



Licence Number	L5415/1988/9
Licence Holder	BHP Billiton Iron Ore Pty Ltd
ACN	008 700 981
File Number:	DER2013/000900
Premises	Wheelarra Hill (Jimblebar) Iron Ore Mine Tenements L52/108, L52/109, L52/163, I126948, M266SA and ML244SA NEWMAN WA 6753
Date of Amendment	19 February 2019

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Louise Lavery

A/Manager, Resource Industries

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

Definitions and interpretation

Definitions

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

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
Amendment Notice	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 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
C&S	Crushing and Screening
CS Act	<i>Contaminated Sites Act 2003 (WA)</i>
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.
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force
Licence Holder/ Licensee	BHP Billiton Iron Ore Pty Ltd

MAR	Managed Aquifer Recharge
Minister	the Minister responsible for the EP Act and associated regulations
MS	Ministerial Statement
mtpa	million tonnes per annum
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Amendment Notice applies, as specified at the front of this Amendment Notice.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited to an amendment to L5415/1988/9 for existing categories 5, 6 and 64 and the addition of a new category, Category 12.

The following guidance statements have informed the decision made on this amendment

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessment (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Amendment description

On 11 September 2018, the Licence Holder submitted an application to amend the Wheelarra Hill (Jimblebar) Iron Ore Mine licence L5415/1988/9. The Licence Holder has requested the following changes to the licence:

- Increase Category 5 approved throughput by an additional 10 million tonnes per annum (mtpa) to a total of 92 mtpa. The licence covers processing plants at Jimblebar (Wheelarra Hill) and at Orebody 18. The increase throughput will occur at the Jimblebar processing hub which currently has a throughput of 65 mtpa. This will increase to 75 mtpa. No new infrastructure will be constructed. The increase will be achieved by minor upgrades to Primary Crusher 3 (an increase in crusher shaft height and a drive upgrade).
- Reconfigure the Orebody 18 managed aquifer reinjection (MAR) scheme to increase the maximum design capacity from 8.76 Gigalitres per annum (GL/a) (24 ML/day) to 13.14 GL/a (36 ML/day). No increase to the approved throughput of 8.76 GL/a (24 ML/day) is proposed. The increase in design capacity will enable mounding within the system to be better managed. The following changes are proposed:
 - Installation of three new injection bores each with a capacity of 4 ML/day (OB18MAR09, OB18MAR10 and OB18MAR11) west of the current scheme. The location of the bores have not yet been confirmed but will be installed within the 'second zone for injection bores' shown in Figure 2;
- Allow for the construction of a new inert landfill. No increase to the approved throughput for Category 63 is proposed; and
- Amend the prescribed premises boundary to include the expansion of the Orebody 18 MAR scheme. This involves the addition of L52/108 to the premises boundary.

On 11 October 2018, the Licence Holder submitted an application to include an additional amendment to L5415/1988/9 as follows:

- Add Category 12 to the licence, with an approved throughput of 200 000 tonnes per annual period. It is proposed that a mobile crushing and screening plant is to be installed and operated to produce material for stemming activities within the prescribed premises.

On 5 November 2018, the Licence Holder clarified via email that the premises boundary on the current licence included a state agreement mining lease that was incorrectly labelled. AM70/266 is to be corrected to M266SA.

This amendment notice is a combined assessment for these two amendment applications

outlined above as applied for by the Licence Holder on 11 September 2018 and 11 October 2018 respectively.

Category 5 – Increase in ore processing

On 11 June 2015 Licence L5415/1988/9 was amended to include the Orebody 18 Operations which had previously operated under Prescribed Premises Licence L8044/1987/2. The Existing Licence currently approves a combined annual ore processing rate of 82 mtpa which is split between Orebody 18 (17 mtpa) and Wheelarra Hill (Jimblebar) (65 mtpa).

The Licence Holder is seeking to increase the Premises Category 5 production limit from 82 mtpa to 92 mtpa (increase of 10 mtpa). The Licence Holder is proposing to undertake minor upgrades to the Jimblebar operations only (no change to Orebody 18 operations) to enable the existing facilities to increase the annual ore processing rate from 65 mtpa to 75 mtpa. This increase in approved throughput has been assessed and approved under the Jimblebar Mine Ministerial Statements 683, 809 and 857.

The proposed works include:

- An upgrade to Primary Crusher 3 from a 6089 MKII Superior Crusher to a 7089 MKII Superior Crusher, this upgrade involves:
 - a longer main shaft;
 - A super spider featuring high arching arms that allows larger particles to enter the crushing chamber;
 - An upper top shell; and
 - An upgraded drive motor from 630 kW to 750kW.

Figure 1 below shows a 6089 MKII Superior Crusher to a 7089 MK II superior Crusher, highlighting the main components of the upgrade (excluding the drive upgrade).

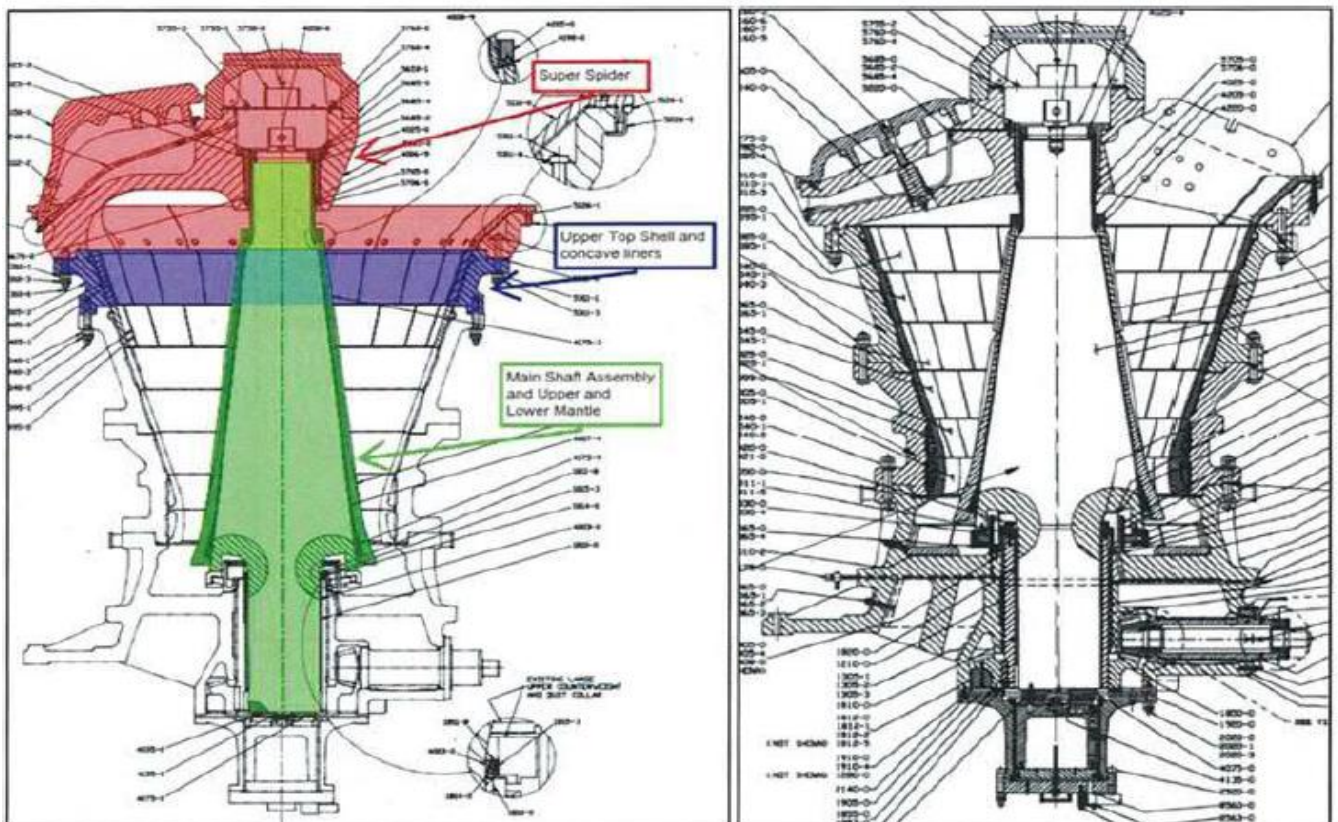


Figure 1: Comparison of a 6089 MKII Superior Crusher to a 7089 MK II Superior Crusher

Category 6 - Orebody 18 MAR scheme

Mine dewatering within the Premises is required to access below the water table ore. In aggregate, Licence L5415/1988/9 allows a maximum of 37.735 GL/a of mine dewater to be discharged to the environment via the emission points specified on the Licence.

A breakdown of the throughputs within the Premises, relevant to the Category 6 discharge capacities are shown below.

37.735 gigalitres per annual period comprising:

- 12.41 gigalitres reinjected (8.76 GL/a Orebody 18 MAR scheme and 3.65 Jimblebar MAR scheme);
- 2.19 gigalitres discharged to Jimblebar Creek and Copper Creek; and
- 23.135 gigalitres discharged to Ophthalmia Dam.

The Licence Holder is seeking to reconfigure the existing Orebody 18 MAR system (consisting of 8 reinjection bores, of which only 4 are constructed) to provide flexibility in managing surplus water from the Jimblebar Hub (Wheelaraa Hill (jimblebar), Orebodies 17, 18 and 31). This will involve expanding the Orebody 18 MAR scheme to the west by installing three new bores (OB18MAR09, OB18MAR10 and OB18MAR11) each with a capacity of 4 ML/day. The bores will be constructed within the 'Second Zone for Injection Bores' shown within Figure 2.

The installation of the three new bores will increase the design capacity of the Orebody 18 MAR scheme from 8.76 GL/a to 13.14 GL/a (an increase of 4.38 GL/a). The Licence Holder does not wish to increase the operational limit of 8.76 GL/a, only the design capacity in order to better manage any potential mounding within the system.

Disposal of surplus water will continue to be via injection into the Basement Rock Aquifers associated with the Paraburdoo and Bee George Members of the Wittenoom Formation. Surplus water being injected will be sourced from the Orebody 31 / Jimblebar pipeline to Ophthalmia Dam. Water will be delivered through surface laid polyethylene pipelines before being injected. Bores will be fitted with for purpose designed reinjection headworks, including a telemetered flow meter, pressure sustaining valve and butterfly valve to control flow.

The Licence Holder has developed triggers for groundwater levels and electrical conductivity and proposes management actions in response to trigger exceedances (Table 3).

Commissioning of the new MAR bores will involve running the system at less than the planned operational levels to equalize the system, calibrate all of the equipment then at incremental injection rates to determine how the infrastructure and the receiving aquifer handles the pressure of the system. Commissioning of each individual bore is expected to take up to 2 months.

Each injection bore will have water level, cumulative volume and flow rate monitored daily for first two weeks, then weekly for first three months, and then monthly subject to review. The following parameters will be monitored at the monitoring bores:

- Water level – weekly for first month, then monthly;
- Field EC, pH and TDS – monthly; and
- Standard Hydrochemistry Suite (e.g. Total Suspended Solids, Al, As, B, Ba, CaCO₃, Cd, Ca, Cl, Cr, Cu, F, Fe, Pb, Mg, Mn, Hg, Mo, Ni, NO₃, K, Se, SiO₂, Na, SO₄, Zn) –quarterly.

Should the Trigger Criteria detailed in Table 2 be reached at any point during commissioning the relevant actions, mitigation measures and monitoring will be undertaken as detailed in Table 3.

Table 2: Proposed Trigger levels and Mitigations Measure for the Orebody 18 MAR scheme.

Trigger Criteria	Action and Mitigation Measures	Monitoring
Groundwater level reaches 20 m below ground level in either one of the two trigger bores.	Review of the monitoring data to establish likely cause and implement remedial actions, if appropriate.	Daily monitoring of groundwater level, and injection water turbidity, EC and pH. Sample for full hydrochemistry suite. Revert to standard monitoring once issue resolved.
Groundwater level reaches 15 m below ground level in either one of the two trigger bores.	Cease injection in proximal injection bore, report to regulators within a week, review monitoring data and recommend subsequent actions to DWER.	Daily monitoring of groundwater level. Commence vegetation monitoring in vicinity of event. Revert to standard monitoring once issue resolved.
Groundwater level reaches 10 m below ground level in either one of the two trigger bores.	Automatic injection cut-off at injection well. Review bore performance data. In the event of failure of the shut-off mechanism, cease injection until mechanism repaired.	Daily monitoring of groundwater level. Revert to standard monitoring once issue resolved.
Groundwater EC exceeds 4,500 µS/cm	Cease injection in vicinity of event and report to regulators within a week. Commence studies to identify cause and recommend subsequent mitigation actions to DoW and DER. ReInjection only to continue with DoW and DER approval of proposed mitigation actions.	Continue standard monitoring of relevant parameters

Table 3: Target levels for monitoring bore water quality (Golder, 2013)

Emission Point Reference	Parameter ¹	Target (including Units)	Averaging Period
HMG0109M	pH	6.5 – 8.0	Spot Sample
HMG0115M	EC	90 – 2,658	
HMG0119M	Nitrate	5.9 mg/L	
HMG0121M	Aluminium	0.055 mg/L	
HMG0058M	Arsenic	0.013 mg/L	
HMG0103M	Bicarbonate	400 mg/L	
HMG0111M1	Boron	0.48 mg/L	
HNPIWR0004M	Cadmium	0.0002 mg/L	
	Calcium	140 mg/L	
	Calcium Carbonate	400 mg/L	
	Chlorine	640 mg/L	
	Chromium	0.005 mg/L	
	Copper	0.0.005 mg/L	
	Fluoride	2 mg/L	
	Iron	0.3 mg/L	
	Lead	0.0034 mg/L	
	Manganese	1.9 mg/L	
	Magnesium	130 mg/L	
	Mercury	0.0008 mg/L	
	Molybdenum	0.034 mg/L	
	Nickel	0.011 mg/L	
	Potassium	30 mg/L	
	Selenium	0.011 mg/L	
	Sodium	350 mg/L	
	Sulfate	400 mg/L	
	TDS	3000 mg/L	
	Zinc	0.032 mg/L	

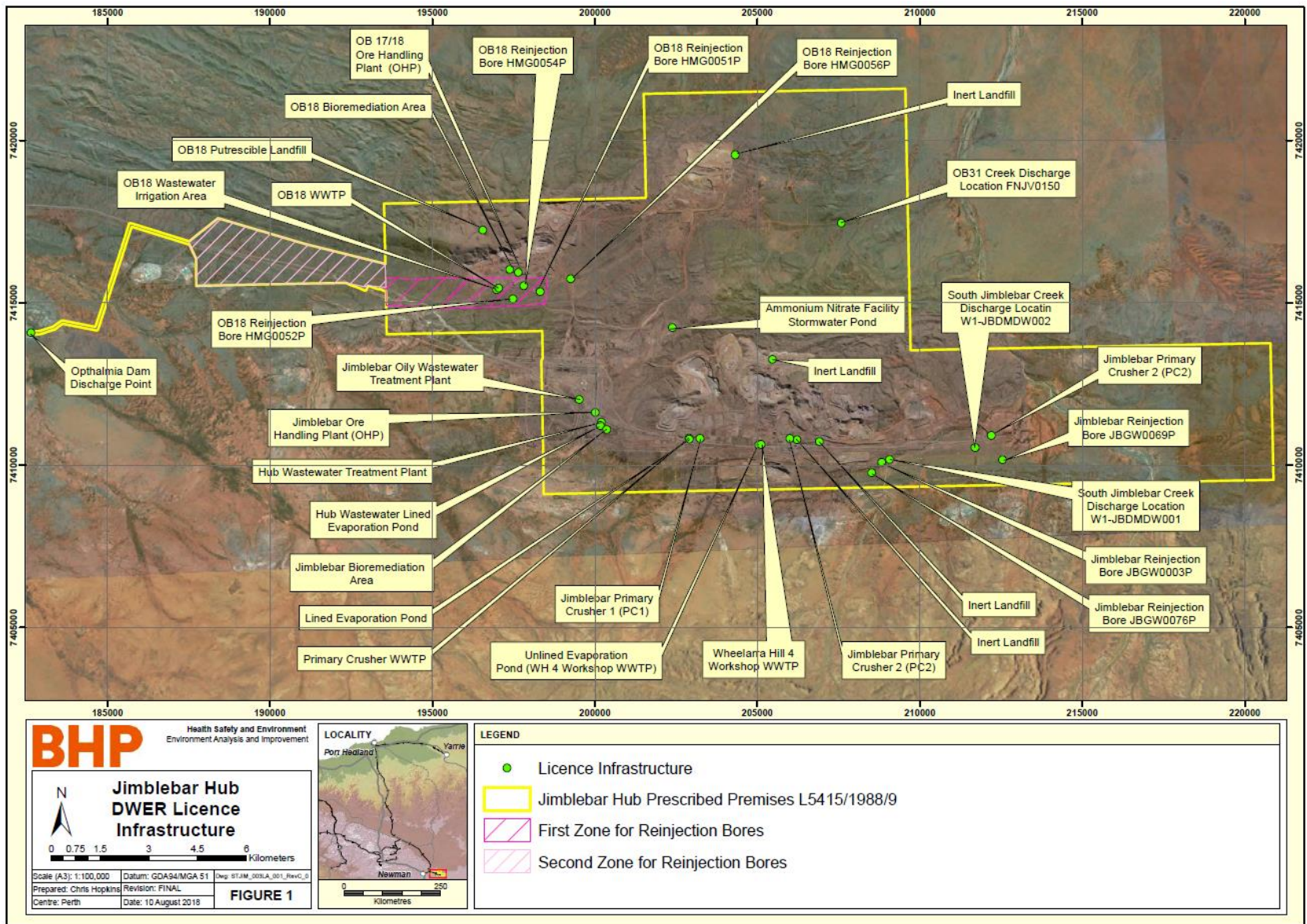


Figure2: Location of three new re-injection bores (within the second zone for re-injection bores)

L5415/1988/9

Category 64 – New inert landfill

The Licence Holder is proposing to construct a new inert landfill at the eastern edge of Orebody 31. Due to a change in the mine plan the area identified for an inert landfill approved under works approval W5638/2014/1 will be covered by a waste rock dump before the facility can be utilised. Therefore the Licence Holder proposes to construct this landfill in a new location on the eastern edge of orebody 31. The new facility will consist of a single cell and will have an earthen bund constructed around the perimeter to prevent storm water entering the facility. Waste will be covered progressively and managed in accordance with existing landfill conditions on the licence. Waste types to be disposed of will comprise of inert wastes as defined in the document titled “Landfill Waste Classification Waste Definitions 1996 (As amended)” such as scrap metals, bricks, rubber, concrete glass, plastics, wire, foam etc. There will be no hazardous waste (with the exception of asbestos waste) disposed of at the inert landfill, these wastes will be removed from site by a licensed contractor. The total capacity of the landfill is expected to be approximately 5,000 tonnes.

No change to the annual disposal limit for Category 64 will be required.

Category 12 – New crushing and screening plant

The Licence Holder is proposing to undertake crushing and screening of material using a mobile crushing and screening plant within the prescribed premises. The plant will be used to produce material for stemming activities. It is expected that 100,000 tonnes of stemming material will be required on an annual basis and the Licence Holder is seeking to have a limit of 200 000 tonnes on the licence to ensure limits are not exceeded. The plant will be fitted with water sprays (typically located at the head drum, discharge point of the main conveyor and at the feed point) and dust covers where appropriate to control dust generated. The plant will be located to prevent stormwater run-off from the crusher location and if necessary earthen bunds will also be used.

Administrative changes

Remove the construction requirements for the Jimblebar to Ophthalmia Dam Pipeline as the pipeline has been completed and the compliance report submitted to DWER.

Amend the prescribed premises boundary to include the expansion of the Orebody 18 MAR Scheme (addition of L52/108). Update the prescribed premises map to include new boundary.

Update the Prescribed Premises categories and design capacity table on the main page of the licence.

Other approvals

The Licence Holder has provided the following information relating to other approvals as outlined in Table 4.

Table 4: Relevant approvals

Legislation	Number	Approval
Iron Ore (McCamey's Monster) Authorization Agreement Act 1972	Mining Lease M266SA	Authorise the execution of an agreement relating to the exploration for and the development and treatment of iron ore and for incidental and other purposes
<i>Rights in Water and Irrigation Act 1914 (RIWI Act)</i>	Groundwater Well Licence (GWL)158795(8) (Expires 13 July 2026)	Taking of water for dust suppressions for earthworks and construction purposes, general campsite purposes, mineral ore processing and other mining purposes, potable water supply purposes and reinjection of groundwater
Part IV of the EP Act (WA)	Statement Number 385 (issued 23 May 1995)	Jimblebar Iron Ore Mine Rationalization and Expansion
	Statement Number 439	Development of Orebody 18
	Statement Number 683 (issued August 2005, supersedes conditions of MS 385)	Wheelarra Hill Iron Ore Mine extension life of mine proposal
	Statement Number 809 (issued October 2009)	Wheelarra Hill mine modification increase mining rate from 12 mtpa to 45 mtpa, additional clearing, increase water supply, construction of a new rail spur and loop and train load out facilities.
	Statement Number 857 (issued 18 February 2011)	Jimblebar Iron Ore Project - extend existing Wheelarra Hill open pits, develop the South Jimblebar and Hashimoto deposits, increase ore processing to 75 million tonnes per annum, discharge of up to 45 ML/d of excess mine dewater from Jimblebar deposit to Ophthalmia Dam
	Statement Number 1021 (issued 12 November 2015)	Development of Orebody 31, including the discharge of surplus mine dewater to Ophthalmia Dam and Jimblebar Creek. (Note: no ore processing throughput [amount] was approved in this MS.)

Amendment history

Table 5 provides the amendment history for L5415/1988/2.

Table 5: Licence amendments

Instrument	Issued	Amendment
L5415/1988/1	17/11/2000	First licence noted in the Industry Licensing System.
L5415/1988/2	17/11/2001	Licence reissue.
L5415/1988/3	17/11/2002	Licence reissue.
L5415/1988/4	17/11/2003	Licence reissue.
L5415/1988/5	17/11/2004	Licence reissue.
L5415/1988/6	17/11/2006	Licence reissue.
L5415/1988/7	17/11/2007	Licence reissue.
W4722/2010/1	2/09/2010	Works approval for a new landfill and bioremediation facility.
L5415/1988/8	17/11/2010	Licence reissue.
W4655/2010/1	13/01/2011	Works approval granted for construction of new ore handling infrastructure to increase the capacity of the mine from 15 Mtpa to 45 Mtpa of iron ore. The expansion involved the construction of new process infrastructure including a primary crusher, conveyor systems, a coarse ore stockpile, a new ore handling plant, a product stockyard, a train load out facility and a rail loop. Additional supporting infrastructure included WWTPs, bulk chemical storage facilities and associated infrastructure.
W5224/2012/1	7/11/2012	Works approval granted for the Managed Aquifer Recharge (MAR) Project that involved the abstraction of groundwater for the purposes of mining followed by reinjection of this water into injection bores. There were two stages assessed: <ul style="list-style-type: none"> • Stage 3a: Injection of approximately 2 ML/day into one of two existing production bores over a period of two to six months. The bores will be retrofitted with headworks appropriate for injection, monitoring and purging. Stage 3a of the trial will guide the planning and design of Stage 3b. • Stage 3b: Injection of approximately 10 ML/day into various combinations of existing retrofitted production bores and new purpose built injection bores.
W5277/2012/1	6/12/2012	Works approval granted for three movable crushers at the premises to supplement ore production through crushing and screening of existing waste stockpile material.
L5415/1988/8	30/05/2013	Licence amendment to: <ul style="list-style-type: none"> • Add in a category 54 WWTP with the capacity to treat a maximum of 102.5 cubic metres per day (m³/day) Another WWTP onsite processes 8 m³/day (total capacity of both plants is 110.5 m³/day); • Remove conditions (conditions 4, 5 and 6 of the previous licence) relating to the Enviroburner as it no longer present onsite. This was picked up during the inspection conducted by Inspection and Compliance Branch in 2012; • Rename sampling locations for the hydrodynamic trial; • Implement operation of Stage 3a of the hydrodynamic trial;

		<p>and</p> <ul style="list-style-type: none"> • Include category 73 for two 1.4 megalitre (ML) vertical cylindrical diesel storage tanks and associated infrastructure.
L5415/1988/8	23/01/2014	<p>Licence amendment to:</p> <ul style="list-style-type: none"> • Increase category 5 from 15 Mtpa to 51 Mtpa – addition of 6 Mtpa constructed under W5277/2012/1 and 30 Mtpa constructed under W4655/2010/1; • Implement operation of Stage 3b of the hydrodynamic trial – injection of approximately 2 ML/day into one existing production bore (JBGW0076P); • Include groundwater monitoring bores associated with Stage 3b; and • Rename bores associated with Stages 2 and 3a of the hydrodynamic trial.
L5415/1988/8	11/06/2015	<p>Licence amendment to:</p> <ul style="list-style-type: none"> • Realign the prescribed premises boundary to include Orebody 18 operations (licensed under L8044/1987/2) and the ANSF; • Approve the disposal of wastewater from the ANSF to the Jimblebar Bioremediation Facility; • Include a third re-injection bore as part of the Managed Aquifer Recharge (MAR) trial; and • Amend the groundwater monitoring requirements.
L5415/1988/9	5/11/2015	Licence renewal and update to template version 2.9
L5415/1988/9	21/04/2016	<p>Licence amendment to:</p> <ul style="list-style-type: none"> • Assess the construction and operation of the Orebody 31 dewatering discharge point to Ophthalmia Dam and discharge of up to 16.2 GLpa; • Increase category 6 to include Orebody 18 and Orebody 31 (total 23.5 GLpa discharged via reinjection and discharge to Jimblebar and Copper Creeks and Ophthalmia Dam); • Realign the prescribed premises boundary to include the Orebody 31 deposit; • Consolidate discharge monitoring locations, amend creekline surface water monitoring, including Orebody 18 MAR monitoring requirements and remove requirement to monitor riparian vegetation; and • Remove conditions which duplicate regulation under Part IV of the EP Act.
L5415/1988/9	13/10/2016	<p>Licence amendment to:</p> <ul style="list-style-type: none"> • Include an additional discharge point to a tributary of Jimblebar Creek; • Amend the Orebody 18 and South Jimblebar MAR programs; • Update conditions relating to sewage monitoring; • Update the prescribed premises address; and • Remove conditions that were not valid, enforceable and/or risk based
L5415/1988/9	27/08/2018	<p>Amendment Notice 1 to:</p> <ul style="list-style-type: none"> • Increase the Jimblebar (Wheellarra Hill) Category 5 premises design capacity by 7 Mtpa to 65 Mtpa, thereby taking the Licence to a full new design capacity of 82Mtpa; • Increase Category 6 throughput to 37.735 GL/a; • Increase Category 64 to 15,000 tonnes per annual period; • Increase Category 73 to 5,000m³; • Removal of monitoring requirements for MAR monitoring bore HSJ0169 and replacement with monitoring bore SJ0571RM;

		<ul style="list-style-type: none"> Removal of rising stage sampler locations JBSW006, JBSW007 and JBSW008 and replacement with three new rising stage sampler locations JBSW009, JBSW010 and JBSW011; and Administrative changes to the licence, comprising: <ul style="list-style-type: none"> Increasing the volume of nutrient rich water in Table 1.2.4 from 400,000 L to 4,000,000 to correct an administrative error; Update Table 1.2.6 to remove completed construction requirements; and Replace the reference to L2 to L1 in Table 4.2.1 of the Licence.
L5415/1988/9		<p>Amendment Notice 2 (this amendment) to approve;</p> <ul style="list-style-type: none"> The upgrade of Primary Crusher 3 at the Wheelarra Hill mine site and subsequent operation to increase throughput by 10 Mtpa Construction and operation of three new reinjection bores for the expanded Orebody 18 MAR project. Increasing the design capacity from 8.76 GL/a to 13.14 GL/a (an increase of 4.38 GL/a). The operational limit of 8.76 GL/a remains the same. Expansion of the premises boundary to accommodate the location of the new Orebody 18 MAR bores. Construction and operation of a new inert landfill. The Category 64 disposal limit remains the same. The processing of up to 200,000 tonnes per annual period of stemming material under Category 12

Location and receptors

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

Table 6: Receptors and distance from activity boundary

Residential and sensitive premises	Distance from Prescribed Premises
Sylvania Pastoral Station	18 km to the southwest
Newman township	Newman township 35 km to the west

Table 7 below lists the relevant environmental receptors in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 7: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Ethel Gorge Stygobiont Threatened Ecological Community (TEC)	The Ethel Gorge Aquifer Stygobiont TEC is located in Ethel Gorge, directly downstream of the Ophthalmia Dam mine dewater discharge point. Ethel Gorge is formed where the Fortescue River flows through the Ophthalmia Range in a northerly direction.
Threatened/Priority Fauna	Nine significant fauna species listed under the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> , the <i>Wildlife Conservation Act</i>

	1950 or listed as Priority Fauna species by the Department of Biodiversity, Conservation and Attractions have been identified within the Premises.
Fortescue Marsh (Priority Ecological Community and listed on the Directory of Important Wetlands of Australia as a wetland of national significance)	Approximately 80 km downstream of Ophthalmia Dam.
Surface water Non-perennial watercourses	<p>The Premises is located in the upper portion of the Fortescue River catchment which drains to the Fortescue Marsh.</p> <p>The Fortescue Marsh is a Priority Ecological Community and listed on the Directory of Important Wetlands of Australia as a wetland of national significance.</p> <p>Two non-perennial watercourses (Shovelanna Creek and Jimblebar Creek) and numerous unnamed non-perennial watercourses flow across the Premises.</p> <p>The majority of the Premises is drained by Jimblebar Creek, which has its headwaters approximately 20km to the south and drains in a northerly direction towards Fortescue River and Fortescue Marsh. The main channel of the Jimblebar Creek passes to the east of the south Jimblebar deposit. Copper Creek is a tributary of Jimblebar Creek which drains the broad valley between the southern flanks of Wheelarra Hill and the northern side of the South Jimblebar deposit (EPA Report 2010).</p> <p>Streamflow in the project area directly correlates to rainfall, with the majority of streamflow occurring during and immediately after each wet season. The known surface water bodies in the vicinity of the Project are Ophthalmia Dam, on the Fortescue River (27km to the west of the project area) and Innawally Pool within Jimblebar Creek (Note – this pool does not receive run-off flow from any of the mining or Prescribed activities within the Premises boundary).</p>
Groundwater	Regional groundwater level is approximately 50 m below ground level. Water quality is generally of fresh quality (TDS 900 mg/L to 1,500 mg/L). The main use of water is for mining and mine dewatering from iron ore mines.

Part IV of the EP Act

As detailed in Table 4 above, a number of proposals for the Wheelarra Hill (Jimblebar) Iron Ore Mine have been assessed under Part IV of the EP Act, resulting in MS approval. The Ministerial Statement that relates to this Amendment Notice is MS 857.

MS 857 (EPA report 1371) approved the development of the Jimblebar Iron Ore Project; to expand the Wheelarra Hill Iron Ore Project and increase ore processing capacity from 45 mtpa to 75 mtpa. The proposal involved an extension to the Wheelarra Hill open pits and overburden storage areas, and the mining (above and below water table) of the South Jimblebar and Hashimoto deposits.

EPA report 1371 outlined that the key environmental factors relevant to the proposal were; flora and vegetation, fauna, groundwater, surface water and mine closure and rehabilitation. The EPA report recommended conditions in relation to the following were to be imposed on the

proponent (see MS 857):

- limiting the clearing of significant flora, vegetation and fauna;
- ensuring no introduction of new weed species;
- protection of fauna from open trenches;
- ensuring that the Ethel Gorge Aquifer Stygobiont Community (TEC) is maintained;
- ensuring acceptable water quality is maintained within the mining area and Ophthalmia Dam;
- re-establishing creek lines in line with landforms and similar species; and
- mine closure and rehabilitation to be imposed on the proponent.

Risk assessment

Tables 8 and 9 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 8: Risk assessment for proposed amendments during construction

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning	
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts					
Category 5 – Ore Processing	Installation and upgrade to Primary Crusher 3 at Jimblebar (Wheelarra Hill) mining operations	Noise: associated with installation works	Sylvania Pastoral Station – 18km to the southwest	Air: Transport through air	Human health impacts	Slight	Unlikely	Low	<p>No new infrastructure will be constructed. The minor construction works at the Jimblebar (Wheelarra Hill) mining operations Category 5 infrastructure, comprises of an upgrade to Primary Crusher 3 from a 6089 MKII Superior Crusher to a 7089 MKII Superior Crusher. This involves:</p> <ul style="list-style-type: none"> • a longer main shaft; • A super spider featuring high arching arms that allows larger particles to enter the crushing chamber; • An upper top shell; and • An upgraded drive motor from 630 kW to 750kW. <p>The distance to residential receptors is approximately 18km. Works will occur on an operating mine site (with lots of other noise sources). Despite the cumulative nature of the noise generation during the construction of the Category 5 infrastructure, minimal offsite impact is anticipated.</p> <p>The consequence is therefore slight with a likelihood of unlikely. As a result the risk rating is determined to be low.</p> <p>The provisions of the Noise Regulations are applicable.</p>

Category 6 - Dewatering	Construction and positioning of infrastructure associated with the three new MAR reinjection bores and pipework at the Orebody 18 MAR scheme	Dust: associated with earthworks and vehicle movement	Sylvania Pastoral Station – 18km to the southwest of the premises boundary	Air: Transport through air	Human health impacts – respiratory illness Smothering and the potential to be deposited on vegetation which may prevent photosynthesis and plant respiration	N/A	N/A	N/A	Minimal dust is expected to be generated during construction of the new MAR bores. The distance to residential receptors is considered to be too great for dust impacts from construction to occur. It is considered that a pathway for dust emissions to residential receptors does not exist. Any potential dust emissions can be regulated by section 49 of the EP Act.
		Noise: associated with earthworks and vehicle movement	Sylvania Pastoral Station – 18km to the southwest of the premises boundary	Air: Transport through air	Human health impacts	N/A	N/A	N/A	The distance to residential receptors is considered to be too great for noise impacts from construction of the 3 new MAR bores to occur. It is considered that a pathway for noise emissions to residential receptors does not exist. The provisions of the Noise Regulations are applicable.
	Purging of the three new MAR reinjection bores and pipework	Discharge to surface water	Surface water (Three non-perennial watercourses (Copper Creek, Shovelanna Creek and Jimlebar Creek) and numerous unnamed non-perennial watercourses flow across the Premises).	Direct discharge	Sediment entering waterways resulting in adverse impacts on aquatic organisms and/ or impacts to riparian vegetation.	Slight	Unlikely	Low	The proposed reinjection bores are north of Shovelanna creek. The Licence Holder has stated that if purging of the bores is required during bore establishment, water will be discharged into a sump to reduce sedimentation or discharged to natural drainage lines with the aid of a lay-flat hose. It is not expected that purge water will come in contact with surface water. This risk associated with this event has been determined to be low due to the temporary short term nature of the discharge and the quality of water being discharged ((TDS ranging from 1,300 to 2,200 mg/L and sediment

									removal via settling sump). No additional controls are necessary. The provisions of the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> are applicable.
Category 12 <i>Mobile crushing and screening plant</i>	Installation of mobile crushing and screening plant	Dust: associated with earthworks and vehicle movement	Sylvania Pastoral Station – 18km to the southwest of the premises boundary	Air: Transport through air	Human health impacts – respiratory illness Smothering and the potential to be deposited on vegetation which may prevent photosynthesis and plant respiration	N/A	N/A	N/A	Minimal dust is expected to be generated during construction / installation of the new mobile crushing and screening plant. The distance to residential receptors is considered to be too great for dust impacts from construction/ installation of the mobile crushing and screening plant to occur. It is considered that a pathway for dust emissions to residential receptors does not exist. Any potential dust emissions can be regulated by section 49 of the EP Act.
		Noise: associated with earthworks and vehicle movement	Sylvania Pastoral Station – 18km to the southwest of the premises boundary	Air: Transport through air	Human health impacts	N/A	N/A	N/A	The distance to residential receptors is considered to be too great for noise impacts from construction /installation of the mobile crushing and screening plant to occur. It is considered that a pathway for noise emissions to residential receptors does not exist. The provisions of the Noise Regulations are applicable.
Category 64 <i>Orebody 31 Inert Landfill</i>	Machinery and vehicle movement	Dust	Sylvania Pastoral Station ~ 18km to the west of Premises boundary ~30km southwest from the new landfill site	Air: Transport through air	Human health impacts – respiratory illness	N/A	N/A	N/A	Minimal dust is expected to be generated during construction of the landfill. The distance to residential receptors is considered to be too great for dust impacts from construction of the landfill to occur. The Delegated Officer considers that a pathway for dust emissions does not exist. Any potential dust emissions can be regulated by section 49 of the EP Act.

		Noise	Sylvania Pastoral Station ~ 18km to the south west of Premises boundary ~30km southwest from the new landfill site	Air: Transport through air	Human health impacts - amenity	N/A	N/A	N/A	The distance to residential receptors is considered to be too great for noise impacts from construction of the landfill to occur. The Delegated Officer considers that a pathway for noise emissions does not exist. The provisions of the Noise Regulations are applicable.
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Table 9: Risk assessment for proposed amendments during operation

Risk Event					Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
Category 5 – increase in throughput	Operation of upgraded Primary Crusher 3 at Jimblebar (Wheelarra Hill) mining operations (increase in throughput by 10 Mtpa)	Dust	Sylvania Pastoral Station – 18km to the west	Air: Transport through air	Human health impacts – respiratory illness	Minor	Unlikely	Medium The Licence Holder is proposing to undertake some minor works at the Jimblebar (Wheelarra Hill) mining operations Primary Crusher 3, which will increase the Jimblebar (Wheelarra Hill) operations design capacity by 10 Mtpa (65 Mtpa to 75 Mtpa) bringing the total approved throughput for the licence to 92 Mtpa. The existing site dust management measures onsite include: <ul style="list-style-type: none"> • Crusher transfer points are enclosed and fitted with water sprays. • Water tankers are used to apply water to sites within areas of operation which have the potential to generate dust, including unsealed roads, haul roads and construction areas. • Areas of exposed soil (land disturbance) are minimised.

									<ul style="list-style-type: none"> • Dust suppression equipment is maintained in efficient operating condition. • Disturbed areas are rehabilitated as they become available. • Routine maintenance and housekeeping practices are employed to ensure that waste materials in or around the premises do not accumulate and lead to the generation of unacceptable airborne dust. • Open areas such as lay-down and machinery maintenance areas will be packed with lump or gravel material to reduce potential wind erosion. • Chemical suppressants will be used for general site dust suppression where practicable. • Dust extraction equipment will be regularly maintained. • Major traffic thoroughfares will be sealed and kerbing or bunding will be installed to discourage offroad passage where practicable. Vehicle traffic will preferably be directed along routes that are regularly maintained and sprayed with dust suppressants. • Speed limits will be enforced to minimise dust emissions. • Site personnel will be required to undergo training and be made aware of their responsibility to reduce and report excessive dust emissions <p>The Licence Holder engaged a consultant (SKM, 2009) to undertake an air quality impact assessment for the Wheelarra Hill Iron Ore Mine</p>
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									<p>Phase 2 Modification which related to the increase in capacity from 45 Mtpa to 75 Mtpa. Predictive modelling was undertaken and based the receptor being the BHPBIO Warrawandu (Jimblebar) Village, located 8km to the west of the premises (note 27km from Primary crusher 3). The modelling predicted that there would be two exceedances to the NEPM 24-hour PM₁₀ criteria (50 ug/m³), with one being deemed due to model limitations and the other due to an unusual meteorological event. Naturally high background concentrations form a significant component of total predicted concentrations. The nearest non-BHP sensitive receptor Sylvia homestead (18km south) which was considered too distant to warrant consideration given the significant dilution of atmospheric pollutants at that distance.</p> <p>The Delegated Officer has considered the distance to the nearest sensitive receptor and the current Licence Holder controls and has deemed them to be appropriate to manage the increase in dust emissions associated with the increase in Category 5 throughput. The Delegated Officer notes that MS 857, 683 and 809 approves a total production rate of 75 Mtpa. No additional regulatory controls are required to mitigate the risk of dust impacts on sensitive receptors.</p>
									Noise

								<p>Statement (MS) 857 on 18 February 2011 and combined with MS 683 and MS 809 approves a total production rate of 75 Mtpa at the Wheelarra Hill mining operations. The associated EPA report 1371 did not list social surrounds/amenity (noise) as a key environmental factor.</p> <p>The Licence Holder has detailed the following controls to manage the increase in noise emissions:</p> <ul style="list-style-type: none"> • Use of low-noise equipment where practicable. • Use of silencers, where necessary. • Use of exhaust mufflers. • Regular service of machinery. <p>The Licence Holder engaged a consultant (SVT, 2009) to undertake a noise impact assessment for the expansion of Jimblebar to 75 Mtpa (for submission to the EPA). Predictive modelling was undertaken and based the receptor being the BHPBIO Warrawandu (Jimblebar) Village, located 8km to the west of the premises (note 27km from Primary Crusher 3). The modelling predicted that there would be no exceedances to <i>Noise Regulations</i>.</p> <p>The Delegated Officer considers the consequence of this risk event to be minor as noise modelling indicates that relevant criteria will not be exceeded (<i>Noise Regulations</i>). The likelihood of this event occurring has been determined to be unlikely due to the separation distance between the site and the nearest sensitive</p>
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									<p>receptor. No additional regulatory controls are required to mitigate the risk of noise impacts on sensitive receptors.</p> <p>The provisions of the <i>Noise Regulations</i> are applicable.</p>
<p>Category 6 – Operation of 3 new reinjection bores</p>	<p>Operation of three new reinjection bores (in addition to the eight already approved) in the expanded reinjection area located to the west of the current scheme.</p>	<p>Discharge to groundwater</p>	<p>Vegetation</p>	<p>Reinjection to groundwater from Brockman Iron Formation</p>	<p>Increase in groundwater levels and development of a groundwater mound resulting in vegetation death and impact on troglofauna habitat.</p>	<p>Minor</p>	<p>Unlikely</p>	<p>Medium</p>	<p>The Orebody 18 MAR scheme is currently approved to operate eight injection bores totaling a maximum design capacity of 8.76 GL/a (24 ML/d).</p> <p>The Licence Holder wishes to make no changes to the amount of excess water being reinjected. However, is proposing to operate three additional bores (OB18MAR09, OB18MAR10 and OB18MAR11) to allow for better management and prevention of any potential groundwater table mounding. The design capacity of the scheme will increase from 8.76 GL/a to 13.14 GL/a. The operational limit will remain the same at 8.76 GL/a as all bores will not be operational at one time. This operational limit will be placed on the licence as a condition as part of this amendment.</p> <p>The Licence Holder has been undertaking dewatering activities at Orebody 18 for at least six years. The location of Orebody 18 MAR scheme has also been the site of a supply bore-field for the duration of the operation of Orebody 18. Therefore the Licence Holder has reported a high understanding of the aquifers operational characteristics in the vicinity.</p> <p>Depth to groundwater is on average 50 mbgl and has a slightly eastward</p>

									<p>flow-gradient. Groundwater movement is generally consistent with surface water flow along the strike of the valley. Groundwater from both aquifers is brackish with Total Dissolved Solids (TDS) ranging from 1,300 to 2,200 mg/L. Generally groundwater quality from the Brockman Iron Formation is considered to be of better quality than the receiving aquifer – Wittenoom Formation (as it is characterised as dolomite).</p> <p>The Licence Holder has stated that based on the level of draw down as a result of current abstraction, the expected mounding from reinjection will be localised and minimal. The water table in the Orebody 18 area is on average 50 mbgl which, during periods of peak injection rates, and could be expected to mound by up to 20 m in monitoring bores (with the impacted area between 500m and 1km from injection bores). This is unlikely to intersect any surface water systems or vegetation root systems. There are no groundwater dependent vegetation systems in the known area of mounding impact.</p> <p>Current injection activities are only occurring at reinjection bore HMG0056P. The closest monitoring bores surrounding HMG0056P (HMG0115M, HMG0119M and HMG0121M) have not shown significant increase in groundwater levels since injection commenced (less than 0.34m) as demonstrated in the latest data presented in the Licence Holders 2017 Annual Environmental Report (AER).</p>
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									<p>Groundwater mounding as a result of the reinjection may impact on troglofauna habitat. A subterranean fauna survey found that troglofauna recorded in the location of the Orebody MAR scheme are not exclusive to the area and have been identified at adjacent regional sites (Bennelongia, 2013). The Licence Holder has stated that mounding that does occur will be localised to within 500m to 1km of the injection bores.</p> <p>The Licence Holder currently monitors groundwater levels and ambient water quality in the vicinity of the existing reinjection bores to monitor the impact. This will continue for the expanded MAR scheme. The Licence Holder has developed trigger levels for groundwater levels and electrical conductivity and proposes management actions in response to trigger exceedances.</p> <p>The Delegated Officer has considered the potential for increases in groundwater levels and the development of a groundwater mound from reinjection and has determined that there will be low level off-site impacts on a local scale. Therefore the Delegated Officer considers the consequence to be Minor. The likelihood of this risk even occurring is considered to be unlikely due to the Licence Holders proposed controls. The risk rating for this event is therefore medium.</p> <p>No additional regulatory controls are required to mitigate this risk as appropriate conditions already exist</p>
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<p>Category 6 – Operation of 3 new reinjection bores</p>	<p>Operation of three new reinjection bores (in addition to the eight already approved) in the expanded reinjection area located to the west of the current scheme.</p>	<p>Discharge to groundwater</p>	<p>Subterranean fauna</p>	<p>Reinjection to groundwater from Brockman Iron Formation</p>	<p>Degradation of receiving aquifer groundwater quality due to mixing of waters of different qualities causing impacts to subterranean fauna</p>	<p>Minor</p>	<p>Unlikely</p>	<p>Medium</p>	<p>on the licence.</p> <p>There is the potential for low level, localised impact to subterranean fauna as a result of the expanded MAR scheme at Orebody 18. A number of troglofauna species have been recorded at Orebody 18, with some recorded only from the Orebody 18 mine area. These species are considered to be troglobitic (restricted to below-ground dispersal). However when the geology and pattern of mineralisation in the area is compared with the known ranges and distributions of troglofauna species, it appears highly likely that these restricted species are likely to be more widespread than just the Orebody 18 area. (Bennelongia, 2013).</p> <p>The proposed new bores will draw water from the Orebody 31 / Jimblebar to Ophthalmia Dam pipeline. The Licence Holder currently undertakes a monitoring program to determine if the quality of reinjection water is of suitable quality. This will be expanded to include the 3 new reinjection bores. The Licence Holder has established site specific water quality trigger values (Golder, 2013) for injected water quality.</p> <p>Ambient groundwater quality is also analyzed for a suite of parameters and compared to the same site specific trigger values (existing condition 3.5.1). The licence Holder has stated that an investigation into any exceedance of these site specific trigger values will occur. The trigger values have been developed based</p>
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									<p>on baseline monitoring undertaken at the receiving aquifer and the subsequent assessment by Golder Associates Pty Ltd (Golder) in 2013. These trigger values are concentrations that, if exceeded, would indicate a potential environmental problem, and consequently should trigger a management process. This is in accordance with the Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ),</p> <p>Water quality and trigger levels and contingency actions are outlined within Tables 3 and 4.</p> <p>The potential for impact to subterranean fauna from reinjection has been considered and it has been determined that there will be low level offsite impacts on a local scale. Therefore the Delegated Officer considers the consequence to be Minor. The likelihood of this risk event occurring is considered to be unlikely due to the Licence Holder's controls. The risk rating for this event is therefore medium.</p> <p>No additional regulatory controls are required to mitigate this risk as appropriate conditions already exist on the licence.</p>
Category 6 – Operation of 3 new	Operation of three new reinjection bores (in	Discharge to the environment as a result of	Vegetation and soil	Direct Discharge	Impacts to vegetation and soil due to inundation	Slight	Unlikely	Low	Surplus water being injected will be sourced from the Orebody 31 / Jimblebar pipeline to Ophthalmia Dam. Water quality is brackish with

reinjection bores	addition to the eight already approved) in the expanded reinjection area located to the west of the current scheme.	pipeline rupture							<p>TDS ranging from 1,300 to 2,200 mg/L.</p> <p>Water will be delivered through surface laid polyethylene pipelines before being injected. Telemetered flowmeters will be located at the start and installed at each bore to detect possible leaks. No sensitive vegetation types or flora are located near the new reinjection bore area.</p> <p>The risk associated with pipeline rupture to the environment has been assessed as low due to the quality of the water being reinjected and the licence holder's controls. No additional controls are required to be added to the licence.</p>
Category 64 – landfill <i>Operation of the Orebody 31 Inert Landfill</i>	Machinery and vehicle movement	Dust	<p>Sylvania Pastoral Station ~ 18km to the west of Premises boundary</p> <p>~30km southwest from the new landfill site</p>	Air: Transport through air	Human health impacts – respiratory illness	N/A	N/A	N/A	<p>Minimal dust is expected to be generated during operation of the landfill.</p> <p>The distance to residential receptors is considered to be too great for dust impacts from operation of the landfill to occur. The Delegated Officer considers that a pathway for dust emissions does not exist.</p> <p>Any potential dust emissions can be regulated by section 49 of the EP Act.</p>
	Machinery and vehicle movement	Noise	<p>Sylvania Pastoral Station ~ 18km to the south west of Premises boundary</p> <p>~30km southwest from the new landfill site</p>	Air: Transport through air	Human health impacts - amenity	N/A	N/A	N/A	<p>The distance to residential receptors is considered to be too great for noise impacts from operation of the landfill to occur. The Delegated Officer considers that a pathway for noise emissions does not exist.</p> <p>The provisions of the Noise Regulations are applicable.</p>
	Contaminated storm water associated	Contaminated storm water or leachate	Two non-perennial watercourses	Overland flow and seepage	Contaminate surface water	N/A	N/A	N/A	<p>There are no surface water features within 2km of the new landfill site. Contaminated storm water is not</p>

	with contact with deposited waste Leachate from deposited waste		(Shovelanna Creek and Jimblebar Creek) and numerous unnamed non-perennial watercourses flow across the Premises. Groundwater (50mbgl)	into soil	Contaminate groundwater				<p>expected to have an impact at this distance.</p> <p>Inert Type 2 waste consists of non-biodegradable materials and therefore is not expected to contribute to any potential leachate coming from the inert landfills. Therefore, impact to groundwater (which is 50mbgl) will be negligible.</p> <p>Management of wastes generated at Jimblebar will be in accordance with existing licence conditions and the BHPBIO Mining Operations Waste Management Program. Asbestos containing waste will be managed in accordance with section 4.3.3 of the Jimblebar Hub Environment Management Plan.</p> <p>Asbestos waste will be disposed of within a separate delineated area of the landfill which is signposted. Asbestos material will be covered as soon as practicable with appropriate materials to a depth of at least 1m. The location, depth and quantity of asbestos waste will be registered and recorded on a plan.</p> <p>Considering the distance to the nearest sensitive receptor is <2km the Delegated Officer considers that a pathway for contaminated stormwater or leachate does not exist and therefore no additional regulatory controls are required.</p>
Category 12 <i>Screening of material</i>	Operation of a mobile crushing and screening	Dust	Sylvania Pastoral Station ~ 18km to the west of Premises	Air: Transport through air	Human health impacts – respiratory illness	N/A	N/A	N/A	The C&S plant will be fitted with water sprays and dust covers to control dust generated. The exact location of these dust controls will depend on the model

	(C&S) plant for stemming activities.		boundary						<p>used, however generally sprays are located at the head drum and discharge point of the main conveyor and at the feed point. Additional dust control may be installed as required.</p> <p>The distance to residential receptors is considered to be too great for dust impacts from operation of the C&S plant to occur. The Delegated Officer considers that a pathway for dust emissions does not exist.</p> <p>Any potential dust emissions can be regulated by section 49 of the EP Act.</p>
	Noise	Sylvania Pastoral Station ~ 18km to the south west of Premises boundary	Air: Transport through air	Human health impacts - amenity	N/A	N/A	N/A	<p>The distance to residential receptors is considered to be too great for noise impacts from operation of the C&S plant to occur. The Delegated Officer considers that a pathway for noise emissions does not exist.</p> <p>The provisions of the <i>Noise Regulations</i> are applicable.</p>	
	Contaminated storm water runoff from stockpiles / operational area (potential hydrocarbon spills)	Surface water and soil.	Direct discharge to land / overland flow	Impacts on surface water quality and ecosystem health	Slight	Unlikely	Low	<p>The exact location within the prescribed premises for the placement of the C&S plant is unknown. The Licence Holder wishes to move and operate the C&S plant to anywhere within the premises boundary as necessary for stemming activities. The location of the plant will be within already cleared operational areas that likely have stormwater diversion already in place.</p> <p>Two non-perennial watercourses (Shovelanna Creek and Jimblebar Creek) and numerous unnamed non-perennial watercourses flow across the Premises.</p> <p>Streamflow in the project area directly correlates to rainfall, with the majority</p>	

									<p>of streamflow occurring during and immediately after each wet season.</p> <p>The Licence holder has stated that refuelling will occur by mobile vehicle with spill clean-up equipment available and that the C&S plant will be situated to prevent stormwater run-off from the crusher location and if necessary earthen bunds will be used.</p> <p>The Delegated Officer considers the consequence of this risk event to be slight and the likelihood of this event occurring as unlikely due to the Licence Holders controls. The risk rating for this event is therefore low.</p>
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Decision

The Delegated Officer has determined to grant the amended Licence to approve:

- The upgrade of Primary Crusher 3 at the Wheelarra Hill mine site and subsequent operation to increase throughput by 10 Mtpa
- Construction and operation of three new reinjection bores for the expanded Orebody 18 MAR project. While increasing the peak design capacity from 8.76 GL/a to 13.14 GL/a (an increase of 4.38 GL/a), the operational limit of 8.76 GL/a remains the same.
- Expansion of the premises boundary to accommodate the location of the new Orebody 18 MAR bores.
- Construction and operation of a new inert landfill. The Category 64 disposal limit remains the same.
- The processing of up to 200,000 tonnes per annual period of stemming material under Category 12.

Category 5 - increase in approved throughput

The Delegated officer has determined the key emissions associated with the construction and operation of the upgraded Primary Crusher 3 at the Wheelarra Hill mine site is dust and noise. Based on the application supporting documentation, the Delegated Officer considers the risk associated with these emissions to be medium.

The Delegated Officer notes that the *Jimblebar (Wheelarra Hill) Environmental Protection Statement (EPS)* that was developed by the Licence Holder for assessment by the EPA assessed the dust and noise impacts associated with Jimblebar (Wheelarra Hill) mining operations up to a processing rate of 75 Mtpa. The proposal was approved by Ministerial Statement MS 857 and combined with MS 683 and MS 809 approves a total production rate of 75 Mtpa at the Wheelarra Hill mining operations. The Delegated Officer has determined that no new conditions are required to manage the risks associated with this increase, based on the dust and noise modelling results, the Licence Holder's controls and distance to the nearest sensitive receptor.

Condition 1.2.10 has consequently been updated to include the increase in Category 5 throughput from 82 Mtpa to 92 Mtpa.

Category 6 - Orebody 18 MAR scheme

The Delegated Officer has determined the key emissions associated with the construction and operation of the three new reinjection bores for the expanded Orebody 18 MAR project to be discharges to groundwater affecting water quality and mounding of the groundwater table. Based on the application supporting documentation, the Delegated Officer has determined that the expanded Orebody 18 MAR project presents a medium risk to the environment. Existing licence conditions have been modified to control this risk.

The Licence Holder has committed to constructing the expanded Orebody 18 MAR scheme to the specifications provided in amendment application (BHP, 2018). Conditions 1.2.11 and 1.2.12 have been amended to include the specific design and construction specifications for the expanded Orebody 18 MAR scheme and to allow the commissioning of each bore for a period of 7 months. Condition 4.1.2 requires the Licence Holder to submit a compliance document to DWER once the bores have been constructed and a commissioning report within one month of the completion of commissioning.

Conditions 2.3.1 has been updated to include the three new reinjection bores as emission points to groundwater. Condition 3.3.1 has been updated to include the three new reinjection bores to

ensure monthly and quarterly monitoring of the discharge to groundwater occurs at the new bores.

Category 64 – New inert landfill

The Delegated officer has determined the key emissions associated with the construction and operation of the new inert landfill are dust, noise and leachate. Based on the application supporting documentation, the Delegated Officer considers the risk associated with these emissions to be low. No new conditions are required to manage this risk as there are existing landfill conditions on the current Licence. No increase in approved throughput is required. The map in scheduled 1 titled 'DWER Licence Infrastructure' has been replaced with a map showing the location of the new Orebody 31 Inert landfill.

Addition of Category 12 Crushing and Screening plant

The Delegated Officer has determined that the key emissions associated with the operation of the C&S plant are dust, noise and storm-water runoff. The Delegated Officer considers the risk associated with these emissions to be low.

The Delegated Officer has determined that an amendment is to be made to the Licence to allow for the inclusion of category 12 with a design capacity of 200,000 tonnes per Annual Period.

Condition 1.2.10 has been updated to include Category 12 and the approved throughput of 200 000 tonnes per annual period.

Other amendments

The Delegated Officer has considered the following administrative changes / corrections and has deemed them acceptable:

- Remove the construction requirements for the Jimblebar to Ophthalmia Dam Pipeline as the pipeline has been completed and the compliance report submitted to DWER.
- Amend the prescribed premises boundary to include the expansion of the Orebody 18 MAR Scheme (addition of L52/108). Update the prescribed premises map to include new boundary.
- Premises boundary on the current licence included a state agreement mining lease that was incorrectly labelled. AM70/266 is to be corrected to M266SA.
- Update the Prescribed Premises categories and design capacity table on the main page of the licence as updates were missed from the last amendment notice.

Licence Holder's comments

The Licence Holder was provided with the draft Amendment Notice on 30/01/2019. The Licence Holder had no comments on the draft.

Amendment

1. The Premises address on Page 1 of the licence has been amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below;

Tenements **L52/108**, L52/109, L52/163, I126948, ~~AM70/266~~, **M266SA** and ML244SA
NEWMAN WA 6753

2. The Prescribed Premises category table on Page 1 of the licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below;

Prescribed premises category

Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes or more per year	75 92 million tonnes per annual period
6	Mine dewatering	50,000 tonnes or more per year	23.5 37.735 gegalitres per annual period (5.11 12.41 gegalitres reinjected, 2.19 gegalitres discharged to Jimblebar Creek and Copper Creek, and 16.2 23.135 gegalitres discharged to Ophthalmia Dam)
12	Screening etc. of material	50 000 tonnes per year	200 000 tonnes per annual period
54	Sewage facility	100 cubic metres or more per day	120 cubic metres per day
64	Class II putrescible landfill site	20 tonnes or more per year	4,580 15 000 tonnes per annual period
73	Bulk storage of chemicals, etc	1,000 cubic metres in aggregate	4,000 5 000 cubic metres in aggregate

3. Condition 1.2.10 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.10 The Licensee shall ensure the limits specified in Table 1.2.5 are not exceeded

Category	Category description	Premises production or design capacity limit
5	Processing or beneficiation of metallic or non-metallic ore	82 92 ,000,000 tonnes of ore per annual period
6	Mine dewatering	37.735 gegalitres per annual period: <ul style="list-style-type: none"> • 12.41 gegalitres reinjected; • 2.19 gegalitres discharged to Jimblebar Creek and Copper Creek; and • 23.135 gegalitres discharged to Ophthalmia Dam
12	Screening etc of material	200 000 tonnes per annual period
73	Bulk storage of chemicals, etc	5,000 cubic metres in aggregate

Note 1: *Environmental Protection Regulations 1987*, Schedule 1.

Note 2: Limit applicable upon submission of compliance documentation required under condition 4.3.1

4. Condition 1.2.11 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.11 The Licence Holder must install and undertake the Works for the infrastructure and equipment:

- (a) specified in Column 1;
 (b) to the requirements specified in Column 2; and
 (c) at the location specified in Column 3 of Table 1.2.6.

Table 1.2.6 Works specifications		
Column 1	Column 2	Column 3
Infrastructure / Equipment	Requirements (design and construction)	Site plan reference
<i>Orebody 18 MAR project</i>		
6 new reinjection bores for the Orebody 18 MAR project (Amendment Notice #1)	Construction of injection bores with flow meters installed; <ul style="list-style-type: none"> HMG0051P and HMG0052P as per location on Site plan in Schedule 1; OB18MAR05, OB18MAR06, OB18MAR07 and OB18MAR08 located within the red area demarcated 'First zone for new reinjection bores' as per Site plan ('DWER Licence Infrastructure') in Schedule 1. 	HMG0051P, HMG0052P, OB18MAR05, OB18MAR06, OB18MAR07 and OB18MAR08 in 'DWER Licence Infrastructure' map in Schedule 1.
3 new reinjection bores for the Orebody 18 MAR project (Amendment Notice #2)	Construction of injection bores with flow meters installed; <ul style="list-style-type: none"> OB18MAR09, OB18MAR10 and OB18MAR11 located within the pink area demarcated 'Second zone for reinjection bores' as per Site plan ('DWER Licence Infrastructure') in Schedule 1. 	Second zone for reinjection bores' as per Site plan ('DWER Licence Infrastructure') in Schedule 1.
Water conveyance	Pipelines constructed using ±3500m of ±DN 200. Borefield pipework to tee off existing 710DN pipeline from Orebody 31 to Ophthalmia Dam to the injection bore headworks	Existing pipeline from Orebody 31 to Ophthalmia Dam in 'DWER Licence Infrastructure' map
Jimblebar (Wheelarra Hill) mining operations		
Wheelarra Hill processing plant works (Amendment Notice #1)	Installation of a larger fines product conveyor belt at the existing Ore Handling Plant	Jimblebar Ore Handling Plant 1 (OHP) in 'DWER Licence Infrastructure' map in Schedule

	<p>Installation of a modified gearbox for product screen feed conveyor at existing Ore Handling Plant; and</p> <p>Adjustment to process controls systems to increase throughput.</p>	1.
Wheelarra Hill processing plant works – Primary Crusher 3 (Amendment Notice #2)	<p>Upgrade of Primary Crusher 3 from a 6089 MKII Superior Crusher to a 7089 MK II Superior Crusher involving the installation of a;</p> <ul style="list-style-type: none"> • Longer main shaft; • A super spider with high arching arms; • An upper top shell; and • An upgraded driver motor from 630 kW to 750 kW. 	Jimblebar Ore Handling Plant 1 (OHP) in ‘DWER Licence Infrastructure’ map in Schedule 1
Category 64 inert landfill	Located at the eastern edge of Orebody 31	Orebody 31 Inert landfill location as shown in ‘DWER Licence Infrastructure’ map in Schedule 1.

5. Condition 1.2.12 of the Licence is amended by the deletion of the text shown in strikethrough below and the insertion of the bold text shown in underline below:

1.2.12 The Licensee shall commission each Orebody 18 MAR Project reinjection bore for a period not exceeding 7 months, in accordance with ‘Jimblebar L5415/1988/9 Licence Amendment Supporting Documentation’ (Including information relating to Attachments 1 to 10) November 2017 ~~and ‘Jimblebar L5415/1988/9 Licence Amendment Supporting Documentation (Including Information relating to Attachments 1 to 10) August 2018.~~

6. Condition 2.3.1 of the Licence is amended by the insertion of the bold text shown in underline below:

2.3.1 The Licensee shall ensure that where waste is emitted to groundwater from the emission points in Table 2.3.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this licence.

Table 2.3.1: Emission points to groundwater		
Emission point reference on Map of emission points	Description	Source including abatement
<u>Jimblebar reinjection bores</u> JBGW0069P JBGW0076P JBGW0003P	Direct injection below ground	Water from dewatering
<u>Orebody 18 reinjection bores:</u> HMG0051P HMG0052P HMG0054P HMG0056P OB18MAR05 OB18MAR06 OB18MAR07		

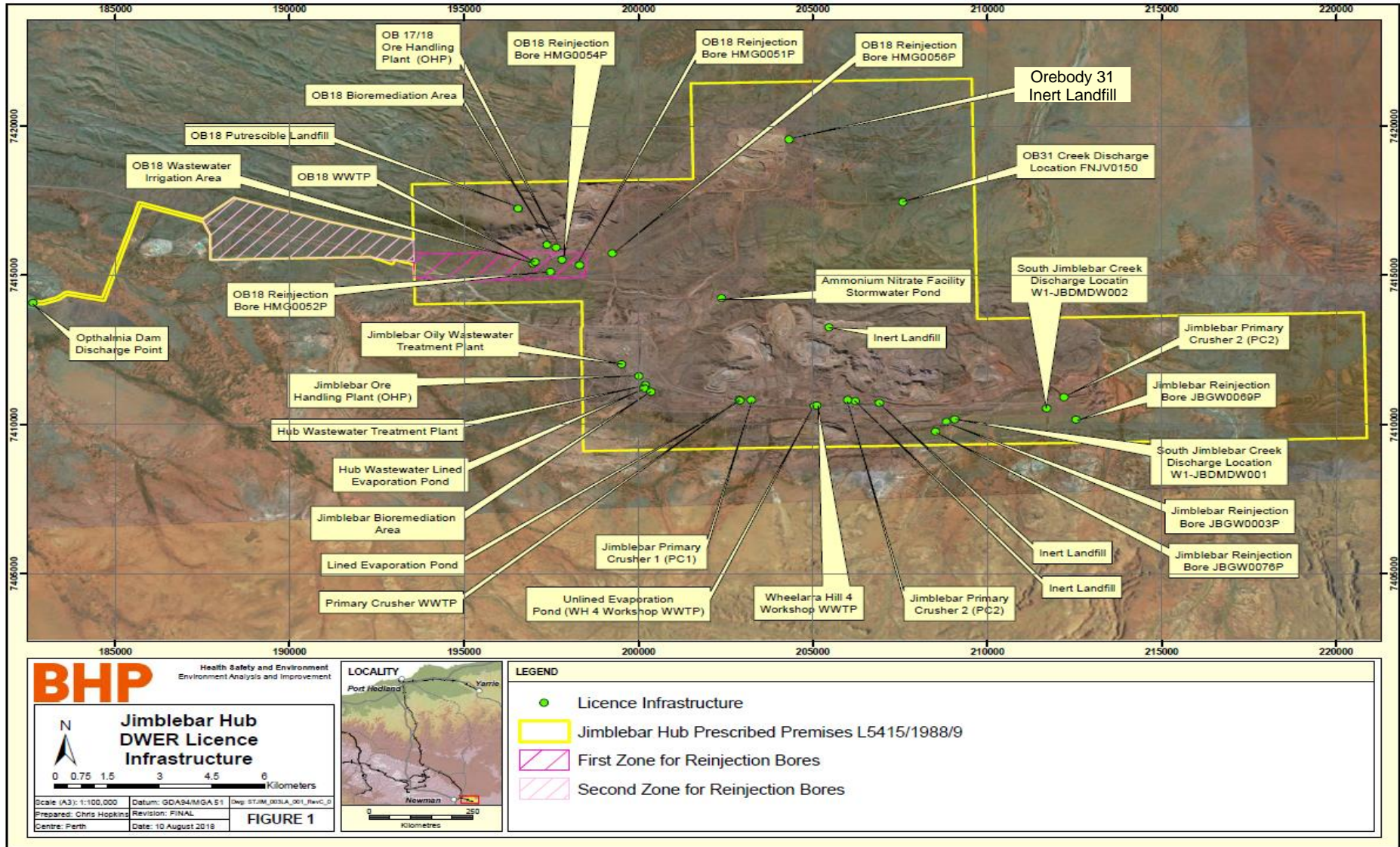
OB18MAR08 OB18MAR09 OB18MAR10 OB18MAR11		
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7. Condition 3.3.1 of the Licence is amended by the insertion of the bold text shown in underline below:

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

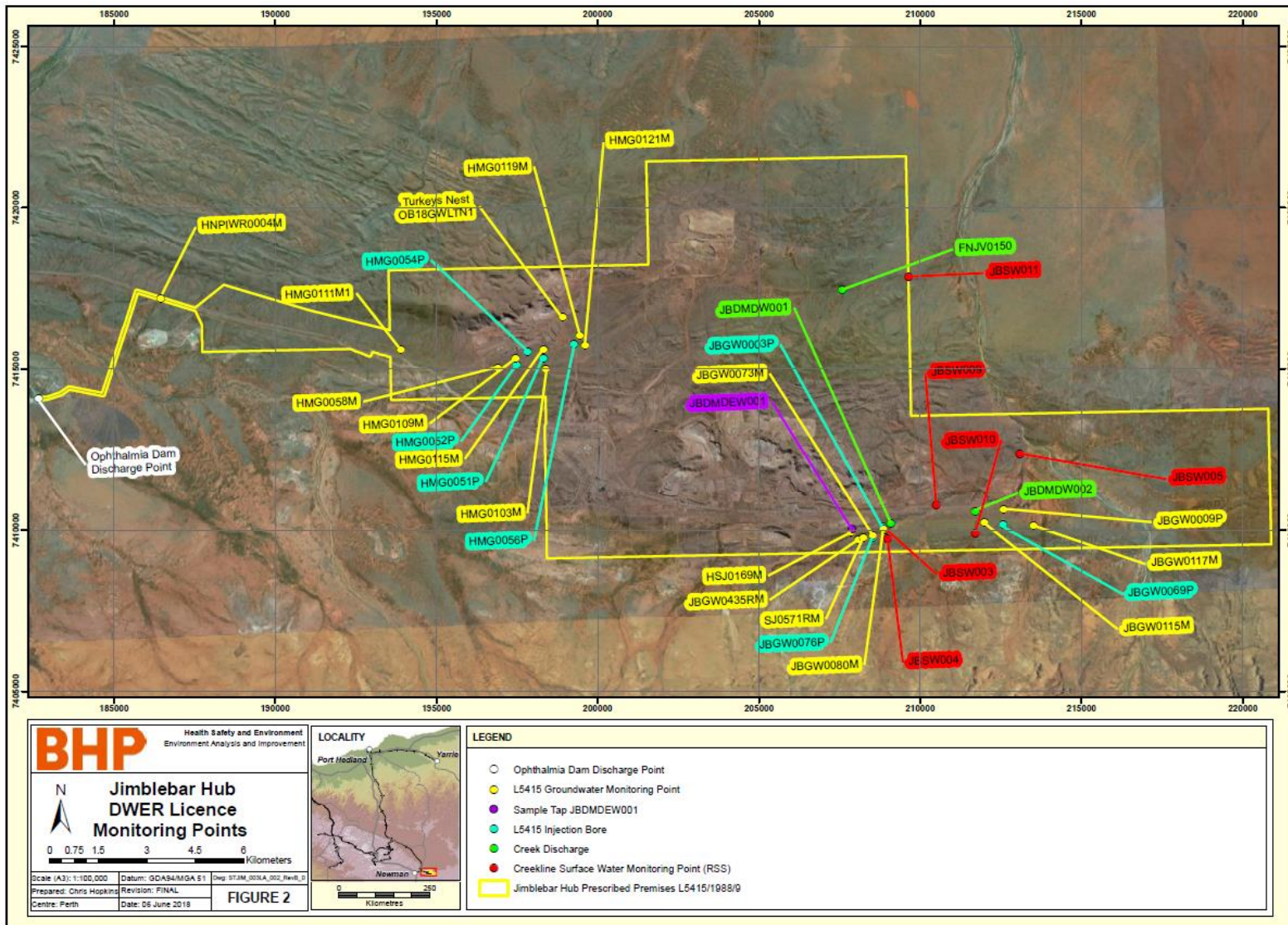
Table 3.3.1: Monitoring of point source emissions to groundwater			
Emission point reference	Parameter	Units	Frequency
<u>Jimblebar</u> JBGW0076P JBGW0003P JBGW0069P <u>Orebody 18</u> HMG0051P HMG0052P HMG0054P HMG0056P OB18MAR05 OB18MAR06 OB18MAR07 OB18MAR08 OB18MAR09 OB18MAR10 OB18MAR11	Water Level	mbgl	Monthly (when reinjecting)
	Cumulative Volume	kL	
	Flow rate	L/s	
<u>Jimblebar</u> JBDMDEW001 (Main pipeline sample point) <u>Orebody 18</u> HMG0051P HMG0052P HMG0054P HMG0056P OB18MAR05 OB18MAR06 OB18MAR07 OB18MAR08 OB18MAR09 OB18MAR10 OB18MAR11	Electrical Conductivity	µS/cm	Quarterly (when reinjecting)
	pH ¹ , Total Dissolved Solids, Total Suspended Solids, Al, As, B, Ba, CaCO ₃ , Cd, Ca, Cl, Cr, Cu, F, Fe, Pb, Mg, Mn, Hg, Mo, Ni, NO ₃ , K, Se, SiO ₂ , Na, SO ₄ , Zn, HCO ₃ , Alkalinity	mg/L	

8. The Premises map titled 'DWER Licence Infrastructure' has been deleted and replaced with the map shown below. The Map now shows the location of the new Orebody 31 Inert Landfill and the second zone for reinjection bores.



L5415/1988/9

9. The Map of emission points and monitoring locations located in Schedule 1 has been deleted and replaced with the map shown below.



L5415/1988/9

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Application to amend the Jimblebar Hub Environmental Licence L5415/1988/9, Licence Amendment form and supporting documentation (Including information relating to Attachments 1 to 10), August 2018	BHP, 2018	DWER records (A1718909)
2	Application to amend the Jimblebar Hub Environmental Licence L5415/1988/9, Licence Amendment form, Category 12, October 2018	BHP, 2018b	DWER records (A1728480)
3	Environmental impact assessment for troglofauna at Orebody 18 hub. Prepared for BHP Billiton Iron Ore Pty Ltd.	Bennelongia, 2004	Provided by applicant
4	EPA Report 1371, October 2010 (Wheellarra Hill open pit extension and development of South Jimblebar and Hashimoto deposits, and to increase the ore processing capacity to 75 mtpa)	EPA Report 2010	http://www.epa.wa.gov.au/sites/default/files/EPA_Report/Report%201371%20Jimblebar%20EPS%20181010.pdf
5	SKM,2009,Jimblebar Iron Ore Project Air Quality and Greenhouse Gas Impact Assessment. Report prepared for BHP Billiton Iron Ore.	SKM, 2009	DWER records (A1739181)
6	SVT Engineering Consultants, 2009, Environmental Noise Impact Assessment for Jimblebar Iron Ore Project, Report Prepared for BHP Billiton Iron Ore.	SVT, 2009	DWER records (A1739180)
7	Ministerial Statement 857	MS 857	accessed at www.epa.wa.gov.au/
8	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	n/a	accessed at www.dwer.wa.gov.au
9	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.		
10	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.		