irrigation Act 1914</i> (RIWI) Ground Water Proclamation Area	<p><u>Groundwater depth:</u></p> <ul style="list-style-type: none"> • 60-90 mbgl between the two pits <p><u>Groundwater quality</u></p> <ul style="list-style-type: none"> • Groundwater is considered Hypersaline (total dissolved solids (TDS) ~200,000Mg/L). <p><u>Beneficial uses</u></p> <ul style="list-style-type: none"> • No beneficial uses outside of mineral processing (EMM 2022); and • The proposed pipeline lies within the Yilgarn River palaeovalley part of the Deborah Groundwater Management Subarea.

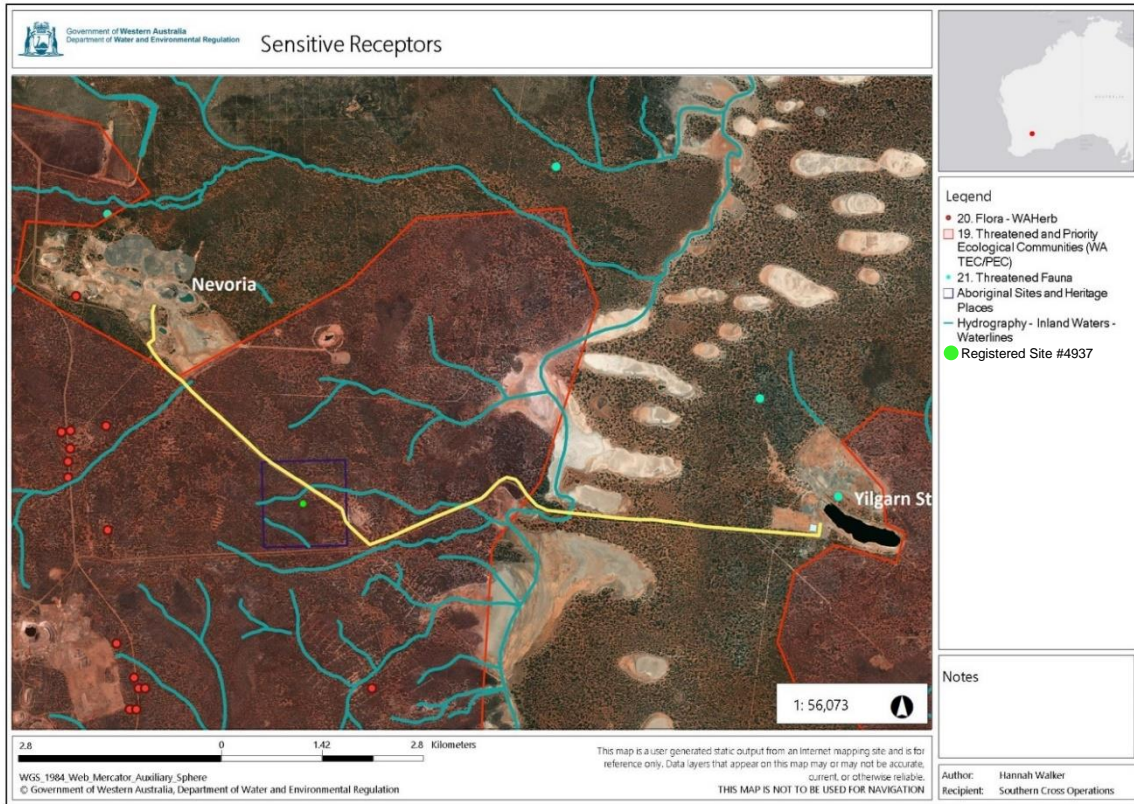


Figure 2: Distance to Sensitive Receptors

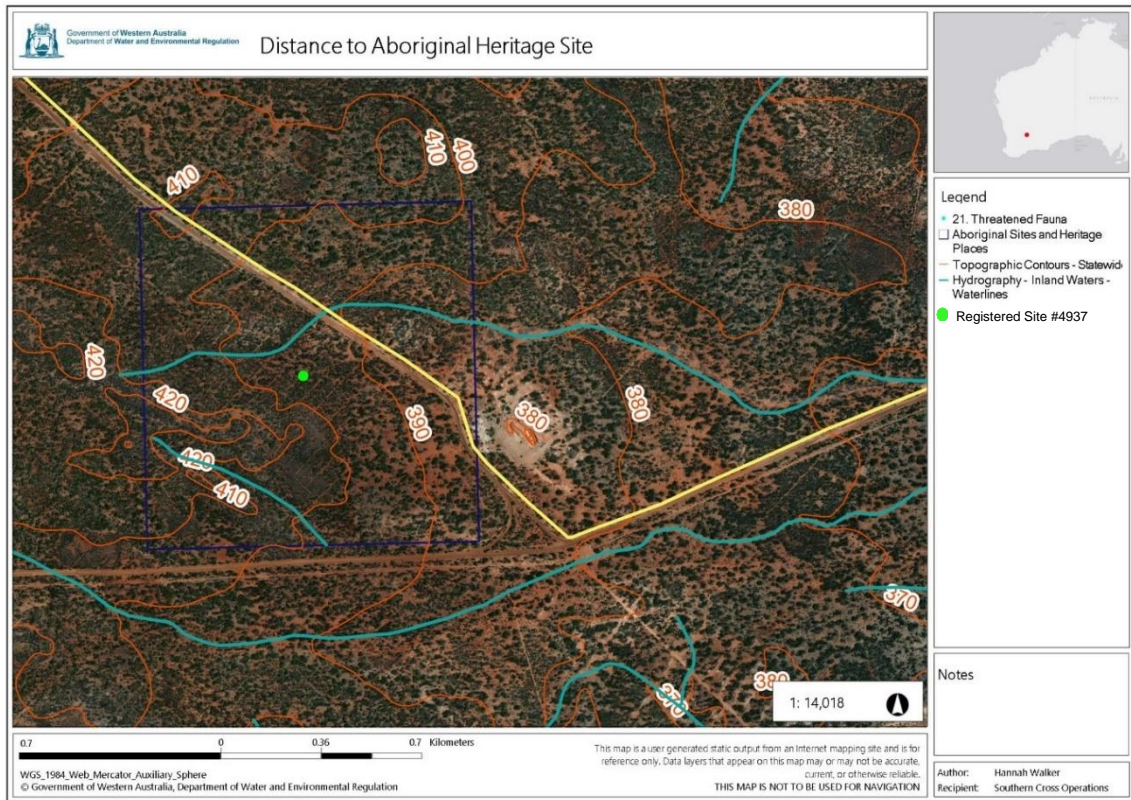


Figure 3: Distance of second pipeline to Aboriginal heritage site #4937

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) 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 incomplete 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 4.

The Revised Licence L4597/1988/14 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 6 activities.

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

Table 4. Risk assessment of potential emissions and discharges from the Premises during construction and 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				
Construction								
Earth moving activities for construction of dewatering pipeline including vehicle movements.	Dust	Pathway: Air / windborne pathway Impact: Smothering of vegetation and disturbance to fauna	Native vegetation, including priority and threatened flora Threatened fauna	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	N	<u>New condition:</u> Condition 26: Malleefowl survey	Undertaken in existing construction corridor. Considering the pipeline goes through a TEC that has recorded Malleefowl sightings, condition 26 has been added to ensure no active mounds are disturbed during construction.
	Hydrocarbon spills/leaks	Pathway: infiltration into ground Impact: contamination of soils	Aboriginal Heritage					
Operation								
Operation of dewatering pipeline	Hypersaline mine dewater	Pathway: Pipeline leak or rupture, resulting in overland runoff (discharge to land) Impact: Disturbance to Aboriginal heritage, fauna or nearby vegetation resulting in increased erosion and contamination of soil and waterbodies.	Native vegetation, including priority and threatened flora Threatened fauna Aboriginal Heritage	Refer to Section 3.1	C = Minor L = Possible Medium Risk	Y	<u>Existing licence conditions:</u> Condition 1: Pipeline spill mitigation Condition 3: Pipeline inspection Condition 27 & 28: environmental compliance reporting requirements <u>Modification to existing conditions:</u> Condition 25: pipeline construction	Applicant proposed controls are considered sufficient to mitigate the risk and have been placed on the licence as regulatory controls. Construction requirements have been updated to include the new dewatering pipeline.

Licence: L4597/1988/14

Risk Event					Risk rating ¹	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	C = consequence L = likelihood			
Deposition of mine dewater from Yilgarn Star to Nevorio complex	Hypersaline mine dewater	<p>Pathway: Overtopping, resulting in overland runoff (discharge to land)</p> <p>Impact: Disturbance to fauna, nearby vegetation and contamination of water bodies</p>	<p>Native vegetation, including priority and threatened flora</p> <p>Threatened fauna</p>	Refer to Section 3.1	<p>C= Minor</p> <p>L = Rare</p> <p>Low Risk</p>	Y	<p><u>New Condition:</u></p> <p><u>Condition 5: Nevorio complex freeboard</u></p> <p><u>Existing Conditions:</u></p> <p>Condition 24: pipeline inspection</p> <p>Condition 34: monitoring at point of emission</p> <p>Condition 38: cumulative volumes of mine</p>	<p>Applicant proposed controls are considered sufficient to mitigate the risk and have been placed on the licence as regulatory controls.</p> <p>The previous condition 5 has been removed and replaced by the new condition 5 that includes all future freeboards.</p>
	Hypersaline mine dewater	<p>Pathway: Seepage and infiltration – lateral movement of pit lake water through walls</p> <p>Impact: Saturation of pit wall may affect stability of infrastructure integrity, mounding of groundwater table, impacts to surface vegetation and pit water could transfer to groundwater.</p>	<p>Groundwater mounding and quality</p> <p>Groundwater depressions</p>	Refer to Section 3.1	<p>C = Minor</p> <p>L = Unlikely</p> <p>Medium Risk</p>	N	<p><u>New Condition:</u></p> <p><u>Condition 5: Nevorio complex freeboard</u></p> <p><u>Conditions 35 – 37: sampling of pit water</u></p> <p><u>Existing Conditions:</u></p> <p>Condition 2: containment infrastructure</p> <p>Condition 3: pipeline inspection</p> <p>Condition 34: monitoring at point of emission</p> <p>Condition 38: cumulative volumes</p>	Refer to section 3.3

Licence: L4597/1988/14

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				
							of mine dewater Condition 39: Groundwater bore monitoring	
	Hypersaline mine dewater	Pathway: Overtopping of the Nevorla Turkey's nest, resulting in overland runoff (discharge to land) Impact: Disturbance to fauna, nearby vegetation, and contamination into water bodies	Native vegetation, including priority and threatened flora Threatened fauna	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	<u>Existing Conditions:</u> Condition 2 – table 1 turkey nest freeboard Condition 3 – table 2 inspection of infrastructure Condition 4 – freeboard requirements	Conditions of the licence are sufficient, and no further actions are required.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

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

3.3 Detailed risk assessment for seepage impacts to adjacent native vegetation

3.3.1 Context

Historical context

In 2005 approval was granted from both DMIRS and DWER for the construction and operation of a pipeline to discharge the Yilgarn Star underground dewater to the Nevoria complex. Discharge occurred for 9 months before the licence holder at the time (St Barbara) discontinued mining the underground at Yilgarn Star and subsequently let the pit flood.

In September 2007 St Barbara recommenced mining at the Nevoria complex. Yilgarn Star then became the storage location for mine dewatering from the Nevoria operations. Directional flow of the existing Yilgarn Star-Nevoria pipeline was reversed to enable Nevoria dewatering. The combination of natural groundwater recharge into the Yilgarn Star pit, plus water inflow from Nevoria over the last 15 years, has now resulted in approximately 7.6GL of hypersaline water stored in the Yilgarn Star pit (Barto, 2022).

Pit Capacity

The total volume of water required to be removed from Yilgarn Star to enable mining to commence is approximately 5,000,000 m³. The total capacity of the Nevoria complex, including open pits and underground voids is approximately 8,957,000 m³, allowing a freeboard capacity of 10m.

3.3.1 Source

Dewater chemistry

The 2022 Annual Environmental Report (AER) (Barto, 2022a) recorded dewater chemistry for the dewater taken from Nevoria before it discharged into Yilgarn Star. The dewater is sampled at the Nevoria Turkey nest. This dewater is classed as hypersaline with an average TDS over the reporting period of 198,000mg/L. The dominant ions sodium and chloride averaging 55,800 mg/L and 105,500 mg/L respectively and the pH of the turkey nest water being 7.38. Due to Yilgarn Star pit, including its turkey nest, being in Care & Maintenance Status we do not have the chemistry of the water from Yilgarn Star turkey nest or from the pit itself, However, with the history of dewatering between the pits the water quality from Yilgarn to Nevoria is expected to be similar.

Groundwater Quality

The natural groundwater recharge will affect the dewater chemistry. Data provided in the 2021 Annual Groundwater Monitoring Summary (Barto, 2022b) in Table 5 below, shows the most prominent differences between the source and receiving pits groundwater. Data has been taken from groundwater bores associated with the pits.

Table 5. Groundwater quality between Yilgarn and Nevoria

Analyte	Source pit: Yilgarn pit	Receiving pit: Nevoria pit
pH	7.4	7.3
TDS	220,000mg/L	190,000mg/L
TSS	21 mg/L	62 mg/L
Arsenic	0.03 mg/L	0.012 mg/L

Nickel	0.09 mg/L	0.039 mg/L
Selenium	<0.005 mg/L	0.012 mg/L
Potassium	930 mg/L	680 mg/L
Magnesium	9,000 mg/L	7,100 mg/L
Sodium	72,000 mg/L	51,000 mg/L
Chloride	130,000 mg/L	100,000 mg/L

Annual evaporation far exceeds annual rainfall (Barto, 2022a) and according to the Licence Holder (Barto, 2021) recharge to the local groundwater system is suggested to be low. Primary water sources are from paleochannels which have traditionally high salt contents within the Yilgarn region.

Local groundwater is hypersaline with minimal beneficial use outside of mineral processing (EMM, 2022). There are no third-party groundwater users near to the proposed activity. Barto will have the continued option of using the water discharged to Nevoria from Yilgarn Star at its Marvel Loch processing plant. It currently has an approved pipeline from Nevoria to Marvel Loch which will enable additional water to be pumped from Nevoria to Marvel Loch for ore processing when required.

3.3.1 Pathway

Hydrogeology and drainage

The proposed project lies within the Yilgarn palaeovalley part of the Deborah Groundwater Management Subarea of the Goldfields Groundwater Management Area. This management area is made up of Alluvium, calcrete, paleochannel and fractured rock aquifer.

Nevoria pit is comprised of rocks of low permeability made up of fractured and weathered rocks. Fractured rock aquifers generally tend to contain groundwater in structurally controlled zones with limited storage. The storage potential is related to the depth of weathering and thickness of sedimentary cover. Yields from fractured rock aquifers can decrease rapidly and are generally less reliable and sustainable than those of other aquifer types.

Regional drainage is to the north-northeast, comprising of the Koorkoordine and Yilgarn tributaries and drains towards Lake Deborah East. Modern drainage is aligned with old palaeovalleys and concealed paleochannels.

3.3.2 Applicant proposed controls

To mitigate pit lake seepage into the ground and groundwater, the applicant has proposed the following control:

- install a 10 m freeboard limit at Nevoria Pit. This will not only prevent overtopping but will prevent groundwater mounding beyond 10 m bgl. This will limit damage to root zone of native vegetation.

3.3.3 DWER assessment

It is expected that on site impacts from seepage of dewater from the base and walls of the receiving pits will be **minor** due to the fact that there are no nearby groundwater users and that water quality of the source and receiving groundwater is similar. The likelihood of impacts occurring has been determined to be **unlikely**. The overall risk rating for this risk event has therefore been determined to be '**medium risk**'.

To mitigate risk associated with seepage, DWER will place the following controls on the licence as regulatory control:

- condition 5 has been proposed by the Licence Holder and requires the receiving pits to have a limit freeboard of 10 meters below crest level. The freeboard requirement will ensure that if mounding were to occur it would not reach the root zones of native vegetation at the surface;
- condition 26 has been proposed for the construction period and requires the Licence Holder to undertake a fauna survey to undertake and record active Malleefowl mounds. If mounds are found management action must be undertaken to reduce disturbance to mounds; and
- addition of conditions 35 – 37 for monitoring of the pit water quality. This requires the Licence Holder to provide data to demonstrate that the pit water is similar for each discharge location and therefore the risk can be managed accordingly.

4. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Licence Holder was provided with draft amendment on 27/01/2023	The applicant requested to waive 21 draft period, no comments provided on the draft documents.	N/A
Southern Cross resident (Ken Fairless) listed as a stakeholder for this premises, advised of proposal on 05/12/2022	No comments received	N/A

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 7 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 7: Summary of licence amendments

Condition no.	Proposed amendments
Premises details	Updated to include additional Mining leases M77/792 and M77/793

Condition no.	Proposed amendments
Condition 5	Updated to include all future pit freeboards to allow for 1:100 year flood event.
Condition 26	Addition of Malleefowl survey prior to pipeline construction
Conditions 35 - 37	Requires sampling and monitoring of the water retained in both pits
Schedule 1	Addition of Figure 16: Location of Secondary Yilgarn Star – Nevoria pipeline with sump locations

References

1. Barto Gold Mining Pty Ltd. 2021. *Annual Groundwater monitoring Summary – Southern Cross Operations*. Perth, Western Australia.
2. Barto Gold Mining Pty Ltd. 2021a. *Notification of detection of the breach of a limit or any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution*.
3. Barto Gold Mining Pty Ltd. 2021b. *Notification of detection of the breach of a limit or any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution*.
4. Barto Gold Mining Pty Ltd. 2022, *Application for Licence Amendment L4597/1988/14*. Perth, Western Australia.
5. Barto Gold Mining Pty Ltd. 2022a, *Southern Cross Operations L4598/1988/14 Annual Environmental Report 2022*. Perth, Western Australia.
6. Barto Gold Mining Pty Ltd. 2022b. *Groundwater Operating Strategy – Barto Gold Mining Pty Ltd: Southern Cross Operations*. Perth, Western Australia.
7. Department of Environment (2005). *RE: Yilgarn Star to Nevoria Water Pipeline*. Kalgoorlie, Western Australia.
8. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
9. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
10. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
11. EMM, 2022, *Water management options assessment, Southern Cross Operations site wide water balance*, June 2022.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY				
Application type				
Works approval	<input type="checkbox"/>			
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L4597/1988/14	
		Relevant works approval number:		N/A
Date application received	24 October 2022			
Applicant and Premises details				
Applicant name/s (full legal name/s)	Barto Gold Mining Pty Ltd			
Premises name	Southern Cross Operations (SXO)			
Premises location	Activities related to Category 6 (Dewatering) are located in mining leases: <ul style="list-style-type: none"> • M77/431 • M77/640 • L77/173 • M77/792 • M77/793 • M77/31 			
Local Government Authority	Shire of Yilgarn			
Application documents				
HPCM file reference number:	DER2014/000887-1~9			
Key application documents (additional to application form):	<ul style="list-style-type: none"> • Proof of occupier status • Copy of DWER Licence L4597/1998/14 • Premise map • Pipeline route • Application scope • Pipeline infrastructure • Statutory considerations • Existing environment • Assessment of impacts • Management of impacts 			
Scope of application/assessment				
Summary of proposed activities or changes to existing operations.	This application relates to Category 6 (Mine Dewatering) <ul style="list-style-type: none"> • Construction of additional pipeline from Yilgarn Star to Nevoria mine area within the existing pipeline corridor; and • Add mining tenement M77/792 and M77/793 to the premise details/boundary 			

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

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production or design capacity	Proposed changes to the production or design capacity
Category 6: Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore	6,000,000 tonnes per annual period	No change in production capacity

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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: N/A Managed under Part V N/A Assessed under Part IV N/A
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: N/A EPA Report No: N/A
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No: N/A
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input checked="" type="checkbox"/> Expiry: 27 November 2029 Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	Approval: Expiry date: If N/A explain why? Premise relating to this amendment are located on mining tenement, not freehold land
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Application reference No: Licence/permit No: GWL59227(10)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Name: Goldfields Groundwater Area Type: Proclaimed Groundwater Area Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Regional office: Goldfields
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/landuse compatible with the PDWSA (refer to <u>WQPN 25</u>)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004</i> , <i>Environmental Protection (Controlled Waste) Regulations 2004</i> , <i>State Agreement Act xxxx</i>)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining Act 1978 Right in Water and Irrigation (RIWI) Act 1914
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Two potentially contaminated sites fall on the path of the proposed pipeline are <i>Awaiting Classification</i> <ul style="list-style-type: none"> • DEC13052 • DEC13049