Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Licence Number	L8308/2008/2
Licence Holder	CITIC Pacific Mining Management Pty Ltd
ACN	119 578 371
File Number:	DER2014/000430-2
Premises	Sino Iron Project Mine Site Mining Tenements M08/123, M08/124, M08/125, M08/264, M08/265, M08/266, G08/54 and L08/126 MARDIE WA 6714
Date of Report	28/01/2020
Decision / Proposed Decision	**Intent to grant licence**

1. Definitions and interpretation

Definitions

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

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Report	refers to this document
BGM	Elastomeric bituminous geomembrane
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
CS Act	*Contaminated Sites Act 2003* (WA)
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
Existing licence	The licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of and during this Review
licence holder	CITIC Pacific Mining Management Pty Ltd

Term	Definition
m^3	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
mtpa	million tonnes per annum
NEPM	National Environmental Protection Measure
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act
PM	Particulate Matter
PM_{10}	used to describe particulate matter that is smaller than 10 microns (µm) in diameter
Prescribed Premises	has the same meaning given to that term under the EP Act
Premises	refers to the premises to which this Amendment Report applies, as specified at the front of this Amendment Report
Revised licence	the amended licence issued under Part V, Division 3 of the EP Act, with changes that correspond to the assessment outlined in this Amendment Report
Risk Event	as described in *Guidance Statement: Risk Assessment*
SWL	Standing Water Level
TSF	Tailings Storage Facility
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)
WWTP	Wastewater Treatment Plant

2. Amendment Description

The following guidance statements have informed the assessment and decision outlined in this Amendment Report:

- *Guidance Statement: Regulatory Principles (July 2015);*
- *Guidance Statement: Setting Conditions (October 2015);*
- *Guidance Statement: Licence Duration (August 2016);*
- *Guidance Statement: Decision Making (June 2019);*
- *Guidance Statement: Risk Assessment (February 2017);* and
- *Guidance Statement: Environmental Siting (November 2016).*

2.1. Purpose and scope of assessment

An amendment application was received by DWER from the Applicant on 23 July 2019 for the following modifications:

- Category 5 – a temporary tailings bypass maintenance pipeline was installed in May 2019 due to a partial blockage within the tailings pipeline which was impeding concentrate production and causing a pressure build-up in the system increasing the risk of rupture. The Applicant is requesting that the bypass pipeline be retained for short term use to enable periodic cleaning and descaling of the tailings pipeline to be incorporated as part of ongoing general maintenance;
- Category 54 – since the relocation of all personnel from the 123 Construction Camp to Eramurra Village (L8387/2009/2) in August 2013, the Camp 123 WWTP has been receiving low volumes of sewage via transfers to maintain it in an operational state, however transfers ceased in January 2019 as the WWTP is no longer required. The Applicant is requesting that this WWTP be removed from the licence. The WWTP and spray irrigation field infrastructure will remain in situ in the short-term, however all infrastructure will be removed prior to it impeding future mining operations;
- Category 64 – The Applicant is requesting that process consumables such as mill wear plates, pipework and conveyor belts that are periodically replaced are disposed of within the TSF. Inert process consumables generated within the mining and processing project areas are to be disposed of within the south-east waste rock landform and inert process consumables generated within the TSF or port operations project areas are to be disposed of within the TSF. This minimises transport distances. This will not result in an increase in the 25,000 tonnes per annual period; and
- Relocation of surface water emission point DC1 1km south-east of the current location to a different tributary of DuBoulay Creek (shown in Schedule 1: Maps, Premises map of the licence), as the current location is within the footprint of the proposed west pit scheduled to be mined within the next five years.

2.2. Consolidation of licence

As part of this amendment package DWER has consolidated the licence by incorporating changes made under the following Amendment Notices:

- Amendment Notice 1, granted 16 December 2016 – an administrative change to extend the date of completion for Improvement program IR1 from 31 December 2016 to 30 June 2018. This is no longer relevant so has not been included in the licence;
- Amendment Notice 2, granted 9 June 2017 – inclusion of six controlled surface water discharge points to the licence. These discharge points are to be within Edwards

Creek and tributaries of Edwards and DuBoulay Creeks, to allow the discharge of excess water to the environment, to maintain safe operating conditions or freeboard onsite;

- Amendment Notice 3, granted 11 August 2017 – construction and operation of the MBBR WWTP; and transfer of the construction of TSF Stage 2 from W4447/2008/1 to the licence;
- Amendment Notice 4, granted 12 January 2018 – increase the design capacity for category 6 from 2,000,000 tonnes per annual period to 8,000,000 tonnes per annual period or 8 gigalitres (GL) per annum (GL/a);
- Amendment Notice 5, granted 19 June 2018 – extension of the commissioning period for the site's new power station – turbine units 1- 3; administrative change to extend the date of completion for Improvement program IR1 from 30 June 2018 to 31 December 2018 (this is no longer relevant so not included in the licence;, include all power station turbines for air emission monitoring; dispose of other inert waste type 2 other than tyres within the landfill and waste rock landforms; and increase the throughput of inert waste type 2 from 1,000 tonnes to 3,000 tonnes per annum;
- Amendment Notice 6, granted 6 November 2018 – include a secondary emission point (AP1), to the current FR2 discharge point to the Fortescue River, on the existing dewatering pipelines to also enable diversion of excess mine dewater to Pastoral Management Pty Ltd's algae pond trial; relocation of emission point EC4 as the current discharge location is within the footprint for future TSF development; and removal of Improvement Condition IR1 as the requirements have been met.
- Amendment Notice 7, granted 18 April 2019 – raise 3 lift to TSF Stage 2; discharge up to 1 GL/annum of TSF decant and seepage water via emission point DC2; and construct a dewatering staging facility to accommodate the increased (up to 12GL/annum) dewatering rates
- Amendment Notice 8, granted 15 November 2019 – replace the third stage magnetic separator drums on Mill Line 6 with magnetic separation elutriation columns as a trial; relocate the used tyre laydown facility to the eastern side of the mine pit adjacent to the new mining operations / administration hub; and establish an interim landfill in the South East Waste Rock Landform.

The obligations of the licence holder have not changed in consolidating the licence. DWER has not undertaken any additional risk assessment of the Premises related to previous Amendment Notices.

In consolidating the licence, the CEO has:

- Updated the format and appearance of the licence;
- Deleted the redundant AACR form set out in schedule 1 of the previous licence and advise the licence holder to obtain the form from the Department's website;
- Revised licence condition's numbers, and removed any redundant conditions and realigned condition numbers for numerical consistency; and
- Corrected clerical mistakes and unintentional errors.

Previously issued Amendment Notices will remain on the DWER website for future reference and will act as a record of DWER's decision making.

3. Other approvals

The licence holder holds a licence to extract water for the purpose of mine dewatering and other mining related operations under section 5C of the *Rights in Water and Irrigation Act 1914*

(GWL167151(6)).

The Sino Iron Project Mine Site is also subject to three Ministerial Statements, MS 635, MS 822 and MS 1066 under Part IV of the *Environmental Protection Act 1986*.

This is a major project with State Agreement Act *Iron Ore Processing (Mineralogy Pty Ltd) Agreement Act 2002.* The State Agreement Act covers the mining and concentration of iron ore, processing, transport, port facilities and shipping.

During the assessment DWER sought confirmation from DMIRS on the disposal of inert wastes to the TSF and TSF bypass pipeline. DMIRS provided the following advice:

Disposal of inert wastes to the TSF -
DMIRS sought specific comment from its geotechnical engineers on the management of disposing of inert materials into the TSF as it may affect geotechnical parameters. The advice received is the following should be considered:

- *No waste disposal should occur within the vicinity of the decant tower, northern and western lined embankments, or within the normal operating extent of the of the supernatant pond;*
- *Any pipes disposed of should be done so in a way to ensure they are filled with tailings;*
- *Details should be recorded of the location, surface elevation (RL), type and quantity of materials disposed of. The requirement to keep these records should be incorporated into the Mine Closure Plan; and*
- *The final tailings level at closure should completely cover any materials disposed of in the TSF, and should not compromise rehabilitation or safety performance at closure* (DMIRS, October 2019).

TSF bypass pipeline -
DMIRS sought specific comment from its geotechnical engineers and has no issues with the proposed bypass pipeline being retained as long as the pipeline has bunding and scour pits appropriate for its purpose (DMIRS, October 2019).

4. Amendment history

Table 4 provides the amendment history for L8308/2008/2.

Table 2: Licence amendments

Instrument	Issued	Amendment
L8308/2008/1	23/01/2014	Licence amendment to include the operation of PC1 and PC2 (W5005/2011/1), ML1 (W4447/2008/1) and the Biomax WWTP (W5273/2012/1)
L8308/2008/2	24/03/2016	Licence amended to increase the design capacity of category 5 (inclusion of PC3, PC4, ML2 to ML4 and TSF Stage 1) and category 64, inclusion of categories 12 and 57 and expansion of the premises boundary
L8308/2008/2	28/07/2016	Licence amended to increase the capacity of category 5 (inclusion of ML5 and 6)
L8308/2008/2	24/11/2016	Licence amended to include category 6 mine dewatering discharge for 2 GL discharge
L8308/2008/2	16/12/2016	Amendment Notice 1 Licence amendment to change the date of completion for Improvement

		program IR1 from 31 December 2016 to 30 June 2018
L8308/2008/2	9/06/2017	Amendment Notice 2 Licence amendment to include controlled surface water discharge points, TSF1B lift and modifications to groundwater monitoring bores BH08-08 and BH08-16
L8308/2008/2	11/08/2017	Amendment Notice 3 Licence amendment to include the MBBR WWTP and transfer TSF Stage 2 construction conditions across from W4447/2008/1 onto the licence.
L8308/2008/2	12/01/2018	Amendment Notice 4 Licence amendment to increase the category 6 design capacity from 2 GL/a to 8 GL/a.
L8308/2008/2	19/06/2018	Amendment Notice 5 Licence amendment to change the date of completion for Improvement program IR1 from 30 June 2018 to 31 December 2018 and to allow for the disposal of other Inert Waste Type 2 (besides tyres) to be disposed of within sites landfill facility and waste rock landforms.
L8308/2008/2	6/11/2018	Amendment Notice 6 Licence amendment to include a secondary emission point (AP1), to the current FR2 discharge point to the Fortescue River, on the existing dewatering pipelines to enable diversion of up to 6 GL/annum of excess mine dewatering water to Pastoral Management Pty Ltd's algae ponds trial. Relocation of current discharge location approximately 600 m upstream within the same remnant tributary of Edwards Creek, as the current discharge location is within the footprint for future TSF development. Removal of Improvement program IR1 from the licence as point source air emissions have been confirmed. Removal of Improvement program IR2 from the licence as replacement bore TSF_017 (17NC764) has been installed to replace BH08-16.
L8308/2008/2	18/04/2019	Amendment Notice 7 Licence amendment to include TSF Stage 2, Raise 3 up to 61 mRL. Replacement of the pit dewatering staging ponds by constructing a HDPE lined dewatering staging facility to accommodate increased dewatering rates of up to 12GL/annum permitted via MS1066. A request to provide completion reports, for mine dewatering water discharges to the Fortescue River, in the AER is also included.
L8308/2008/2	15/11/2019	Amendment Notice 8 Licence amendment to include: • replacing the third stage magnetic separator drums on Mill Line 6 with magnetic separation elutriation columns as a trial; • relocating the used tyre laydown facility to the eastern side of the mine pit adjacent to the new mining operations/administration hub. This is outside of the future mine pit footprint; and • an interim landfill is required, which is proposed in the South East Waste Rock Landform.
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		Licence consolidated, with the following amendments: • inclusion of tailings bypass pipeline; • removal of Camp 123 WWTP; and • disposal of inert waste to the TSF.

5. Location and receptors

Table 3 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 3: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Fortescue River Mouth recreational area (informal campsite not managed by the City of Karratha).	Fortescue River Mouth recreational area (informal campsite not managed by the City of Karratha).
More than 5 km to the north-west.	More than 5 km to the north-west.
Mardie Station Pastoral Lease	The Prescribed Premises is within the Mardie Station Pastoral Lease

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

Table 4: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Fortescue River	Fortescue River
More than 5 km to the north-west.	More than 5 km to the north-west.
De Boulay Creek	De Boulay Creek
More than 2.5 km to the north	More than 2.5 km to the north

6. Risk assessment

Table 5 below describes the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls. No risk assessment has been conducted for proposed amendments during construction as there is no construction associated with the amendments.

Table 5: Risk assessment for proposed amendments during operation

Risk Event				Consequence rating[1]	Likelihood rating[1]	Risk[1]	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/Activities*	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Tailings bypass pipeline used when maintaining the permanent tailings pipeline that runs from the Processing Plant out to the TSF	Increased seepage from the TSF as the tailings bypass pipeline bypasses the secondary thickeners so a reduced solid content of approximately 52% is achieved compared to approximately 62% from the permanent tailings pipeline	Infiltration through the base and laterally from the TSF due to additional water within the tailings, seeping to the shallow groundwater below Groundwater dependent vegetation utilizing the groundwater becoming inundated with additional water or contaminants in the seepage	See Section 7	Moderate	Possible	Medium	See Section 7	Condition 1.2.14, Table 1.2.6 has requirements for seepage design / construction of TSF Stage 2 and TSF2 Raise 3 lift. Condition 3.5.1, Table 3.5.1 requires process monitoring of volumes of decant water and seepage water and tailings, with notifications of limits breached by condition 4.3.1 and an assessment of the information contained within the AER against previous monitoring results, licence limits and any impacts detected as a result of activities on the Premises required by condition 4.2.2. Condition 3.6.1, Table 3.6.1 requires ambient groundwater quality monitoring in the vicinity of the TSF, including SWL. Condition 4.2.1, Table 4.2.1 requires groundwater monitoring results and process monitoring results to be provided in the AER.
	Tailings spills/leaks due to rupture of the pipeline. Due to its infrequent and limited use, it is not proposed to install pressure sensors and/or telemetry alarms on the bypass pipeline	Direct discharge to vegetation causing inundation / smothering and impacting on photosynthesis	• Limited operations. Bypass maintenance pipeline will only be used when the tailings pipeline is offline during to maintenance activities (anticipated once or twice a year); • Due to its infrequent and limited use, it is not proposed to install pressure sensors and/or telemetry alarms on the bypass pipeline, however, daily integrity inspections of the pipeline will be conducted whilst operational; • Pipeline is constructed within an excavated compacted earthen bund approximately 1m high (0.5m below natural ground level and 0.5m above natural ground level); • Where the pipeline crosses surface water expressions, the pipe has been encased within a steel sleeve so tailings will be directed towards the earthen bund in the event of a rupture; and • A pressure transmitter is to be installed within the bypass pipeline and connected to the existing control systems on the main tailings pipeline. Any large drops in pressure during the operation of the bypass pipeline will trigger an alarm in the control room.	Minor	Unlikely	Medium	The Delegated Officer considers that the licence holder has numerous appropriate controls in place to ensure that tailings discharge to the environment is prevented, and if a rupture does occur then controls are in place. DMIRS has also confirmed that they have no objections to this bypass pipeline as per Section 3.	Condition 1.2.10, Table 1.2.4 updated to include daily inspections of the Permanent tailings pipelines and the Bypass tailings pipeline. The bypass pipeline meets the requirements of condition 1.2.11 as it has telemetry and process alarms and adequate diversion containment.
Disposal of inert wastes (mill wear plates, pipework and conveyor belts) to the TSF. It is projected less than 500 tonnes of inert process consumables may be deposited to the TSF during the 2019-20 annual period, however actual tonnages may vary depending on operational requirements.	Dust from accessing and disturbing the TSF	Air/windborne pathway causing impacts to health and amenity of closest human receptors, Fortescue River Mouth recreational area is the nearest receptor located more than 5 km to the north-west	• Disposal can be conducted with ramps, without personnel accessing or machinery tracking the tailings beach; • Waste shall be placed at a location that will not result in the tailings beach being disturbed (i.e. adjacent to the eastern embankment). If this is not practicable, the tailings beach must be wet immediately prior to the disposal of waste; • Disposal location will ultimately be fully encapsulated by tailings; • Inert waste shall not be placed within 2m of the TSF maximum operating level; and • Established ambient dust monitoring to continue with PM_{10} triggers.	Minor	Unlikely	Medium	The Delegated Officer considers that the licence holder has appropriate controls in place in manage dust emissions including the ambient dust monitoring network onsite.	Condition 1.2.3 updated to not refer to the TSF. Condition 1.2.4 updated to not refer to the TSF. Condition 1.2.5 updated to not refer to the TSF. Condition 1.2.8, Table 1.2.3 has been amended to include inert waste type 1 disposal to the TSF. Condition 1.2.9 requires the licence holder to prevent dust generation from the surface of the TSF.
	Fibrous material from accessing and disturbing the TSF	Air/windborne pathway causing impacts to health and amenity of closest human receptors, Fortescue River Mouth recreational area is the	• Fibrous Minerals Management Plan; and • TSF is a designated area, all deposited material will be handled as if it has the potential to contain fibrous materials.	Moderate	Unlikely	Medium	The Delegated Officer considers that the licence holder has appropriate controls in place in manage dust emissions including the	

Risk Event				Consequence rating[1]	Likelihood rating[1]	Risk[1]	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/Activities*	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
		nearest receptor located more than 5 km to the north-west					Fibrous Minerals Management Plan.	
	Windblown waste deposited within the TSF	Windblown waste littering the adjacent area	• Typical consumables generated by these areas are of sufficient weight they do not pose a significant risk of becoming windblown.	Slight	Rare	Low	The Delegated Officer considers that the products to be disposed of to the TSF are too heavy to become windblown.	No regulatory controls added.
	Breach of the TSF due to the disposal of the inert waste impacting on the freeboard or overtopping of the TSF	Tailings directly discharging to adjacent soils, vegetation and potentially surface water areas	• Where possible, construction ramps will be utilised to place the inert waste in areas within the TSF embankments where tailings deposition has not commenced. Areas scheduled for upcoming tailings deposition will be preferentially selected for waste disposal; • Once the tailings beach has consumed all areas inside the tailings embankments, waste will only be placed inside the embankments if it can be achieved safely without personnel traversing the tailings beach; • No waste disposal will occur within the vicinity of the decant tower, northern or western lined embankments or any area within the normal operating extent of the supernatant pond. Deposition of inert-waste is not anticipated to impact seepage volumes; and • The process consumables to be deposited are used to transport magnetite ore, magnetite concentrate or tailings. The composition of any material present on the consumables at deposition will be comparable to that of the surrounding tailings. No detrimental impact on seepage quality is anticipated.	Moderate	Unlikely	Medium	The Delegated Officer considers that direct discharge of tailings to the environment could have both onsite and offsite impacts, however, DMIRS advice has been sought and the Applicant has already committed to the recommendations to reduce the likelihood of a breach of the TSF by correctly disposing of the inert waste.	See Section 3 for DMIRS advice on the disposal of inert wastes to the TSF to ensure that geotechnical stability is maintained. Condition 1.2.2, Table 1.2.1 has been updated to include the TSF and the following requirements incorporated to reduce potential freeboard impacts, overtopping and seepage: • No waste disposal should occur within the vicinity of the decant tower, northern and western lined embankments, or within the normal operating extent of the supernatant pond; • Any pipes disposed of should be done so in a way to ensure they are filled with tailings; and • Details should be recorded of the location, surface elevation (RL), type and quantity of materials disposed of.
	Changes to quantity and quality of seepage from the TSF due to the deposition of the inert waste		• Process consumables to be deposited are inert wastes used to transport magnetite ore, magnetite concentrate or tailings. No change to the seepage quality should occur; and • No waste disposal will occur within the vicinity of the decant tower, northern or western lined embankments or any area within the normal operating extent of the supernatant pond. Therefore, the deposition of the inert waste should not impact seepage volumes.	Moderate	Possible	Medium	The Delegated Officer considers that there should be no modifications to the seepage quality or quantity as there are no additional contaminants introduced by the disposal of the inert materials and disposal will not occur in the vicinity of the decant tower, northern or western lined embankments or any area within the normal operating extent of the supernatant pond.	
Relocation of surface water discharge point DC1	Surface water discharges during extreme rainfall events that could otherwise result in flooding of mining infrastructure and uncontrolled discharges.	Erosion of creek banks Negative impacts to water quality causing ecosystem disruption on fauna if discharge water is contaminated	• Only required in the event of significant weather events, which pose an immediate risk of flooding of in-pit infrastructure; • No discharges have been necessitated via DC1 since its inception in 2017; and • A layer of rip-rap will be placed at the new emission point location.	Slight	Possible	Low	The Delegated Officer considers that controlled surface water discharges will occur only as a last resort and will be pre-planned. The licence holder has committed to minimise erosion and scouring with the use of multiple	Condition 1.2.14, Table 1.2.6 requires that controlled surface water discharge points have a layer of rip-rap installed to protect the receiving water bank from erosion. Condition 2.2.1, Table 2.2.1 requires that stormwater and process water is discharged in a controlled manner as a result of an uncontrollable event and that controlled surface water discharge points: • Control the discharge rate so that erosion and scouring is minimised;

Risk Event				Consequence rating[1]	Likelihood rating[1]	Risk[1]	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/Activities*	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
							discharge points to spread the flow (these other surface water discharge points are already authorised via the licence), and a layer of rip-rap will be installed to protect the receiving water bank from erosion.	• Use multiple discharge points to spread the flow; and • Maintain a layer of rip-rap to protect the receiving water bank from erosion. Condition 2.2.1, Table 2.2.1 DC1 Description column updated to remove "*within footprint of proposed west pit*" as the new location is not within the footprint. Condition 2.2.2, Table 2.2.2 has pH and TDS limits for discharge water. Condition 3.3.2, Table 3.3.1 requires monitoring of pH and TDS prior to discharge. Condition 3.6.1, Table 3.6.2 requires ambient monitoring 500m downstream of the discharge point for pH and TDS to determine if there is any incline in these results from the discharges. Condition 3.6.1, Table 3.6.3 requires native flora and fauna monitoring within three months of the discharge to determine if the discharges are having any noticeable impacts on the ecosystems. Condition 4.2.1, Table 4.2.1 requires reporting in the AER. Schedule 1: Maps, Premises map is updated to include the new DC1 discharge location.
		Disruption of normal ecosystem function from modifications to water quality and increased turbidity	• Water quality limits of TDS <10,000mg/L and pH 6.5-9; and • Ambient water quality samples to be collected 500m downstream prior to and during the discharge event.	Minor	Unlikely	Medium	The licence holder will implement a monitoring campaign due to the lack of baseline data available and will monitor both point source discharge and ambient water quality. Limits have been set for pH and TDS. Ambient monitoring of pH and TDS will be conducted 500m downstream during a discharge.	
		Disruption of normal ecosystem function from inundation of riparian vegetation	• Water quality limits of TDS <10,000mg/L and pH 6.5-9; and • Vegetation health monitoring post discharge event.	Minor	Unlikely	Medium	The use of multiple discharge points to spread the flow and riprap to prevent erosion forming a pool should ensure that pooling of water in areas does not occur and that water discharged should flow downstream along with natural flows. Discharge will predominantly occur immediately prior to after a rainfall event when water will likely be flowing through the creek lines. Visual monitoring of the discharge point will occur within three months of a discharge event to assess for signs of stress on native flora and fauna and monitoring is conducted under Part IV of the EP Act, Ministerial Statement 635, conditions 6-1 to 6-3 Pit Dewatering and Vegetation Monitoring Plan.	

Risk Event				Consequence rating[1]	Likelihood rating[1]	Risk[1]	Reasoning	Regulatory controls (refer to conditions of the granted instrument)
Source/Activities*	**Potential emissions**	**Potential receptors, pathway and impact**	**Applicant controls**					
Removal of Camp 123 WWTP from the Licence	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Camp 123 WWTP 1,000 m^3/day has been removed from the Prescribed premises table at the front of the licence. Condition 1.2.2, Table 1.2.1 has been updated to state that treated effluent from the Biomax WWTP and MBBR WWTP is disposed of to the Process Water Dam prior to reuse of wastewater within the Processing Plant. It was not previously clear on the licence that treated effluent from these WWTPs is not discharged to land. Camp 123 WWTP has been removed from condition 1.2.2, Table 1.2.1. Condition 2.3.1, Table 2.3.1 has been removed from the licence as the Camp 123 WWTP is not discharging to land and the Biomax WWTP and MBBR WWTP treated effluent is not disposed of to land, it is discharged to the Process Water Dam and reused in the Processing Plant. Previous condition 3.4.1, Table 3.4.1 is removed from the licence as the Camp 123 WWTP treated effluent is not discharged to land. Condition 4.2.1, Table 4.2.1 is amended to remove AER reporting requirements for condition 3.4.1, Table 3.4.1.
Infrastructure Requirements	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Condition 1.2.14, Table 1.2.6 includes Infrastructure Requirements and this has been updated as part of this Amendment Report to remove any infrastructure that has completed construction and compliance documentation submitted. The following infrastructure has been removed: • Mine dewatering discharge infrastructure; • MBBR WWTP; and • TSF Stage 2 (49mRL). Conditions 1.2.14, 1.2.15 and condition 4.3.1, Table 4.3.1 have been amended to remove the mine dewatering discharge infrastructure, the MBBR WWTP and TSF Stage 2.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017)

7. Risk Assessment – Tailings bypass pipeline TSF seepage

The installation of the bypass pipeline (Figure 1) occurred in May 2019 due to a blockage in the permanent TSF pipeline that transfers tailings from the Processing Plant to the TSF. A 1m diameter poly pipe was installed from the lowest section of the tailings pipeline (adjacent to the North/South Road) to enable direct discharge within the south-west corner of the TSF Stage 2 embankment, thereby bypassing the tailings thickeners.

The blockage was attributed to a build-up of solid and cemented material at the lowest section of the tailings pipeline (where the pipeline stops running adjacent to the North/South Road and runs east uphill). It should be noted that the bypass pipeline is only expected for short-term use when maintenance of the permanent TSF pipeline is necessitated.

As the bypass pipeline bypasses the tailings thickeners the tailings achieved has a reduced solids content of approximately 52% compared to approximately 62% when the tailings is thickened and goes through the permanent tailings pipeline. The increased water content results in a larger supernatant pond and thus potentially more seepage.

Figure 1: Tailings Bypass Maintenance Pipeline Corridor

1.1.1 Description of TSF seepage

The tailings bypass was used periodically from 14 May 2019 – 10 July 2019 while clearing the blockage from the permanent pipeline. During this time decant return water rates to the Processing Plant increased from approximately 300,000m^3 in April 2019 up to 830,000m^3 in June 2019. Seepage rates for May 2019 (52,017m^3) and June 2019 (82,937m^3) exceeded the long-term average of 50,000m^3 per month, but the seepage was contained within the existing series of finger drains, trenches and sumps. TSF groundwater monitoring bores up until the end of June 2019 did not indicate any adverse impacts from the use of the tailings bypass pipeline. It should also be noted that future uses of the tailings bypass pipeline will be conducted during project shutdowns when minimal tailings are produced and the permanent pipeline will have regular ongoing maintenance so cleaning times will be reduced.

1.1.2 Identification and general characterisation of emission

Table 6 shows the water quality of the TSF decant and seepage water compared to the DuBoulay Creek Baseline Range to give an indication on the quality of the TSF decant and seepage water. Some of the historic decant water and seepage water dissolved metals were marginally above the DuBoulay baseline range, however, the majority of samples below both the ANZECC/ARMCANZ, 2018 Freshwater and Marine 95% protection guidelines.

Table 6: TSF decant and seepage water quality

Parameters		Decant Water Range†	Seepage Water Range‡	DuBoulay Creek Baseline Range*	13 March 2019		11 May 2019		30 July 2019		ANZECC/ARMCANZ 95% Guidelines	
					DC2 In- Pipe	500m downstream DC2	DC2 In- Pipe	500m Downstream DC2	DC2 In- Pipe	500m Downstream DC2	Freshwater	Marine
Major Analytes												
pH Value	pH Unit	8.17 – 8.81	7.72 – 8.41	7.8 – 8.6	7.95	8.28	8.08	8.11	8.12	8.35	-	-
Electrical Conductivity @ 25°C	µS/cm	1,190 – 6,570	2,590 – 13,600	1,530 – 106,000	9,980	60,000	7,150	62,800	6,400	25,200	-	-
Total Dissolved Solids @180°C	mg/L	1,160 – 4,140	1,470 – 10,400	359 – 92,000	5,620	42,800	5,330	47,700	4,450	17,400	-	-
Total Suspended Solids	mg/L	-	-	BD – 96.0	6.0	BD	-	-		-	-	-
Dissolved Oxygen	mg/L	-	-	8.2 – 10.9	8.7	9.7	8.43	7.89	-	-	-	-
Nitrates	mg/L	-	-	BD – 0.06	9.17	0.68	-	-	-	-	0.7	ID
Total Nitrogen	mg/L	-	-	BD – 1.2	15.0	1.2	-	-	-	-	0.25 (estuaries)	
Total Phosphorus	mg/L	-	-	BD – 0.5	BD	0.02	-	-	-	-	0.02 (estuaries)	
Dissolved Metals									**Total Metals**x			
Aluminium	mg/L	BD – 0.02	BD	BD – 0.0013	BD	BD	BD	BD	0.08	0.16	0.055	-
Arsenic	mg/L	0.002 – 0.006	BD – 0.002	BD – 0.0028	BD	BD	BD	BD	BD	0.002	0.024	-
Boron	mg/L	-	-	0.26 – 7.68	1.33	5.86	-	-	-	-	0.37	-
Cadmium	mg/L	BD	BD	BD	BD	BD	BD	BD	BD	BD	0.0002	0.0055
Cobalt	mg/L	BD – 0.001	BD	BD – 0.001	BD	BD	BD	BD	BD	BD	-	0.001
Chromium	mg/L	BD – 0.013	BD	BD – 0.0003	BD	BD	BD	BD	BD	BD	-	0.0274
Copper	mg/L	BD – 0.001	BD – 0.001	BD – 0.017	BD	BD	BD	BD	BD	0.002	0.0014	0.0013
Iron	mg/L	BD – 0.037	BD	BD – 0.009	BD	BD	BD	BD	0.11	0.26	-	-
Lead	mg/L	BD	BD	BD – 0.169	BD	BD	BD	BD	BD	BD	0.0034	0.0044
Manganese	mg/L	BD – 0.003	BD – 0.021	BD – 0.0186	BD	0.014	BD	BD	0.004	0.016	1.9	-
Nickel	mg/L	BD – 0.003	BD – 0.002	BD – 0.0013	BD	BD	BD	BD	0.001	BD	0.011	0.07
Zinc	mg/L	BD	BD	BD	BD	BD	0.008	BD	0.009	0.008	0.008	0.015
Mercury	mg/L	BD	BD	-	BD	BD	BD	BD	BD	BD	0.0006	0.0004

BD Below Analytical Detection Limit

† Opportunistic sampling conducted as part of the TSF quarterly groundwater monitoring program. Total of 12 laboratory samples collected from Sept-14 to Apr-18 and analysed for Major Analytes; three samples included dissolved metals.

‡ Opportunistic sampling conducted as part of the TSF quarterly groundwater monitoring program. Total of 16 laboratory samples collected from Sept-14 to Jul-18 and analysed for Major Analytes; four samples included dissolved metals.

* Range of 14 monthly opportunistic sampling events conducted between Apr-14 and Feb-16 at 408643, 7673190 (approximately 350m downstream of emission)

x A total metal sample is conducted without the field filtering and acidify. This can result in an overestimate of the metal concentration with the water, as some of the colloidal material that is a function of infrastructure construction/sampling can end up entrained and misrepresenting the water quality within the aquifer.

1.1.3 Description of potential adverse impact from the emission

As the tailings is not treated through the tailings thickeners when discharged via the tailings bypass pipeline there will be an increased liquid content within the tailings that can increase the potential for seepage and, therefore, groundwater mounding in the vicinity of the TSF. This can impact on vegetation due to water logging. As the seepage water also contains elevations in salinity and nitrates this may contaminate soils, groundwater and impact on groundwater dependent vegetation.

1.1.4 Criteria for assessment

ANZECC/ARMCANZ, 2018 Freshwater and Marine 95% protection guidelines.

1.1.5 Licence holder controls

This assessment has reviewed the controls set out in Table 7 below.

Table 7: Licence holder's proposed controls for TSF seepage

Site infrastructure	Description	Operation details
TSF	The TSF has been constructed with the following seepage controls in place: • A BGM liner system along the northern and western embankments to limit seepage through the embankment; • A low permeability zone within the upstream northern embankment and south-western corner to reduce potential seepage should the supernatant pond exceed normal operating levels; and • Seepage trenches and pumps are installed to control seepage from the TSF	The TSF is operated to reduce seepage: • Pumping rates are monitored to provide an indication of any increase in seepage rates as a result of the larger supernatant pond. Seepage flow rates within the interception trench will aid in determining the area from which any increased seepage may be emanating; • Ongoing monitoring of the supernatant pond, seepage pumping and flow rates, and monitoring bore water levels and quality; • In the event excessive seepage rates are noted, CPM will conduct a risk assessment in consultation with the TSF geotechnical engineers which may include a review of tailing discharge rates and decant return water pumping rates; • Groundwater monitoring network is in place with monitoring bores in the vicinity of the TSF, including Standing Water Level monitoring; • Operating strategy to provide a framework for data collection and reporting; • Future uses of the tailings bypass pipeline will be conducted during project shutdowns when minimal tailings are produced; and • Additional pumping of decant water will occur to redirect water for reuse via the Processing Plant when the tailings bypass pipeline is in use.

1.1.6 Key findings

The Delegated Officer has reviewed the information regarding TSF seepage and has found:

1. **Future uses of the tailings bypass pipeline will be conducted during project shutdowns when minimal tailings are produced.**
2. **Seepage trenches and pumps are installed to control seepage from the TSF.**
3. **Additional pumping of decant water will occur to redirect water for reuse via the Processing Plant when the tailings bypass pipeline is in use.**

1.1.7 Consequence

If increased TSF seepage occurs, then the Delegated Officer has determined that the impact of the seepage could have low level onsite impacts and minimal local scale impacts. Therefore, the Delegated Officer considers the consequence of additional seepage to be **minor**.

1.1.8 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of additional seepage could occur at some time. Therefore, the Delegated Officer considers the likelihood of additional seepage to be **possible**.

1.1.9 Overall rating of TSF seepage

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 8) and determined that the overall rating for the risk of additional seepage is **medium**.

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 8 below.

Table 8: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

8. Consultation

Table 9: Summary of consultation

Method	Comments received	DWER response
Local Government Authority advised of proposal	N/A	N/A
DMIRS advised of proposal (27/09/2019)	14/10/2019 See Section 3	N/A
Applicant referred draft documents (12/12/2019)	Detail comments received – refer to Appendix 2	Refer to Appendix 2

9. Conclusion

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

9.1. Summary of amendments

Table 10 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 10: Licence amendments

Condition No.	Proposed amendments
Prescribed premises table	Camp 123 WWTP 1,000 m^3/day has been removed
Condition 1.2.2, Table 1.2.1.	Camp 123 WWTP has been removed
Condition 1.2.2, Table 1.2.1	Updated to state that treated effluent from the Biomax WWTP and MBBR WWTP is disposed of to the Process Water Dam prior to reuse of wastewater within the Processing Plant. It was not previously clear on the licence that

	treated effluent from these WWTPs is not discharged to land.
Condition 1.2.2, Table 1.2.1	Updated to include the TSF and the following requirements incorporated: • No waste disposal should occur within the vicinity of the decant tower, northern and western lined embankments, or within the normal operating extent of the supernatant pond; • Any pipes disposed of should be done so in a way to ensure they are filled with tailings; and • Details should be recorded of the location, surface elevation (RL), type and quantity of materials disposed of.
Condition 1.2.3	Updated to not refer to the TSF.
Condition 1.2.4	Updated to not refer to the TSF.
Condition 1.2.5	Updated to not refer to the TSF.
Condition 1.2.8, Table 1.2.3	Amended to include inert waste type 1 disposal to the TSF.
Condition 1.2.10, Table 1.2.4	Updated to include daily inspections of the Permanent tailings pipelines and the Bypass tailings pipeline.
Condition 1.2.14, Table 1.2.6	Includes Infrastructure Requirements and this has been updated as part of this Amendment Report to remove any infrastructure that has completed construction and compliance documentation submitted. The following infrastructure has been removed: • Mine dewatering discharge infrastructure; • MBBR WWTP; and • TSF Stage 2 (49mRL).
Condition 1.2.15	Amended to remove the mine dewatering discharge infrastructure, the MBBR WWTP and TSF Stage 2.
Condition 2.2.1, Table 2.2.1	DC1 Description column updated to remove “within footprint of proposed west pit” as the new location is not within the footprint.
Condition 2.3.1, Table 2.3.1	Removed from the licence as the Camp 123 WWTP is not discharging to land and the Biomax WWTP and MBBR WWTP treated effluent is not disposed of to land, it is discharged to the Process Water Dam and reused in the Processing Plant.
Condition 3.4.1, Table 3.4.1	Removed from the licence as the Camp 123 WWTP treated effluent is not discharged to land.
Condition 4.2.1, Table 4.2.1	Remove AER reporting requirements for condition 3.4.1, Table 3.4.1.
Condition 4.3.1, Table 4.3.1	Amended to remove the mine dewatering discharge infrastructure, the MBBR WWTP and TSF Stage 2.
Figure 1	Updated Schedule 1: Maps, Figure 1 to include the new location for DC1

ALANA KIDD
MANAGER, RESOURCE INDUSTRIES
INDUSTRY REGULATION
An officer delegated by the CEO under section 20 of the EP Act

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L8308/2008/2 – Sino Iron Project	L8308/2008/2	accessed at www.dwer.wa.gov.au
2	Ministerial Statement 1066	MS1066	accessed at www.epa.wa.gov.au/
3	Ministerial Statement 822	MS822	accessed at www.epa.wa.gov.au/
4	Ministerial Statement 635	MS635	accessed at www.epa.wa.gov.au/
5	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	N/A	accessed at www.dwer.wa.gov.au
6	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	N/A	
7	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	N/A	
8	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	N/A	
9	DER, June 2019. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	N/A	
10	Email titled "DR047494 LTR 2019.07.23 CPM to DWER Alteration to Operations Categories 5, 54 and 64 (L8308)" dated 23/07/2019 1:10pm and authored by CITIC Pacific Mining Management Pty Ltd	N/A	DWER records (DWERDT181858)
11	Email titled "R047882 LTR 2019.09.23 CPM to DWER Addendum to Alteration to Operations Categories 5 54 and 64 (L8308 DC1)" dated 26/09/2019 8:37am and authored by CITIC Pacific Mining Management Pty Ltd	N/A	DWER records (A1826648)
12	Email titled "Sino Iron DWER License Amendment queries" dated 8/10/2019 10:26am and authored by CITIC Pacific Mining Management Pty Ltd	N/A	DWER records (A1832274)
13	Email titled "Sino Iron DWER License Amendment queries" dated 8/10/2019 11:49am and authored by DMIRS	N/A	DWER records (A1832275)
14	Email titled "TASK 190392 - STAKEHOLDER NOTIFICATION - L8308/2008/2 - REFERRAL OF A	DMIRS, October 2019	DWER records (A1832265)

	LICENCE AMENDMENT - REQUEST FOR ADVICE/COMMENT" dated 14/10/2019 8:27am and authored by DMIRS		
15	Email titled "DR047948 LTR 2019.10.23 CPM to DWER L8308 Amendment Submission Response to RFI" dated 23/10/2019 1:17pm and authored by CITIC Pacific Mining Management Pty Ltd	N/A	DWER records (A1834521)
16	ANZECC/ARMCANZ 2018 95% species protection freshwater guidelines	ANZECC/ ARMCANZ 2018 95%	Available at: https://www.waterquality.gov.au/anz-guidelines/resources/previous-guidelines/anzecc-armcanz-2000
17	Email titled "DR048178 LTR 2019.12.20 CPM to DWER Response to L8308 Consolidated Licence" dated 23/12/2019 10:43am and authored by CITIC Pacific Mining Management Pty Ltd	N/A	DWER records (A1860154

Appendix 2: Summary of licence holder comments

The licence holder was provided with the draft Amendment Report on 12 December 2019 for review and comment. The licence holder responded on 23 December 2019 and the following comments were received on the draft Amendment Report.

Condition	Summary of licence holder comment	DWER response
Condition 1.1.2, Table 3: Definitions	Monthly period definition requested: *monthly period means a one-month period commencing from the first calendar day of a month until the final calendar day of the same month..*	Updated as requested.
Condition 1.2.2, Table 1.2.1: Management of Waste	Revised format for Table 1.2.1 to clarify requirements for each facility. Plastic only removed from Inert Waste Type 2 to enable the disposal of other wastes (conveyor belts and rubber pipes). Aggregate annual deposition rate 25,000 tonnes per annum for all waste types removes specified Inert Waste Type 2 limit of 3,000 tonnes per annum. Typical consumables proposed for disposal within the TSF are rubber concentrate pipe and rolls of used conveyor belts. To accommodate these waste streams it is required that Inert Waste Type 1 and Inert Waste Type 2 are noted as authorised waste types for TSF disposal.	Updated as requested
Condition 1.2.8, Table 1.2.3: Containment Infrastructure	Typical consumables proposed for disposal within the TSF are rubber concentrate pipe and rolls of used conveyor belts. To accommodate these waste streams it is required that Inert Waste Type 1 and Inert Waste Type 2 are noted as authorised waste types for TSF disposal. Table 1.2.3, Note 1 can be omitted as all relevant approvals have been obtained from DMIRS to accommodate TSF2 construction up to a maximum	Updated as requested

Condition	Summary of licence holder comment	DWER response
	embankment height of 61 mRL.	
Condition 1.2.14, Table 1.2.6: Infrastructure Requirements	The inclusion of DC1 within Table 1.2.6 will trigger the requirement for submission of a compliance document within 7 day of completion of construction/relocation (as defined by condition 4.3.1, Table 4.3.1). The compliance documentation will confirm the installation of adequate erosion controls and provide a mechanism to evaluate and note any minor variation in location necessitated during install required to improve functionality. Table 1.2.6, Note 2 can be omitted as all relevant approvals have been obtained from DMIRS to accommodate TSF2 construction up to a maximum embankment height of 61 mRL.	Updated as requested
Condition 3.3.2, Table 3.3.1: Monitoring of point source emissions to surface water	Table 3.3.1 includes reference to the proposed Dewatering Staging Facility Emission Point.	Updated as requested
Condition 4.2.1, Table 4.2.1: Annual Environmental Report	Form WR1 has been removed from the consolidated licence. The elutriation column trial summary report is better suited as a once off notification requirement, rather than in the AER.	Updated as requested
Condition 4.3.1, Table 4.3.1: Notification Requirements	Consent for the installation of elutriation columns on all mill lines is requested (subject to an environmentally and commercially successful trial on ML6), negating the requirement for multiple licence amendment submissions. Therefore, reference to ML6 specifically is removed from Table 4.3.1.	Updated as requested
Condition 4.3.1, Table 4.3.1: Notification Requirements	It is proposed that monitoring of the existing landfill groundwater bores will continue post closure. The ongoing monitoring of these groundwater bores may be reviewed as part of a future licence amendment submission. Post	Updated as requested

Condition	Summary of licence holder comment	DWER response
	closure of the current landfill facility, the site will be consumed and incorporated into the SE waste rock landform. Monitoring of the existing groundwater bores will continue for as long as practicable, however, some or all of these bores will need to be decommissioned. It is proposed that CPM notify DWER at least 7 days prior to the scheduled decommissioning of monitoring bore(s) and the relevant bore(s) be removed from the licence as part of the next subsequent amendment request.	