



Application for Licence Amendment

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

Licence number	L8148/2006/4
Licence holder	Koolan Iron Ore Pty Ltd
ACN	099 455 277
File number	DER2014/000374-1
Premises	Koolan Iron Ore Mine and Port Facility Mining Tenements M04/416, M04/417 and L04/29 KOOLAN ISLAND (BUCCANEER ARCHIPELAGO) WA 6733
Date of report	24 July 2020
Decision	Revised licence granted

Alana Kidd

Manager, Resource Industries

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

1. Definitions and interpretation

Key terms relevant to this decision report and their associated definitions are listed in **Table 1**.

Table 1: Definitions

Term	Definition
AER	Annual Environment Report
Amendment Report	refers to this document
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer CEO for the purposes of notification means: Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 JOONDALUP DC WA info@dwer.wa.gov.au
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act
DER	former Department of Environment Regulation
DWER	Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EQC	environmental quality criteria
EQG	environmental quality guideline
EQO	environmental quality objective
EQS	environmental quality standard
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
LEPA	low ecological protection area

Term	Definition
licence holder	Koolan Iron Ore Pty Ltd
m ³ /day	metres cubed per day
MEPA	moderate ecological protection area
mg/L	milligrams per litre
Minister	the Minister responsible for the EP Act and associated regulations
MMP	Marine Management Plan
MS	Ministerial Statement
NTU	Nephelometric Turbidity Units
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 <i>Guidance Statement: Risk Assessment</i>
SDL	Submerged Data Logger
t/day	tonnes per day
TSS	Total Suspended Solids

2. Amendment description

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

- *Guidance Statement: Regulatory Principles (DER, 2015a)*
- *Guidance Statement: Setting Conditions (DER, 2015b)*
- *Guidance Statement: Licence Duration (DER, 2016a)*
- *Guidance Statement: Environmental Siting (DER, 2016b)*
- *Guidance Statement: Risk Assessment (DWER, 2017)*
- *Guidance Statement: Decision Making (DWER, 2019a)*
- *Guideline: Industry Regulation Guide to Licensing (DWER, 2019b).*

2.1 Purpose and scope of assessment

On 20 March 2020, Koolan Iron Ore Pty Ltd (the licence holder) applied for an amendment to licence L8148/2006/4 under Part V, Division 3 of the *Environmental Protection Act 1986* (EP Act). The amendment relates to the inclusion of a contingency dewatering discharge point for Main Pit at the Koolan Iron Ore Mine and Port Facility during and immediately after high-volume seasonal rain events. This proposed contingency dewatering discharge point is to allow safe access to Main Pit for operational purposes.

The Koolan Iron Ore Mine and Port Facility has been assessed by the Environmental Protection Authority (EPA) under Part IV of the EP Act and is subject to conditions of Ministerial Statement (MS) 715.

The scope of this report includes assessment of emissions and discharges associated with infrastructure as specified in section 2.3, in accordance with Department of Water and Environmental Regulation (DWER) *Guidance Statement: Risk Assessments* (DWER, 2017).

2.2 Classification of Premises

Table 2 shows the changes to the Categories for the licence and the requested amendments.

Table 2: Classification of premises, approved production capacity and requested amendment

Category	Description	Approved production capacity	Amendment requested
Category 5	Processing or beneficiation of metallic or non-metallic ore	4,000,000 tonnes per Annual Period	No change
Category 6	Mine dewatering	5,000,000 tonnes per Annual Period	No change to capacity, addition of contingency discharge point
Category 12	Screening	2,000,000 tonnes per Annual Period	No change
Category 54	Sewage facility	100 cubic metres per day	No change
Category 58	Bulk material loading or unloading	75,000 tonnes per day	No change

Category	Description	Approved production capacity	Amendment requested
Category 64	Class II or III putrescible landfill site	4,500 tonnes per Annual Period	No change
Category 73	Bulk storage of chemicals	1,200 cubic metres in aggregate	No change

2.3 Description of proposed activity

Background

The licence holder owns and operates the Koolan Iron Ore Mine and Port Facility off the Kimberley coast of Western Australia in the Buccaneer Archipelago. Koolan Island is located approximately one kilometre from the mainland and 130 kilometres north of Derby. Ore is currently mined from Main Pit, which is located at the south coast of the island (**Figure 1**).

Main Pit has been mined below sea level and is separated from the marine environment (Arbitration Cove) by an engineered seawall. Water enters Main Pit via several pathways:

- seepage through the engineered seawall;
- seepage through the underlying rock, and
- surface flows from the Main Pit catchment in response to rainfall events.

Main Pit dewater is routinely discharged, via a settlement pond, to an ocean outfall fitted with a diffuser located approximately 70 m south of Main Pit. The ocean outfall is emission point W1 in licence L8148/2006/4 (**Figure 2**). A target discharge for Total Suspended Solids (TSS) of less than 20 mg/L applies at W1. Monitoring of W1 discharges occurs at the settlement pond monitoring point M12 in L8148/2006/4 (**Figure 3**).

Current contingency discharge in the licence for Main Pit is from emission points W2 and W3 (**Figure 2**); the TSS target of less than 20 mg/L also applies to these emission points. No changes are proposed to emission points W2 and W3.

Additional to the licence L8148/2006/4, a Marine Management Plan (MMP) applies to the project required under condition 7 of MS 715, as described in Section 3.1.

The estimated remaining life of the mine is currently four years.

Proposed amendment

High-volume seasonal rain events at Koolan Island in early January 2020 have resulted in a large volume of water currently being held in Main Pit, precluding mining. The licence holder proposes to undertake additional (contingency) dewatering to allow for safe access and mining of Main Pit. The licence holder proposes to use the existing ocean outfall emission point in licence L8148/2006/4 (W1 emission point) to discharge dewater from Main Pit for the current proposed and expected future (ongoing) contingency discharge for Main Pit during and immediately after high-volume seasonal rain events.

Main Pit contingency discharge will be from Main Pit directly to the W1 discharge point bypassing the settlement pond; monitoring will occur at a tap on the bypass line prior to discharge.

DWER notes that the contingency dewatering requirement will vary throughout the year, however, the licence holder anticipates that dewatering volume would be approximately 2,790,000 tonnes at a rate of 45,000 t/day for up to 62 non-consecutive days in the year. This is additional to the approved routine dewatering under Category 6 which occurs year-round.

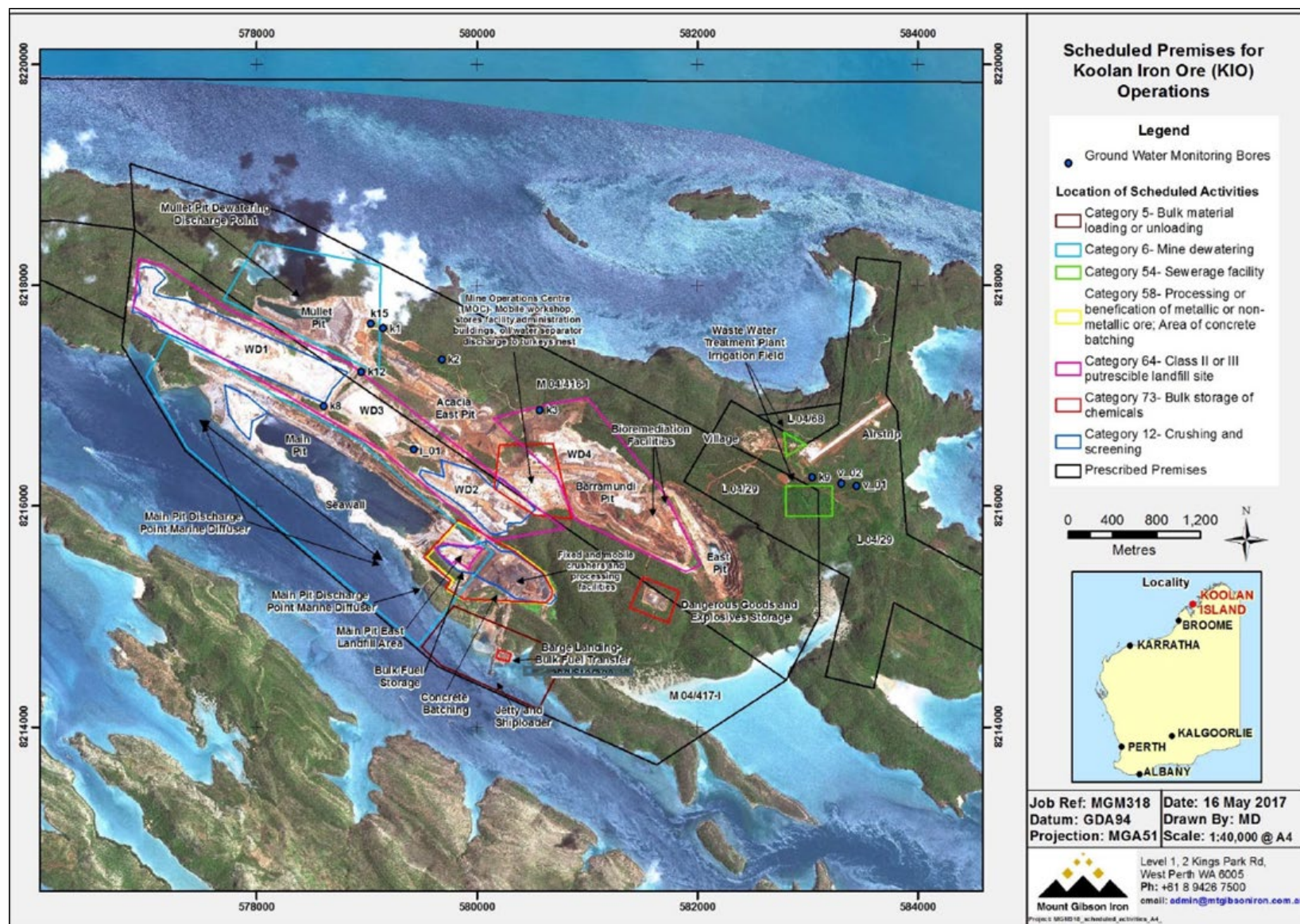


Figure 1: Site layout

Licence: L8148/2006/4

IR-T15 Amendment Report Template v1.0

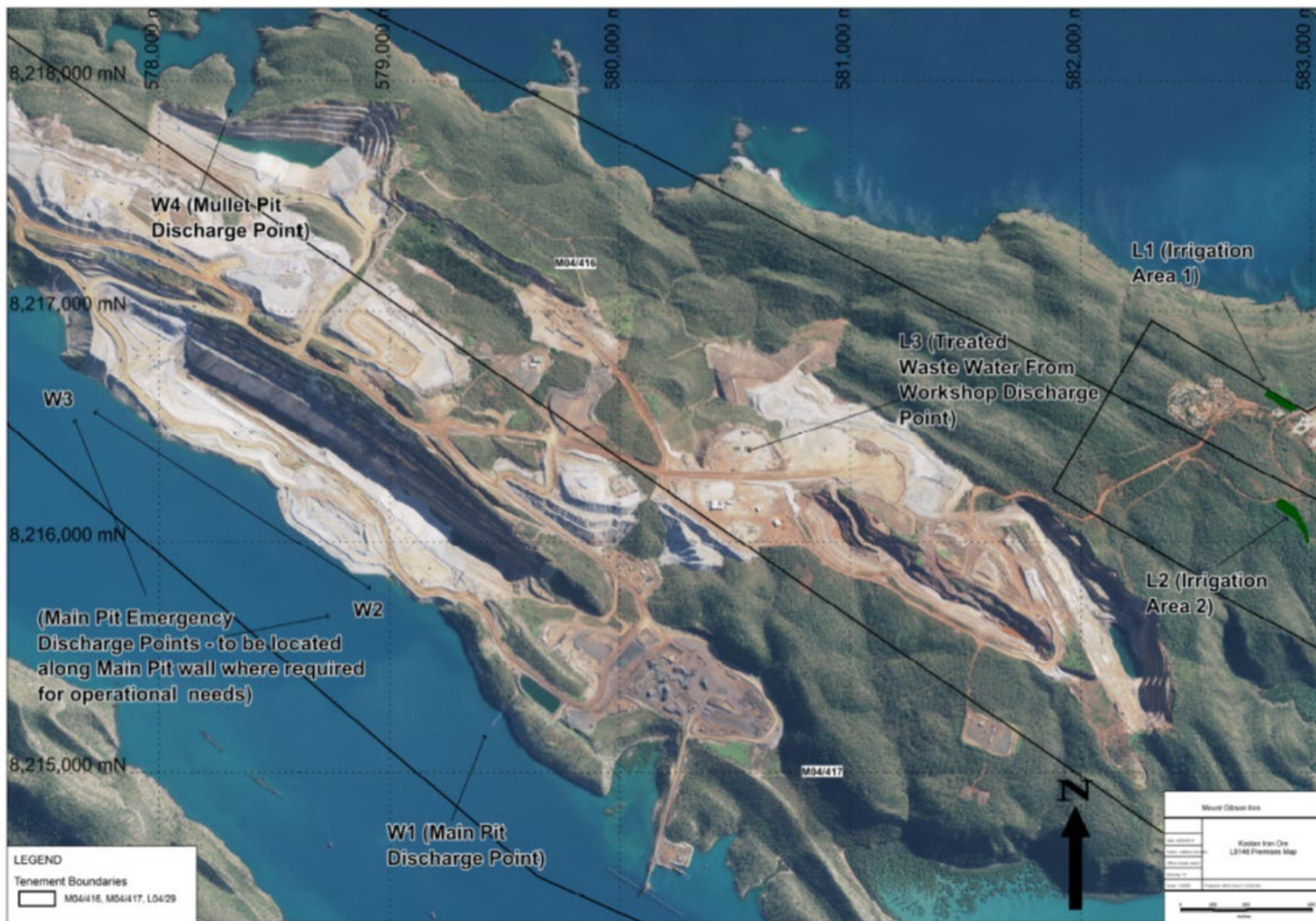


Figure 2: Existing discharge locations

Licence: L8148/2006/4

IR-T15 Amendment Report Template v1.0

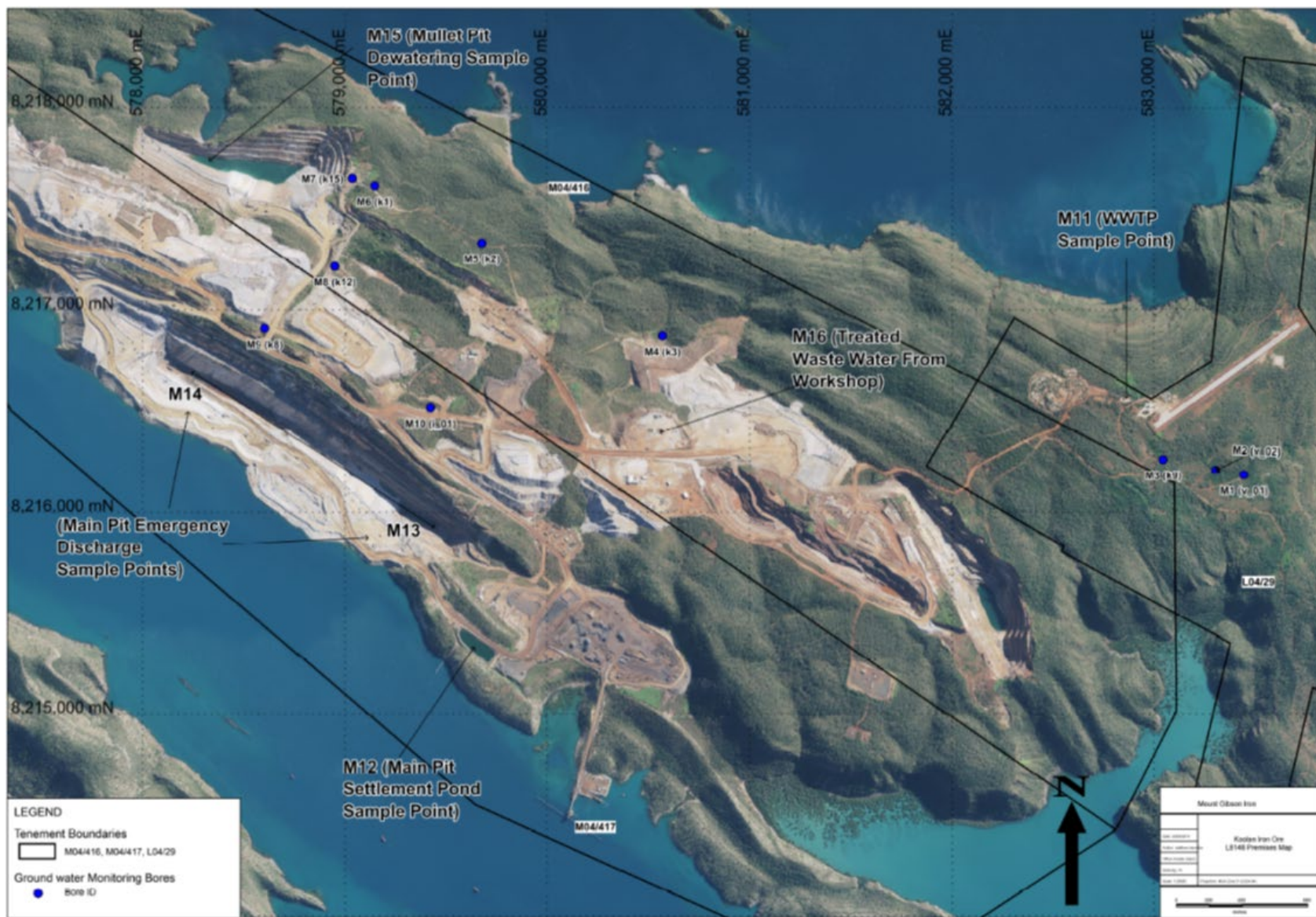


Figure 3: Existing monitoring locations

Licence: L8148/2006/4

IR-T15 Amendment Report Template v1.0

3. Legislative context and other approvals

The legislative framework for this assessment is the EP Act and *Environmental Protection Regulations 1987* (EP Regulations). Relevant guidance documents are outlined in Appendix 1: Key documents. Approvals relevant to the premises are outlined in **Table 3**.

Table 3: Other approvals

Legislation	Number	Approval
<i>Mining Act 1978</i>	Reg ID. 60751	Addendum to Koolan Island Iron Ore Mining Proposal Reg ID 5601, Koolan Island Iron Ore Mine and Port Facility – Seawall Construction and Mine Pit Dewatering on M04/416, M04/417 & L04/29, Mt Gibson Iron Limited, 19 September 2016.
	Reg ID. 56401	Koolan Island Iron Ore Mine and Port Facility – Mine Closure Plan (document ID: MGI-KIO-MCP version 4), Koolan Iron Ore Pty Ltd, 14 September 2015.
<i>Environmental Protection and Biodiversity Conservation Act 1999</i>	Referral EPBC 2016/7848	Referral for construction works on the renovated seawall and pit water, determined to be 'Not Controlled' in February 2017.
Part IV of the EP Act	MS 715 (approved 22 February 2006) [EPA assessment 1605, EPA report 1203]	Koolan Island Iron Ore Mine and Port Facility requiring the Licence Holder to implement the following: Closure Plan; Marine Management Plan; Water Management Plan; Quarantine Management Plan; Contamination Plan; and Asbestos Management Plan. Change to proposal approved under section 45C of the EP Act was approved 13 April 2018 allowing for the reconstruction of a portion of engineered seawall; and dewatering of approximately 25 gigalitres of seawater from the inundated Main Pit.
	MMP version 19	Approved in 2014. The plan outlines relevant Environmental Quality Criteria (EQC) and monitoring such as water quality, habitat and sediment monitoring, and management such as emergency spill management and rehabilitation. This version is currently being applied to site operations.
	MMP version 20	Approved in 2017 to facilitate the re-implementation of seawall construction and Main Pit capital dewatering.
	MMP version 21 (currently being considered by EPA Services)	Submitted in 2019 for management of potential direct and indirect effects of the proposal. Currently being assessed.

3.1 Part IV Assessment

EPA assessment

The EPA undertook an assessment (Assessment No. 1605) of the Koolan Island Iron Ore Mine and Port Facility and released a report (EPA report 1203, published in November 2005). The environmental factors assessed were marine ecosystem, flora, fauna and weeds, and soil contamination.

For the marine ecosystem factor, and in particular, dewatering discharge, the EPA recommended that impacts from dewatering discharge on the marine environment should be minimised in accordance with a MMP as per condition 7 of the Ministerial Statement 715 (published on February 2006).

The objectives of the MMP are to manage the impacts on the marine environment to:

- maintain the ecological integrity and biodiversity of the marine environment;
- avoid impacts that may arise from the operations of the project on the coral pool community at Mangrove Inlet; and
- manage project activities to ensure that impacts on marine habitats, communities and biota outside the project footprint are avoided.

The MMP set out procedures for, but not limited to, the following:

- analyse the quality of the water to be discharged from dewatering of the Main Pit;
- spatially and temporally define the mixing zones where water will be discharged to the marine environment;
- manage impacts associated with dewatering discharge to the marine environment;
- establish suitable reference sites from which to collect data for sediment and water quality and benthic habitat health indicators and derive site-specific environmental quality criteria for the direct and indirect impact zones;
- develop a marine environmental quality monitoring programme, including:
 - procedures for routine monitoring of sediment and water quality and benthic habitat health during the life of the mine;
 - the environmental quality criteria for triggering pre-determined management action(s) and where necessary the rationale for their derivation;
 - methodologies for evaluating data collected at the monitoring and reference sites against the environmental quality criteria;
 - the pre-determined adaptive management actions which will be implemented in the event that environmental quality criteria are not being achieved.

Marine Management Plan

As MMP version 20 was specifically relevant to the re-building of the Main Pit sea wall and its capital dewatering, version 19 of the MMP is currently being applied to site operations. An updated version (version 21) is being considered by EPA Services.

The MMP outlines relevant Environmental Quality Criteria (EQC) and monitoring such as water quality, habitat and sediment monitoring, and management such as emergency spill management and rehabilitation. The MMP implements management actions if unacceptable changes occur, which are measured using trigger values. Trigger values are generally based on the results of environmental condition monitoring at 'reference' (unaffected) sites and the assigned level of protection in the marine environment.

Level of protection

To determine the level of protection to the marine environment, the MMP determined the mixing zone in the waters surrounding the diffuser was a low ecological protection area (LEPA). The LEPA (**Figure 4**) is 150 m either side of the diffuser (approx. north and south) and 100 m wide (from the shore). The dilution from the diffuser to the edge of the LEPA is likely to be upwards of 1:2000+ (Application 2020).

Environmental quality criteria

Trigger values are either fixed values or percentiles at reference sites for water quality and sediment monitoring. For turbidity, the trigger value is the median turbidity at test site is greater than 80th percentile at the relevant reference sites. The percentile of the water quality at the reference sites is used to take into account natural variability in background conditions. If the trigger is exceeded at the reference sites, a management response is triggered. Other EQCs related to loss of coral habitat apply.

Monitoring program

Water quality is monitored prior to discharge (at monitoring point M12 in L8148/2006/4, **Figure 3**) and within the marine environment, for example at the edge of the LEPA/moderate ecological protection area (MEPA, **Figure 4**).

Submerged Data Loggers (SDLs) are used to monitor water quality at various sites (**Table 4**, **Figure 5**). A telemetry-enabled SDL at the settlement (sedimentation) pond (**Figure 5** and **Table 4**, S1; monitoring point M12 in L8148/2006/4) continuously monitors Nephelometric Turbidity Units (NTU) and other parameters, allowing continuous real-time monitoring of dewater discharge. Live monitoring data from the SDL at M12 has been available since 23 September 2019. Also, static SDLs have been deployed in receiving waters at specified sites (such as at the LEPA/MEPA boundary) to monitor the same water quality parameters as at M12.

Management/reporting

In relation to turbidity, if TSS exceeds 20 mg/L for a prolonged period of time (for example 7 days) further water quality and habitat monitoring may be undertaken and results of monitoring may be used to determine an effect on the environment and would be reported to DWER.

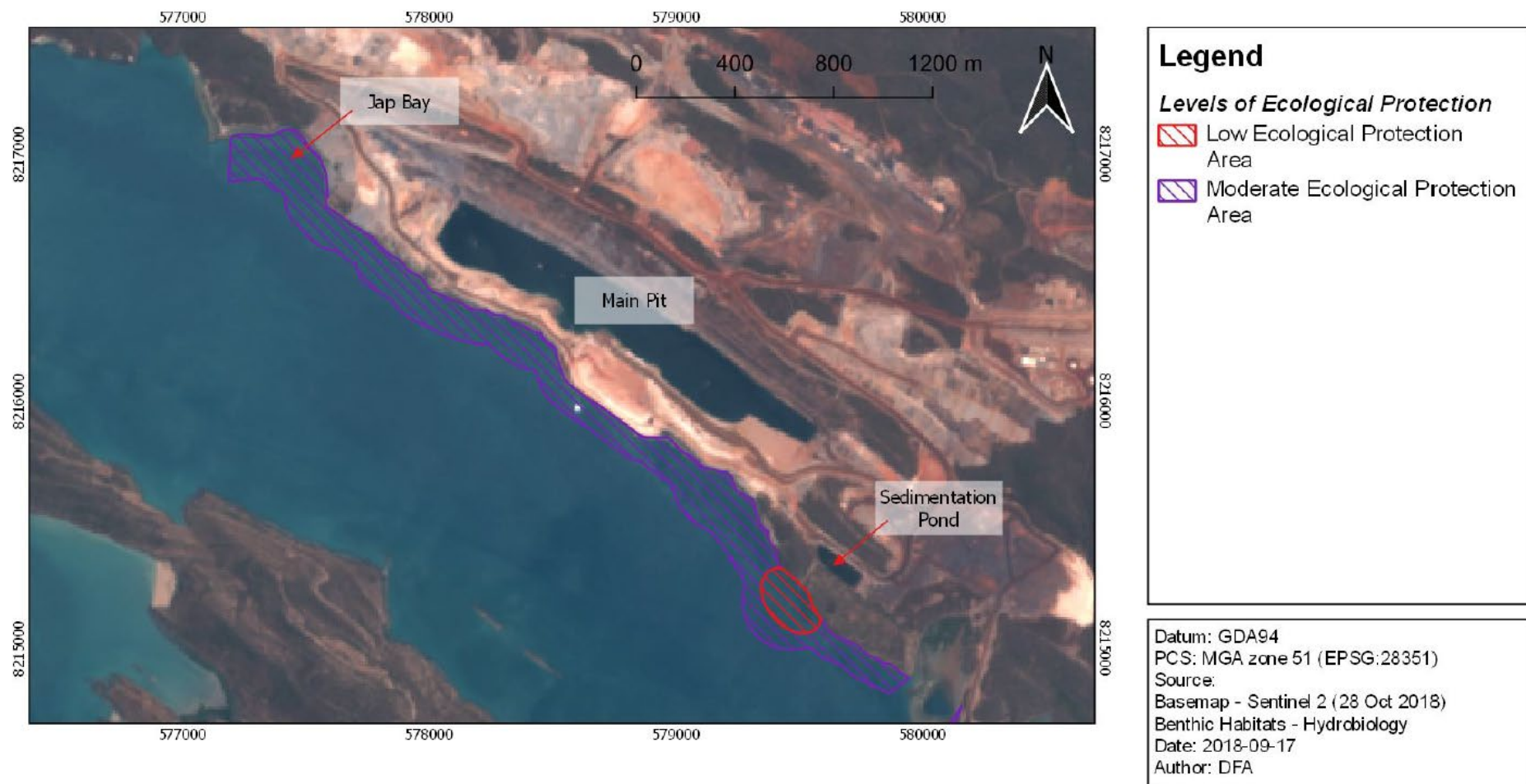


Figure 4: Areas of ecological protection

Table 4: SDL monitoring sites

Location	MMP reference	SDL type	Easting	Northing
Seawall West	NC-2	Non-telemetry	578466	8216189
Seawall East	SC-1	Non-telemetry	578963	8215823
Diffuser A	DIFF A	Non-telemetry	579356	8215342
Diffuser B	DIFF B	Non-telemetry	579540	8215104
Southern Reference	SOUTH REF	Non-telemetry	575449	8217742
Settlement pond (outlet)	S1	Telemetry	579573	8215387



Figure 5: Monitoring stations

4. Licence history

Table 5 provides the licences and works approvals issued since 20 June 2006.

Table 5: Licences and works approvals issued for the Premises

Instrument	Issued	Description
W4220/2006/1	20/06/2006	Works approval issued for construction of the ship loading facility on Koolan Island.
W4225/2006/1	21/08/2006	Works approval issued for construction of infrastructure including the processing plant, bulk chemical storage facility, landfill and sewage facility.
L8148/2006/1	18/06/2007	New licence application issued to allow operation of the processing plant, ship loader, bulk chemical storage facility, landfill and sewage facility.
W4315/2006/1	17/12/2007	Works approval issued for construction of the dewatering diffuser, sediment sump and associated pumps and pipework for the dewatering of Main Pit.
L8148/2006/2	18/06/2009	New Licence.
W4961/2011/1	30/06/2011	Works approval issued for construction of equipment to dewater Mullet Pit and re-use of water onsite for dust suppression and wash-down water.
W5056/2011/1	05/12/2011	Works approval issued for construction of new wastewater treatment plant and infiltration areas. Also assessed new workshop facilities to contain waste (wash down bays connected to interceptors/separators and bulk fuel storage).
L8148/2006/3	18/06/2012	New Licence.
L8148/2006/4	12/06/2014	New Licence and conversion to new format.
L8148/2006/4	18/06/2015	Licence amendment following Minister's appeal determination number 123 of 2014.
L8148/2006/4	31/03/2016	Licence amendment to include category 12 to allow for the crushing and screening of quartzite to produce aggregate for construction purposes, increase the category 73 design capacity and make changes to the groundwater monitoring requirements. The Licence also updated in accordance with licence template and relevant guidance statements.
L8148/2006/4	29/04/2016	Amendment of Licence expiry date.
L8148/2006/4	19/05/2016	Licence amendment to change the approved production limits for each Licence category to the minimum threshold amount (site in care and maintenance).
L8148/2006/4	17/02/2017	Amendment Notice 1 Licence amendment to increase the throughput for category 12.

Instrument	Issued	Description
L8148/2006/4	18/10/2017	Amendment Notice 2 Licence amendment to increase the design capacity of category 6 and 64.
L8148/2006/4	12/09/2018	Amendment Notice 3 Licence amendment to increase the design capacity for category 5, 58 and 73. Site coming out of care and maintenance, operations to resume.
L8148/2006/4	19/07/2019	Amendment Notice 4 Licence amendment to revert back to Total Suspended Solids with a limit of 20 mg/L for point source emissions to surface water.
L8148/2006/4	N/A	Amendment Notice 5 (Withdrawn)
L8148/2006/4	21/05/2020	Consolidation of licence DWER consolidated the licence by incorporating changes made under the following Amendment Notices: <ul style="list-style-type: none"> • Amendment Notice 1, issued 17 February 2017 • Amendment Notice 2, issued 18 October 2017 • Amendment Notice 3 issued 12 September 2018 • Amendment Notice 4, issued 19 July 2019.
L8148/2006/4	24/07/2020	Amendment to include a contingency dewatering discharge point for Main Pit during and immediately after high-volume seasonal rain events at discharge point W1.

5. Receptors

Table 6 lists the relevant sensitive land uses and environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 6: Sensitive and environmental receptors

Receptors	Distance from Prescribed Premises	Screening for Risk Event
Residential and sensitive premises		
Cockatoo Island	9.5 km to North West.	Screened out. Distance is sufficient to inform the risk of emissions as not foreseeable.
Environmental receptors		
Marine environment such as benthic habitats, including reef flat, coral slope, lower slope, channel floor and the Coral Pool	Adjacent to mining, ship loading and fuel storage activities. Coral Pool at the mouth of Mangrove Inlet directly west of the shiploading conveyor is of conservation significance (source: EPA report 1203). The health of the coral pool community is managed in the MMP as required under MS 715, condition 7.	Marine environment is a potential receptor for risk assessment (section 7) The conservation significant coral pool is screened out as impacts are managed under MS 715.

6. Monitoring and modelling

Benthic surveys

Long term benthic habitat monitoring, with a focus on coral habitat, has been conducted at Koolan Island as per requirements of the MMP. Surveys undertaken during 2018 and 2019 indicated that, aside from a localised area of approximately 50 metres in length adjacent to the barge ramp at Arbitration Cove (attributed to barge ramp improvement works and barge operations), coral communities have not been affected by Main Pit dewatering or recent past mining operations, and corals near the edge of the LEPA are in good condition (Application 2020).

Coral habitat monitoring is proposed to be conducted in 2020 via an annual survey in May/June and additional monitoring in October/November.

Modelling of contingency dewater

Dilution of Main Pit dewater proposed to be discharged from W1 was modelled (Application 2020). Modelling incorporated initial dilution for various discharge TSS concentrations (up to 150 mg/L), discharge rates (up to 45,000 m³/day) and tidal conditions (ebb and flood tides).

For the highest TSS and discharge rate modelled, the results of the model showed that the TSS trigger value for the edge of the LEPA (4 NTU, 2.78 mg/L) would be met outside a 23.0 x 11.0 m mixing zone at flood tide, which is well within the edge of the LEPA.

Dispersion modelling indicated that for discharge TSS concentration up to 150 mg/L, suspended solids are diluted within the LEPA to meet the applicable level of ecological protection prior to the edge of the LEPA. The edge of the LEPA boundary turbidity trigger value (4 NTU; 2.78 mg/L TSS) was not exceeded for any of the modelled scenarios. The modelling indicated that the contingency Main Pit dewater is able to be discharged such that TSS is adequately mixed within the LEPA boundary.

The modelling assumed full daily advection and dispersion of TSS, and no recycling or resuspension on the basis of the anticipated large daily tidal prisms (the volume of water between mean high tide and mean low tide) that would be experienced during and immediately after high-volume seasonal rain events, which is when the contingency dewater is proposed. The modelling did not consider the potential prolonged exposure effects associated with longer term discharges of TSS greater than 20 mg/L (the current TSS limit in L8148/2006/4) at W1.

Monitoring program validation and triggers

The previous monitoring (Hydrobiology 2020) and modelling (Application 2020) has been used by the applicant to develop the triggers that will be used to manage impacts of the contingency discharge:

- A trigger value of daily median turbidity of 6 NTU recorded at monitoring point M12 has been historically used as equivalent to the TSS limit of 20 mg/L within the licence L8148/2006/4. Subsequent analysis of turbidity measurements at M12 and laboratory-analysed TSS measurements showed that 17.9 NTU was approximately equivalent to 20 mg/L TSS, indicating the original trigger of 6 NTU was excessively conservative. Turbidity of 17 NTU as approximately equivalent to 20 mg/L TSS has been adopted at the project since June 2019 and has been used in developing and validating the monitoring program, triggers and corrective actions.
- Considering dispersion modelling indicates a TSS discharge concentration up to 150 mg/L is sufficiently diluted prior to the edge of the LEPA, a contingency discharge concentration of turbidity = 42.5 NTU (approximately 50 mg/L TSS) has been selected as a trigger value/ environmental quality objective (EQO) for further assessment.

- Monitoring of discharge would be undertaken at a tap along the bypass line from the Main Pit to the W1 emission point (denoted as emission point M12a).
- If monitoring shows that an environmental quality guideline (EQG) of 80th percentile daily median turbidity at M12a is greater than 42.5 NTU (50 mg/L TSS), the applicant will analyse the potential cause(s) of the exceedance (e.g. 'first flush' after rain event, excessive pumping rate), and if the trigger is exceeded on two consecutive days, corrective action(s) will be implemented within 24 hours to rectify (e.g. reduce pumping/increase retention time in Main Pit).
- If monitoring at the edge of the LEPA shows daily median turbidity is, for two or more consecutive days, greater than the 95th percentile of baseline/ambient turbidity and greater than 4 NTU (2.78 mg/L TSS), the daily median M12a water quality EQO will be revised down after comparing source water quality at M12a on those days. Monitoring of receiving waters will be undertaken during the wet season in discreet campaigns.
- The environmental quality standard (EQS) for coral loss which will trigger management measure is a 5% loss of coral cover at monitoring sites, adjusted for any losses at the Southern Reference site. This is considered to be conservative, as triggering of this EQS would indicate the possibility of significant risk that the associated EQG (turbidity at the edge of the LEPA) had not been achieved, and a management response was required.
- If benthic surveys in the vicinity of the diffuser show live coral cover decreases by 5% and is statistically significant from previous and/or reference cover rates, release of contingency dewater from W1 will cease and will not recommence until the potential cause(s) is determined and any identified management measures have been implemented. An investigation to determine whether the LEPA/MEPA boundary is appropriate will be undertaken, potentially requiring revision of the MMP.

Turbidity of 17 NTU being approximately equivalent to 20 mg/L TSS is being considered by the DWER Environmental Science Branch. The above triggers are not considered within the existing versions of the MMP.

Key Findings:

1. Coral communities have not likely been affected by Main Pit dewatering, and corals near the edge of the LEPA are in good condition.
2. Further coral habitat monitoring is proposed to be conducted in 2020.
3. Review of turbidity of 17 NTU being approximately equivalent to 20 mg/L TSS is being undertaken by DWER Environmental Science Branch.
4. Dilution modelling for highest TSS (150 mg/L) and discharge rate (45,000 m³/day) anticipates that the TSS trigger value would be met before the edge of the LEPA.
5. The modelling did not consider the potential prolonged exposure effects associated with longer term discharges of TSS.
6. The applicant has developed triggers to manage impacts of the contingency discharge; however, these triggers do not form part of an approved MMP.

7. Risk assessment

Table 7 describes the Risk Event associated with the amendment consistent with the *Guidance Statement: Risk Assessments*, and identifies whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 7: Risk assessment for proposed amendments during operation

Risk Event				Consequence rating	Likelihood rating	Risk	Reasoning	Regulatory controls (refer to conditions of the granted instrument) ¹
Source/Activities*	Potential emissions	Potential receptors, pathway and impact	Licence holder controls					
Category 6: Mine dewatering Main pit dewater discharged through W1 emission point	Discharge to marine environment	Receptor: Marine environment, including sensitive coral communities Pathway: High concentrations of TSS from Main Pit discharge through the marine outfall Impact: impacts to the marine environment such as loss of benthic habitats	<p>During contingency discharge, the applicant commits to continuously monitoring water quality prior to discharge (at M12a).</p> <p>The applicant has proposed trigger values based on previous monitoring and modelling to ensure that management and corrective actions are implemented for the contingency discharge into the marine environment, such as:</p> <ul style="list-style-type: none"> An early warning trigger for corrective actions EQG of 80th percentile daily median turbidity values at M12a exceeding 42.5 NTU (analogous to 50 mg/L TSS). An EQS of 5% loss of coral cover at monitoring sites, adjusted for any losses at the Southern Reference site. <p>If values are triggered, the applicant has committed to the following management and corrective actions:</p> <ul style="list-style-type: none"> If monitoring shows that the daily 80th percentile turbidity at M12a is greater than 42.5 NTU (EQG), the applicant will analyse the potential cause(s) of the exceedance (e.g. 'first flush' after rain event, excessive pumping rate). If trigger is exceeded on two consecutive days, corrective action(s) will be implemented within 24 hours to rectify (e.g. reduce pumping/increase retention time in Main Pit). If monitoring of receiving waters shows daily median turbidity is, for two or more consecutive days, greater than daily 95th percentile of baseline/ambient turbidity and greater than 4 NTU (2.78 mg/L TSS), the daily median M12a water quality EQO will be revised down after comparing source water quality at M12a on those days. Monitoring of receiving waters will be undertaken during the wet season in discreet campaigns. If benthic surveys in the vicinity of the diffuser show live coral cover decreases by 5% and is statistically significant from previous and/or reference cover rates, release of contingency dewater from W1 will cease and will not recommence until the potential cause(s) is determined and any identified management measures have been implemented. An investigation to determine whether the LEPA/MEPA boundary is appropriate will be undertaken, potentially requiring revision of the MMP. <p>The applicant has committed to the following management measures to further reduce impacts from the contingency dewatering discharge:</p> <ul style="list-style-type: none"> Offtake from upper portion of mine pit water column Discharge rate to return to routine rate once contingency dewatering is complete Continue using the multi-port diffuser at ocean offshore discharge point (W1) for routine discharge Pumping rate in accordance with diffuser specifications Discharge paused if monitoring indicates a water quality trigger is exceeded. 	Offsite impacts not detectable Slight	The risk event could occur at some time Possible	Low Acceptable, not subject to controls	<p>The Delegated Officer notes that the applicant currently undertakes monitoring of dewater discharge stream for TSS at W1 under the licence L8148/2006/4, with a TSS limit of 20 mg/L. Where routine discharge TSS exceeds 20 mg/L, these exceedances would continue to be reported to DWER as per the requirements of the licence. The Delegated Officer notes that this limit would not apply during contingency discharge from the W1 emission point, and that there are existing provisions in the licence to advise when contingency discharge is proposed (form CD1 in L8148/2006/4).</p> <p>The Delegated Officer notes that from June 2019 onwards, turbidity of 17 NTU being approximately equivalent to 20 mg/L TSS has been adopted. This is being reviewed by the DWER Environmental Science Branch.</p> <p>The Delegated Officer notes that modelling has been undertaken to predict the behaviour of the discharge in the marine environment and that the applicant has developed a suite of trigger values to ensure that management and corrective actions are implemented for the contingency discharge. The Delegated Officer considers that monitoring of contingency discharge will occur at the discharge point (M12a) and that there is proposed management if the discharge trigger is exceeded on two consecutive days at the discharge point.</p> <p>The Delegated Officer notes that monitoring within the receiving waters (at the edge of the LEPA/MEPA) is proposed to be undertaken in discreet campaigns during the wet season. The campaign timeframe is likely to be over twelve weeks in the typical wet season period of December to May. This timeframe would provide information on some of the contingency events expected during the wet season, and would capture comparative data to understand differences between contingency emissions, routine emissions and periods/days of no emissions.</p> <p>The Delegated Officer notes EPA Services' advice that the activities proposed do not contain anything that would be considered outside the approval granted by MS 715, and that the MMP is reviewed on a regular basis and can capture any amendments as needed. The Delegated Officer notes that monitoring and management of impacts within the marine environment should be captured within the MMP required under MS 715. This should include the proposed monitoring, management and corrective actions for contingency discharge. The applicant should liaise with EPA Services for any requirements regarding the review/update of the MMP. The Delegated Officer notes that dependent upon the outcome of the review/update of the MMP, that an amendment for licence L8148/2006/4 may be required to capture any changes. The Delegated Officer considers that the information provided for the contingency discharge is likely to be captured in future reviews of the MMP, and considers that additional regulatory controls are not required to mitigate the risk to the marine environment from contingency dewatering discharge.</p>	<p><u>Discharge point W1a added to Table 2.2.1</u></p> <p><u>Monitoring point M12a added to Table 3.2.1 for the measurement of TSS</u></p> <p>Condition 4.3.1 for notification of activation and cessation of contingency discharge (form CD1)</p>

Note 1: Already existing controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by the Department

Consequence and likelihood of risk events

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

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

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with **Table 9**.

Table 9: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance^ Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance^ Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

"onsite" means within the Prescribed Premises boundary.

Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment **Table 10**.

Table 10: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

8. Consultation

Table 11: Consultation undertaken for the licence amendment

Method	Comments received	DWER response
Department of Mines, Industry Regulation and Safety (29 May 2020)	No matters of concern raised.	N/A
Review of draft revised Licence by applicant (3 June 2020)	Condition 2.2.1, Table 2.2.1: Amend the source for emission point W1a to "Mine dewater discharged to the ocean via an ocean discharge diffuser". This distinguishes between the settlement pond being used for routine dewatering (W1) and not for contingency dewatering (W1a), but each arising from Main Pit and discharged via the ocean diffuser.	DWER considers that this clarification is acceptable and has included this wording into the licence.

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.

Summary of amendments

Table 12 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 12: Summary of licence amendments

Condition No.	Proposed amendments
Condition 2.2.1, Table 2.2.1	Addition of emission point W1a
Condition 3.2.1, Table 3.2.1	Addition of M12a monitoring location for volumetric flow rate and TSS.
N/A	Minor administrative amendments

Appendix 1: Key documents

	Document title	In text reference	Availability
1.	Licence (L8148/2006/4) amendment application form and supporting documentation (March 2020)	Application 2020	DWER record: A1877971
2.	Marine Management Plan, Koolan Island Iron Ore Mine and Port Facility, Version 19 ()		DWER record: 2019-1555574627007
3.	Marine Management Plan, Koolan Island Iron Ore Mine and Port Facility, Version 20 (April 2018)		DWER record: 2018-1522983274230
4.	KIO Dewatering SDL Monitoring Report, Prepared by Hydrobiology Pty Ltd (May 2020)	Hydrobiology 2020	DWER record: DWERDT280994
5.	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	DER, 2015a	accessed at www.dwer.wa.gov.au
6.	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	DER, 2015b	
7.	DER, August 2016. <i>Guidance Statement: Licence duration</i> . Department of Environment Regulation, Perth.	DER, 2016a	
8.	DER, November 2016. <i>Guidance Statement: Environmental Siting</i> . Department of Environment Regulation, Perth.	DER, 2016b	
9.	DWER, February 2017. <i>Guidance Statement: Risk Assessments</i> . Department of Water and Environmental Regulation, Perth.	DWER, 2017	
10.	DWER, June 2019 <i>Guidance Statement: Decision Making</i> . Department of Water and Environmental Regulation, Perth.	DWER, 2019a	
11.	DWER, June 2019. <i>Guideline: Industry Regulation Guide to Licensing</i> . Department of Water and Environmental Regulation, Perth.	DWER, 2019b	