Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L9036/2017/1
Licence Holder	Pilgangoora Operations Pty Ltd
ACN	616 560 395
File Number	DWERVT15824~1
Premises	Pilgangoora Lithium Project Mining tenements M45/1230 and M45/1231 MARBLE BAR WA 6760 As defined by the Premises map attached to the Revised Licence
Date of Report	27/05/2025
Decision	Revised licence granted

Alana Kidd
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Date: 2025.05.27 08:16:23 +08'00'

Alana Kidd
Manager, Green Energy

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

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1. Decision summary

Licence L9036/2017/1 is held by Pilgangoora Operations Pty Ltd (Licence Holder) for the Pilgangoora Lithium Project (the Premises), located at mining tenements M45/1230 and M45/1231.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L9036/2017/1 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 22 August 2024, the Licence Holder submitted an application to the department to amend Licence L9036/2017/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- increase the maximum production capacity limit for the processing plant under prescribed premises category 5 from 1,540,000 tonnes per annual period to 1,800,000 tonnes per annual period;
- increase the maximum tailings discharge limit to the tailings storage facility (TSF) under prescribed premises category 5 from 770,000 tonnes per annual period to 840,000 tonnes per annual period;
- include the operation of the TSF Stage 5 southern section, constructed under works approval W6859/2023/1, and allow for the operation of TSF Stage 5 northern section following the submission of an appropriate compliance report;
- addition of a 1,000,000 tonnes per annual period (tpa) mobile crusher under prescribed premises category 5; and
- addition of prescribed premises category 6 (mine dewatering) to allow dewatering from the south pit and discharge into Pilgangoora Creek through a discharge point located outside of the current prescribed premises boundary. Category 6 applies for mine dewatering, where water is extracted and discharged to the environment to allow the mining of ore (at or above 50,000 tonnes or more per year).

This amendment is limited only to the addition of category 6 and the changes to category 5 activities from the existing Licence outlined above. No changes to the other aspects of the existing Licence relating to Category 5 have been requested by the Licence Holder.

Table 1 below outlines the proposed changes to the existing Licence.

Table 1: Proposed design or throughput capacity changes

Category	Current design/ throughput capacity	Proposed design/ throughput capacity	Description of proposed amendment
5	Total – 2,310,000 tonnes per annual period	Total – 3,640,000 tonnes per annual period	*Increase to maximum design/throughput capacity*
	Process plant – 1,540,000 tonnes per annual period	Process plant – 1,800,000 tonnes per annual period	*Increase to the maximum processing limit*
	TSF – 770,000 tonnes of tailings per annual period	TSF – 840,000 tonnes of tailings per annual period	*Increase to the maximum discharge limit*
	Mobile crusher – N/A	Mobile crusher – 1,000,000 tonnes per annual period	*Addition of a mobile crusher, up to 1,000,000 tonnes per annual period*
6	N/A	106,000 tonnes per annual period	*Mine dewater discharge up to 106,000 tonnes per annual period*

2.2.1 Category 5 activities

The Licence Holder proposes to construct and operate a mobile crusher that will be operated as required to support crushing operations at the site. The mobile crusher will have a maximum processing capacity of up to 1,000,000 tpa and its initial installation would occur within the prescribed premises boundary on mining tenement M45/1230. Ore processed at the mobile crusher will be trucked to the run of mine (ROM) for processing using the existing processing plant. In addition to this, the Licence Holder is also seeking to increase the processing limit for the existing process plant to 1,800,000 tonnes per annual period.

The operation of the mobile crusher and increased processing limit for the processing plant will result in an increase to the volume of tailings produced at the site, and therefore the applicant is also seeking to increase the maximum discharge limit to the existing TSF to 840,000 tonnes per annual period. The Licence Holder is approved to construct a Stage 5 embankment lift for the TSF under works approval W6859/2023/1 and is seeking to include the TSF Stage 5 lift in the licence as part of this amendment. The Licence Holder provided a Critical Containment Infrastructure Report for the TSF Stage 5 southern section to the department on 17 October 2024, and permission to commence time limited operations for the TSF Stage 5 southern section was granted on 12 November 2024. A Critical Containment Infrastructure Report for the TSF Stage 5 northern section was submitted to the department on 9 April 2025, and the department responded that its construction met the requirements of the works approval on 30 April 2025.

The Licence Holder advised that no changes to the design of the TSF or additional construction works beyond those approved under works approval W6859/2023/1 are required, as the TSF, inclusive of the previously approved Stage 5 embankment lift, has sufficient capacity to cater for the proposed increase to the maximum discharge limit.

The Licence Holder provided an updated water balance for the TSF that indicates that the existing TSF has sufficient capacity to accommodate the proposed increase to tailings production.

The proposed change to the TSF maximum discharge limit represents approximately 10 per cent increase to the current limit. The updated water balance provided by the Licence Holder indicates that the current rate of seepage from the TSF is approximately 1,517 cubic metres per day. A 10 per cent increase to the volume of tailings discharged to the existing TSF would result in an increased seepage rate of approximately 1747 cubic metres per day.

The existing TSF is expected to reach full capacity soon, however the department notes that the TSF Stage 5 embankment lift that the Licence Holder has approval for under works approval W6859/2023/1 is expected to provide an additional 6-9 months of capacity in total. This amendment allows for the TSF Stage 5 to be operated as part of the amended licence.

The Licence Holder advised that once the existing TSF reaches full capacity, tailings will be deposited into TSF3, currently being constructed under works approval W6859/2023/1. This amendment is limited to the deposition of tailings into the existing TSF included in licence L9036/2017/1 only. The Licence Holder is advised that a future licence amendment will be required to incorporate TSF3 into licence L9036/2017/1, at which time the increased tailings maximum discharge limit in relation to TSF3 will be assessed.

2.2.2 Category 6 activities

The Licence Holder proposes to amend the licence to include prescribed premises category 6 to permit the discharge of water from the south pit into Pilgangoora Creek. Dewater discharge will consist of water that has accumulated in the south pit following significant rainfall or cyclonic events.

A 1.5 km dewatering pipeline will extend north from the south pit in mining tenement M45/1230 to within the L9056/2017/1 prescribed premises boundary, also held by the Licence Holder, where it will connect with an existing pipeline and the discharge point. The location of the dewatering pipeline and the discharge point is shown in Figure 3, Appendix 2. The dewatering pipeline will be secured with stakes. There are no records of threatened or priority flora or fauna near the pipeline route, and the department notes that it follows an existing road that crosses over Pilgangoora Creek, approximately 0.4 km west of the approved discharge point. Water to be discharged will be fresh to brackish.

As the dewatering pipeline crosses over Pilgangoora Creek, the department notes that a permit to interfere with bed and banks under the *Rights in Water and Irrigation Act 1914* may be required and the Licence Holder should engage with the department's water licensing branch to determine whether a permit to interfere with bed and banks is required for the proposed pipeline.

The Licence Holder has advised that the collection of run-off in the south pit sumps will allow the settling of sediment prior to discharge to the environment.

To monitor the impacts of the dewater discharge, the Licence Holder proposes to continue with its current monitoring regime under its existing Surface Water Management Plan, which includes:

- taking upstream and downstream samples from Pilgangoora Creek during flow events, with samples analysed at an accredited National Association of Testing Authority (NATA) laboratory;
- annual, fixed point monitoring of Pilgangoora Creek beds and banks at each monitoring location, inclusive of taking photographs, observations of visual changes to Pilgangoora Creek, and the recording of sediment deposition and erosion; and
- recording the maximum annual creek depth at each monitoring point.

The Licence Holder is not required to undertake monitoring in the south pit under the existing conditions of licence L9036/2017/1, however has provided some monitoring results of the quality of water in the south pit, as shown in Table 2. There is a lack of recent monitoring results, with the most recent for some parameters from 19 February 2021. Due to the lack of recent data for key parameters, additional monitoring is required to be undertaken prior to the commencement of any discharge to accurately determine the quality of the dewater discharge from the south pit.

The department notes that works approval W6443/2020/1 for the construction of the dewater

discharge point did not include time limited operations (TLO) or any monitoring conditions, given that the discharge is to be limited to stormwater accumulated within the south and central pits following heavy rain or cyclonic events. Under works approval W6859/2023/1 (increase to category 5 only) and the existing licence (L9036/2017/1), the Licence Holder is required to undertake regular groundwater monitoring and during the works approval W6859/2023/1 TLO period. The department notes that no non-compliances with condition 11 (comparison of monitoring results against ASC NEPM and ANZECC 2000 guidelines) have been recorded at the site in the Licence Holder's Annual Environmental Reports for the previous three reporting periods.

The Licence Holder will be required to undertake ongoing monitoring for water quality at specific locations along Pilgangoora Creek to ensure that water quality parameters are acceptable. As the dewater discharge point is located within the L9056/2017/1 prescribed premises boundary, conditions relevant to this monitoring will be included in L9056/2017/1, which is currently being amended alongside this amendment of L9036/2017/1.

Table 2: South pit water quality monitoring results

Parameter	Unit	26/10/24	17/08/24	12/05/23	09/03/23	30/11/22	31/08/22	27/06/21	19/02/21
Alkalinity (bicarbonate) as HCO_3	mg/l		148	183		250		200	99
Alkalinity (carbonate)	mg/l		<1	<0.001					
Alkalinity (carbonate) as CO_3	mg/l		<1	<1		<5		<5	<5
Alkalinity (hydroxide) as $CaCO_3$	mg/l		<1	<1					
Alkalinity (hydroxide) as OH	mg/l					<5			
Alkalinity (total)	mg/l		122	183		200		170	81
Aluminium (Al)	mg/l								<0.005
Ammonia (NH_3)	mg/l								3.8
Antimony (Sb)	mg/l								7
Arsenic (As)	mg/l								0.21
Barium (Ba)	ug/l								15
Benzene	mg/l								<0.5
Bismuth (Bi)	ug/l								<1
Boron (B)	ug/l								270
Bromide	mg/l								0.36
Cadmium (Cd)	mg/l								0.0002
Caesium (Cs)	mg/l								0.14
Calcium (dissolved)	mg/l		90						
Calcium carbonate ($CaCO_3$)	mg/l			<1					
Calcium (Ca)	mg/l			153		130		80	96
Chloride	mg/l		177	227		240		140	100

Parameter	Unit	26/10/24	17/08/24	12/05/23	09/03/23	30/11/22	31/08/22	27/06/21	19/02/21
Chromium (Cr)	mg/l								<0.001
Cobalt (Co)	mg/l								0.007
Copper (Cu)	mg/l								0.001
EC	uS/cm	1.91	1.812	2770	1.76	2.96	2.48		
EC at 25°C	uS/cm		1,810			2,800		2,000	2,000
Fluoride (F)	mg/l								0.8
Iron (Fe)	mg/l								<0.005
Lead (Pb)	mg/l								<0.001
Lithium (dissolved)	ug/l		1,970	3,900				2,200	1,900
Lithium (Li)	ug/l					5,200			
Magnesium (dissolved)	mg/l		89						
Magnesium (Mg)	mg/l			134		110		110	110
Manganese (Mn)	ug/l								2
Mercury (Hg)	ug/l								<0.05
Molybdenum (Mo)	ug/l								9
Nickel (Ni)	ug/l								72
Nitrate (NO_3^-)	mg/l		397	857		660		530	630
Nitrite (NO_2)	mg/l								47
pH	pH		8.16						
Phosphorous (P)	ug/l								60
Potassium (dissolved)	ug/l		6,000						
Potassium (K)	ug/l			6,000		8,600		4,100	5,600
Rubidium (Rb)	ug/l								180
Selenium (Se)	ug/l								10

Parameter	Unit	26/10/24	17/08/24	12/05/23	09/03/23	30/11/22	31/08/22	27/06/21	19/02/21
Silicon as SiO_2 (dissolved)	ug/l		28,300						
Silicon (Si)	ug/l			34,300					12,000
Sodium (dissolved)	mg/l		125						
Sodium (Na)	mg/l			204		190		130	110
Sulfate (SO_4)	mg/l			309		160		160	170
Tantalum (Ta)	ug/l								<10
TDS	mg/l	1,336		2,130		1,900		1,200	1,200
TDS (dried at 180^{o}C)	mg/l		1,280	2,130					
Temperature	^{o}C					30.4	23.5		
Thallium (Tl)	ug/l								<1
Thorium (Th)	ug/l								<1
Tin (Sn)	ug/l								<1
Total nitrogen as N	mg/l								160

A summary of the south pit monitoring results outlined in Table 2 for several key parameters is shown in Table 3. The department notes that several of the concentrations recorded in the south pit water are above ANZECC trigger values for freshwater or recommended livestock drinking water quality values (ANZECC 2000).

Table 3: South pit water quality

Parameter	Unit	South pit sample (17/08/2024)	ANZECC criteria for livestock[1]	ANZECC criteria for freshwater[2]
pH Value	pH Unit	8.16	N/A	6.5 – 8.5
Electrical Conductivity (EC) at 25°C	µS/cm	1,810	N/A	N/A
TDS (dried at 180°C)	mg/L	1,280	4,000	N/A
Alkalinity (bicarbonate) as HCO_3		148	N/A	N/A
Alkalinity (carbonate)		<1	N/A	N/A
Alkalinity (carbonate) as CO_3		<1	N/A	N/A
Alkalinity (hydroxide) as $CaCO_3$		<1	N/A	N/A
Alkalinity (total)		122	N/A	N/A
Calcium (dissolved)		90	1,000	N/A
Chloride		177	N/A	N/A
Lithium (dissolved)		1,970	N/A	N/A
Magnesium (dissolved)		89	600	N/A
Nitrate (NO_3^-)		397	400	0.7
Potassium (dissolved)		6,000	N/A	N/A
Silicon as SiO_2 (dissolved)		28,300	N/A	N/A
Sodium (dissolved)		125	N/A	N/A

Note 1: National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3 Primary Industries, 2000, ANZECC and ARMCANZ (ANZECC 2000).

Note 2: National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 2 Freshwater Ecosystems, 2000, ANZECC and ARMCANZ (ANZECC 2000).

The Licence Holder has proposed that if nitrate levels are elevated beyond the following trigger values, then the water from the south pit will be redirected to the turkey's nest (Figure 2) for use as dust suppression, rather than discharged into Pilgangoora Creek:

- water sampled from the south pit:
    - 400 mg/L, in accordance with the livestock drinking water quality value for cattle (ANZECC 2000).

- water sampled from downstream Pilgangoora Creek:
    - 25 mg/L, corresponding closely to the 90% environmental protection level derived from a Pilbara-based study (A van Dam, Bankin, and Parry 2022); or
    - result is within 10% of a sampling result taken from upstream Pilgangoora Creek.

The Licence Holder has proposed to undertake monthly monitoring of water quality in the south pit so that impacts to the environment can be monitored and managed. Given that the water in the south and central pits is expected to be a mixture of groundwater inflow and rainwater, the quality of the combined discharge to Pilgangoora Creek is not considered to pose a significant risk to the environment (and should be well diluted). The department considers that collecting a representative sample of the water in the south pit prior to commencing discharge is sufficient to manage the risks to the environment, particularly as the amended L9056/2017/1, which is currently under assessment, will include conditions relating to the combined monitoring of the discharge to Pilgangoora Creek and management actions.

Compliance

The existing pipeline and discharge point were constructed under works approval W6443/2020/1 and an Environmental Compliance Report was provided to the department on 12 December 2022. The Licence Holder noted that the construction of the pipeline was non-compliant with Item 2 of Schedule 3 of the works approval as it was not located within a bund. The pipeline was instead placed along the natural contour of the ground to minimise clearing requirements and the Licence Holder advised that leaks or spills from the pipeline would runoff back into the mine pit or into Pilgangoora Creek, the approved discharge location.

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 4 below. Table 4 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 4: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Category 5 – installation of mobile crusher			
Dust	Works associated with the construction and installation of the mobile crusher	Air/windborne pathway resulting in poor vegetation health/death	No controls proposed by Licence Holder.
Category 6 – construction of dewatering pipeline			
Dust	Works associated with the construction of the dewatering pipeline	Air/windborne pathway resulting in poor vegetation health/death	No controls proposed by Licence Holder. The department notes that no controls relating to dust suppression are included in works approval W6443/2020/1.
Operation			
Category 5 – increased production capacity and operation of mobile crusher			
Dust	Operation of the mobile crusher and increased production capacity of process plant	Air/windborne pathway causing impacts to adjacent threatened and priority flora, native vegetation	**Proposed controls** • Equipped with a functioning dust suppression system • Contained so no contaminated runoff - as listed in the Environmental Protection (Unauthorised Discharges) Regulations 2004 is discharged to any drainage line or watercourse • Earthworks around the plant to be graded to ensure all clean stormwater from the surrounding areas is diverted around the mobile crushing and screening area • Construction of a sump located at a topographic low point within the mobile crushing and screening area to capture all stormwater and plant runoff within the mobile crushing and screening area.
Sediment laden stormwater		Overland run off causing impacts to adjacent threatened and priority flora, native vegetation	
Tailings and contaminated water (metals/ metalloids)	Increased deposition into the TSF	Increased seepage through base and embankments, causing groundwater contamination and mounding, impacting the root zones of native vegetation	**Proposed controls** • Use of an emulsion spray (Gluon 500 or similar) on the surface of the TSF to suppress dust emissions and particle lift off

Emission	Sources	Potential pathways	Proposed controls
		Overtopping of tailings management facility	
		Particle lift off from TSF causing impacts to health of vegetation and contamination of soil and surface water	
Category 6 – mine dewatering			

Dewatering from south pit to final discharge point in Pilgangoora Creek	Mine dewater discharge from south pit	Spills and leaks along pipelines causing impacts to health of vegetation and contamination of soil, surface water and potentially groundwater	**W6443/2020/1 controls**
			• Constructed of HDPE
			• Dewatering pipeline is located within a bund of sufficient capacity to completely contain any spills from pipeline leakage or breach for a period equal to the time between routine inspections
			• Dewatering pipeline anchored at regular intervals to restrict movement in the event of a significant rainfall event
			• Dewatering pump fitted with cumulative flow meter to measure flow rate and discharge volumes
			• Pilgangoora Creek outfall facility specifications:
			  ○ Layer of riprap installed to protect the receiving Pilgangoora Creek bank from erosion and scouring
			  ○ Only benign, non-acid forming (NAF) mine waste material used for rock armouring
			  ○ Diffuser arrangement at the end of the pipeline to spread the flow of mine dewater prior to release on the Pilgangoora Creek bed.
			W6443/2020/1 monitoring
			• Visual inspection every 12 hours when dewatering in operation for pipeline leakage or breach

		Mine dewater discharged to Pilgangoora Creek (and subsequently Turner River) causing: • Reduced quality or contamination surface water and potentially groundwater; and • Impacts to native vegetation, fauna and subterranean fauna health	

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 5 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 nearest human receptors are Indee Station and Wodinga Mine Camp, located 30 km northwest and 30 km southwest of the premises boundary, respectively.

Table 5: Sensitive environmental receptors and distance from prescribed activity

Environmental receptors	Distance from prescribed activity
Native vegetation • Priority 3 flora species Flora and vegetation surveys undertaken in 2016 did not identify any threatened or significant flora species, however it was noted that the priority 3 species *Stackhousia clementii* in a 2013 survey. The surveyor noted that the species was likely to be present but not flowering at the time of the survey. A total of 60 flora species were identified during the survey, three of which were introduced species. Five vegetation types were identified within the study type, with the majority of the site consisting of *Triodia hummock* grasslands.	Two individuals located within the prescribed premises boundary.
Fauna • Priority 4 fauna species • Migratory bird species Habitat for one priority 4 fauna species, the Western Pebble-mound Mouse (*Pseudomys chapmani*), was identified during a 2016 survey, including two active mounds. No individuals were observed during the survey. A threatened migratory bird species, the Rainbow Bee-eater (*Merops ornatus*) was observed during the survey.	Active mounds for a Priority 4 fauna species, the Western Pebble-mound Mouse (*Pseudomys chapmani*), located within the northwestern corner of the prescribed premises boundary. Two individuals sighted within the southwestern section of the prescribed premises boundary.

Subterranean Fauna
A subterranean fauna assessment was undertaken in 2016 within and to the north, east and south of the prescribed premises boundary. The key findings were:
• A total of 635 specimens were found, representing 19 species
• Five species were known only from within the project area and were collected from bores within the expected groundwater drawdown zone:
  ○ Two amphipods
  ○ Two syncarids
  ○ One ostracod.
Seven major groups were represented with composition typical of other Pilbara stygofauna communities. Three species were recorded in reference bores outside the project area and five troglofauna species were recorded outside the mine pits.
A targeted stygofauna survey was undertaken in 2019 for four species being known only from bores within areas anticipated
	Several species of stygofauna, troglofaunal harpacticoid copepods, cyclopoid copepods and ostracods identified within bores located within the prescribed premises boundary.
	Of the targeted stygofauna survey:
	• *Melitidae* sp. B08 (sp. 1 group) was located 0.1 km north of the prescribed premises boundary
	• *Nedsia* nr *hurlberti* sp.l was located 2.6 km north of the prescribed premises boundary
	• *Microceberidae* sp. B11 was located 1.9 km north of the prescribed premises boundary
	• *Bathynella* sp. B25 was located 0.1 km north of the prescribed premises boundary.

Environmental receptors	Distance from prescribed activity
to experience habitat loss through groundwater drawdown. These species include: • *Melitidae* sp. B08 (sp. 1 group) • *Nedsia* nr *hurlberti* s.l • *Microceberidae* sp. B11 • *Bathynella* sp. B25 Results indicated that the four targeted species occurred outside the predicted extent of any potential groundwater drawdown associated with mine dewatering.	
<u>Groundwater</u> • *Rights in Water Irrigation Act 1914* – Pilbara Groundwater Area Previous field investigations indicate that there are generally low permeability conditions around the site, with several discrete features in the bedrock reporting modest permeability. Water levels on the eastern side of the pit are 174 mAHD and fall to 165 mAHD on the western side of the pit. Groundwater recharge is predominantly through surface water runoff and flooding events along Pilgangoora Creek. The nearest groundwater dependent ecosystem to the project is the Chinnamon Creek system, approximately 2 km south of the project and 3 km south of any dewatering activities. A hydrogeological investigation was completed in 2016, including distance drawdown analysis of supply production bores. The investigation found that drawdown of up to 5 m may be possible at a distance of up to 3 km, noting that this represents a worst-case scenario.	The prescribed premises is located within the Pilbara Groundwater Area. Groundwater within the project area ranges from 7 to 25 mbgl and flows from east to west. Groundwater is considered fresh to brackish with 500-1,000 mg/L TDS. The department notes that TDS in the south pit water is higher than this and ranges from 1,200-2,130 mg/L TDS (Table 2). The main beneficial uses of the groundwater system in the vicinity of the project are mining and livestock drinking water. Groundwater is also used to produce potable water for the project by reverse osmosis treatment.
<u>Surface Water</u> • *Rights in Water Irrigation Act 1914* – Pilbara Surface Water Area The project area is located in the Turner River catchment, which discharges to the sea in tidal flats to the west of Port Hedland. Two creeks flow into the site and through operational areas. The southeast creek flows into the site from the southeastern corner and has a catchment of 1.6 square km. The channel is 5 m wide and would be 1.5-2.0 m deep in a 100-year flow of 13.9 cubic metres per second. The western creek is a similar size to the southeast creek and is cut off by the pit development.	The prescribed premises is located within the Pilbara Surface Water Area. Several minor ephemeral creeks are located within the prescribed premises boundary, primarily draining in a westerly direction, but with some flow to the north and south. Surface water flows from the east and southeastern sides of the project area towards the west, with all runoff eventually reaching the Turner River, approximately 20 km from the project area.

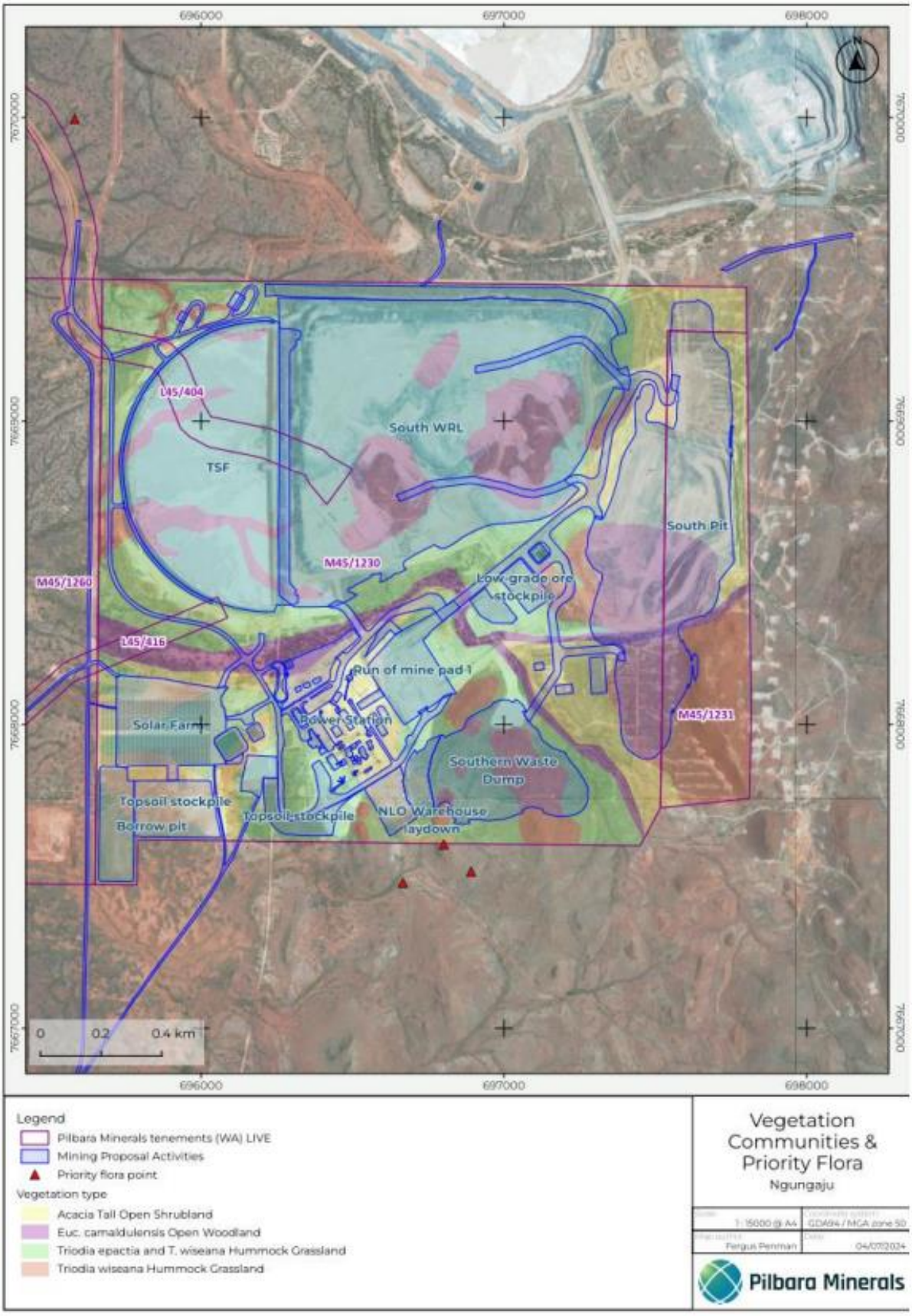

Figure 1: Distance to sensitive receptors

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 6.

The Revised Licence L9036/2017/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. category 5 and 6 activities.

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

Table 6. 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								
Category 5 – installation of mobile crusher								
Works associated with the installation of the mobile crusher	Dust	Air/windborne pathway resulting in poor vegetation health/death	Adjacent threatened and priority flora and native vegetation	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	**Conditions 25-27**	Regulatory requirements to ensure that the mobile crusher is installed as per the Licence Holder's commitments.
Category 6 – construction of dewatering pipeline								
Works associated with the construction of the dewatering pipeline	Dust	Air/windborne pathway resulting in poor vegetation health/death	Adjacent threatened and priority flora and native vegetation	Refer to Section 3.1	C = Slight L = Unlikely **Low Risk**	Y	**Conditions 25-27**	The controls for dewatering pipeline construction outlined in works approval W6443/2017/1 are considered sufficient and have been placed on the licence as regulatory controls
Operation								
Category 5 – increased production capacity and operation of mobile crusher								
Operation of the mobile crusher and increased production capacity of process plant	Dust	Air/windborne pathway resulting in poor vegetation health/death	Adjacent threatened and priority flora and native vegetation	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	**Condition 1**	Regulatory requirements to ensure that the mobile crusher is installed and operated as per the Licence Holder's commitments.
	Sediment laden stormwater	Overland run off causing impacts to adjacent threatened and priority flora, native vegetation	Adjacent threatened and priority flora and native	Refer to Section 3.1	C = Minor L = Unlikely **Medium Risk**	Y	**Condition 1**	Regulatory requirements to ensure that the mobile crusher is installed and operated as per the Licence Holder's

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**				
			vegetation					commitments.
Increased deposition into the TSF	Tailings and contaminated water (metals/ metalloids)	Increased seepage through base and embankments, causing groundwater contamination and mounding, impacting the root zones of native vegetation	Adjacent threatened and priority flora and native vegetation	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	**Conditions 1, 2, 5-9, and 20-24**	Deposition into the existing TSF will cease between May and August 2025 once it reaches full capacity. The department notes that no non-compliances with condition 11 (comparison of monitoring results against ASC NEPM and ANZECC 2000 guidelines) have been recorded at the site in the Licence Holder's Annual Environmental Reports for the previous three reporting periods. Additionally, given the amount of time between this assessment and the time when the TSF reaches full capacity, the increased volume of tailings to be deposited into the TSF during this period represents a small increase compared to current operations. The existing controls outlined in licence L9036/2017/1 are therefore considered sufficient for the period remaining. The department notes that a future licence amendment will be required to incorporate TSF3 into the licence, at which time the risks associated with the increased maximum discharge limit into TSF3 will be assessed.
		Air/windborne pathway resulting in poor	Adjacent threatened and priority	Refer to Section 3.1	C = Minor	Y	**Condition 1 (Table 2)**	Addition to the existing Table 2 to ensure that TSF lift-off is managed as per the Licence

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**				
		vegetation health/death	flora and native vegetation		L = Unlikely **Medium Risk**			Holder's current practices.
		Overtopping of TSF	Adjacent native vegetation and threatened and priority flora, fauna and surface water bodies	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	**Conditions 1, 2, 5-9, and 20-24**	The updated water balance provided by the Licence Holder demonstrates that the existing TSF has sufficient capacity to cater for the proposed increase. The existing controls outlined in licence L9036/2017/1 are therefore considered sufficient.
Category 6 – mine dewatering								
Dewatering from south pit to final discharge point in Pilgangoora Creek	Mine dewater discharge from south pit	Spills and leaks along pipelines causing impacts to health of vegetation and contamination of soil, surface water and potentially groundwater	Adjacent threatened and priority flora and native vegetation, fauna, soils, surface water bodies and groundwater	Refer to Section 3.1	C = Moderate L = Unlikely **Medium Risk**	Y	**Conditions 1, 3, and 4**	Regulatory requirements to ensure that the dewatering pipeline is installed and operated as per the Licence Holder's proposal.
		Mine dewater discharged to Pilgangoora Creek (and subsequently Turner River) causing: • Reduced quality or contamination surface water and potentially groundwater • Impacts to native vegetation, fauna and subterranean fauna health.		Refer to Section 3.1	C = Moderate L = Likely **High Risk**	N	**Conditions 1, 3, 4, 10, 11, and 25-30**	The Licence Holder is proposing to directly discharge mine dewater into the environment through the addition of a new prescribed premises category (category 6: mine dewatering) to licence L9036/2017/1. This presents an additional risk to the environment that is not currently managed through the existing licence conditions. Monitoring results for the south pit water provided by the Licence Holder indicate that there are several parameters that are in exceedance of

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**				
								relevant ANZECC values, if not diluted. Impacts to the environment are therefore considered likely to occur if the quality of mine dewater discharge is not managed appropriately. Discharge conditions are applied on L9056/2017/1 at the point of discharge to the environment, where additional discharge from the L9056/2017/1 premises is also discharged. The department has set additional conditions to monitor the quality of mine dewater taken from the south pit and allow for contingency actions to be taken in the event that exceedances of relevant values are identified, prior to any discharge event.

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.

4. Consultation

Table 7 provides a summary of the consultation undertaken by the department.

Table 7: Consultation

Consultation method	Comments received	Department response
Shire of East Pilbara advised of proposal on 18 September 2024	None received.	N/A
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal on 18 September 2024	DEMIRS advised that the application for an amendment to licence L9036/2017/1 is consistent with the Licence Holder's Mining Proposal (Reg ID 127709), currently under assessment. DEMIRS does not anticipate any significant alterations to the Mining Proposal.	The department acknowledges the consistency of the proposed amendment to licence L9036/2017/1 with the Licence Holder's Mining Proposal.
Department of Planning, Lands and Heritage (DPLH) advised of proposal on 18 September 2024	DPLH advised that a lodged Aboriginal heritage place (ID 37226) is located within mining tenement M45/1230 and that approvals under the Aboriginal Heritage Act 1972 are required for any works within the boundary of the Aboriginal heritage place.	The department notes that the current layout of the site is such that infrastructure is located outside of the boundary of the lodged Aboriginal heritage place. The location of the proposed works is also outside of the boundary.
Nyamal Aboriginal Corporation advised of proposal on 18 September 2024	None received.	N/A
Licence Holder was provided with a draft amendment on 28 October 2024.	The Licence Holder provided a response on 4 November 2024. Refer to Appendix 1.	Refer to Appendix 1.
Licence Holder was provided with a second draft amendment on 4 April 2025.	The Licence Holder provided a response on 28 April 2025. Refer to Appendix 1.	Refer to Appendix 1.

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 8 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 8: Summary of licence amendments

Condition no.	Proposed amendments
Definitions	Removed duplicated terms and terms not used in the licence. Amended term names for consistency with other instruments held by the Licence Holder.
Condition numbering	Amended numbering following inclusion and removal of conditions.
1.1	Removed reference to removed conditions. Inclusion of Licence Holder proposed controls for the management of particle lift off from the TSF and the inclusion of the operation of TSF Stage 5 in the licence.
1.3	Inclusion of Licence Holder proposed controls to mitigate risks associated with operation of the mobile crusher.
1.4	Inclusion of operational requirements and Licence Holder proposed controls to mitigate risks associated with operation of dewatering pipeline.
2	Increased maximum annual discharge limit for tailings to the TSF.
3	Inclusion of a maximum discharge limit for mine dewater to the approved discharge point.
4	Inclusion of Licence Holder proposed requirement to monitor the integrity of the dewatering pipeline during operations.
13 (formerly 11)	Amended the guidelines and standards that monitoring results are to be compared to for consistency with other instruments held by the Licence Holder.
14 (formerly 12)	Amended term name to be consistent with the name in the definitions table.
Formerly 14-17	Removed conditions relating to construction requirements for TSF Stage 3/4 infrastructure that has been constructed.
16	Specification of where tailings may be deposited.
17-19	Inclusion of Licence Holder proposed controls and associated reporting requirements relating to the construction and installation of the mobile crusher and dewatering pipeline.
20	Specification of when mine dewatering is permitted to commence.
21	Specification of monitoring requirements for any south pit water to be discharged.
22	Specification of where mine dewater must be directed to in the event of an exceedance of required parameter concentrations.

References

1. Australian and New Zealand Environment and Conservation Council (ANZECC) 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Canberra, Australian Capital Territory.
2. A van Dam, Rick, Bankin, Karin, and Parry, David 2022, *Derivation of Site-specific Guideline Values for Nitrate Toxicity in Pilbara Receiving Waters with High Hardness*, Integrated Environmental Assessment and Management, 18(4), 1035-1046.
3. Bennelongia Environmental Consultants 2016, *Pilgangoora Project: Level 1 Short-range Endemic Fauna Assessment*, Perth, Western Australia.
4. Bennelongia Environmental Consultants 2016, *Pilgangoora Project: Subterranean Fauna Desktop and Level 1 Assessment*, Perth, Western Australia.
5. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
6. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
7. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
8. Natural Area 2016, *Flora, Vegetation and Fauna Survey Report – Pilgangoora Lithium Project*, Perth, Western Australia.
9. Natural Area 2016, *Memo to Altura Mining Limited*, Perth, Western Australia.
10. Pilbara Minerals 2024a, *Annual Environmental & Audit Compliance Report – L9036/2017/1*, Perth, Western Australia.
11. Pilbara Minerals 2024b, *Licence Amendment Application – L9036/2017/1 Supporting Document*, Perth, Western Australia.
12. RPS 2016, *Pilgangoora Surface Water Assessment*, Perth, Western Australia.

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

Condition	Summary of Licence Holder's comment	Department's response
Licence		
Definition table	Some terms in the table are not used within the licence.	Unused terms have been removed.
1 Table 2	For Item 1 "Tailings delivery and decant return pipelines", add provision for double-skinning the pipeline where a trench is not appropriate.	The requested change is outside of the scope of this amendment application and has not been implemented.
13(b) (formerly 11)	Amend reporting requirements to be consistent with reporting requirements from L9056/2017/1.	Condition 13(b) has been amended and 13(c) added so that reporting requirements are consistent with the current assessment of a licence amendment application for L9056/2017/1.
9 (formerly 7) Table 3	Table 3 incorrectly refers to Radium 266; it should refer to Radium 226.	This typo has been amended.
14-17	TSF Stages 3/4 have been constructed and the required reports have been submitted to the department, so these conditions are no longer required.	The conditions have been removed.
16 (new)	Draft version of the amended licence outlined construction and reporting requirements for TSF Stage 5 northern section to reduce regulatory burden by providing a pathway to operate the TSF Stage 5 northern section without an additional licence amendment. Construction was completed and compliance satisfied in the time between the department providing the draft amended licence to the Licence Holder for comments, and the Licence Holder providing comments. The construction and reporting requirements are no longer required to be included within the licence.	The conditions have been removed. Condition 16 has been amended to refer to TSF Stage 5 in its entirety.
17 (new) Table 6	Request removal of the requirement for the dewatering pipeline to be located within a bund. The Licence Holder advised that "the water quality is likely to be of a level that poses minimal environmental risk in the event of spill, considering the level of dilution expected during a 'significant rainfall event'."	The requirement for bunding was consistent with the corresponding condition for the connected dewatering pipeline constructed under works approval W6443/2020/1. The department notes that the construction was found to be non-compliant due to the bunding not being constructed. The Licence Holder advised that the pipeline was placed following the natural contour of the ground instead, and that any leak or spill from the pipeline would either runoff back into the pit, or into the natural creek line, which is the approved

Condition	Summary of Licence Holder's comment	Department's response
Licence		
		discharge location. The department considered that the dewatering pipeline and associated infrastructure were constructed sufficiently meeting the requirements of the works approval. The department has therefore amended the requirement for bunding to instead specify that any runoff must be directed back to the south pit or to the approved discharge point, in alignment with the deviation to the requirements of works approval W6443/2020/1.
22 (new)	The Licence Holder proposed trigger values for nitrate (NO_3) levels relating to the ability to discharge dewater and reporting requirements.	The proposed nitrate trigger value for water from the south pit has been included in this condition, as requested. The department notes that sampling of Pilgangoora Creek (including nitrate levels) is included in its assessment of the current amendment application for L9056/2017/1. Trigger values relating to sampling of Pilgangoora Creek have therefore not been included in this licence amendment.
Decision Report		
Throughout	Page numbers are incorrect.	Page numbers have been corrected.
Section 2.2.1	Discussions regarding TSF Stage 5 construction are accurate, however since the time that the draft amended licence and decision report were provided to the Licence Holder for comments, compliance for the TSF Stage 5 northern section has been determined. The section should be reflected to update the current status, and relevant conditions amended.	The department has updated the decision report and amended licence to reflect recent changes.
Section 2.2.2	Dewatering pipeline length is incorrect.	This has been amended.
Section 2.2.2	The Licence Holder proposed trigger values for nitrate (NO_3) levels relating to the ability to discharge dewater and reporting requirements.	As above. The proposed trigger values have been outlined in this decision report for completion.
Table 3	The Licence Holder requested that the table is amended to match the format of a similar table in the decision report for the L9056/2017/1 amendment application currently being assessed by the department.	The table has been amended.

Appendix 2: Proposed dewatering pipeline and discharge point locations

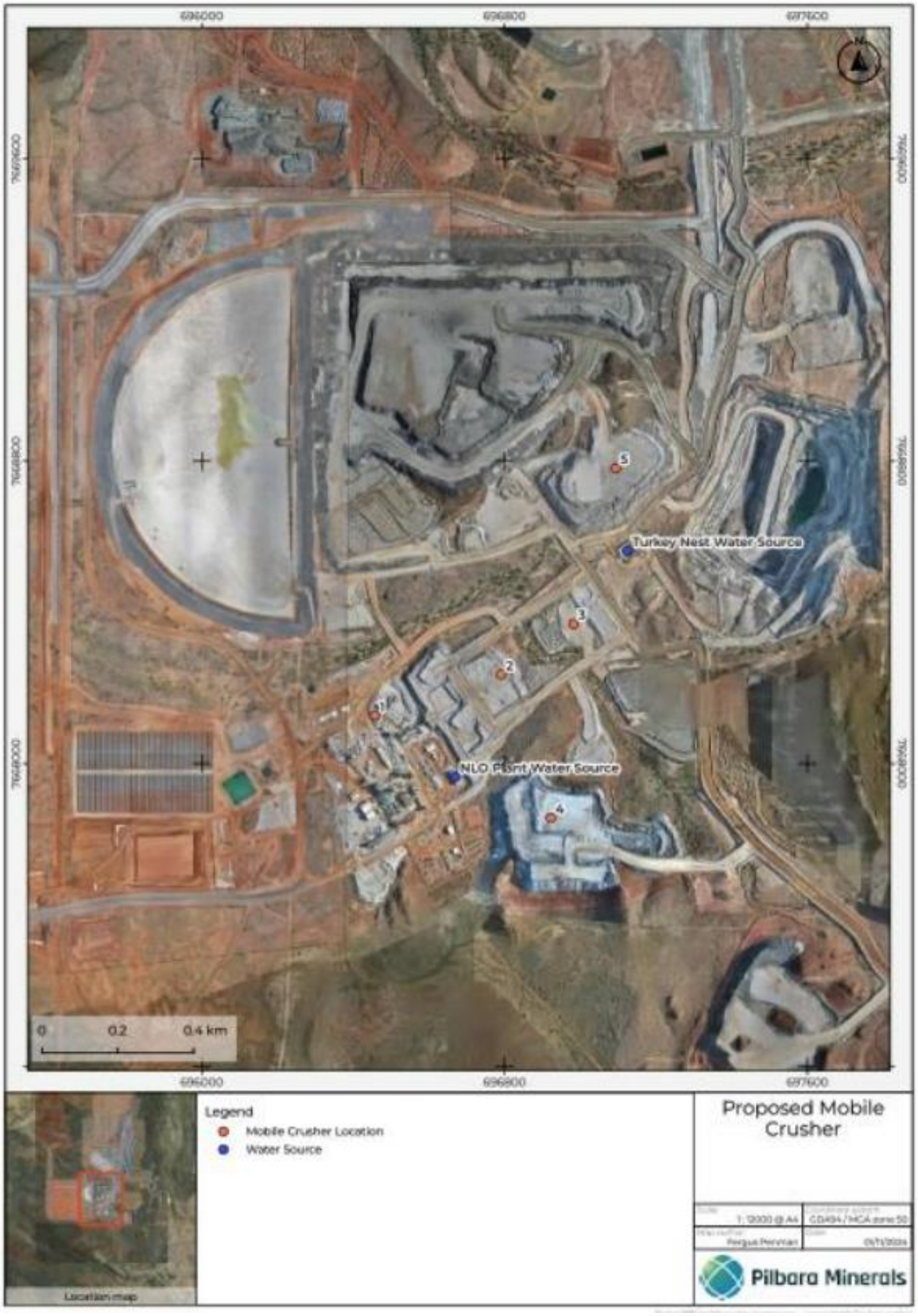

Figure 2: Turkey's nest location

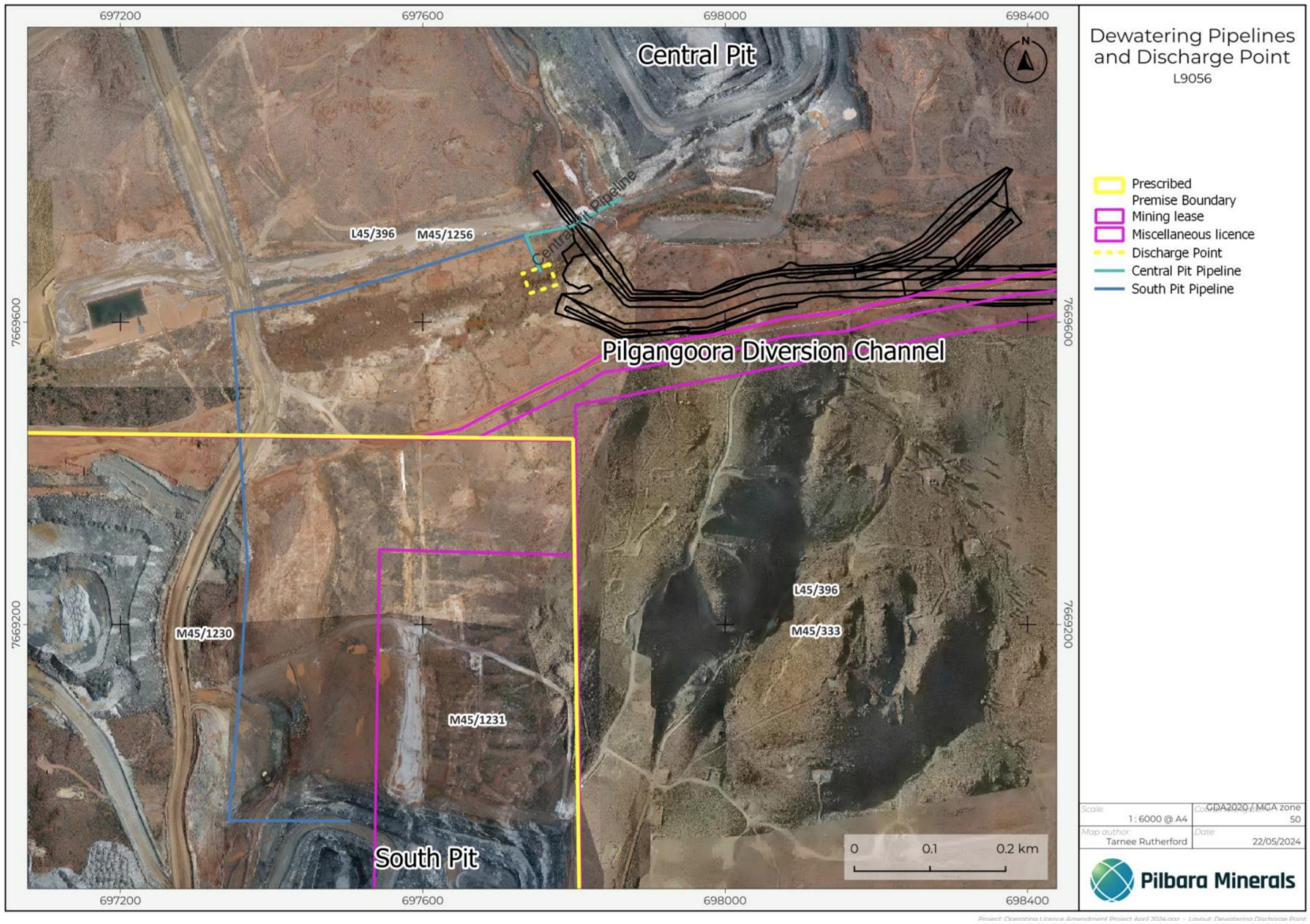

Figure 3: Proposed dewatering pipeline and discharge point locations

Licence: L9036/2017/1