Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6338/2019/1
Applicant	BHP Billiton Iron Ore Pty Ltd
ACN	008 700 981
File Number	DER2019/000622
Premises	Mining Area C Mining Tenement ML281SA and ML249SA NEWMAN WA 6753
Date of Report	21 April 2020
Status of Report	Final

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1. Definitions of terms and acronyms

In this Decision 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
Applicant	BHP Billiton Iron Ore Pty Ltd
BOM	Bureau of Meteorology
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CS Act	*Contaminated Sites Act 2003* (WA)
Decision Report	refers to this document.
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 As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the *Public Sector Management Act 1994* and is responsible for the administration of the *Environmental Protection Act 1986* along with other legislation.
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

Livestock Guidelines	NWQMS, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Livestock drinking water quality as the beneficial use of groundwater is for livestock watering.
MAC	Mining Area C
MAR	Managed aquifer recharge
m^3	cubic metres
Livestock Guidelines	ANZECC/ARMCANZ NWQMS, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Livestock drinking water quality
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 Decision Report applies, as specified at the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act following the finalisation of this Review.
Risk Event	As described in *Guidance Statement: Risk Assessment*
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)
$\mu g/m^3$	micrograms per cubic metre
µg/L	micrograms per litre

2. Purpose and scope of assessment

This is a new works approval application for category 6 to install a new MAR scheme at South Flank to dispose of 12.76 gigalitres per annum (GL/a) of mine dewatering water and also enable surface water discharge of 12.76 GL/a to Pebble Mouse Creek. The MAC Project is already a prescribed premises and operates under Licence L7851/2002/6.

2.1 Application details

The Applicant has applied for a works approval for 12.76 GL/a discharge of mine dewatering water to South Flank via reinjection bores and also 12.76 GL/a surface water discharge to Pebble Mouse Creek.

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
Application form: Works Approval / Licence / Renewal / Amendment / Registration Application for a Works Approval: South Flank Surplus Water Scheme, Supporting Documentation (Including Information relating to Attachments 1 to 10), October 2019	15 November 2019
RE: APPLICANT NOTIFICATION - APPLICATION FOR A WORKS APPROVAL (W6338/2019/1) - REQUEST FOR FURTHER INFORMATION	5 February 2020

3. Background

The MAC Hub consists of MAC and Southern Flank mining operations located approximately 90 km northwest of the Newman Township. Ore from MAC is transported to Port Hedland via the BHP Newman to Port Hedland Mainline and associated spur lines and shipped out through Port Hedland at the BHP facilities at Nelson Point and Finucane Island.

The discharge of the mine dewatering is required as it is surplus groundwater that will be taken from the aquifers to allow mining of below water table ore. The Applicant has selected two options for disposal of this surplus water – MAR and surface water discharge to Pebble Mouse Creek.

Table 3 lists the prescribed premises categories that are being applied for.

Table 3: Prescribed Premises Categories

Classification of Premises	Description	*Premises production or design capacity or throughput*
Category 6	Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore	12.76 GL/a MAR at South Flank 12.76 GL/a surface water discharge to Pebble Mouse Creek

4. Overview of Premises

4.1 Operational aspects

The key mine dewatering activities that are currently utilised onsite include dewatering of the existing and expanded MAC via borefields to allow mining of ore, with surplus water generated

through dewatering discharged via Managed Aquifer Recharge in the form of reinjection borefields, infiltrations basins and surface water discharged via the Packsaddle infiltration ponds.

This works approval is for a new MAR scheme at South Flank and surface water discharge scheme to Pebble Mouse Creek.

4.2 Infrastructure

The mine dewatering infrastructure, as it relates to category 6 activities, is detailed in Table 4 and with reference to the Site Plan (attached in the issued works approval).

Table 4 lists infrastructure associated with each prescribed premises category.

Figure 1 shows the infrastructure and monitoring locations.

Table 4: Mine dewatering category 6 infrastructure

	Infrastructure	**Site Plan Reference**
	Prescribed Activity Category 6	
MAR scheme with discharge of 12.76 GL/a mine dewatering water to South Flank		
1	14 km pipeline	Schedule 1: Maps
2	1,100 kL balance tank	Schedule 1: Maps
3	South Flank Turkeys Nest (already constructed and operated) Capacity: 4ML Dimensions: Approx 43m x 57m, RL to top of TN RL786.933. Max water level RL 786.633 Lining: HDPE liner 1.5mm thick fully welded. Bottom layer Geofabric BIDM A49	Schedule 1: Maps
4	Nominally 10 reinjection bores: •HSF5461P; •HSF5462P; •HSF5463P; •HSF5464P; •HSF5465P; •HSF5466P; •HSF5467P; •HSF5468P; •HSF5469P; and •HSF0063P	Schedule 1: Maps
5	Additional reinjection bores (although additional reinjection bores may be required). This will be determined prior to the construction period. DWER will then be notified one month prior to construction commencing of additional reinjection bores requested	Locations not yet determined
6	Five regional monitoring bores in the vicinity of the MAR scheme area: •HSF0055M2; •HSF5473M; •HSF5480M; •HSF5494M; and •HSF5495M	Schedule 1: Maps

	Infrastructure	Site Plan Reference
Surface water scheme with discharge of 12.76 GL/a to Pebble Mouse Creek		
7	Discharge point to Pebble Mouse Creek consisting of pipe with a diameter of 200mm that then increases to a pipe diameter of 500mm and water discharges via a series of 24 holes on each side of the discharge pipe Rip rap protection underneath, to each side and downstream of the discharge pipe	Schedule 1: Maps
8	<u>Gauging Station Data Logger at the Wetting Front Discharge Early Warning Point (already in place)</u> Mounting / installation details: • 600mm x 600mm concrete pad with two 500mm stabilisers driven into the river bed in two different directions; • All concreted in with 800kgs of concrete • All equipment mounted approx. 3m high on an aluminium tilt/snapback pole downstream of major tree for protection, and chained to tree for added protection • InSitu Troll mounted inside the bottom of the pole, with drain holes at the bottom, as well as two 25mm inlet/outlets at troll height to allow free water movement, and minimise silt build up. • Iridium X-Link data logger mounted on northern side of pole powered by 7Ah internal battery and 5W solar panel mounted on top spigot • Camera (with internal modem) and infrared light mounted together on top of pole, facing downstream (east), powered by internal lithium batteries and a 10W solar panel mounted on the top spigot • This is transmitting via 3G 9Db antenna mounted at the top of the spigot. Data logger details: • Sutron Iridium X-Link data logger, transmitting every 30 minutes to the control room. Internal 7Ah battery, and external 5W solar panel. • InSitu Troll attached via SDI-12, measuring water depth of water at 30min intervals. Camera details: • Camera has an internal modem and infrared light for night time images. • Programmed to take hourly photos. • Powered by internal lithium batteries and a 10W solar panel. • Facing downstream, (east) towards trees. <u>Gauging Station Data Logger at the Wetting Front Discharge Limit</u> To be installed with the same details as those listed above for the Wetting Front Discharge Early Warning Point	Schedule 1: Maps

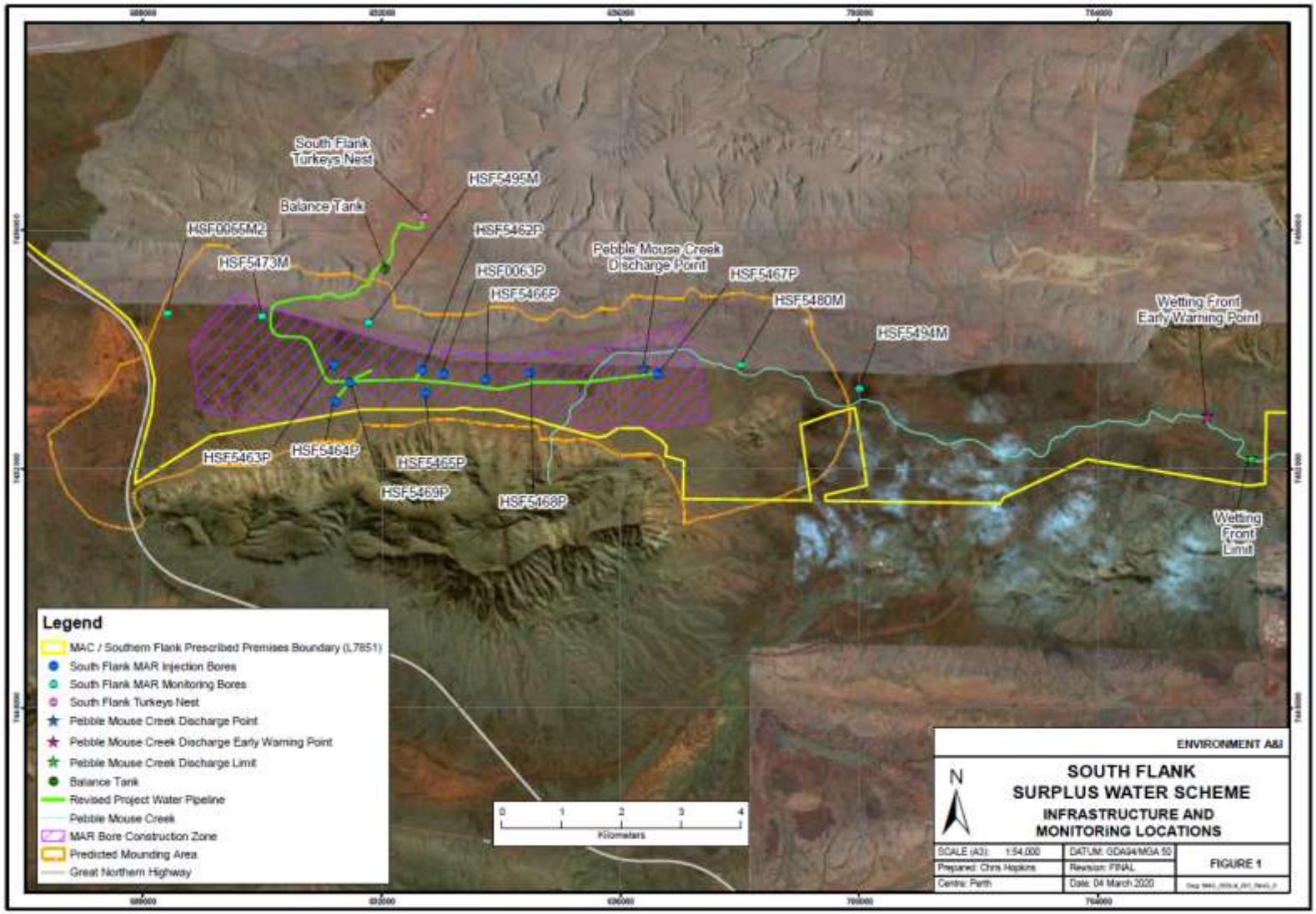

Figure 1: Infrastructure and monitoring locations

4.3 Exclusions to the Premises

The abstraction of the surplus water is not regulated under Part V of the EP Act, only the discharge of this surplus water to the environment is.

5. Legislative context

Table 5 summarises approvals relevant to the assessment.

Table 5: Relevant approvals and tenure

Legislation	Number	Approval
Iron Ore (Mount Goldsworthy) Agreement Act 1964	ML281SA and ML249SA	Tenure (State Agreement)
	State Agreement Project Proposals	Detailed Proposals describing the proposed infrastructure and mining operations. There are no State Agreement proposals in preparation for MAC / South Flank at this time. All proposed activities are covered under existing approved State Agreement Proposals.
Environment Protection and Biodiversity Conservation Act 1999 (Cth)	*Strategic Environmental Assessment Approval Notice dated 19 June 2017*	Matters of National Significant: • Northern Quoll (*Dasyrurus hallucatus*); • Greater Bilby (*Macrotis lagotis*); • Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia*); • Pilbara Olive Python (*Liasis olivaceus barroni);* and • Ghost Bat (*Macroderma gigas*).
Part IV of the EP Act (WA)	Ministerial Statement - MS1072 dated 20 February 2018	Approval to implement revised proposal to mine the Mining Area C Northern Flank and Southern Flank orebodies. Replaces former MS 491 which was for 'Multiple Iron Ore Mine Development, Mining Area C – Northern Flank, 100 km north-west of Newman (Note: '*Water usage and dewatering requirements'* was removed as a Part IV Key Characteristic in March 2014 as *'conservation values are managed under the Life of Mine Environmental Management Plan; dewatering and discharge can be managed under other legislation'*).' Central Pilbara Water Resource Management Plan Version 3.4 submitted to DWER Part IV of the EP Act for review on 1 March 2019 and endorsed 9 April 2019 (BHP Billiton, 2019).
Rights in Water and Irrigation Act 1914 (RIWI Act)	Groundwater Licence (GWL) 110044(10)	Mining Area C- Up to 15,330,000 kilolitres per annum (kL/a) from Pilbara, Hamersley Fractured Rock aquifer
	GWL178477(2)	Juna Downs Borefield allocation of 750,000kL/a from Wittenoom Aquifer
	GWL174613(1)	Mulla Mulla Camp Borefield 50,000kL/a from Pilbara, Hamersley Fractured Rock aquifer
	GWL166477(5)	Up to 1,500,000 kL/a from Pilbara, Hamersley Fractured Rock aquifer

	GWL166389(1)	Up to 1,500,000 kL/a from the Pilbara, Wittenoon – Wittenoom aquifer
Dangerous Goods Safety Act 2004	Dangerous Goods Licence DGS017237	Facilities added to the manifest as required.
Health Act 1914	Permit to operate apparatus for the treatment of sewage.	To operate WWTPs.

5.1 Part IV of the EP Act

5.1.1 Background

MAC has previously been subject to MS 491 for MAC – Northern Flank Project, however, MS1072 is a revision of this and also includes MAC - Southern Flank. This is documented in the Report and recommendations of the EPA 1610.

5.1.2 MS 1072

MS 1072 was published on 20 February 2018 for the MAC Northern Flank and Southern Flank orebodies. Condition 6 requires that a Water Management Environmental Management Plan be implemented:

Water Management Environmental Management Plan

6-1 The proponent shall prepare and submit an Environmental Management Plan (the Plan), on the advice of the Department of Water and Environmental Regulation, and the Department of Biodiversity, Conservation and Attractions, that demonstrates how the proponent will achieve the following:

(1) no reduction in the extent of each of the following components of the Coolibah-Lignum Flats Priority Ecological Community occurrence on the Coondewanna Flats:

(a) Coolibah woodlands over lignum over swamp wandiree, or

(b) Coolibah and mulga woodland over lignum and tussock grasses on clay plains,

attributable to the Revised Proposal

(2) no reduction in the extent of the Weeli Wolli Spring occurrence of the Weeli Wolli Spring Priority Ecological Community attributable to the Revised Proposal.

(3) no reduction in the extent of the Ben's Oasis occurrence of the Weeli Wolli Spring Priority Ecological Community attributable to the Revised Proposal.

6-2 The Plan shall specify Outcome/s, Trigger Criteria, Threshold Criteria, Monitoring, Trigger Level Actions, Threshold Contingency Actions, and Reporting to demonstrate that the outcome in Condition 6-1(1) will be met.

6-3 The Plan shall specify Management Actions, Management Targets, Monitoring and Reporting to demonstrate that the objectives in Condition 6-1(2) and 6-1(3) will be met.

6-4 The Plan shall be prepared in accordance with the EPA's Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans, or any guideline published by the EPA which amends or replaces this document from time to time.

6-5 The proponent shall submit the Plan to the CEO within six (6) months of the date of this Statement, or as otherwise agreed in writing by the CEO.

6-6 The proponent shall implement the Central Pilbara Water Resource Management Plan (Version 3.0) until the CEO has confirmed by notice in writing that the Plan required by condition 6-1 satisfies the requirements of condition 6-2 and 6-3 to meet the objectives required by condition 6-1.

6-7 The proponent shall implement the most recent version of the Plan approved by the CEO.

6-8 In the event of exceedance of threshold criteria in condition 6-2 or failure to meet management targets in condition 6-3, the proponent shall meet the requirements in condition 3 (Compliance Reporting) and shall implement the measures outlined in the Plan, including, but not limited to, actions and investigations to be undertaken, and reporting to the CEO.

6-9 Any changes to Trigger Criteria, Threshold Criteria, Trigger Level Actions, Threshold Contingency Actions, Management Actions, Management Targets Monitoring or Reporting in the Plan must be approved by the CEO in writing.

The *Central Pilbara Water Resource Management Plan Revision 3.4* is used by the Applicant to address this conditions requirements.

A section 45C (s45C) application for MS 1072 for the MAR and discharge scheme was approved 15 January 2020. This resulted in modifications to Table 2 of MS 1072 for surplus water management (shown in bolded text below):

Up to 34.84 GL per annum via managed aquifer recharge, infiltration ponds, discharge from sedimentation basin **and discharge to a drainage line that leads to Pebble Mouse Creek.**

Discharge along drainage line and Pebble Mouse Creek:

- **will not extend further than 14 km from the discharge point or extend beyond the boundary of the Mining Area C development envelope.**
- **shall be intermittent under natural no flow conditions for maximum of 120 days in any 12 month period.**

Mounding as a result of managed aquifer recharge at South Flank will be maintained at or below 30 m from ground level within an area of 400 m around the HSF5495M bore.

5.2 Contaminated sites

There are a number of contaminated sites within the licence boundary, but none within the project area associated with this works approval. The closest site is approximately 250m north of the northwestern edge of the project area and is a suspected minor hydrocarbon spill associated with the decommissioned South Flank Exploration Camp.

5.3 Other relevant approvals

Groundwater abstraction at MAC / Southern Flank is undertaken in accordance with Groundwater Licence GWL 110044(10).

5.4 Part V of the EP Act

5.4.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015);*
- *Guidance Statement: Setting Conditions (October 2015);*
- *Guidance Statement: Land Use Planning (February 2017);*
- *Guidance Statement: Decision Making (June 2019);*
- *Guidance Statement: Risk Assessments (February 2017); and*
- *Guidance Statement: Environmental Siting (November 2016)*

5.4.2 Works approval and licence history

Table 6 summarises the works approval and licence history for the premises.

Table 6: Works approval and licence history

Instrument	Issued	Nature and extent of works approval, licence or amendment
L7851/2002/6	17/11/2014	Licence reissue and amendment to new format template
L7851/2002/6	22/01/2014	Minor amendment
L7851/2002/6	7/04/2016	Licence amendment to update to template version 2.9
L7851/2002/6	29/09/2016	Licence amendment initiated by Licensee to increase Category 6 production capacity, approve construction of the Packsaddle Infiltration Ponds and MAC WTP, include Category 85B and include the Western and Central Sediment Basins as emission points to land
L7851/2002/6	5/10/2017	Amendment Notice 1 Licence amendment initiated by Licensee to increase Category 6 and Category 63 production capacity, approve construction of the Juna Downs MAR Scheme, approve construction and operation of a new WWTP spray field for the Mulla Mulla Camp and include associated monitoring conditions, include the light vehicle washdown bay as emission point to land along with associated monitoring conditions and expand the premises boundary
L7851/2002/6	16/10/2018	Amendment Notice 2 Licence amendment initiated by Licensee to update to the Premises legal description to include new (approved) tenure, expand the approved L7851/2002/6 boundary, install a second screening plant to increase the capacity of the existing relocatable (ore) crushers, increase to Category 5 processing rate of 6Mtpa, amend reinjection bore nomenclature and amend associated figures, add four new dewatering discharge locations, add a new Premises Category (12) to allow for the operation of two 1 million tonne capacity mobile crushing screening units, increase Category 54 throughput from 480 m_3/day to 1,110 m_3/day (increase of +630 m_3/day) in line with the

		Mulla Mulla Village WWTP throughput, incorporate construction requirements for the Mulla Mulla Village WWTP (W6092/2017/1) into L7851/2002/6, add new effluent emission (reference) points for the two spray field locations associated with the Mulla Mulla Village WWTP, increase Category 63 inert waste disposal volume by 5,000tpa to account for an increase in inert waste resulting from the construction of the Southern Flank mining hub, increase Category 73 fuel storage volume by 2,500m3 to allow for the installation of an additional 15 fuel bullets within the revised Premise boundary, increase Category 89 putrescible waste volume by 2,000tpa to account for an increase in putrescible waste resulting from the expansion of Mulla Mulla Village, approve the construction and operation of a new putrescible landfill, assess the increased discharge of mine dewater to the western sediment basin and increased the maximum discharge volume accordingly.
L7851/2002/6	07/11/2019	Licence amendment initiated by the Licence Holder for the following: Category 5 minor upgrades to the conveyors and stacker drives for the Ore Handling Plants and installation of a new 5 Mtpa relocatable crusher. Category 6 remove the depth to groundwater restriction on the six Juna Downs Reinjection bores and place this restriction on six adjacent bores; Retain 34.931 GL/a maximum surplus water disposal, but increase the Juna Downs MAR reinjection limit from 7.3 GL/a to 12.775 GL/a, replace the Juna Downs MAR monitoring bore HCF0044M, as it is shallow and often dry, with HCF0023M, which is located 12 m south west, include two additional reinjection bores (HGSL0037P and HGSL0038P) and two associated monitoring bores (HGSL0019M and HGSL0025M) at Juna Downs (these bores will be managed under the existing licence limits and thresholds), remove A Deposit MAR monitoring bores, add a new discharge point for the Western Sediment Basin and allow the overtopping of the Packsaddle infiltration ponds to the natural drainage line as part of a three year trial. Cateogry 12 increase the capacity of the single mobile stemming plant from 130 ktpa to 400 ktpa to create a 2 – 3 year stockpile of stemming material. Category 52 addition of Category 52 to enable operation of the existing 20 MW Power Station beyond the current standby / emergency usage. Category 63 construction and operation of 3 new inert landfills for South Flank and increase the approved capacity from 14,000 tpa to 16,500 tpa to allow a once off disposal of waste rail ballast. Category 73 construction and operation of two 2 ML hydrocarbon storage facilities at South Flank that are to be located at Primary Crusher 1 and Primary Crusher 2 and increase the capacity from 6,000 m^3 in aggregate to 10,000 m^3 in aggregate. Groundwater monitoring bore GWB0039M removed as the bore has become blocked and redrilling would be difficult as it's located within the Coondewanna Flats Priority Ecological Community (PEC). HCF0032M will be used instated.
W6338/2019/1	21/04/2020	Works approval to install new MAR scheme at South Flank to dispose of 12.76 GL/a of mine dewatering water and also surface water discharge of 12.76 GL/a to Pebble Mouse Creek.

5.4.3 Compliance inspections and compliance history

The latest inspection was conducted 7 May 2015 with non-compliances / not-determined conditions for some stormwater management issues, landfill management, sampling results and groundwater monitoring.

The licence holder's response to the inspection was received on 9 October 2015 and agreed actions completed. Accordingly the inspection was closed.

During the 2018-2019 reporting period, the licence holder deemed themselves non-compliant with the following conditions in the AACR:

- Condition 1.2.11 – Packsaddle Infiltration Ponds mine dewatering water overtopped on 19/19/2018, 18/12/2018 and 31/12/2018. Pumping has ceased and a Licence amendment application requests overtopping of the ponds from the Runaway Valley Infiltration Ponds. Water quality was within BHP internal trigger levels aside from chloride, sulphate as SO^{2-}_4, sodium, magnesium, and zinc (on one or more occasions), however, these were only slightly over the trigger values. The environmental risk associated with this non-compliance is considered low;
- Condition 1.2.9 – Mulla Mulla Camp WWTP spray fields leaking through gravel bunds at southern corner into nearby environment (24/07/2018). The environmental risk associated with this non-compliance is considered low;
- Condition 2.2.2 - During commissioning Juna Downs MAR the SWL at reinjection bore HGSL0006 exceeded 7mbl limit to 6.88mbgl for 50 minutes (8/02/2019). The environmental risk associated with this non-compliance is considered low;
- Condition 3.2.1 – A number of point source emissions to groundwater SWL, volume, EC and pH were not monitored during the reporting period for mine dewatering water discharge due to an administrative error. The monitoring schedule has been implemented so that this is remediated. The environmental risk associated with this non-compliance is considered low;
- Condition 3.2.1 / Condition 5.1.4 – point source emissions to groundwater exceeded established internally set trigger values for mine dewatering water discharge. Parameters included Calcium Carbonate, Chloride, Sodium, Sulphate as SO^{2-}_4, Magnesium, Zinc and although the exceedances of the parameters were not excessively over the trigger values and environmental risk considered low, it may be beneficial for BHP to reassess these internal trigger values if all monitoring campaigns are resulting in a breach;
- Condition 3.3.1 – monitoring results were not recorded at four of the mine dewatering discharge points to the Packsaddle Infiltration ponds in Q1 and Q3 for non-organics, pH and EC due to no flow conditions during the time of sampling. Valves can be manually turned on to ensure samples are taken. The environmental risk associated with this non-compliance is considered low;
- Condition 3.3.1 – Treated effluent exceeded internal trigger values for BOD, TSS and E.coli for a number of the sampling campaigns during the reporting period. Although the risk to the environment is considered low, it may be worth BHP assessing the sewage treatment onsite to ensure that it is operating as per manufacturer's specifications and/or realigning internal trigger values if these are continuing to not be met;
- Condition 3.5.1 – ambient groundwater was not conducted at GWB0039M in Q3 and Q4 due to bore case damage so it was not possible to insert a dip. Adjacent groundwater monitoring bores were sampled to identify trends and environmental impact is considered low. BHP have requested that that groundwater monitoring bore is removed from the Licence as part of the amendment that is currently progressing;
- Condition 3.5.2 – there were a number of groundwater monitoring bores that were not sampled during the reporting period due to no safe access, bore destruction due to haul road expansion, logger data was not able to be uploaded or the area was barricaded off and not accessible. Adjacent groundwater bores have been monitored to identify trends and the environmental impact is considered low; and

- Condition 4.3.1 – Packsaddle Infiltration Ponds and Juna Downs MAR scheme compliance documentation was not submitted within 7 days of the completion of construction and prior to commissioning. These have since been submitted and a process put in place to ensure that the requirements are within the project and commissioning plans.

5.4.4 Clearing

All clearing associated with the project will be undertaken in accordance with MS 1072.

6. Modelling and monitoring data

6.1 Monitoring of discharges to surface water and groundwater

The quality of water extracted in mine dewatering for discharge via reinjection and to Pebble Mouse is shown in Table 7. There is a comparison of the source water quality aquifers to both the receiving water quality aquifer and the Livestock Guidelines. The water appears to be good quality, similar between the source and receiving aquifers, and well within the Livestock Guidelines. The Livestock Guidelines have been used as a comparison as the beneficial use of the water in the area would be for livestock watering of cattle.

A summary of the reinjection bores and monitoring bores to be used as part of the MAR scheme are shown in Table 8. **.** Note that while the bores that are listed as "Drilled" have been drilled and pump tested, injection headworks have not been installed.

Table 7: Comparison of water quality at source (MAC) and receiver (South Flank Valley)

		Source (MAC)				Receiver (South Flank Valley[4])	
Analyte (mg/L unless specified otherwise)	**Livestock Guidelines[1]**	**A Deposit MAR[2] Minimum**	**A Deposit MAR[2] Maximum**	**C Deposit[3] Minimum**	**C Deposit[3] Maximum**	**Minimum**	**Maximum**
Aluminium	5	0.006	0.006	<0.005	<0.005	<0.005	<0.005
Arsenic	0.5	-	-	<0.001	<0.001	0.002	0.010
Barium	-	0.007	0.0098	0.002	0.010	0.001	0.013
Bicarbonate Alkalinity as $CaCO_3$	-	210	250	180	290	220	280
Boron	5	0.24	0.27	0.19	0.50	0.140	0.770
Cadmium	0.01	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	1,000	38	44	31	60	34	130
Chloride	-	39	47	32	66	16	73
Chromium	1	-	-	<0.001	0.001	<0.001	0.002
Copper	1	0.001	0.001	0.002	0.003	<0.001	<0.001
Electrical	-	510	598	430	680	510	1300

Conductivity at 25°C (µg/m^3)							
Fluoride	2	0.3	0.3	0.3	0.4	0.2	0.3
Lead	0.1	0.0293	0.0368	0.006	0.023	0.005	0.035
Iron Sol.	-	0.002	0.002	<0.001	<0.001	0.03	0.06
Magnesium	2,000	26	302	21	38	22	64
Manganese	-	0.00275	0.00825	0.001	0.038	0.001	0.14
Mercury	0.002	-	-	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum	0.15	-	-	<0.001	<0.001	0.001	0.001
Nickel	1	-	-	<0.001	<0.001	0.001	0.011
Nitrate as N	1,500	0.7	0.7	0.075	5.40	-	-
pH	-	8.1	8.3	7.6	8.5	7.9	8.5
Potassium	-	5.4	6.9	4.4	7.7	6.4	14
Reactive Silica as SiO_2	-	24	26	18	29	26	45
Selenium	0.02	-	-	<0.001	<0.001	0.001	0.017
Silica	-	22	25	17	26	25	42
Sodium	-	23	32	19	44	20	53
Sulphate as SO_4^{2-}	1,000	31.5	39	29	40	9	380
Total Dissolved Solids at 180°C	5,000	290	348	240	410	280	950
Total Hardness as $CaCO_3$	-	200	230	160	250	170	590
Zinc	20	0.007	0.013	0.006	0.038	0.005	0.011

Note 1: Data from the ANZECC/ARMCANZ NWQMS, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Livestock drinking water quality as the beneficial use of groundwater is for livestock watering.

Note 2: Data from A Deposited injection borefield (2016-2019), provided in s45C application

Note 3: Data from C Deposit dewatering (2016-2019)

Note 4: Data from South Flank Valley detritals (2016-2019)

Table 8: MAR injection and monitoring bores

Groundwater bores	Type	Status
HSF5462P	Injection	Drilled
HSF5461P	Injection	Drilled
HSF5464P	Injection	Drilled
HSF0063P	Injection	Drilled
HSF5463P	Injection	Drilled
HSF5467P	Injection	Drilled
HSF5466P	Injection	Drilled
HSF5465P	Injection	Drilled
HSF5468P	Injection	To be drilled
HSF5469P	Injection	Drilled
HSF0055M2	Monitoring	Drilled
HSF5473M	Monitoring	Drilled
HSF5480M	Monitoring	Drilled
HSF5494M	Monitoring	Drilled
HSF5495M	Monitoring	Drilled

The Applicant will use the established Juna Downs MAR scheme limits for the mine dewatering water in the South Flank Turkeys Nest that is to be discharged via the South Flank MAR or the Pebble Mouse Creek (see Table 9)). If the water quality breaches these limits, the water will not be discharged.

Table 9: Limits established for South Flank Turkeys Nest mine dewatering water to be discharged to South Flank MAR or Pebble Mouse Creek

Analyte	Units	Limits
Aluminium	mg/L	0.055
Arsenic	mg/L	0.013
Barium	mg/L	0.020
Boron	mg/L	0.370
Cadmium	mg/L	0.0001
Chromium	mg/L	0.001
Copper	mg/L	0.002

Iron	mg/L	0.1
Lead	mg/L	0.003
Manganese	mg/L	1.9
Mercury	mg/L	0.001
Molybdenum	mg/L	0.001
Nickel	mg/L	0.011
Nitrate	mg/L	4.2
Selenium	mg/L	0.017
Total Dissolved Solids at 180°C	mg/L	590
Zinc	mg/L	0.043

The major ions Calcium, Magnesium, Sodium, Potassium, Sulfate, Chloride, Fluoride, Silica and Bicarbonate do not have individual limits, but will be tracked using TDS.

Key finding: Water quality of both the source aquifer water and the receiving aquifer water is good quality and well within the Livestock Guidelines.

7. Consultation

The works approval application documentation was published on DWER's website on 22 January 2020 and advertised in The Western Australian newspaper on 27 January 2020.

The draft works approval and Decision Report were provided to the Applicant for comments on 09 April 2020. The Applicant provided comments on 20 April 2020, which are summarised, along with DWER's response, in Appendix 2.

8. Location and siting

8.1 Siting context

The Premises boundary of MAC (including the Southern Flank area) is located approximately 100 kilometres (km) north-west of the town of Newman in the Pilbara region of Western Australia.

8.2 Residential and sensitive Premises

Table 10 lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment. This is in accordance with DWER's Guidance Statement: *Environmental Siting*.

Table 10: Receptors and distance from activity boundary

Sensitive Land Uses	Approximate distance from the prescribed premises boundary	Approximate distance from the nearest Category 5, Category 6, Category 12, Category 52, Category 63, Category 73 activities
Great Northern Highway	100 m	5.5. km
Rio Tinto Iron Ore's Hope Downs One Mining Operation and village	1.5 km	6.5 km
Juna Downs Pastoral Station Homestead	28 km	42 km
Marillana Pastoral Station	44 km	53 km
Town of Newman	100km	85 km

8.3 Specified ecosystems

Table 12 lists the relevant specified ecosystems/environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment. This is in accordance with DWER's Guidance Statement: *Environmental Siting*.

Table 11: Specified ecosystems

Specified ecosystems	Distance from the proposed Premises boundary	Approximate distance from the nearest Category 5, Category 6, Category 12, Category 52, Category 63, Category 73 activities
PEC - Priority 3: Coondewanna Flats ((Coondewanna Flats and Wanna Munna Flats)* - Priority 3(i))	200 m	200 m
PEC - Priority 1: Weeli Wolli Spring Community	PEC - Priority 1: Weeli Wolli Spring Community	PEC - Priority 1: Weeli Wolli Spring Community
PEC – Priority 1: West Angelas Cracking-Clays	PEC – Priority 1: West Angelas Cracking-Clays	PEC – Priority 1: West Angelas Cracking-Clays
Threatened flora	No species listed under the EPBC Act or the *Wildlife Conservation Act 1950* are within the prescribed premises. Twelve flora species listed as priority flora by the Department of Biodiversity, Conservation and Attractions occur within the premises boundary: • *Acacia bromilowiana* (Priority 4) • *Aristida jerichoensis supsp. spinulifera* (Priority 3). • *Aristida lazaridis* (Priority 2). • *Eremophila magnifica subsp. magnifica* (Priority 4). • *Goodenia nuda*: Priority 4. • *Grevillea saxicola* (Priority 3). • *Nicotiana umbratica* (Priority 3). • *Rhagodia sp. Hamersley* (M. Trudgen 17794) (Priority 3). • *Rostellularia adscendens var. latifolia* (Priority 3). • *Sida sp. Barlee Range* (S. van Leeuwen 1642) (Priority 3). • *Themeda sp. Hamersley Station* (M.E. Trudgen 11431): Priority 3. • *Triodia sp. Mt Ella* (M.E. Trudgen 12739) (Priority 3).	

Threatened fauna	The development envelope contains large areas of suitable habitat for four species listed as vulnerable or endangered under both the *Wildlife Conservation Act 1950* and the EPBC Act. These species are the *Dasyurus hallucatus* (Northern quoll), the *Liasis olivaceus barroni* (Pilbara olive python), the *Rhinonicterus aurantia* (Pilbara leafnosed bat), and the *Macroderma gigas* (Ghost Bat). The following significant fauna species have also been identified within the proposed prescribed premises boundary: • *Anilios ganei*, (Pilbara Flat-headed Blind-snake): DPaW Priority 1; • *Apus pacificus* (Fork-tailed Swift):EPBC Act Migratory, WC Act Schedule 5; • *Falco hypoleucos* (Grey Falcon): Schedule 3; • *Falco peregrinus* (Peregrine Falcon): WC Act Schedule 7; • *Merops ornatus* (Rainbow Bee-eater): EPBC Act Migratory, WC Act Schedule 5; • *Pseudomys chapmani* (Western Pebble-mound Mouse): DPaW Priority 4; and • *Underwoodisaurus seorsus* (Pilbara Barking Gecko): DPaW Priority 2. Nine major fauna habitats occur within the proposed prescribed premises. In addition to the major fauna habitats, significant habitat features, such as caves and waterholes have been recorded.
Parks and Wildlife (now Department of Biodiversity, Conservation and Attractions) tenure	The Juna Downs MAR scheme is located on Unallocated Crown Land (excluded from the Juna Downs Pastoral Lease in July 2015) and proposed to be added to the conservation reserve system, due to the occurrence of the Coondewanna Flats (Priority 3(i)) and Lake Robinson (Priority 1) Priority Ecological Communities (PEC) (Parks and Wildlife, 2017).
Other values	
The majority of vegetation within the premises is considered to be good or better condition. Vegetation in areas of higher relief with restricted access to stock ranged from Excellent to Pristine. Vegetation on drainage lines and flood plains and areas where exploration activities have occurred or impacted by stock declines to very good to good.	

8.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 12.

Table 12: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Public drinking water source areas	There are no public drinking water source areas within or adjacent to the project area.	Potable water use
Major watercourses/waterbodies Pebble Mouse Creek	Pebble Mouse Creek, a named perennial water course, flows across the project area and a number of unnamed perennial watercourses also flow across the project area.	Pebble Mouse Creek is located within the Upper Weeli Wolli Creek sub catchment and exhibits high inter-annual variability of streamflow, with long periods of low or no flow. Southern Flank valley receives drainage from the higher ground north of the main valley and from the north-eastern slopes of Mount Robinson. Drainage from the Southern Flank ridgeline generally passes through narrow valleys or gorges before reaching the valley floor. The valley floor drains into Pebble Mouse Creek which enters Southern Flank valley from the south and continues on to the east into Weeli Wolli Creek. Water quality in the catchment is considered to be

		good, with total dissolved solids up to 100 mg/L in Pebble Mouse Creek. The water is beneficial use to flora and fauna.
Groundwater The project area is within the Hamersley – Fractured Rock Aquifer and the Hamersley – Wittenoom Aquifer	Groundwater levels within South Flank Valley vary between 35 mbgl and 100 mbgl Groundwater in the catchment typically has a low salinity with a typical TDS range of 600 – 700mg/L	Water is used for potable use within the Packsaddle and Mulla Mulla Camps with treatment via a nano-filtration Water Treatment Plant Water is used within the processing circuit and dust suppression onsite

8.5 Soil type

Table 13 details soil types and characteristics relevant to the assessment.

Table 13: Soil and sub-soil characteristics

Soil unit	Description	Acid Sulfate Soil Risk
Fa13	“Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. Associated are (Dr2.33, Dr2.32) soils on the limited areas of dissected pediments, while (Um5.52) and (Uf6.71) soils occur on the valley plains.”	Low
Fa14	“Steep hills and steeply dissected pediments on areas of banded jaspilite and chert along with shales, dolomite, and iron ore formations; some narrow winding valley plains: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. (Dr2.33 and Dr2.32) soils which occur on the pediments are more extensive than in unit Fa13. (Um5.52) and (Uf6.71) soils occur on the valley plains.”	Low
Fb3	"High-level valley plains set in extensive areas of unit Fa13. There are extensive areas of pisolitic limonite deposits: principal soils are deep earthy loams (Um5.52) along with small areas of (Gn2.12) soils."	Low

8.6 Meteorology

Average annual rainfall is 329.5 mm derived from tropical storms and cyclones during summer, producing sporadic, heavy rains over the Newman area. BOM shows that the mean maximum temperature in summer months (October to March) is 35.2^{o}C – 39.2^{o}C and mean maximum temperatures in winter months (April to September) is between 23^{o}C – 32.1^{o}C.

9. Risk assessment

9.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 14.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 14 and Table 15 below.

Table 14. Identification of emissions, pathway and receptors during construction

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Construction, mobilisation and positioning of infrastructure	Vehicle movements on unsealed access roads	Noise	The closest receptor is Rio Tinto's Hope Downs accommodation camp located more than 7.5 km away.	Air / wind dispersion	Amenity impacts	No	Construction is a minimal period (six months) and *Environmental Protection (Noise) Regulations 1997*
		Dust			Amenity impacts	No	Construction is a minimal period (six months) and water carts to be used. Minimal clearing is required for the balance tank, pipelines and bores.
	Construction of balance tank, pipeline, drill pads and Pebble Mouse Creek discharge point	Noise	The closest receptor is Rio Tinto's Hope Downs accommodation camp located more than 7.5 km away.	Air / wind dispersion	Amenity impacts	No	Construction is a minimal period (six months) and *Environmental Protection (Noise) Regulations 1997*
		Dust			Amenity impacts	No	Construction is a minimal period (six months) and water carts to be used. Minimal clearing is required for the balance tank, pipelines and bores.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Bore pump testing	Discharge of groundwater from bore pump testing	Groundwater of good quality	Soils, vegetation	Direct discharge	Erosion Contamination of soils / vegetation	No	Pump testing requires small short term discharges from a newly constructed bore to confirm bore yield an integrity. Water is to be tested and discharged to nearby drainage lines. Discharge only during construction due to bore pump testing and groundwater is good quality.

Table 15: Identification of emissions, pathway and receptors during commissioning and operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Dewatering	Abstraction resulting in drawdown of groundwater levels at South Flank	None	Groundwater dependent ecosystems	Abstraction of groundwater	Reduction in groundwater availability for dependent vegetation	No	Not within scope of Part V of the EP Act. Regulated under the RiWI Act and Part IV of the EP Act.
	Transfer of mine dewatering water along 14km of pipelines to 1,400kL balance tank for MAR reinjection and creek line discharge	Pipeline ruptures resulting in discharge of good quality water	Soils, vegetation	Direct discharge	Deterioration in soils and inundation of vegetation	No	This would only result from an incident or malfunction and occur for a short duration. The water is good quality it is unlikely that adverse impacts would occur. There are flow meters at the South Flank Turkeys Nest, balance tank, MAR Borefield and Pebble Mouse Creek discharge point. Ruptures can be determined utilising the difference between these if there is a rupture. The balance tank has a level sensor with an alarm that goes back to the control room and an overflow pipe with rip rap at the discharge point

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Discharge via reinjection bores using the new MAR scheme at South Flank	Dewatered water from A Deposit and C Deposit that is good quality and well within the Livestock Guidelines into South Flank MAR	Deep rooted vegetation and subterranean fauna	Direct discharge	Mounding of groundwater in the vicinity of the MAR scheme resulting in decline in vegetation health and reduction in subterranean fauna stygofauna habitat	Yes	See Section 9.4
					Deterioration in groundwater quality in the vicinity of the MAR scheme	Yes	
	Surface water discharge scheme to Pebble Mouse Creek	Dewatered water from A Deposit and C Deposit that is good quality and well within the Livestock Guidelines into Pebble Mouse Creek	Riparian vegetation and hyporheic zone subterranean fauna	Direct discharge	Scouring and erosion of Pebble Mouse Creek banks	Yes	See Section 9.5
					Inundation of riparian vegetation and hyporheic zone subterranean fauna	Yes	
					Decline in vegetation health from deteriorated water quality discharged to Pebble Mouse Creek	Yes	
					Incline in vegetation growth and weeds ingression from additional water entering the Pebble Mouse Creek	Yes	

9.2 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 16 below.

Table 16: 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 17 below.

Table 17: 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	• **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	• 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	• **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	• **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
Possible	The risk event could occur at some time	Moderate	• **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	• **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	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• 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	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **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.

9.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment Table 18 below:

Table 18: 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.

9.4 Risk Assessment – MAR discharges

9.4.1 Description of MAR discharges

Approximately 12.76 GL/a of surplus water will be dewatered from the A Deposits and C Deposits and transferred by approximately 14km of pipeline to the South Flank Turkeys Nest and then into a 1,100 kL balance tank. Water will then gravity feed to the 10 reinjection bores at South Flank.

9.4.2 Identification and general characterisation of emission

A maximum of 35 ML/day of dewatered mine water will be pumped and discharged as the pumping capacity is a maximum of 35 ML/day.

The water appears to be good quality, similar between the source and receiving aquifers, and well within the Livestock Guidelines.

9.4.3 Description of potential adverse impact from the emission

Reinjection of the mine dewatering water into the South Flank aquifer may cause mounding of the water and result in a decline in vegetation health or loss of subterranean fauna habitat. Groundwater mounding potential impacts can occur for *Eucalyptus* Low Open Forest at 15 mbgl and *Acacia* Low Open Forest / *Acacia* Open Scrub at 7 mbgl. Mounding may be localised around each injection bore, but this isn't reflective of water levels in the wider aquifer unit.

If there water quality varies between the source groundwater aquifer compared to the receiving groundwater aquifer then changes to the groundwater quality can result in a loss of subterranean fauna habitat.

9.4.4 Criteria for assessment

The dewatered water has been compared between the A Deposit and C Deposit to the South Flank water quality, with the water quality quite similar. The Livestock Guidelines have been used as a comparison as the beneficial use of the water in the area would be for livestock watering of cattle. The water quality is well within the Livestock Guidelines.

9.4.5 Applicant controls

This assessment has reviewed the controls set out in Table 19 below.

Table 19: Applicant's proposed controls for MAR discharges

Site infrastructure	Description	Operation details
MAR	Mounding: Five groundwater monitoring bores will be installed: • HSF0055M2; • HSF5473M; • HSF5480M; • HSF5494M; and • HSF5495M	During commissioning the system will be ran at less than the planned operational levels to equalise the system, calibrate all of the equipment and then at incremental injection rates to determine how the infrastructure and receiving aquifer handles the pressure. Groundwater monitoring bores will be used to identity mounding that occurs close to the Eucalyptus Low Open Forest and Acacia Low Open Forest / Acacia Open Scrub and also significant troglofauna habitat. The monitoring will be used to confirm that groundwater mounding does not intersect with the root zones of vegetation or significant troglofauna habitat. Limits of 30 mblg will be used and is stringent to prevent any impacts to vegetation associated with the operation of the MAR scheme. The actual injection bores will not be monitored for SWL, as these bores: • do not occur in significant broad floristic communities or troglofauna habitat; • are located significantly higher in the landscape creating a greater depth to water than the monitoring bores, therefore, the triggers would be reached at the monitoring bores before any significant impact would occur at the injection bores; and • can operate with significantly higher heads inside the bore basing due to well efficiency issues, which aren't reflective of water levels in the wiser aquifer unit.

Site infrastructure	Description	Operation details
	<u>Groundwater quality:</u> Commissioning: *Monthly* testing of the abstracted groundwater quality *Monthly* testing of the five monitoring bores: • HSF0055M2; • HSF5473M; • HSF5480M; • HSF5494M; and • HSF5495M Time Limited Operations: *Quarterly* testing of the abstracted groundwater quality *Quarterly* testing of the four monitoring bores: • HSF0055M2; • HSF5473M; • HSF5480M; • HSF5494M; and • HSF5495M	Groundwater quality testing will be conducted of the abstracted water from South Flank Turkeys Nest and compared to the groundwater quality testing from the four monitoring bores. Reinjection will cease if the water quality limits for the South Flank Turkeys Nest are reached as per Table 9.
	<u>Subterranean fauna</u> Considerable sampling has been conducted within the area, with no significant species or communities identified.	No specific subterranean fauna monitoring is proposed as the water quality of the source and receiving aquifers is similar so no impacts are expected. As groundwater mounding has the potential to flood the habitat, the Applicant has stated that the depth to groundwater limits at the four monitoring bores (threshold of 35 mbgl and limit of 30 mbgl as per Table 20) are considered appropriate to protect subterranean fauna.

Table 20: South Flank MAR Regional Monitoring Locations, Parameters, Thresholds and Limits (Commissioning and Operations)

Monitoring Point[1]	Status	Parameter	Unit	Averaging period	Frequency during Commissioning	Frequency during Operation	Threshold	Action	Limit	Action
HSF0055M2 HSF5473M HSF5495M HSF5480M HSF5494M	Drilled	Depth to groundwater	mbgl	Spot Sample	Weekly	Monthly	35 mbgl	Manage injection rates to ensure that the groundwater depth limit is not reached.	30 mbgl	Cease injection at bore(s) associated with the breach of the limit.
		EC[2]	µS/cm		Monthly	Quarterly	–	–	–	–
		pH[2]	pH Units		Monthly	Quarterly	–	–	–	–
South Flank Turkeys Nest	Constructed	EC[2]	µS/cm		Monthly	Quarterly	–	–	–	–
		pH[2]	pH Units		Monthly	Quarterly	–	–	–	–
South Flank Turkeys Nest HSF0055M2 HSF5473M HSF5495M HSF5480M HSF5494M	Constructed Drilled	Aluminum Arsenic Barium Boron Calcium Carbonate Cadmium Calcium Chloride Chromium Copper Fluoride Iron Lead Magnesium Manganese Mercury Molybdenum Nickel Nitrate Potassium Selenium Sodium Sulfate TDS Zinc	mg/L		Monthly	Quarterly	–	–	–	–

[1] pH, electrical conductivity and hydrochemistry samples are only required to be taken from one emission point during each quarterly monitoring event and only emission points that are active in the monitoring period are required to be sampled.
[2] In-field non-NATA accredited analysis permitted

9.4.6 Key findings

The Delegated Officer has reviewed the information regarding MAR discharges and has found:

1. Four groundwater monitoring bores will be used to monitoring SWL to confirm that groundwater mounding does not intersect with the root zones of vegetation or significant troglofauna habitat.
2. Groundwater quality monitoring will compared of the source groundwater to the receiving aquifer to ensure water quality is similar.
3. Limits for both SWL and groundwater quality are used.

9.4.7 Consequence

Mounding:

If impacts from mounding occurs, then the Delegated Officer has determined that the impact of mounding could result in low level onsite impacts, minimal off-site impacts (local scale) and not detectable offsite impacts (wider scale). Therefore, the Delegated Officer considers the consequence of impacts from MAR discharges to be **minor**.

Water Quality:

If impacts from water quality occurs, then the Delegated Officer has determined that the impact of groundwater contamination could result in low level onsite impacts, minimal off-site impacts (local scale) and not detectable offsite impacts (wider scale). Therefore, the Delegated Officer considers the consequence of impacts from MAR discharges to be **minor**.

9.4.8 Likelihood of Risk Event

Mounding:

The Delegated Officer has determined that the likelihood of impacts from mounding occurring will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of impacts from MAR discharges to be **unlikely**.

Water Quality:

The Delegated Officer has determined that the likelihood of impacts from water quality occurring will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of impacts from MAR discharges to be **unlikely**.

9.4.9 Overall rating of MAR discharges

Mounding:

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 16) and determined that the overall rating for the risk of mounding is **medium**.

Water Quality:

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 16) and determined that the overall rating for the risk of water quality is **medium**.

9.5 Risk Assessment – Pebble Mouse Creek discharges

9.5.1 Description of Pebble Mouse Creek discharges

Approximately 12.76 GL/a of surplus water will be dewatered from the A Deposits and C Deposits and transferred by approximately 14km of pipeline to a 1,100 kL balance tank for discharge to Pebble Mouse Creek.

9.5.2 Identification and general characterisation of emission

A maximum of 35 ML/day of dewatered mine water will be pumped and discharged as the pumping capacity is a maximum of 35 ML/day.

The water appears to be good quality, similar between the source and receiving aquifers, and well within the Livestock Guidelines.

The discharge along the drainage line and Pebble Mouse Creek will be restricted to not extend further than 14 km from the discharge point or extend beyond the boundary of the MAC development envelope and to 120 days of discharge in any 12 month period.

Discharge periods may range from a few days to a constant flow at differing discharge volumes.

Commissioning of the discharge will occur for a period of approximately two months.

9.5.3 Description of potential adverse impact from the emission

Discharge of the mine dewatering water to the creek line may result in erosion / scouring impacts at the point of discharge if not managed correctly, with detrimental impacts to riparian vegetation and subterranean fauna in the vicinity.

Riparian vegetation and subterranean fauna habitats may be impacted if the area becomes inundated and/or the water quality of the discharge is dissimilar to the rainwater that periodically flows the ephemeral creek system.

Discharge of the mine dewatering water to the creek line may encourage vegetation growth during the discharge that will be impacted when the discharge eventually ceases.

Weeds may ingress to the creek line due to the surplus water discharge.

9.5.4 Criteria for assessment

The dewatered water has been compared to the Livestock Guidelines as the beneficial use of the water in the area would be for livestock watering of cattle. The water quality is well within the Livestock Guidelines.

9.5.5 Applicant controls

This assessment has reviewed the controls set out in Table 19 below.

Table 21: Applicant's proposed controls for Pebble Mouse Creek discharges

Site infrastructure	Description	Operation details
Pebble Mouse Creek discharge point	<u>Erosion:</u> Erosion controls to be built as part of discharge point installation Discharge point to Pebble	During commissioning the system will be run at less than the planned operational levels to equalise the system, calibrate all of the equipment and then incrementally increased rates. Erosion impacts will be assessed via

Site infrastructure	Description	Operation details
	Mouse Creek consisting of pipe with a diameter of 200mm that then increases to a pipe diameter of 500mm and water discharges via a series of 24 holes on each side of the discharge pipe. The change in pipe diameter at the discharge points acts to reduce the water velocity in a similar manner to rip rap protection Rip rap protection underneath, to each side and downstream of the discharge pipe disperses the kinetic energy of the water leaving the pipe These controls will be confirmed to be effective during commissioning and if erosion is identified then additional controls to be implemented such as extending rip rap / repairs	regular visual inspections.
	<u>Inundation:</u> Wetting Front Early Warning Point, which is a gauging station (see Figure 2) approximately 11km from the discharge point to Pebble Mouse Creek Wetting Front Discharge Limit that is a further 1km from the Wetting Front Early Warning Point. This is also 240m from the tenure boundary to ensure discharge water does not leave the Applicant's tenure. This will be the same as the Wetting Front Early Warning Point gauging station design.	During commissioning the system will be operated at lower rates than proposed for the operational phase. This will allow monitoring of the discharge volumes and how rapidly the wetting front extends and recedes, giving an indication as to the likely maximum discharge rate that can be achieved without exceeding the wetting front limit. The Applicant has stated that trialled creek discharges at similar creeks indicate the wetting front propagates at around 100m/d and, based on this, if water were to reach the Wetting Front Early Warning Point, they would have approximately 15 days to react and turn the discharge off prior to it reaching the Wetting Front Discharge Limit. MS 1072 requires that discharge along the drainage line and Pebble Mouse Creek does not extend further than 14 km from the discharge point or extend beyond the boundary of the Mining Area C development envelope, however, the Applicant has put in more stringent requirements to ensure that this is met.
	<u>Water quality:</u> Commissioning:	Groundwater quality testing will be conducted of the abstracted water from South Flank Turkeys Nest and compared

Site infrastructure	Description	Operation details
	Monthly testing of the abstracted groundwater quality *Monthly* testing of the four monitoring bores: • HSF0055M2; • HSF5473M; • HSF5480M; • HSF5494M; and • HSF5495M Time Limited Operations: *Quarterly* testing of the abstracted groundwater quality *Quarterly* testing of the four monitoring bores: • HSF0055M2; • HSF5473M; • HSF5480M; • HSF5494M; and • HSF5495M	to the groundwater quality testing from the four monitoring bores. Discharge will cease if the water quality limits for the South Flank Turkeys Next are reached as per Table 9.
	<u>Vegetation</u> The erosion controls at the discharge point to Pebble Mouse Creek listed above will prevent impacts to vegetation in the direct discharge point area.	The s45C to MS 1072 that was approved 15 January 2020 (Section 5.1.2) resulted in restricting the discharge along the drainage line and Pebble Mouse Creek to not extend further than 14 km from the discharge point or extend beyond the boundary of the MAC development envelope and to 120 days of discharge in any 12 month period. This was based on the historical gauging station information recorded for Pebble Mouse Creek upstream of the proposed discharge point and 120 days deemed a sufficiently short a timeframe to prevent any impacts to the surrounding vegetation. Therefore, the Applicant has not proposed any specific vegetation monitoring along the Pebble Mouse Creek discharge route.

Figure 2: Wetting Front Early Warning Point gauging station (already in place)

9.5.6 Key findings

The Delegated Officer has reviewed the information regarding Pebble Mouse Creek discharges and has found:

1. Water quality monitoring of the water to be discharged to Pebble Mouse Creek will regularly occur.
2. Erosion controls will be in place prior to the discharge commencing, with weekly visual inspections of the discharge point to confirm these are working.
3. Wetting Front Early Warning Point gauging station is already in place and a Wetting Front Discharge Limit gauging station is to be put in place prior to discharge occurring. Data is sent to the control room every 30 minutes.

9.5.7 Consequence

Erosion:

If erosion impacts from Pebble Mouse Creek discharges occurs, then the Delegated Officer has determined the impact of the erosion to be minimal onsite impacts. Therefore, the Delegated Officer considers the consequence of erosion impacts from Pebble Mouse Creek discharges to be **slight**.

Inundation:

If inundation impacts from Pebble Mouse Creek discharges occurs, then the Delegated Officer has determined that the impact of inundation impacts occurring could have low level on-site impacts, minimal local scale off-site impacts and not detectable wider scale off-site impacts. Therefore, the Delegated Officer considers the consequence of inundation impacts from Pebble Mouse Creek discharges to be **minor**.

Water quality:

If contamination impacts from Pebble Mouse Creek discharges occurs, then the Delegated Officer has determined that the impact of water quality changes will be low level on-site impacts, minimal local scale off-site impacts and not detectable wider scale off-site impacts.

Therefore, the Delegated Officer considers the consequence of contamination impacts from Pebble Mouse Creek discharges to be **minor**.

9.5.8 Likelihood of Risk Event

Erosion:

The Delegated Officer has determined that the likelihood of erosion impacts from Pebble Mouse Creek discharges occurring could occur at some time. Therefore, the Delegated Officer considers the likelihood of erosion impacts from Pebble Mouse Creek discharges to be **possible**.

Inundation:

The Delegated Officer has determined that the likelihood of inundation impacts from Pebble Mouse Creek discharges could occur at some time. Therefore, the Delegated Officer considers the likelihood of inundation impacts from Pebble Mouse Creek discharges to be **possible**.

Water quality:

The Delegated Officer has determined that the likelihood of water quality impacts from Pebble Mouse Creek discharges will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of water quality impacts from Pebble Mouse Creek discharges to be **unlikely**.

9.5.9 Overall rating of Pebble Mouse Creek discharges

Erosion:

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 16) and determined that the overall rating for the risk of erosion impacts from Pebble Mouse Creek discharges is **low**.

Inundation:

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 16) and determined that the overall rating for the risk of inundation impacts from Pebble Mouse Creek discharges is **medium**.

Water quality:

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 16) and determined that the overall rating for the risk of water quality impacts from Pebble Mouse Creek discharges is **medium**.

9.6 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 22 below. Controls are described further in section 11.

Table 22: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
1.	Good quality surplus mine dewatering water	Abstracted from A Deposit and C Deposit	Direct discharge of surplus water to South Flank MAR potentially causing mounding	Regional groundwater bores to be installed to monitor SWL. Limits imposed for SWL and to monitor distance to deep rooted vegetation	Minor consequence Unlikely likelihood **Medium Risk**	Acceptable subject to proponent controls conditioned / outcomes based controls
2.			Direct discharge of surplus water to South Flank MAR potentially causing deterioration in water quality	Regional groundwater bores to be installed to monitor water quality. Limits imposed for water quality	Minor consequence Unlikely likelihood **Medium Risk**	Acceptable subject to proponent controls conditioned / outcomes based controls
3.	Good quality surplus mine dewatering water	Abstracted from A Deposit and C Deposit	Direct discharge to Pebble Mouse Creek potentially causing erosion / scouring	Infrastructure design includes erosion controls and weekly visual inspections to confirm these are working	Slight consequence Possible **Low risk**	Acceptable subject to proponent controls conditioned / outcomes based controls
4.			Direct discharge to Pebble Mouse Creek potentially causing inundation of riparian vegetation and/or subterranean fauna	Wetting Front Early Warning Point gauging station and Wetting Front Discharge Limit gauging station	Minor consequence Possible **Medium risk**	Acceptable subject to proponent controls conditioned / outcomes based controls
5.			Direct discharge to Pebble Mouse Creek potentially causing deterioration in the water quality	Water quality monitoring at the South Flank Turkeys Nest	Minor consequence Possible **Medium risk**	Acceptable subject to proponent controls conditioned / outcomes based controls

10. Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Table 23. The risks are set out in the assessment in section 10 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the works approval will be set to give effect to the determined regulatory controls.

Table 23: Summary of regulatory controls to be applied

		Controls (references are to sections below, setting out details of controls)						
		Infrastructure and equipment	Specified actions	Commissioning	Time limited operations	Monitoring	Inspections	Reports
Risk Items (see risk analysis in section 9)	1. Mounding from reinjection		●	●	●	●		●
	2. Deterioration in water quality from reinjection		●	●	●	●		●
	3. Erosion / scouring from creek line discharge	●		●	●		●	●
	4. Inundation of vegetation / subterranean fauna from creek line discharge	●		●	●	●		●
	5. Deterioration in water quality from creek line discharge			●	●	●		●

10.1 Works Approval controls

10.1.1 Mounding from reinjection

The works approval requires:

- Limits of 30 mbgl in groundwater monitoring bores HSF0055M2, HSF5473M, HSF5480M, HSF5494M and HSF5495M.

Grounds: risks associated with mounding from reinjection have been assessed as medium (section 9.4.9). Requirements are derived from the controls outlined by the Applicant.

Records of the monitoring results obtained are required to be recorded.

10.1.2 Deterioration in water quality from reinjection

The works approval requires:

- Water quality monitoring of the mine dewatering water that is transferred and stored in the South Flank Turkeys Nest. Monitoring will occur on a monthly basis during commissioning and on a quarterly basis during time limited operations. Limits are in place, in line with the Applicant's internal limits. If monitoring results obtained indicate that these limits are breached, then discharge to South Flank MAR or to the Pebble Mouse Creek will not occur.

Grounds: risks associated with deterioration in water quality from reinjection have been assessed as medium (section 9.4.9). Requirements are derived from the controls outlined by the Applicant.

Records of the monitoring results obtained are required to be recorded.

10.1.3 Erosion from creek line discharge

The works approval requires:

- Pipe diameter of 200mm that then increases to a pipe diameter of 500mm;
- Series of 24 holes on each side of the discharge pipe; and
- Rip rap protection underneath, to each side and downstream of the discharge pipe.

Grounds: risks associated with erosion from creek line discharge have been assessed as low (section 9.5.9). Requirements are derived from the controls outlined by the Applicant. The change in pipe diameter at the discharge points acts to reduce the water velocity in a similar manner to rip rap protection.

Compliance reports are required to be submitted to confirm the infrastructure has been put in place and design commitments met prior to operation.

10.1.4 Inundation of vegetation / subterranean fauna from creek line discharge

The works approval requires:

- A Wetting Front Early Warning Point gauging station approximately 11km from the discharge point to Pebble Mouse Creek. If the mine dewatering water discharge crosses the Wetting Front Discharge Early Warning Point, then the discharge must be turned off within 15 days; and
- A Wetting Front Discharge Limit that is a further 1km from the Wetting Front Early Warning Point. No mine dewatering water discharge down Pebble Mouse Creek to cross the Wetting Front Discharge Limit.

Grounds: risks associated with inundation of vegetation / subterranean fauna in the creek line have been assessed as medium (section 9.5.9). Requirements are derived from the controls outlined by the Applicant.

Records of the monitoring results obtained are required to be recorded.

10.1.5 Deterioration in water quality from creek line discharge

The works approval requires:

- Water quality monitoring of the mine dewatering water that is transferred and stored in the South Flank Turkeys Nest. Monitoring will occur on a monthly basis during commissioning and on a quarterly basis during time limited operations. Limits are in place, in line with the

Applicant's internal limits. If monitoring results obtained indicate that these limits are breached, then discharge to South Flank MAR or to the Pebble Mouse Creek will not occur.

Grounds: risks associated with deterioration in water quality from creek line discharge have been assessed as medium (section 9.5.9). Requirements are derived from the controls outlined by the Applicant.

Records of the monitoring results obtained are required to be recorded.

10.1.6 Monitoring requirements

The works approval requires the following monitoring regimes:

- Monthly monitoring of SWL and quarterly water quality at the South Flank Turkeys Nest that discharges to the reinjection bores and creek line discharge point, during commissioning and time limited operations, with comparison of the results to trigger values;
- Baseline monitoring of SWL and quarterly water quality at the ambient groundwater monitoring bores and continued monthly (for SWL) and quarterly (for water quality) monitoring with comparison to the ANZECC/ARMCANZ NWQMS, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Livestock drinking water quality.

Grounds: Monitoring of the mine dewatering water is required with comparison to ANZECC/ARMCANZ NWQMS, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Livestock drinking water quality so that the quality of the water is known for discharges into MAR reinjection and Pebble Mouse Creek discharges.

Monitoring of ambient groundwater is required to determine if SWL is changing indicating mounding from MAR reinjection or water quality is deteriorating. Comparison to the ANZECC/ARMCANZ NWQMS, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Livestock drinking water quality and to the baseline groundwater water is required.

10.1.7 Inspections

The works approval requires the following inspection regimes:

- Mine dewatering water pipeline, balance tank, reinjection bores and Pebble Mouse Creek discharge point weekly inspections during commissioning and time limited operations.

Grounds: Visual inspections of containment infrastructure and pipelines are required during commissioning and time limited operations and the Applicant is required to keep records of visual monitoring undertaken (but is not required to report this on an annual basis but is required to record the information in their books).

10.1.8 Monitoring reports

The works approval requires the following reports be submitted:

- Environmental Compliance Report demonstrating that the infrastructure has been installed as committed to and as per the required Infrastructure and equipment requirements table, with no material defects;
- Environmental Commissioning Report providing a summary of the commissioning activities with timeframes, volumes of mine dewatering water discharges to the South

Flank MAR and to the Pebble Mouse Creek, summary of monitoring results obtained and environmental performance; and

- Time limited operations report providing volumes of mine dewatering water discharges to the South Flank MAR and to the Pebble Mouse Creek, summary of monitoring results obtained and environmental performance.

Grounds: Reporting requirements are necessary for the administration of the works approval, validating ongoing acceptability of the operations and for validation against design criteria.

11. Determination of Works Approval conditions

The conditions in the issued Works Approval in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

Table 24 provides a summary of the conditions to be applied to this works approval.

Table 24: Summary of conditions to be applied

Condition Ref	Grounds
Construction phase	
Infrastructure and Equipment 1, 2 and 3	These conditions require that infrastructure is constructed and designed as per the supporting documents and that groundwater monitoring bores are installed. Environmental compliance is a valid, risk-based condition to ensure appropriate linkage between the licence and the EP Act.
Compliance reporting 4 and 5	These conditions require a compliance report to be provided following construction completion. Environmental compliance is a valid, risk-based condition to ensure appropriate linkage between the licence and the EP Act.
Environmental commissioning phase	
Environmental commissioning requirements and emission limits 6, 7 and 8	These conditions allow commissioning of the infrastructure to occur for 90 days provided that the compliance documentation has been received. These conditions are valid, risk-based and consistent with the EP Act.
Monitoring during environmental commissioning 9, 10, 11, 12, 13, 14 and 15	These conditions require monitoring of water quality of the South Flank Turkeys Nest, mine dewatering water flow to the Wetting Front Discharge Early Warning Point and Wetting Front Discharge Limit along Pebble Mouse Creek and SWL and water quality at the ambient groundwater monitoring bores and that a commissioning report be provided that includes this data, and environmental performance of the infrastructure. These conditions are valid, risk-based and consistent with the EP Act.

Time limited operations phase	
Commencement and duration 16, 17, 18 and 19	These conditions require that compliance and commissioning reports have been received prior to time limited operations commencing and sets operational requirements. These conditions are valid, risk-based and consistent with the EP Act.
Monitoring during time limited operations 20	This condition requires emissions monitoring and ambient groundwater monitoring during time limited operations. These conditions are valid, risk-based and consistent with the EP Act.
Compliance reporting 21 and 22	These conditions require a time limited operations report be provided with a summary of the performance of the infrastructure and details on product produced, tailings produced, tailings water content, water balance etc. These conditions are valid, risk-based and consistent with the EP Act.
Inspections 22	This condition requires visual inspections of infrastructure occur during commissioning and time limited operations.
Records and reporting general	
Records and reporting (general) 24, 25 and 26	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the works approvals under the EP Act.

12. Applicant's comments

The Applicant was provided with the draft Decision Report and draft works approval on 09 April 2020. The Applicant provided comments which are summarised, along with DWER's response, in Appendix 2.

13. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Issued Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

ALANA KIDD
MANAGER, RESOURCE INDUSTRIES
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Licence L7851/2002/6 – Mining Area C Project	L7851/2002/6	accessed at www.der.wa.gov.au
2.	Amendment Notice 1	N/A	
3.	Amendment Notice 2	N/A	
4.	Amendment Notice 3	N/A	
5.	Ministerial Statement	MS 1072	accessed at www.epa.wa.gov.au/
6.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	N/A	accessed at www.dwer.wa.gov.au
7.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	N/A	
8.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	N/A	
9.	DER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	N/A	
10.	DER, June 2019. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	N/A	
11.	Email titled “Works Approval Application - MAC Surplus Water Management Scheme Phase Three” dated 5/11/2019 1:29pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1864298)
12.	Email titled “RE: APPLICANT NOTIFICATION - APPLICATION FOR A WORKS APPROVAL	N/A	DWER records (DWERDT250857)

	(W6338/2019/1) - REQUEST FOR FURTHER INFORMATION" dated 5/02/2020 1:18pm and authored by BHP Billiton Iron Ore Pty Ltd		
13.	Email titled "Re: APPLICANT NOTIFICATION - APPLICATION FOR A WORKS APPROVAL (W6338/2019/1) - REQUEST FOR FURTHER INFORMATION" dated 27/02/2020 9:43am and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1874484)
14.	Email titled "Minor Update to the Layout of the South Flank MAR (W6338)" dated 4/03/2020 8:45am and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1874483)
15.	Email titled "RE: APPLICANT NOTIFICATION - APPLICATION FOR A WORKS APPROVAL (W6338/2019/1) - REQUEST FOR FURTHER INFORMATION" dated 12/03/2020 12:34pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1876036)
16.	Email titled "RE: APPLICANT NOTIFICATION - APPLICATION FOR A WORKS APPROVAL (W6338/2019/1) - REQUEST FOR FURTHER INFORMATION" dated 20/03/2020 12:26pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1878298)
17.	Email titled "RE: W6338 MAC Surplus Water" dated 31 March 2020 12:24pm and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1880790)
18.	Email titled "RE: APPLICANT NOTIFICATION - W6338/2019/1 APPLICATION FOR A WORKS APPROVAL - DRAFT INSTRUMENT AND DECISION REPORT" dated 20 April 2020 6:57am and authored by BHP Billiton Iron Ore Pty Ltd	N/A	DWER records (A1886047)

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of Applicant comment	DWER response
Table 1, Item 2	Remove the reference to the flow meter. This is captured in Line Item 1.	Updated in works approval and Decision Report.
Table 1, Item 4	Amend the pipe diameter to 500mm	Updated in works approval and Decision Report.
Table 1, Item 4	Amend the wording on rip rap protection to "Rip rap protection underneath, to each side and downstream of the discharge pipe".	Updated in works approval and Decision Report.
Table 1, Item 4	Add "Flow meter to calculate the flow".	Updated in works approval and Decision Report.
Table 2, Item 1	Replace reinjection bore HSF0067P with HSF5467P (as per Figure 1). This appears to have been a typo in the bore name.	Updated in works approval and Decision Report.
Table 2, Item 3	Add Monitoring bore HSF5495M (currently on Figure 1). This was the new monitoring bore that relates to Ministerial Statement 1072 and is already shown on Figure 1 of the works approval.	Updated in works approval and Decision Report.
Table 4, Item 4	Add Monitoring bore HSF5495M.	Updated in works approval and Decision Report.
Table 6	Add Monitoring bore HSF5495M.	Updated in works approval and Decision Report.

Attachment 1: Issued works approval W6338/2019/1